Digital Games as Tools for Scholarly Research, Communication and Pedagogy

Jon Saklofske
Welcome to DHSI 2018!

Thanks for joining the DHSI community!

In this booklet, you will find essential course materials prefaced by some useful information about getting settled initially at UVic, finding your way around, getting logged in to our network (after you’ve registered the day before our courses begin), and so on.

Given our community’s focus on things computational, it will be a surprise to no one that we might expect additional information online for some of the classes - your instructors will let you know - or that the most current version of all DHSI-related information may be found on our website at dhsi.org.

To access the DHSI wifi network, simply go into your wireless settings and connect to the “DHSI” network and enter the password “dhsi2018”.

And please don’t hesitate to be in touch with us at institut@uvic.ca or via Twitter at @AlyssaA_DHSI or @DHInstitute if we can be of any help ....
The 2018 schedule is just about ready! A very few things to confirm, add, etc, but this is the place to be to find out what is happening when / where ...

Psst: Some Suggested Outings

If you’re here a day or two before we begin, or staying a day or two afterwards, here are a few ideas of things you might consider doing ....

▼ Suggested Outing 1, Botanical Beach (self-organised; car needed)

A self-guided visit to the wet, wild west coast tidal shelf (and historically-significant former research site) at Botanical Beach: we recommend departing early (around 8.00 am) to catch low tide for a better view of the wonderful underwater life! Consider bringing a packed lunch to nibble-on while looking at the crashing waves when there, and then have an afternoon drink enjoying the view from the deck of the Port Renfrew Hotel.

▼ Suggested Outing 2, Butchart Gardens (self-organised)

A shorter journey to the resplendently beautiful Butchart Gardens and, if you like, followed by (ahem) a few minutes at the nearby Church and State Winery, in the Saanich Peninsula. About an hour here by public bus from UVic, or 30 minutes by car.

▼ Suggested Outing 3, Saltspring Island (self-organised; a full day, car/bus + ferry combo)

Why not take a day to explore and celebrate the funky, laid back, Canadian gulf island lifestyle on Saltspring Island. Ferry departs regularly from the Schwartz Bay ferry terminal, which is about one hour by bus / 30 minutes by car from UVic. You may decide to stay on forever ....

▼ Suggested Outing 4, Paddling Victoria's Inner Harbour (self-organised)

A shorter time, seeing Victoria’s beautiful city centre from the waterways that initially inspired its foundation. A great choice if the day is sunny and warm. Canoes, kayaks, and paddle boards are readily rented from Ocean River Adventures and conveniently launched from right behind the store. Very chill.

▼ And more!

Self-organised High Tea at the Empress Hotel, scooter rentals, visit to the Royal BC Museum, darts at Christies Carriage House, a hungry breakfast at a local diner, whale watching, kayaking, brew pub sampling (at Spinnaker's, Swans, Moon Under Water, and beyond!), paddle-boarding, a tour of used bookstores, and more have also been suggested!

Sunday, 3 June 2018 [DHSI Registration + Suggested Outings]

If you’re here a day or two before we begin, or staying a day or two afterwards, here are a few ideas of things you might consider doing ....

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Monday, 4 June 2018

Your hosts for the week are Alyssa Arbuckle, Ray Siemens, and Dan Sondheim.

7:45 to 8:15  
Last-minute Registration (MacLaurin Building, Room A100)

8:30 to 10:00  
Welcome, Orientation, and Instructor Overview (MacLaurin A144)
10:15 to Noon

Classes in Session (click for details and locations)

- 1. [Foundations] Text Encoding Fundamentals and their Application (Cornett A128, Classroom)
- 3. [Foundations] Making Choices About Your Data (MacLaurin D109, Classroom)
- 4. [Foundations] DH For Department Chairs and Deans (Hickman 120, Classroom)
- 5. [Foundations] Introduction to Javascript and Data Visualization (Clearihue D132, Classroom)
- 6. [Foundations] Introduction to Computation for Literary Criticism (Clearihue A105, Lab)
- 7. Out-of-the-Box Text Analysis for the Digital Humanities (Human and Social Development A160, Lab)
- 8. Sounds and Digital Humanities (MacLaurin D111, Classroom)
- 9. Digital Humanities Pedagogy: Integration in the Curriculum (MacLaurin D016, Classroom)
- 10. Text Processing - Techniques & Traditions (McPherson Library A003, Classroom)
- 11. 3D Modelling for the Digital Humanities and Social Sciences (MacLaurin D010, Classroom)
- 12. Conceptualising and Creating a Digital Edition (MacLaurin D103, Classroom)
- 13. Visualizing Information: Where Data Meets Design (MacLaurin D107, Classroom)
- 14. Introduction to Electronic Literature in DH: Research and Practice (MacLaurin D115, Classroom)
- 15. Race, Social Justice, and DH: Applied Theories and Methods (MacLaurin D105, Classroom)
- 16. XML Applications for Historical and Literary Research (Clearihue A103, Lab)
- 17. Digital Humanities Multimedia (Human and Social Development A150, Lab)
- 18. Introduction to IIIF: Sharing, Consuming, and Annotating the World’s Images (MacLaurin D114, Classroom)
- 19. Digital Games as Tools for Scholarly Research, Communication and Pedagogy (MacLaurin D110, Classroom)
- 20. Web APIs with Python (Human and Social Development A170, Lab)
- 21. Ethical Data Visualization: Taming Treacherous Data (MacLaurin D101, Classroom)
- 22. Digital Publishing in the Humanities (Clearihue D131, Classroom)
- 23. Linked Open Data and the Semantic Web (Clearihue D130, Classroom)
- 24. Introduction to iIIF: Sharing, Consuming, and Annotating the World’s Images (MacLaurin D114, Classroom)
- 25. Feminist Digital Humanities: Theoretical, Social, and Material Engagements (Cornett A229, Classroom)
- 26. The Frontend: Modern JavaScript & CSS Development (Clearihue A030, Lab)

12:15 to 1:15

Lunch break / Unconference Coordination Session (MacLaurin A144)
(Grab a sandwich and come on down!)

Undergraduate Meet-up, Brown-Bag (details via email)

1:30 to 4:00

Classes in Session

Institute Panel: Perspectives on DH (or, #myDHis ...)
Chair: Alyssa Arbuckle (U Victoria)
(MacLaurin A144)

- Milena Radzikowska (Mt Royal C): “Release the Kraken: Story-Driven Prototyping for the Digital Humanities.”
  Abstract: I have spent the last 15 years of my career designing text analysis tools for use by humanities scholars. In this brief presentation, I propose to share a concept-based approach to interface design for DH.

- Emily Murphy (U Victoria): “#MyDHIs Edgy.”
  Abstract: I will build upon—or, possibly, perform a misprision of—a tweet by Polina Vinogradova; “#myDHIs messy, dusty, edgy, and radically inclusive!” Vinogradova evokes the mess and dust of the archives, the edges that connect nodes of a network, and the political impetus to think of cultural history and community together. I argue that these aspects of DH have a renewed importance as we head into a moment of feminist historiography.

- Margaret Konkol (Old Dominion U): “Prototyping Mina Loy’s Alphabet with a 3D Printer.”
  Abstract: This talk discusses the interpretive and methodological implications of using 3D printing technologies to prototype the archival diagrams of a proposed but never constructed plastic segmental alphabet letter kit——a game designed by modernist poet Mina Loy for F.A.O Schwarz. Although intended as a toy for young children, “The Alphabet that Builds Itself,” as a work of “object typography” articulates a theory of language as kinetic, geometric, recombinant, and open to mutation. Alphabetic segments extend into the x, y, and z coordinates in exponential iterations and conjoin with magnets. Combining elements of contemporaneous typefaces like Futura and Gill Sans, which represented modernity’s functional ideals and democratic principles of simplicity, these recombinant letters represent, as this talk argues, Loy’s unpublished modernist poem, an articulation of Loy’s concept of language as a physical fact in which substance, not just form, is semantic.

4:10 to 5:00

- Lee Zickel (Case Western Reserve U): “Comfortably Trepid.”
  Abstract: #myDHIs found outside the well-established, DH-friendly institutions, at an institution that is devoted predominantly to Medicine and Engineering, I, and with increasing frequency other DH practitioners and instructors, am not positioned in a DH Lab or Humanities Center, but in ITS. Part teacher, part technologist, part translator, I will briefly discuss my work supporting humanists and social scientists, particularly those who are new to or less comfortable with computational methodologies.

- Dorothy Kim (Vassar C): “#MyDHIs Antifascist.”
  Abstract: I’ve spent a lot of time in the last 12 months thinking about fascism, digital humanities, its long histories, and what it means to do DH work that centers social justice particularly in this global rise of late fascism. I will speak briefly about DH’s history, including the medieval history related to Busa but how that history really connects to data systems that created the Holocaust and also participated in the Cold War nuclear military complex.
Randa El Khatib (U Victoria): "Learning from the Iterative Process."
Abstract: #MyDHis Iterative. In addition to the improvements that come with iterative projects, the iterative process itself is a fruitful area for scholarly inquiry. Within this iterative context, the various teams that I work with and I have been reflecting on and rethinking central DH practices, such as what it means to collaborate, prototype, remix, and implement DH values in our work. In this talk, I will present the various lessons learnt along the way.

Sarah Melton (Boston C): "#MyDHis...People."
Abstract: Taking seriously Miriam Posner’s exhortation to “commit to DH people, not DH projects,” I invite us to reflect on how people are the core of DH. In this brief talk, I will explore the intersections between DH, labor, and infrastructure.

5:00 to 6:00
Opening Reception (University Club)
We are grateful to Gale Cengage for its sponsorship.

Tuesday, 5 June 2018

9:00 to Noon
Classes in Session

12:15 to 1:15
Lunch break / Unconference
"Mystery" Lunches
▼ DHSI Lunchtime Workshop Session (click for workshop details and free registration for DHSI participants)
◆ 73. Introduction to ORCID (Digital Scholarship Commons, Classroom).

1:30 to 4:00
Classes in Session

▼ DHSI Colloquium Lightning Talk Session 1 (MacLaurin A144)
Chair: James O’Sullivan
◆ New Modes of DH and Archival Skills Acquisition in a Graduate Public History Course. Paulina Rousseau (Ryerson U)
◆ Walking a Transect: Exploring a Soundscape. John Barber (Washington State U)
◆ Centering the Edge Case: Designing Services for Humanities Data Research. Grace Afsari-Mamagani (New York U)
◆ Orwellian Vocabulary and the 21st-Century Politics. Ilgin Kizilgunesler (U Manitoba)
◆ Making Open Data from a Gray Archive. Sara Palmer (Emory U)

4:15 to 5:15
DHSI Colloquium Lightning Talk Session 2 (MacLaurin A144)
Chair: James O’Sullivan
◆ Visual Recognition of Symbolic and Natural Patterns. Alexandra Branzan Albu (U Victoria)
◆ The Future of DH Learning: A New Model. Nathan Waddell (University of Victoria)

6:00 to 8:00
DHSI Newcomer’s Beer-B-Q (Felicitas, Student Union Building)

Wednesday, 6 June 2018

9:00 to Noon
Classes in Session

Lunch break / Unconference
"Mystery" Lunches
▼ Brown Bag Lecture: Alexandra Branzan Albu (U Victoria): "Visual Recognition of Symbolic and Natural Patterns" (Digital Scholarship Commons, 3rd Floor McPherson Library)

Abstract: Image-based object recognition is a visual pattern recognition problem; one may characterize visual patterns as either symbolic or natural. Symbolic patterns evolved for human communication; they include but are not limited to text, forms, tables, graphics, engineering drawings etc. Symbolic patterns vary widely in terms of size, style, language, alphabet and fonts; however, literate humans can easily compensate for this variability and instantly recognize most symbolic patterns. On the other hand, natural patterns characterize images of physical structures; they often lack the intrinsic discriminability and structure of symbolic patterns, and vary widely in terms of pose, perspective, and lighting.

This lecture will explore similarities and differences in approaches designed for recognizing visual and symbolic patterns, and will address the following questions via examples.
- What are the distinctive characteristics of natural patterns? What dimensions of variability can we infer?
- What are the distinctive characteristics of symbolic patterns? What dimensions of variability can we infer?

Alexandra Branzan Albu is an Associate Professor with the Department of Electrical and Computer Engineering and cross-listed with Computer Science. Her research interests are related to image analysis, computer vision, and visual computing. She is actively pursuing outreach activities dedicated to increasing the women's presence in electrical engineering and computer science.

1:30 to 4:00
Classes in Session
Thursday, 7 June 2018

9:00 to Noon
Classes in Session

12:15 to 1:15
UVIC Library/ETCL lunchtime talk: “A Humanities Application of 3D printing and Machine Translation in the ChessBard and Loss Sets” by Dr. Aaron Tucker
Digital Scholarship Commons, 3rd floor, Mearns Centre for Learning / McPherson Library
Bring your lunch and come on up!

[Instructor lunch meeting]

1:30 to 4:00
Classes in Session

4:15 to 5:15
DHSI Colloquium Lightning Talk Session 3 (MacLaurin A144)
Chair: James O’Sullivan
- Documenting Deportation: A Collaborative Digital Collection. Paulina Rousseau (Ryerson U)
- Unleashing the Power of Texts as Networks: Visualizing the Scholastic Commentaries and Texts Archive. Jeffrey Witt (Loyola U Maryland) and Drew Winget (Stanford U)
- #haunteDH: Punching holes in the International Busa Machine Narrative. Arun Jacob (McMaster U)
- Text in World: Computational Analysis of Trauma in Genocide Narratives. Nanditha Narayananmooorthy (U York) and Krish Perumal (U Toronto)

7:30 to 9:30
(Groovy?) Movie Night (MacLaurin A144)

Friday, 8 June 2018 [DHSI; DLFxDHSI Opening]

9:00 to Noon
DHSI Classes in Session

12:15 to 1:15
DHSI Lunch Reception / Course E-Exhibits (MacLaurin A100)

1:00 to 2:00
DLFxDHSI Registration (MacLaurin A100)

1:30 to 1:50
[DHSI] Remarks, A Week in Review (MacLaurin A144)

2:00 to 3:00
Joint Institute Lecture (DHSI and DLFxDHSI):
Chair: Lisa Goddard (U Victoria)
(MacLaurin A144)

Abstract: The basic constitution of our digital collections becomes vastly more important in the face of two understandings: first, that archives of modernity are archives of the sixth great mass extinction of life on our planet; and next, that we no longer steward cultural heritage for human readers alone. In the same way that we people are shaped by what we read, hear, and see, the machine readers that follow us into and perhaps beyond the Anthropocene have begun to learn from “unsupervised” encounters with our digital libraries. What will we preserve for the living generations and artificial intelligences that will come? What do we neglect, or even choose to extinguish? And from an elegiac archive, a library of endings, can we create forward-looking, speculative collections--collections from which to deep-dream new futures? The most extra/ordinary power we possess is the power to make poetry from records of the past. Could it be called on, one day, to reconstitute the world?
3:30 to 5:00

Joint Reception: DHSI and DLFxDHSI (University Club)
DLFxDHSI Poster/Demo Session

- DHSI Colloquium Poster/Demo Session
  - Mediers as a Colonialist Artifact in Menzies’ Journal. Paula Johanson (U Victoria)
  - Camp Edit: the Institute for the Editing of Historical Documents. Nikolaus Wasmöen (Association for Documentary Editing, U Buffalo), Jennifer Stertzter (Association for Documentary Editing, U Virginia), and Cathy Moran Hajo (Association for Documentary Editing, Ramapo C)
  - A Digital Archaeology of Life in Cleveland’s Depression-Era Slums. Charlie Harper (Case Western Reserve U) and Jared Bendis (Case Western Reserve U)
  - Feminist Pest Control: controlling and not controlling nonhuman pests. Lindsay Garcia (C of William and Mary)
  - Legends of the Buddhist Saints. Jonathan S. Walters (Whitman C) and Dana Johnson (Freelance Web Developer)
  - Accessibility in Digital Environments Via TEI-Encoded Uncontracted Braille. Gia Alexander (Texas A&M U)
  - Translation3point0: Why Literary Translation Data Matters. Katie King (U Washington)
  - PoéticaSonora: A Digital Audio Repository Prototype for Latin American Sound Art and Poetry. Aurelio Meza (Concordia U)
  - Beauty and the Book: Pre-Raphaelite Artistic Practice Contained. Josie Greenhill (U Victoria)
  - Poetic Procedures/Digital Deformances. Corey Sparks (California State U, Chico)
  - Miranda, the Folger Shakespeare Library’s new Digital Asset Platform. Meaghan Brown (Folger Shakespeare Library)
  - Living Song Project. Quinn Patrick Ankrum (U Cincinnati) and Elizabeth Avery (U Oklahoma)
  - Digital Frankenstein Variorum. Rikk Mulligan (Carnegie Mellon U)

Saturday, 9 June 2018 [DLFxDHSI + DHSI Conference and Colloquium]

8:30 to 9:00
DLFxDHSI Registration (MacLaurin A100)

9:00 to 5:30
DLFxDHSI UnConference Sessions

- DHSI All Day Workshop Session (click for workshop details and free registration for DHSI participants)

9:00 to 4:00

- 53. Building Your Academic Digital Identity (MacLaurin D105, Classroom)

- DHSI Colloquium Day Conference (MacLaurin A144)

Welcome

People I: Documenting Online Lives. Chair: Molly Nebiolo (University of New York)
  - Examining Gendered Harassment Online and in Silicon Valley. Andrea Flores (Utica College)
  - This is Just to Say I Have <X> the <Y> in your <Z>: Modernist Memes in an Era of Public Apology. Shawna Ross (Texas A&M University)

Break

People II: Documenting Lives Online. Chair: Dheepa Sundaram (College of Wooster)
  - Youtube Yoga and Ritual on Demand: The Virtual Economics of Hindu Soteriology. Dheepa Sundaram (College of Wooster)
  - The Resemblage Project: Creativity and Digital Health Humanities in Canada. Andrea Charise (University of Toronto) and Stefan Krecsy (University of Toronto)

Lunch

Projects I: Building and Analyzing. Chair: Yannis Rammos (New York University)
  - Building the ARTECHNE Database: New directions in Digital Art History. Marieke Hendriksen (Old Dominion University)
  - The Ineffective Inquisition: The Holy Office’s Sphere of Influence in Early Modern New Spain. Kira Homo (Pennsylvania State University)

Break

Projects II: Mapping and Visualizing. Chair: Innocent Opara (Qumet Institute)
  - Mapping Sarah Sophia Bank’s Numismatic Collection. Erica Hayes (North Carolina State University) and Kacie Wills (University of California, Riverside)
  - Text Mining and Visualizing 18th Century American Correspondence. Ashley Sanders Garcia (University of California, Los Angeles)

Break

Practices: Digital Scholarship on Campus and in the Classroom. Chair: Alyssa Arhuckle (University of Victoria)
**Sunday, 10 June 2018 [SINM + DHSI Registration, Workshops]**

8:30 to 9:00  
**Symposium on Indigenous New Media Registration** *(MacLaurin A100)*

9:00 to 5:00  
**DHSI Registration** *(MacLaurin A100)*

9:00 to 4:00  
**SINM Sessions**
- 63. Symposium on Indigenous New Media: Reading Group *(Hickman 105, Classroom)*
- 72. Symposium on Indigenous New Media: Indigitization *(Hickman 120, Classroom)*
  [Full details here](#)

9:00 to 4:00  
**DHSI All Day Workshop Sessions** *(click for workshop details and free registration for DHSI participants)*
- 53. Building Your Academic Digital Identity *(MacLaurin D105, Classroom)*
- 54. An Introduction to the Archaeology of 1980s Computing *(MacLaurin D114, Classroom)*

9:00 to Noon  
**DHSI AM Workshop Sessions** *(click for workshop details and free registration for DHSI participants)*
- 55. Regular Expressions *(MacLaurin D111, Classroom)*
- 56. 3D Visualization for the Humanities *(MacLaurin D010, Classroom)*
- 58. DH Fieldwork Methods *(MacLaurin D016, Classroom)*
- 60. Pedagogy of the Digitally Oppressed: Inculcating De-/Anti-/Post-Colonial Digital Humanities *(MacLaurin D107, Classroom)*
- 61. Introduction to #GraphPoem. Digital Tools for Poetry Computational Analysis and Graph Theory Apps in Poetry *(MacLaurin D101, Classroom)*
- 62. Creating a CV for Digital Humanities Makers *(MacLaurin D115, Classroom)*

1:00 to 4:00  
**DHSI PM Workshop Sessions** *(click for workshop details and free registration for DHSI participants)*
- 64. Agent-Based Modelling in the Humanities *(MacLaurin D111, Classroom)*
- 65. Unleash Linux on MacOS *(MacLaurin D010, Classroom)*
- 66. DHSI Knits: History of Textiles and Technology *(MacLaurin D016, Classroom)*
- 67. Crowdsourcing as a Tool for Research and Public Engagement *(MacLaurin D109, Classroom)*
- 69. Web Annotation as Critical Humanities Practice *(MacLaurin D103, Classroom)*
- 70. Dynamic Ontologies for the Humanities *(MacLaurin D107, Classroom)*
- 71. Social Media Research in the Humanities *(MacLaurin D101, Classroom)*

4:10 to 5:00  
**Joint Institute Lecture (DHSI and SINM):**
  - David Gaertner (U British Columbia): "A Landless Territory?: CyberPowWow and the Politics of Indigenous New Media."
  - Chair: Deanna Reder (Simon Fraser U) *(MacLaurin A144)*

- Digital Humanities in Latin American Studies: Cybercultures Initiative. Angelica Huizar *(Old Dominion University)*
- Making it Seem Easy: Interdisciplinary Team Defines and Measures DH interest at SUNY Oswego. Serenity Sutherland *(SUNY Oswego)*, Fiona Coll *(SUNY Oswego)*, Sarah Weisman *(SUNY Oswego)*, Candis Haak *(SUNY Oswego)*, and Mural Yasar *(SUNY Oswego)*
- ARL Digital Scholarship Institute. Sarah Melton *(Boston College)*

- Abstract: Following the 1997 launch of Skawennati’s (Mohawk) CyberPowWow, digital space has become a vital new territory for the resurgence of Indigenous storytelling and cultural practice: “We have signed a new treaty,” Cree artist Archer Pechawis wrote of this period, “and it is good. We have the right to hunt, fish, dance and make art at www.CyberPowWow.net, .org and .com for as long as the grass grows and the rivers flow.” This talk will critically explore the theoretical, cultural, political-economic, and gendered dynamics understudying the histories and futures of Indigenous new media. Particular attention will be given in examining the ways in which new media and digital storytelling connect to and support key issues in the field of Indigenous studies, such as sovereignty, self-determination, decolonization, and land rights.

After the day, many will wander to **Cadboro Bay** and the pub at **Smuggler’s Cove** OR the other direction to **Shelbourne Plaza** and **Mauve Hunter’s Pub** OR even into the city for a **bite to eat**.

**Monday, 11 June 2018 [DHSI + SINM]**
Your hosts for the week are Ray Siemens and Dan Sondheim.

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<th>Time</th>
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<td>Jordan Abel (Simon Fraser U): &quot;Indigeneity, Conceptualism, and the</td>
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1:30 to 4:00  Classes in Session

- DHSI Colloquium Lightning Talk Session 4 (MacLaurin A144)
  Chair: Lindsey Seatter
  - Mapping Indigenous and Chicana/o Environmental Imaginaries using GIS. Stevie Ruiz (California State U, Northridge), Quetzalli Enrique (California State U, Northridge), Enrique Ramirez (California State U, Northridge), and Tomas Figueroa (California State U, Northridge)
  - Doing DH with Graphic Narratives. John Barber (Washington State U)
  - "But is it any good?: A quantitative approach to the popularity of digital fanfiction. Suzanne Black (U Edinburgh)
  - The American Prison Writing Archive (APWA). Doran Larson (Hamilton C), Janet Simons (Digital Humanities Initiative, Hamilton C), and William Rasenberger (Hamilton C)

4:15 to 5:15

4:15 to 5:15

DHSI Colloquium Lightning Talk Session 5 (MacLaurin A144)
Chair: Lindsey Seatter
- Faraway, so close: Has the political environment really changed in Ecuador?. Luis Meneses (Electronic Textual Cultures Lab, U Victoria)
- Re-mixing Melville's Reading: Text Analysis of Marginalia with R and XSLT. Christopher Ohge (U London, School of Advanced Study) and Steven Olsen-Smith (Boise State U)
- Developing Interactive and Open-Source OER: Inquiry-Based Music Theory. Evan Williamson (U Idaho)
- Spatial Humanities and the Web of Everywhere. Ken Cooper (SUNY Geneseo)

6:00 to 8:00

DHSI Newcomer's Beer-B-Q (Felicitas, Student Union Building)

Wednesday, 13 June 2018

9:00 to Noon  Classes in Session

12:15 to 1:15

Lunch break / Unconference
"Mystery" Lunches

1:30 to 4:00  Classes in Session

- DHSI Colloquium Lightning Talk Session 5 (MacLaurin A144)
  Chair: Lindsey Seatter

4:15 to 5:15

4:15 to 5:15

- "Half Way There (yet again)!" [An Informal, Self-Organized Birds of a Feather Get-Together] (Felicitas, Student Union Building)
  Bring your DHSI nametag and enjoy your first tipple on us!

Thursday, 14 June 2018

9:00 to Noon  Classes in Session

12:15 to 1:15

Lunch break / Unconference
"Mystery" Lunches

1:30 to 4:00  Classes in Session

- DHSI Colloquium Lightning Talk Session 6 (MacLaurin A144)
  Chair: Lindsey Seatter

4:15 to 5:15

4:15 to 5:15

- Composition not Inheritance: Imagining a Functional Digital Humanities. Andrew Pilsch (Texas A&M U)
- Plotting Our Trajectories: Navigating, Situating, and Re-Inventing Research Topoi with R. Sean McCullough (Texas Christian University) and Jongkeyong Kim (Texas Christian U)
- Herb Simon and His Books. Avery Wiscomb (Carnegie Mellon U) and Daniel Evans (Carnegie Mellon U)
- (De/Re)Defining “The Digital”: A Decolonial Approach to Digital Humanities. Ashley Caranto Morford (U Toronto) and Arun Jacob (McMaster U)

7:30 to 9:30  (Groovier?) Movie(r) Night (MacLaurin A144)

Friday, 15 June 2018

9:00 to Noon  Classes in Session

12:15 to 1:15  Lunch Reception / Course E-Exhibits (MacLaurin A100)
Institute Lecture: William Bowen (U Toronto Scarborough): “Discovery, Collaboration and Dissemination: Lessons Learned and Plans for the Future” (MacLaurin A144)

Abstract: Much has changed and continues to change in digital humanities since the formal establishment of Iter in the Fall of 1997. However, the mandate of the not-for-profit partnership to support “the advancement of learning in the study and teaching of Middle Ages and Renaissance (400–1700) through the development and distribution of online resources” continues to have relevance. This presentation explores the striking challenges faced by Iter and presents our current thinking on the realization of this mandate for the future through a platform with a focus on facilitating the discovery of the academic resources necessary to our work; creating an environment for collaboration, sharing and developing projects; and on enabling the distribution and publication of our scholarship.

Awards and Bursaries Recognition
Closing, DSI in Review (MacLaurin A144)

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DHSI 2018: Digital Games as Interactive Tools for Scholarly Research, Communication, and Pedagogy

Instructor:
Jon Saklofske
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Description and Objectives:
Digital games are often studied as texts, as objects of research. However, given that games can function as simulations, models, arguments and creative collaboratories, game-based inquiry can be used as a potential method of humanities research, communication and pedagogy. This course will explore the ways that simple game environments can be used as research, reporting and teaching tools that involve broad communities of players and publics in creative problem solving, open social scholarship, scholarly communication, and engaged and immersive learning. Participants will be introduced to the affordances and constraints of multiple game types, including transmedia gaming, alternate reality games, vast narrative games and serious games. We will explore existing examples, discuss realistic planning, development and outcome logistics, and critically engage with the theoretical and practical implications of game-based scholarly engagement as participants work towards the development of their own prototypes (which may or may not be exclusively digital). Foundational and contextual talks, discussions, debates and explorations will be mixed with planning, playing, creating, and building.

Tentative Schedule:
(Material and topics may dynamically change to suit the interests of participants and the flow of discussion)
- Coursepack readings are indicated by **
- This collection of readings is symptomatic of my enthusiasm for the topic. As such, please consider the coursepack as a collection of foundational reference material for consideration during and after the course, not as a collection of texts that need to be comprehensively read during the week!

Monday: Defining games: parameters, play and purpose
Morning: (10:15-noon)
- Introductions: skills, experience, motivations, and interests
  - Small group formation (Research, Communication, or Pedagogy focus)
- Playing some game examples (TBA)
- Exploring and expanding definitions of games and play: Collective Discussion
  - **Luis Arata: “Reflections on interactivity” (pgs 5-15)
  - **Brian Sutton Smith: from “The Ambiguity of Play” (pgs 16-52)
  - **Ian Bogost, “Play is in Things” (53-63)
  - **Jan Klabbers “Classifying Games and Simulations” (pgs 64-78)
  - **Roger Caillois “The Classification of Games” (pgs 79-114)

Afternoon: (1:30-4:00)
- Extending ideas relating to critical making (Ratto) & carpentry (Bogost)
Tuesday: Games as research environments/tools
Morning: (9:00 – Noon)
• Methodological critique/ imagining research otherwise
  o **Jerome McGann “Books in N-Dimensional Space” (pgs 212-233)
• Using games as environments to generate data and experience
  o **Mary Flanagan “ Critical Play” (pgs 234-274)
  o **Mary Flanagan & Helen Nissenbaum “Values at Play” (pgs 275-303)
  o **Mary Flanagan, et al. “Failed Games” (pgs 304-316)
  o Erin Manning - 10 Propositions for Research-Creation video
  o **Jane McGonigal from “Reality is Broken” (pgs 317-394)
  o **Geoffrey Rockwell “Serious Games and Play” (pgs 395-405)
  o Emma Westecott “Games as research tools”
    (file in Google classroom)
  o **Pauline Sameshima research model (pg 406)
Afternoon: (1:30-4:00)
• Stranger Things: Ivanhoe as a provocative case study of playing at research
  o **Jerome McGann, Johanna Drucker, Bethany Nowviskie: “IVANHOE_ Education in a New Key” (pgs 407-409)
• ARGs and Transmedia Storytelling
  o Pokemon Go and other mobile games
  o Games for Change
  o World Without Oil
  o Folding@home
• Game jams as a research method
• Feminist war games prototypes

Wednesday: Games as scholarly communication and reporting tools
Morning: (9:00 – Noon)

- Through and beyond papers, monographs and conferences
- Open social scholarship
- Games vs. essays/articles
- **Bogost on Procedural rhetoric from “Persuasive Games” (pgs 410-442)
- **Frasca “Videogames of the Oppressed” from First Person (pgs 443-454)
- Games as persuasive arguments
  - Jeff Howard “Interpretative Quests in Theory and Pedagogy”
    - [http://digitalhumanities.org:8081/dhg/vol/1/1/000002/000002.html](http://digitalhumanities.org:8081/dhg/vol/1/1/000002/000002.html)

Afternoon: (1:30-4:00)

- **Kopas: Intro from “Videogames for Humans” (pgs 455-471)
- Tools: Twine, Unity, Renpy, Sequel/Chatfuel, Sketchup+Kubity
- Research and scholarly communication experiments with Twine
  - [https://www.onsequel.com/](https://www.onsequel.com/)
    - Sequel Bot Platform
  - [https://chatfuel.com/](https://chatfuel.com/)
    - Facebook chatbot creator.

Thursday: Games as teaching platforms

Morning: (9:00 – Noon)

- What are we trying to teach?
  - What are players?
  - Affordances and constraints
  - Problem solving, creativity and curiosity.
- Students as players; students as builders.
  - **Prensky “Computer Games and Learning” (pgs 472-499)
  - **Gee “36 learning principles” (pgs 500-507)

Afternoon: (1:30 – 4:00)

- My use of games in the classroom
  - Natural Daughter game
  - Twine games
- Anastasia Salter:
  - Board games
  - games in classrooms:
Friday: *Wrap Up*

Morning: *(9:00 – Noon)*

- Challenges
- Futures
- Iterations
- Sharing prototypes and projects
Rethinking Media Change
The Aesthetics of Transition

Edited by David Thorburn and Henry Jenkins
Associate Editor: Brad Seawell

The MIT Press
Cambridge, Massachusetts
London, England
Interactivity tends to evoke thoughts of digital media. In literature, digital interactivity is commonly associated with hypertext and more recently with cybertext. Hypertext gives the reader choices to branch out among chunks of text linked by multiple pathways. George Landow traces the origins of this term to Theodor Nelson, who used it in the 1960s to refer to non-sequential writing on a computer.\(^1\) Espen Aarseth looks beyond hypertexts to cybertexts which he defines as involving calculations in their production.\(^2\) Such explorations of other possible ways to generate literature open the question of the very nature of literature as a collection of fixed texts. Literature is moving from its origins in oral traditions to a future that we can hardly envision from current experiments in the new media. As for the arts, they are becoming harder to contain. Fixed objects are increasingly perceived as only fossilized traces of much broader ensembles, organic, in process. The objective nature of museums is turning fuzzy.\(^3\) More generally, Sherry Turkle observes that we are starting to move toward a culture of simulation.\(^4\) This is possible, she points out, because people are increasingly comfortable with substituting representations of reality for the real. How simulation is able to deal flexibly and creatively with the always problematic notion of reality, is perhaps one of the most important epistemological advances of our times.

Yet such developments overflowing traditional boundaries actually recall creative features which have been neglected and now resurface in new guises. The sense of interactivity that dominates the digital media stretches as far back as we care to look into the roots of human creation. The most deliberately interactive books span the ages, from the *I Ching* to Julio Cortázár’s *Hopscotch*. In many ways these books are beyond what computer driven texts achieve these days.\(^5\) In an entirely different cultural world, interactivity surfaces right from the start of the *Popol Vuh*, the ancient Maya book of creation, when a narratorial voice speaks of the text as a seeing instrument which can help the viewer understand clearly all there is. The notion of interactivity appears in
Aristotle’s notion of tragic catharsis and the pleasures of imitation described in the *Poetics*. I recounted in *The Festive Play of Fernando Arrabal* how theatre developed in ancient Greece as a festive medium using mainly episodic forms. This was a highly interactive mode of creation. It served as vehicle to interconnect performance, audience, and a pre-existing festive background. But this began to change as theatre detached itself from its active web of links. Aristotle rejected the episodic form in favor of the more sophisticated plot-structures which had started to emerge. The constraints of plots have in fact reduced the interactivity of theatre and literature. Such well-made frames tend to tame the imagination and narrow the field of expectations. However, they can enhance a game-like virtuosity through a mastery of specific rules, so that both authors and audiences can rely on artificial yet objectified expectations as marks of excellence.

Antonin Artaud used the medium of theatre in an intransitive mode, as incantation, to make what he envisioned as its double reveal itself. Political and philosophical literary texts use the medium in a more transitive way to communicate messages that could effect change. In the arts, André Malraux conceived museums without walls. He wished to see art works move beyond the boundaries of museum walls, and have art history establish dialogues across space and time. Malraux noted how Picasso was interested in the process of creation rather than in the final products. He quoted Picasso saying: “it’s always painting that wins in the end.” Picasso was satisfied by the certainty that, like cave painters, he had captured something with his creations. What it was, he could not tell. The object captured is not important. Framing only brings the work to an end. The process of interaction is essential for artists. It is now beginning to count for the museum as well.

The exploration of interactivity brings us back to the roots of literary and dramatic creation. It takes us beyond more classic issues such as Eco’s question of whether texts are to be used or interpreted. Interpretation becomes one of the many uses of texts, rather than being an alternative. Richard Rorty has already noted that a work of literature is neither a mirror of nature nor a fixed object, thus recalling many other uses of literature including its potential for simulation and modeling which are essentially interactive features. The issues that return when exploring interactivity, not surprisingly, are concerned with the play set in motion through the medium. As it turns out, these are pragmatic issues.

What is an interactive work? Without shutting the door on an open concept, we can say that interactivity points to active interrelations between players and mediums. The interactions can be of many types. The forms of interactivity tend to be as diverse as the
artists who make them possible. What the rise of new digital media has done is to widen the focus of interest beyond the object created, to the participation in a process of playing out a multitude of interactions. Interactivity in its most general form is a mode of creation, a way of being, a perspective. The basic characteristics of such a perspective can be grouped tentatively into four areas. An interactive approach favors the use of multiple points of view that can coexist even if they appear mutually exclusive; it celebrates the creative value of play; it is a catalyst for emergence; and it tends to be ultimately pragmatic.

Like a statue on a pedestal or a frozen oracle, the object of creation has been defined classically as something to contemplate. From an interactive perspective, this leaves most of the creation out of the picture. A first quality of an interactive perspective is that it opens multiple points of view through the blurring of boundaries of realities and objects once conveniently fixed. This shifts the emphasis away from the object and tilts it more toward the subject who perceives. Viewers interact with objects in a way that celebrates subjectivity and diversity. Multiple views of a common phenomenon can coexist even if they are mutually exclusive. Objects themselves can remain fuzzy and metamorphic.

The genial French mathematician Henri Poincaré provided a striking illustration of both classical and interactive views in the sciences. Poincaré used to say that when truth is reached, what remains to be done is to sit back and contemplate it. Truth, when perceived in detached, static terms, becomes a precious object that can only be admired from a distance. The world turns into a museum. Look but don’t touch.

Poincaré, however, had other more complex and contradictory views. The man who would sit back to contemplate also thought it was impossible to find truth in things in themselves. Truth hovered only in relations among things. He saw in the emergence of non-Euclidean geometries a clear indication of the ephemeral and arbitrary nature of theories: what mattered was not an ontology but convenience of use. He thought that failed theories left a valuable trace even as they vanished, and that trace had the scent of truth.

The second characteristic of an interactive perspective is that it favors open approaches that stimulate play. Unfortunately, the creative function of play at the adult level tends to be underestimated. In cultural studies, Johan Huizinga’s *Homo ludens* sparked an interest in play. It was published in 1938 when Herman Hesse was already at work in his novel *The Glass Bead Game*. Both writers situated play as a free activity deliberately outside of ordinary life. Huizinga saw play as an activity originating in the mind, distinct from all other forms of thought as a “second, poetic world alongside the world of nature.” In this realm of illusion, the mind is able to break down what Huizinga presupposed was “the absolute
determinism of the cosmos.” In a similar fashion, Hesse separated Castalia, the domain of the abstract, intellectual & artistic glass bead game, from the domain of sensuous, down-to-earth worldly life. But such view left out the interactive side of play. The ending of The Glass Bead Game highlights such conflict. It is precisely the dilemma that Magister Ludi Joseph Knecht faces toward the end of his career. He has reached the limits of the game and begins to find it an empty exercise, all too perfect and formulaic. The world, thought imperfect and chaotic from a Castalian point of view, begins to appear vaster and richer, full of change, history, struggles, and new beginnings. Knecht fears that the isolation of the Castalian game-culture might be its own doom because it has lost the capacity for further growth and change. Castalia has reduced interactivity to a minimum. The only variations allowed are brilliant new moves within the strict rules of the world-like Glass Bead Game. But these moves escape the ongoing changes that take place in the outside world. Knecht foresees that unless Castalia interacts with the world, it will come to an end. Such is the end of all systems that try to remain closed, and exhaust their possibilities.

Huizinga’s separation of play from “ordinary life” cuts along somewhat similar lines as Hesse’s but is more problematic. Whereas Hesse saw that life was the realm of change, Huizinga considered life fixed in its basic order. Chemist and Nobel laureate Ilya Prigogine bridged this gap and introduced the question of play directly into what Huizinga had imagined was an absolutely deterministic cosmos. Prigogine’s work in the area of complex systems explores a world that might function with both laws and play at the same time. In The End of Certainty, Prigogine pointed out that scientific laws formulated in traditional ways, describe an “idealized, stable world that is quite different from the unstable, evolving world in which we live.” He envisioned science hovering between “the two alienating images of a deterministic world and an arbitrary world of pure chance.”

Perhaps Jean Piaget offered the most functional definition of play. He presented play as a type of adaptive action understood in contrast to imitation. Adaptation to situations involves a combination of imitation and play. These two activities are the extremes in the spectrum of adaptive behavior ranging from accommodation to assimilation, respectively. When imitating, we accommodate ourselves to the outside model. But in play we undo the world, so to speak, and assimilate it to our preferences. Adaptation is reached through a balancing of these processes. A way to look at the spread of adaptive attitudes ranging from imitation to play is to gauge them in terms of interactivity: imitation minimizes interactivity, but interactivity increases the more play there is.

Marshall McLuhan used a temperature metaphor to distinguish between what we consider are interactive features. He distinguished between hot and cold media. He wrote
that hot media leave little to be filled or completed by the audience. Hot media are low in participation, and cool media are high in participation or completion by the audience. In this sense, the new interactive media is mostly cool.

Sherry Turkle prefers the metaphor of solidity to that of temperature. Cool media for her is soft. It allows for flexible, nonhierarchical interactivity. It embodies the notion of a decentered self. It facilitates bricolage and simulation. Along similar lines, Ian Hacking proposes that hard sciences tend to be indifferent because participation is excluded. Natural laws are supposed to be what they are independently of the observers. But social sciences, far softer, are interactive because there is change introduced by the very process of structuring the sciences. In other words, observations affect what is observed.

Many have already started to question the validity of the metaphorical division of the sciences into a range from hard to soft, noting that there is interaction and lack of objectivity even in physics, in the area of quantum mechanics, for example. The possibility of interactive emergence extends then to all areas of human research and creation. Much depends on how a medium is used rather than on the properties of the medium or on the discipline. As works like the *I Ching* or *Hopscotch* show, hot medium can be used in cool ways. Or, to put it differently, a hard science like physics has plenty of soft spots.

A third and perhaps the most unique feature of an interactive view is that it allows us to consider emergent phenomena without downgrading them by reductions. An emergent phenomenon cannot be predicted. Nor can it be entirely explained away a posteriori. Emergent phenomena are above all those that cannot be predicted by the behavior of their constituent parts. They happen as if on their own. Here we see the crucial role of interactivity. Only through the play or jiggling of interactivity is the stage set for emergent surprises. Marvin Minsky ranks intelligence as one of such surprises. In *The Society of Mind* he investigated how a mind could possibly emerge from an ensemble of mindless little parts. In writing the book, Minsky tried to simulate the process of emergence of possible solutions to the question of how a mind comes into being, by writing collections of short pieces and letting the parts conjure themselves into solutions. Emergent phenomena can be seen as successful yet unpredictable mutations. John Holland has even suggested that life itself may well be an emergent phenomena.

Concerning the digital media, Jim Gasperini has noted the emergence of an interactive aesthetic in the structural ambiguity which permeates decentered computer environments and the internet. He thinks this sense of interactivity is still in its infancy,
especially in the area of interactive games. But the development of more user-friendly interfaces and the way the Internet has broken down barriers so that every page is literally next to every other one in the world, are interactive breakthroughs which begin to show the extraordinary richness of the digital media. Eric Drexler suggested that a breakthrough in the order of the Gutenberg revolution has taken place with the advent of digital hypertext. The introduction of movable print made producing texts much easier. Now hypertext and its spread to the Internet, make searching for information incredibly fast and effective.21

The investigation of emergent phenomena is truly a new frontier of both the sciences and the arts. The two domains of human creation seem to join hands in this realm of exploration. Science has traditionally dealt with repetitive phenomena, whereas the arts have favored special events charming by their inspiring uniqueness. In the realm of emergence we begin to look into events which are neither regular nor unique. They are surprises that can be managed to happen but never coerced into predictable repetitions. What I suggest is that an interactive perspective helps us map more effectively this new frontier opening between chaos and total order.

The fourth broad characteristic of an interactive perspective is that it favors pragmatic views. Richard Rorty captured the spirit of pragmatism stating that it is the “refusal to believe in the existence of Truth, in the sense of something not made by human hands, something which has authority over human beings.” Pragmatism is a self-organizing, bootstrap-like approach.

Rorty pointed out that “the end of human activity is not to rest, but rather richer and better human activity.” He envisions solidarity as an expression of this human interactivity directed toward the goal of enhancing our lot in the world in an all-inclusive rather than exclusive way. The method of working in solidarity hinges on what Rorty calls a “new fuzziness” in which “objectivity” gives way to “unforced agreement.” The expression of this creative solidarity is democracy: “a conception which has no room for obedience to a nonhuman authority, and in which nothing save freely achieved consensus among human beings has any authority at all.” Following John Dewey, what Rorty stresses is the notion of interactive participation, of being an agent rather than a spectator.

From a pragmatic point of view, objectivity is an illusion. What Rorty proposes instead is to acquire habits of action to deal with the world. Pragmatic interactions should not force preconceptions on others. Agreements for action should come from reaching positions of solidarity and working toward common purposes freely chosen. In this sense, pragmatism favors a local flexibility. In the absence of absolutes, what works, works—within a context that by necessity must be local.
Rorty suggests that the reward for pragmatists is Dewey’s sense of democracy with its utopian possibilities and sense of hope. He believes that we can mitigate our finitude by self-creation rather than by invoking untenable and ultimately confining truths. This creative imagination begins with self-imagining: an inward interaction which gives rise to processes and models to interact with the world. The pragmatic high value of feedback, a deep concern with reflexivity, is perhaps the most critical navigating tool of a mature interactive perspective.

Finally, interactivity itself can be brought under focus. What does interactivity have to offer in its approach that we did not already have? I have suggested that it is best suited to deal with multiple perspectives, it invites emergence, offers a broader sense of play, and has a pragmatic outlook. In other words, an interactive view celebrates a constructive flexibility well suited for navigating in open, changing, or unknown environments. But such outlook also exposes us to the risks of the new, to sudden conflicts, disintegration, fragmentation, and other unpleasant surprises. When science is more open to the whims of the imagination it may be more vulnerable to ridicule. Literature may lose the greatness of canonical values. The message in the new media may turn out to be hollow, mindless. Creativity could be compromised. Minsky already warned that total interactivity leads to chaos. He argued in the appendix to *The Society of Mind* that insulators are needed just as much as interactive links.

Borders have shifted from autocratic theories to democracies of models. Politics are evolving from dogmatisms to networks of pragmatic solidarities. A drift in cultural plates is changing the artistic landscape. And as new architectures metamorphose the imagination, science also seems to overflow its banks and touch uncharted domains. The Internet is emerging as a model of constructive freedom to link with few insulations or barriers. Upon reflection, I suggest that these reconfigurations are best explored from an interactive perspective that moves us from teleology to play.

But an interactive perspective does not exclude other approaches. Its tendency toward decentering and autonomy does not negate hierarchical structures. This perspective is one more tool at our disposal, another creative instrument to enhance our flexibility. And in order to learn how to manage the initial anarchism of total interactivity, we must put to good use all the tools we have at hand. The development of new links is not enough. We must also develop new ways to manage those links. The development of flexible management tools is a critical and challenging part of our interactivity.

Finally, couldn’t we say that all creative works are always produced by interactions? Yes, to varying degrees, unless, of course, we think they originate from one-way divine inspiration, from the whispers of muses.
Notes


3. Robert Markley warns in *Virtual Realities and Their Discontents* (Baltimore: Johns Hopkins University Press, 1996) that the new media is not displacing the old ones. The book stresses that we must remain skeptical of the notion that a new form can place itself above what has come before. I agree. Virtual reality is a new modeling medium sprouting among the many others we already have. Any claim to transcend other forms of expression goes against the grain of an interactive perspective. Such claim would also be unproductive. The fascinating issue is not hierarchical, but how the new media interacts with previous ones and stimulates transitions.


5. Cortázar favored active readers rather than armchair ones, as he put it. *Hopscotch* celebrates his notion of interaction by inviting the reader to follow at least two paths through the text. Works that focus on plot are the least interactive in this sense. The interactive nature of Maya textuality is rather different in that readings are based on spiritual links with the text. Readings vary depending on the quality of such links. Texts are not fixed. The *I Ching* also contains this type of interactive quality of reading, although here it is enhanced with the throwing of sticks or coins to arrive at one of sixty-four hexagrams. Espen Aarseth noted the hypertextual nature of the *I Ching* and argued that it is the first expert system based on the principles of binary computing (Landow 1994, 64–65).

6. Luis O. Arata, *The Festive Play of Fernando Arrabal* (Lexington: University Press of Kentucky, 1982), 1. The episodic form reappeared during the revival of theatre in the Middle Ages, and has continued to crop up since then in many playful guises.

7. Such was the case with classical French tragedy made to follow neo-Aristotelian rules of time, place, and action. Shakespeare, fortunately, had enjoyed a much freer hand.


13. Ibid., 189.
16. This mirrors a solidity scale common in the sciences. Physics is considered the hardest discipline.
24. Ibid., 38.
THE AMBIGUITY OF PLAY

Brian Sutton-Smith

HARVARD UNIVERSITY PRESS
Cambridge, Massachusetts
London, England
Play and Ambiguity

A nip is but a nip
And a boojum
Is but a buttercup.
*after* Lewis Carroll

We all play occasionally, and we all know what playing feels like. But when it comes to making theoretical statements about what play is, we fall into silliness. There is little agreement among us, and much ambiguity. Some of the most outstanding scholars of children’s play have been concerned by this ambiguity. For example, classical scholar Mihael Spariosu (1989) calls play “amphibolous,” which means it goes in two directions at once and is not clear. Victor Turner (1969), the anthropologist, calls play “liminal” or “liminoid,” meaning that it occupies a threshold between reality and unreality, as if, for example, it were on the beach between the land and the sea. Geoffrey Bateson (1955), biologist, suggests that play is a paradox because it both is and is not what it appears to be. Animals at play bite each other playfully, knowing that the playful nip connotes a bite, but not what a bite connotes. In turn, Richard Schechner (1988), dramaturge, suggests that a playful nip is not only not a bite, it is also *not* not a bite. That is, it is a positive, the sum of two negatives. Which is again to say that the playful nip may not be a bite, but it is indeed what a bite means. Kenneth Burke’s works suggest that play is probably what he terms a “dramatistic negative,” which means that for animals who do not have any way of saying “no,” it is a way of indicating the negative through an affirmative action that is clearly not the same as that which it represents (thus, again, nipping rather than biting). He says
that prior to the evolutionary emergence of words, the negative
could be dramatized only by the presentation of stylized and gestural
forms of the positive (Burke, 1966, p. 423). “The most irritating
feature of play,” says Robert Fagen (1981), leading animal play theo-
rist, “is not the perceptual incoherence, as such, but rather that play
taunts us with its inaccessibility. We feel that something is behind it
all, but we do not know, or have forgotten how to see it.”

If we seek greater definitional clarity by analyzing the meaning of
ambiguity itself, following William Empson’s classic Seven Types of
Ambiguity (1955), then we can say that play involves all of his seven
types, which are as follows, with the play examples in parentheses:

1. the ambiguity of reference (is that a pretend gun sound, or are
   you choking?);
2. the ambiguity of the referent (is that an object or a toy?);
3. the ambiguity of intent (do you mean it, or is it pretend?);
4. the ambiguity of sense (is this serious, or is it nonsense?);
5. the ambiguity of transition (you said you were only playing);
6. the ambiguity of contradiction (a man playing at being a woman);
7. the ambiguity of meaning (is it play or playfighting?).

And finally, as if all these paradoxes were not enough, Stephen Jay
Gould, evolutionist, says that there are some human traits that are just
side effects of more fundamental genetic functions and really deserve
no functional explanation themselves. The quotation that heads this
chapter, and those in the chapters that follow, would suggest that, if
that is the case, there are nevertheless many interesting things about
our so-called junk genes. The quotations at the beginning of each
chapter also often bring up interesting rhetorics from much earlier
times. Many authors use children’s play as a metaphor for the ephe-
merality of life, for what quickly passes, or for what is innocent, infant-
tile, or foolish. Others who are quoted render adult life as a very
serious mortal game in which foul play is possible. The diversity of this
metaphoric playfulness would seem to suggest that, whether junk or
not, play takes on multiple forms in somber discourse.3

3Play-related quotations here and throughout the rest of this work are, for the most
part, from Bartlett’s Familiar Quotations, 16th ed. (Boston: Little, Brown, 1992) Playful
quotes, noted as “after” are of fictional status. Dr. Frech is frivolous.
This chapter is a search for some of the more obvious possible reasons for the ambiguity, as well as an introduction to the particular focus of the volume as a whole: the ideological underpinnings of play theories, and what an understanding of them can contribute to clearing up these confusions. The ambiguity is most obvious, however, in the multiple forms of play and the diversity of the kinds of play scholarship they have instigated. Obviously the word *play* stands for a category of very diverse happenings, though the same could be said about most omnibus categories, such as, for example, religion, art, war, politics, and culture.

The Diversity of Play Forms and Experiences

The diversity of play is well illustrated by the varied kinds of play that are to be found within the larger menagerie of the “play” sphere. Almost anything can allow play to occur within its boundaries, as is illustrated, for example, by works on tourism as play (McCannell, 1976), television as play (Stephenson, 1967), daydreaming as play (Caughey, 1984), sexual intimacy as play (Betcher, 1987), and even gossip as play (Spack, 1986). Travel can be a playful competition to see who can go to the most places or have the most authentic encounters. “Have you done London, the Eiffel Tower, Ayres Rock, Palmer Station, and Easter Island?” Watching television can be watching and identifying with other people at play, whether in fiction or in real life—and, after all, one can turn it off or on, which makes it like play and not like real life. Viewers can control their involvement just as if the “play” belongs to them, as in “playing” with the channels. Even the news, which is “live at five,” is only an account from a studio with theatrical backdrops. All of us carry dozens of characters around in our daydreams with whom we carry on imaginary encounters and conversations, none of which are real in the usual sense. Many of the characters in our heads are also people on television or in films, but most are everyday acquaintances. Sexual intimates are said to play with each other in innumerable ways, painting each other’s bodies, eating food off of each other, playing hide the thimble with bodily crevices, communicating in public with their own esoteric vocabulary, and, in general, teasing and testing each other with playful impropriety. Gossip,
by contrast, can be a playfully irreverent game of denigrating those who are not present.

A list of activities that are often said to be play forms or play experiences themselves is presented below. The terms illustrate the great diversity of play phenomena, although they do not indicate the even wider extension of informal play through all other spheres of life. This list itself awaits both adequate description and adequate play theorizing, because the items that it contains are often typically called by other names, such as entertainments, recreations, pastimes, and hobbies, as if it would be an embarrassment to admit that they can also be called play. Each of these states of mind, activities, or events could be described as has I have described with travel and gossip, above. The boundaries between them are never as discrete as listing them here might imply. They are arranged in order from the mostly more private to the mostly more public.

Mind or subjective play: dreams, daydreams, fantasy, imagination, ruminations, reveries, Dungeons and Dragons, metaphors of play, and playing with metaphors.

Solitary play: hobbies, collections, (model trains, model airplanes, model power boats, stamps), writing to pen pals, building models, listening to records and compact discs, constructions, art projects, gardening, flower arranging, using computers, watching videos, reading and writing, novels, toys, travel, Civil War reenactments, music, pets, reading, woodworking, yoga, antiquing, flying, auto racing, collecting and rebuilding cars, sailing, diving, astrology, bicycling, handicrafts, photography, shopping, backpacking, fishing, needlework, quilting, bird watching, crosswords, and cooking.

Playful behaviors: playing tricks, playing around, playing for time, playing up to someone, playing a part, playing down to someone, playing upon words, making a play for someone, playing upon others as in tricking them, playing hob, putting something into play, bringing it into play, holding it in play, playing fair, playing by the rules, being played out, playing both ends against the middle, playing one’s cards well, playing second fiddle.

Informal social play: joking, parties, cruising, travel, leisure, dancing, roller-skating, losing weight, dinner play, getting laid, potlucks,
malls, hostessing, babysitting, Saturday night fun, rough and tumble, creative anachronism, amusement parks, intimacy, speech play (riddles, stories, gossip, jokes, nonsense), singles clubs, bars and taverns, magic, ham radio, restaurants, and the Internet.

Vicarious audience play: television, films, cartoons, concerts, fantasies, spectator sports, theater, jazz, rock music, parades (Rose Bowl, mummers’, Thanksgiving), beauty contests, stock-car racing, Renaissance festivals, national parks, comic books, folk festivals, museums, and virtual reality.

Performance play: playing the piano, playing music, being a play actor, playing the game for the game’s sake, playing New York, playing the fishes, playing the horses, playing Iago, play voices, play gestures, playbills, playback, play by play, player piano, playgoing, playhouses, playlets.

Celebrations and festivals: birthdays, Christmas, Easter, Mother’s Day, Halloween, gifting, banquets, roasts, weddings, carnivals, initiations, balls, Mardi Gras, Fastnacht, Odunde.

Contests (games and sports): athletics, gambling, casinos, horses, lotteries, pool, touch football, kite fighting, golf, parlor games, drinking, the Olympics, bullfights, cockfights, cricket, Buzkashi, poker, gamesmanship, strategy, physical skill, chance, animal contests, archery, arm wrestling, board games, card games, martial arts, gymnastics.

Risky or deep play: Caving, hang gliding, kayaking, rafting, snowmobiling, orienteering, snowballing, and extreme games such as bungee jumping, windsurfing, sport climbing, skateboarding, mountain biking, kite skiing, street luge, ultrarunning, and sky jumping.

The Diversity of Players, Play Agencies, and Play Scenarios

The ambiguity of play, as well as lying in this great diversity of play forms, owes some of its force to the parallel diversity of the players. There are infant, preschool, childhood, adolescent, and adult players, all of whom play somewhat differently. There are male and female players. There are gamblers, gamesters, sports, and sports players, and there are playboys and playgirls, playfellows, playful
people, playgoers, playwrights, playmakers, and playmates. There are performers who play music and act in plays and perhaps play when they paint, sing, or sculpt. There are dilettantes, harlequins, clowns, tricksters, comedians, and jesters who represent a kind of characterological summit of playfulness. There are even playful scholars, such as Paul Feyerabend (1995), Jacques Derrida (1980), and Mikhail Bakhtin (1981). Playful persons in literature and the arts are countless.

Then there is the diversity of multiple kinds of play equipment, such as balls, bats, goals, cards, checkers, roulettes, and toys. Practically anything can become an agency for some kind of play. The scenarios of play vary widely also, from playpens, playrooms, playhouses, and playgrounds to sports fields, circuses, parade grounds, and casinos. Again, while some playfulness is momentary, other kinds, with their attendant preparations, can last throughout a season (as in many festivals and team sports) and, in some cases, over periods of years, as in the World Cup and the Olympics. Play has temporal diversity as well as spatial diversity.

The Diversity of Play Scholarship

Although most people throughout history have taken for granted their own play, and in some places have not even had a word for it, since about 1800 in Western society, intellectuals of various kinds have talked more or less systematically and more or less scientifically about play, and have discovered that they have immense problems in conceptualizing it. Presumably this is in part because there are multiple kinds of play and multiple kinds of players, as described above. Different academic disciplines also have quite different play interests. Some study the body, some study behavior, some study thinking, some study groups or individuals, some study experience, some study language—and they all use the word play for these quite different things. Furthermore their play theories, which are the focus of this present work, rather than play itself, come to reflect these various diversities and make them even more variable.

For example, biologists, psychologists, educators, and sociologists tend to focus on how play is adaptive or contributes to growth, development, and socialization. Communication theorists tell us that
play is a form of metacommunication far preceding language in evolution because it is also found in animals. Sociologists say that play is an imperial social system that is typically manipulated by those with power for their own benefit. Mathematicians focus on war games and games of chance, important in turn because of the data they supply about strategy and probability. Thermonuclear war games, it appears, can be either a hobby or deadly serious. Anthropologists pursue the relationships between ritual and play as these are found in customs and festivals, while folklorists add an interest in play and game traditions. Art and literature, by contrast, have a major focus on play as a spur to creativity. In some mythology scholarship, play is said to be the sphere of the gods, while in the physical sciences it is sometimes another name for the indeterminacy or chaos of basic matter. In psychiatry, play offers a way to diagnose and provide therapy for the inner conflicts of young and old patients alike. And in the leisure sciences, play is about qualities of personal experience, such as intrinsic motivation, fun, relaxation, escape, and so on. No discipline is, however, so homogeneous that all its members are funneled into only one such way of theorizing. Nevertheless the diversity exists, and it makes reconciliation difficult.

Finally there are the ambiguities that seem particularly problematic in Western society, such as why play is seen largely as what children do but not what adults do; why children play but adults only recreate; why play is said to be important for children’s growth but is merely a diversion for adults. The most reviled form of play, gambling, is also the largest part of the national play budget. How can it be that such ecstatic adult play experiences, which preoccupy so much emotional time, are only diversions? And why do these adult play preoccupations, which seem like some vast cultural, even quasi-religious subconsciousness, require us to deny that this kind of play may have the same meaning for children?

The Rhetorical Solution

It is the intent of the present work to bring some coherence to the ambiguous field of play theory by suggesting that some of the chaos to be found there is due to the lack of clarity about the popular cultural rhetorics that underlie the various play theories
and play terms. The word *rhetoric* is used here in its modern sense, as being a persuasive discourse, or an implicit narrative, wittingly or unwittingly adopted by members of a particular affiliation to persuade others of the veracity and worthwhileness of their beliefs. In a sense, whenever identification is made with a belief or a cause or a science or an ideology, that identification reveals itself by the words that are spoken about it, by the clothes and insignia worn to celebrate it, by the allegiances adopted to sustain it, and by the hard work and scholarly devotion to it, as well as by the theories that are woven within it (Burke, 1950). Authors seek to persuade us in innumerable ways that their choice and their direction of research or study is sound. These identifications of theirs, and their persuasiveness, implicit or otherwise, are the intellectual odor that is to be known here as their rhetoric. It needs to be stressed that what is to be talked about here as rhetoric, therefore, is not so much the substance of play or of its science or of its theories, but rather the way in which the underlying ideological values attributed to these matters are both subsumed by the theorists and presented persuasively to the rest of us. As the term is used here, the rhetorics of play express the way play is placed in context within broader value systems, which are assumed by the theorists of play rather than studied directly by them. Having said that, however, it must be admitted that it is still almost impossible to suppress the desire to ask the question: “Yes, all right, but what is play itself?”—an impulse that the reader needs to stifle for now, though it will not go untrifled with before this work is played out.

It follows that all the sciences, physical and social, whatever their empirical virtues, are presented here as being maintained by rhetorical means, whether these be seen optimistically, for example, as the “scientific attitude,” or somewhat more cynically, as the way in which disciplines, through controlling a knowledge base, enhance their own political power (Foucault, 1973). In what follows, the rhetorics that are the focus of this work will be called popular ideological rhetorics, and where necessary, these will be distinguished from what are called scientific or scholarly rhetorics, as well as from disciplinary rhetorics and personal rhetorics. The popular rhetorics are large-scale cultural “ways of thought” in which most of us participate in one way or another, although some specific groups will be more strongly
advocates for this or that particular rhetoric. The larger play rhetorics are part of the multiple broad symbolic systems—political, religious, social, and educational—through which we construct the meaning of the cultures in which we live. It should be made clear that I do not assume these value presuppositions to be necessarily in vain or negative, nor to be without considerable value to those committed to them. In fact, it is impossible to live without them. The issue is only whether, by becoming confused with our play theories, they set us in pursuit of false explanations or false grandiosity. One promise of such an analysis as I propose is that, by revealing these rhetorical underpinnings of the apparently diverse theoretical approaches to play, there is the possibility of bridging them within some more unifying discourse. *The Recovery of Rhetoric* (Roberts and Good, 1993) offers much optimism for the possibilities of a more genuinely interdisciplinary organization of any subject matter, not excluding that of play. However, opinion has to be reserved on the integrating promise of rhetorical analysis until there is an examination of the present popular rhetorics specific to play and their interaction with the scholarly studies that have arisen around them. It is just as possible that the rhetorics, when explicated, will be revealed to be themselves a deceptive gloss over other, far more fundamental cultural disagreements. For example, play’s supposed frivolity may itself be a mask for play’s use in more widespread systems for denigrating the play of other groups, as has been done characteristically throughout history by those of higher status against the recreations of those of lower status (Armitage, 1977).

**Seven Rhetorics**

The seven rhetorics to be presented in this work are characterized as follows.

*The rhetoric of play as progress,* usually applied to children’s play, is the advocacy of the notion that animals and children, but not adults, adapt and develop through their play (Chapters 2 and 3). This belief in play as progress is something that most Westerners cherish, but its relevance to play has been more often assumed than demonstrated. Most educators over the past two hundred years seem to have so needed to represent playful imitation as a form of children’s
socialization and moral, social, and cognitive growth that they have seen play as being primarily about development rather than enjoyment.

The rhetoric of play as fate (Chapter 4) is usually applied to gambling and games of chance, and it contrasts totally with the prior rhetoric. It is probably the oldest of all of the rhetorics, resting as it does on the belief that human lives and play are controlled by destiny, by the gods, by atoms or neurons, or by luck, but very little by ourselves, except perhaps through the skillful use of magic or astrology. This rhetoric enjoys only an underground advocacy in the modern world. It is no longer a widespread and conscious value system among the intellectual elites, though it remains popular among lower socioeconomic groups. It contrasts most strongly also with those modern theories of leisure that argue that the distinguishing feature of play is that it is an exercise of free choice.

The rhetoric of play as power (Chapter 5), usually applied to sports, athletics, and contests, is—like fate, community identity, and frivolity—a rhetoric of ancient hue. These four all predate modern times and advocate collectively held community values rather than individual experiences. Recently these ancient rhetorics have been given much less philosophical attention than the modern three, progress, the imaginary, and the self, though they are more deep seated as cultural ideologies. The rhetoric of play as power is about the use of play as the representation of conflict and as a way to fortify the status of those who control the play or are its heroes. This rhetoric is as ancient as warfare and patriarchy. It is an anathema to many modern progress- and leisure-oriented play theorists.

The rhetoric of play as identity, usually applied to traditional and community celebrations and festivals, occurs when the play tradition is seen as a means of confirming, maintaining, or advancing the power and identity of the community of players (Chapter 6). Chapter 7, in turn, deals with the place of the rhetorics of both power and identity in children’s play. Because so much twentieth-century attention has been given to children’s play as a form of progress, I have found it valuable to present a more balanced rhetorical advocacy of the character of their play from the point of view of these other rhetorics, power and fantasy, both in Chapter 7 and later in Chapter 9 on child phantasmagoria.
The rhetoric of play as the imaginary (Chapter 8), usually applied to playful improvisation of all kinds in literature and elsewhere, idealizes the imagination, flexibility, and creativity of the animal and human play worlds. This rhetoric is sustained by modern positive attitudes toward creativity and innovation. Chapter 9, on child phantasmagoria, attempts to moderate some of this idealization by indicating the large amounts of inversion and irrationality that are also a typical part of play's flexibility. The rhetoric of progress, the rhetoric of the self, and the rhetoric of the imaginary constitute the modern set of rhetorics, with a history largely elaborated ideologically only in the past two hundred years.

The rhetoric of the self (Chapter 10) is usually applied to solitary activities like hobbies or high-risk phenomena like bungee jumping, but it need not be so proscribed. These are forms of play in which play is idealized by attention to the desirable experiences of the players—their fun, their relaxation, their escape—and the intrinsic or the aesthetic satisfactions of the play performances. Here the central advocacies of the secular and consumerist manner of modern life invade the interpretations of play and are questioned because of their twentieth-century relativity.

The rhetoric of play as frivolous (Chapter 11) is usually applied to the activities of the idle or the foolish. But in modern times, it inverts the classic “work ethic” view of play, against which all the other rhetorics exist as rhetorics of rebuttal. But frivolity, as used here, is not just the puritanic negative; it is also a term to be applied more to historical trickster figures and fools, who were once the central and carnivalesque persons who enacted playful protest against the orders of the ordained world. This chapter is placed last in this work because of its largely reflexive character, as commentary on all the other rhetorics. Historically frivolity belongs with the ancient set that includes fate, power, and identity.

I should note that although each of these rhetorics is discussed in the singular, there are multiple variants within each category, so that it might be more proper to speak of the plural rhetorics throughout. To repeat, each is called a rhetoric because its ideological values are something that the holders like to persuade others to believe in and to live by. Much of the time such values do not even reach a level of conscious awareness. People simply take it for granted, for example,
that children develop as a result of their playing; or that sports are a part of the way in which different states and nations compete with each other; or that festivals are a way in which groups are bonded together; or that play is a desirable modern form of creativity or personal choice; or that, contrary to all of these, play is a waste of time. By seeing how the play descriptions and play theories can be tied in with such broad patterns of ideological value, one has greater hope of coming to understand the general character of play theory, which is the ultimate objective here.

A Scale of Rhetorics

These seven play rhetorics can be illuminated by contrasting them, on the one hand, with rhetorics that are broader than they are, and on the other, with rhetorics that are narrower. Of the broader kind are those that derive from beliefs about religion, politics, social welfare, crime, and morality—that is, from all the matters that priests, politicians and salespersons constantly harangue folks about. These are the rhetorics that fill the airwaves of daily life, in churches, in schools, and in the community. People cannot live without them, even if they often can't stand some of them. They constitute the incessant discourse about who we are and how we should live. The group of rhetorics for the particular subject matter play are of the same broad kind, being about progress and power, but they are more limited in the present usage because they are applied only to the specific subject of play theories. The rhetorics of science are generally of a narrower and more explicit kind. Science, after all, has its own epistemological rhetorics of reliability, validity, and prediction. Scholarship in general has its required consistency, coherence, and authenticicy. All of these scientific and scholarly tenets are also rhetorics, because they assume and propagate the view that there is a knowable world, or a knowable text, and then, acting as if that assumption is real (a hypothetical fiction), proceed to their methodological undertakings. As Pepper (1961) has shown, even philosophical scholars must make arbitrary distinctions about which part of the world they seek to study, some focusing on the structures or forms of reality, some on the causes of reality and behavior, others on the changing historical context in which these things occur, and yet
others on the kinds of integration or organicism that they can
discover. What is added here to any such “scientific” (play) rhetorics is
that the subject-matter rhetorics (those seven listed above) may be
able to suggest why the scientific rhetorics take the direction they
do—and also suggest why that direction may often have limitations
deriving not so much from the science or scholarship, but from the
presuppositions of the value systems in which the science is embed-
ded. Parenthetically, the present focus on such presuppositions is not
meant to suggest that “objective” social science is without value, or
that “objectivity” is not fruitful within the ideological frames being
presented. My aim here is much more modest, it seeks only for the
sources of ambiguity in play rhetoric.

In the past several decades the claims of scholarship or science for
sheer objectivity have been frequently challenged. The limitations of
the claims for scholarly literature’s independence from propaganda
are challenged by Burke in such works as The Rhetoric of Motives
(1950) and Language as Symbolic Action (1966). The same orienta-
tion is made a criticism of general scientific objectivity by Kuhn’s now
famous The Structure of Scientific Revolutions (1970), in which he points
out the role played by human motivation in the development of
science, particularly in respect to the way in which accepted theories
often are not displaced until a new generation of thinkers finds them
irrelevant. Science is not as cumulative or as autonomously objective
in the growth of its knowledge as has often been supposed. But the
roots of the present enterprise can be found in the work of many
other scholars as well, from Wittgenstein’s emphasis on the meaning
of language relying on its context of usage, for example, to Foucault’s
stricture that knowledge is always an exercise of power, never merely
information. Those who create information are those who decide
how others shall think about their lives. Leading play theorists who
quite explicitly see themselves talking about the rhetorics of play in
order to talk about play theory at all include Helen Schwartzman
(1978), Margaret Duncan (1988), and Mihail Spariosu (1989).

Between the historically based subject-matter rhetorics that will be
presented here (progress, power, and so on) and the most general
scientific epistemological rhetorics, which involve, for example, the
metaphysical assumptions underlying the expectancy of causal regu-
larities in nature, a host of other disciplinary rhetorics also play their
part in the amalgam that is social science. Elsewhere, for example, I have described rhetorics that are applied to childhood in modern life, with children variously being seen as: the child of god, the child as the future, the predictable child, the imaginary child, the child as consumer, and the gender androgynous child (Sutton-Smith, 1994c).

But the physical scientists are not immune to such rhetorics either, and there are disputes about how the public should interpret the personality of their science in the culture. These can be called questions about the ontological rhetorics of the scientists. They may be seen as “objective” or “cautious,” but at times they are also seen as rebels, subversives, Frankenstein’s, relentless creatures of reason, conquerors of nature, empirical reductionists, mathematical formalists, artists, philosophers, secular saints, or irresponsible devils. And as Dyson (1995) shows, these kinds of rhetorics, when personal to the scientists, make an enormous difference in the direction of their inquiries. One might conclude that all scholars are creatures of their personal disposition, which may become a motivating rhetoric for them, and they are also, historically, inheritors of larger ideological or cultural patterns that affect their scholarship. They are the legatees as well of the rhetorics of disciplinary assumptions and disciplinary methodologies.

What needs most emphasis at this initial point is that rhetorical involvement at some or all of these levels is inescapable. Scholarly objectivity always exists within such contexts as broad cultural rhetorics (political, religious, moral), disciplinary rhetorics (sciences, humanities, arts), epistemological rhetorics (validity, reliability, causalism, formism), subject-matter rhetorics (in the present case, play rhetorics), general ontological rhetorics (objectivity, scientific caution), and personal rhetorics (idiosyncratic dispositions).

Within the subject of the present inquiry (play), the major emphasis is on the way in which the theories within this scholarly domain are underlain by the seven rhetorics outlined above. As William Kessen, a leading scholar of such reflexive self-consciousness in developmental psychology, states that we should

recognize that, deeply carved into our professional intention is a desire to change the lives of our readers, to have them believe something that we believe. In grand nineteenth-century style, we
can call this the Unspoken Intention that is hidden by the wonderful devices all of us have learned to speak with the voice of certain authority . . . Our work is packed with our values, our intentions for our small part of the world: a great deal would be gained by a critical analysis and display of those intentions, [but] the governing principle for evidence in both psychology and history [is that] we do not seek proofs; we do not attempt demonstrations. We all want to tell plausible stories. (1993, p. 229)

Validating the Existence of the Seven Rhetorics

Though it is not difficult to assert in a general way that the science of play is underlain by these seven subject-matter narratives, or rhetorics, the assertion itself has fairly vague “scientific” or “scholarly” cogency without some criteria of coherence that can be used to affirm their presence. The criteria I use to frame the rhetorical contentions are as follows:

1. That the assumed seven rhetorics can be shown to have a clear basis in well-known cultural attitudes of a contemporary or historical kind. This historical context, although not dealt with in great detail here, is the most basic source of their cultural construction (Glassie, 1982).
2. That the rhetorics have their own specific groups of advocates, a necessary precondition if these phenomena are to be seen as not just narratives but also rhetorics of persuasion.
3. That each rhetoric applies primarily to a distinct kind of play or playfulness. If this is so, it suggests some kind of epistemological affinity between the rhetorics and their ludic subject matter. They are not accidentally correlated.
4. That each rhetoric applies primarily to distinct kinds of players.
5. That there is an affinity between the rhetoric and particular scholarly or scientific disciplines, and between particular play theories and play theorists.
6. That (following criteria 2 through 5), there is a “matching” interplay between the nature of the rhetorical assertions and the character of the forms of play to which they are applied. Thus a rhetoric of progress might find partial substantiation in the finding that
some kinds of skill during play can take “progressive” forms. In addition it may be possible to show that the rhetoric itself is often the way in which the play passes into the culture, because the play practice is thus justified ideologically. In this way, the two, play and rhetoric, have an impact on each other. The recommendation that the interplay between play and nonplay should be more carefully studied was made by the famous play theorist Erik Erikson in his book *Toys and Reasons* (1977). But this recommendation is also the constant beguilement of all those who study the interrelationships between play and nonplay to try to puzzle out how they reciprocally affect each other (Abrahams, 1977).

7. That the group that maintains the rhetoric benefits by the exercise of hegemony over the players, over their competitors, or over those who are excluded from the play. This postulate makes explicit why the present approach to play centers on the rhetorics of the theorists rather than, more simply, on the narratives they tell themselves. Rhetorics are narratives that have the intent to persuade because there is some kind of gain for those who are successful in their persuasion. Telling plausible stories would not be enough.

8. That the way in which the scholarly disciplines define the subject matter of play may or may not make sense in terms of the rhetorics that are being proposed in this work. This is open to investigation. Three kinds of play definitions will be considered where they are available:

(a) The definitions by players of their own *play experiences* and functions. What do the players reckon to be the character of and the reasons for their own participation? Obviously there is not much research to be referred to here, although there is a considerable amount of anecdotal opinion to be cited. It is useful to discover that there can be—and often is—very little relationship between the players’ own play definitions and those of the theorists.

(b) The definitions by theorists of *intrinsic play functions*. These are definitions drawn from the research literature, or new ones arising out of the present analysis, that are supposed to account scientifically for the play’s functioning by pointing to the players’ game-related motives for playing.
(c) The definitions by the theorists of *extrinsic play functions*, which account for the forms of play in terms of functions they are supposed to serve in the larger culture.

It is with the two last types of definitions (b and c) that this study is preoccupied. It is quite possible, for example, for players to have one rhetoric while "experts" have another. But it is also possible for experts to use one rhetoric when talking about the players' responses and another rhetoric when discussing theoretically what they think is the underlying function of the forms of play. A description of the players' enjoyments, after all, need not be the same as an account of the supposed adaptive functions of those enjoyments. More important, finding the relationship between accounts of play in terms of intrinsic and extrinsic functions is yet another way of talking about the interplay of play and nonplay. There is promise here of some clarification of the causalities of play and life.

As a final point of each chapter, it will be necessary to return to the issue of play's ambiguity, with which this work begins. My aim is to establish to what extent ambiguity is an outcome of the seven rhetorics, or if it must instead be attributed to the character of play itself.
Conclusion

No epilogue, I pray you, for your play needs no excuse. Never excuse.

*William Shakespeare*, *A Midsummer Night’s Dream*

This work begins with the announcement by experts that, theoretically speaking, play is difficult to understand because it is ambiguous. My focus is on the way in which these ambiguities are instigated by the seven systems of value here called the ideological rhetorics of progress, fate, power, identity, the imaginary, the self, and frivolity, and I offer reasons for claiming some valid internal coherence for each of these separate rhetorics, as well as for their ambiguous effects on the theories of play. In general each rhetoric has a historical source, a particular function, a distinctive ludic form, and specialized players and advocates, and is the context for particular academic disciplines. In addition its advocates and scholars manifest hegemonies both within their own form of play and toward other forms. Some of the connections that give the rhetorics their own distinctive validity are summarized in the accompanying table.

The rhetorics are a source of various kinds of ambiguity. Obviously no rhetoric (the arguments made about a play form) is totally identifiable with any play practice (the way the ludic form is played). But because the rhetoric is making a statement about the value of the play form, there is apt to be a conflation of the two. Those who make statements about the value of the play are inclined to imply that their statements are also descriptions of the behaviors
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<td>Turner, Falassi, De Koven, Abrahams</td>
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<tr>
<td>5. Imaginary</td>
<td>Romanticism</td>
<td>Creativity, flexibility</td>
<td>Fantasy, tropes</td>
<td>Actors</td>
<td>Art and literature</td>
<td>Bakhtin, Fagen, Bateson</td>
</tr>
<tr>
<td>6. Self</td>
<td>Individualism</td>
<td>Peak experience</td>
<td>Leisure, solitary, extreme games</td>
<td>Avant-garde, solitary players</td>
<td>Psychiatry</td>
<td>Csikszentmihalyi</td>
</tr>
<tr>
<td>7. Frivolity</td>
<td>Work ethic</td>
<td>Inversion, playfulness</td>
<td>Nonsense</td>
<td>Tricksters, comedians, jesters</td>
<td>Pop culture</td>
<td>Welsford, Stewart, Cox</td>
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</table>
or experiences taking place on the playing field. In some cases the
identification is very close, as when a child’s prank is itself the ex-
pression of the way in which the child embarrasses an adult figure.
Here the child’s hidden transcript (an implicit rhetoric) against
authority is made overt. In sport, the agonistic cries of exultation
over the opposition sometimes carry much the same attitude as
the actual physical or strategic contests between the opposing play-
ers. Similarly there can be a closeness between verbal jingoistic exu-
erances and the forms, costumes, and music of a martial parade.
Against all this, by contrast, it is clear that verbalizations about a
ludic experience are not the same as that experience. When the
adult says play is a developmental experience, for the child it may
be nothing but hide-and-seek. What the Puritan says is character-
destroying gambling may be, for the player, the one satisfying ex-
perience in the week. Because forms of play, like all other cultural
forms, cannot be neutrally interpreted, it is impossible to keep am-
biguity from creeping into the relationship between how they are
perceived and how they are experienced. The rhetorical informa-
tion in the preceding chapters certainly helps illuminate why there
are so many scholars of play with quite divergent theories about
what play actually is.

I cannot pass by this considerable exercise in the rhetorics of play,
however, only in terms of the ambiguities to which it gives rise. Are
the rhetorics of any other value? Roberts and Good (1993) hope that
knowing that the rhetorics are what science presupposes will lead to
a broader integration across disciplines and, in the present case, to a
decrease in ambiguity about their common subject matter, play. But
the present enterprise has been partly an unmasking of the tenden-
tiousness and hegemony of these rhetorics. If in consequence there
is less ambiguity about play, it would have to be because the sheer
irreconcilability of these different play complexes is clearer than it
was previously. From this study of some aspects of the way in which
rhetorics in general are influential within the scholarly disciplines
about play, it would have to be concluded that scholars also seem to
have in common, wittingly or not, the way they manipulate these
rhetorics to justify their own preoccupations with the different play
forms. It is not just that play is susceptible to these ideological value
systems but also that the scholars often need these rhetorics to license
their own authority over the kinds of play with which they are concerned. If the interpretations given here have any validity, then this volume makes scholars more alike, but largely because of their shared tendentiousness and their use of “objective methods” in highly self-rationalizing and narrow ways as a part of their disciplinary identifications. This is not in itself a higher form of integration across the disciplines. That would require some new postmodern rhetoric of tolerance toward the variabilities of each other group’s kinds of play and play rhetorics. One could imagine that it might become politically correct to see that there is increased opportunity for all players to go their own play ways and also to have more access to and understanding of the ambiguities of the others. Perhaps that is what a heteroglossic ludic rhetoric of the future might advocate. More simply, it is also possible that understanding the confusion of one’s own rhetoric and one’s own theories might lead to more useful general scientific theorizing. At the same time, some skeptics and romantics have commented that it might be kinder to leave play in the diffuse, inchoate conceptual shape in which it was found at the beginning of this inquiry. Then, ironically, all players could continue to have the satisfaction of making their own Rorschach interpretations without having to worry about academic redress. More fun, less stress.

Defining Play: Some Issues

Clearly a book of this kind is unsatisfying unless it can lead one beyond these particular rhetorics toward some more central definition or more universal rhetoric. A great variety of concepts and definitions of play have already been cited. Chapter 1 also provides the kind of material for those descriptive (ostensive) definitions of play that come about when knowledgeable members of a culture agree on the actions, persons, objects, places, times, and motives that they refer to when they use the word play. The reader might hope, however, that some attempt would be made here to overcome these more practical but narrow definitions. Given the varieties of play dimensions that have been raised, that seems difficult if not impossible. All the same, to just walk away from the theoretical disturbances
that have been created in the preceding pages would also be a kind of betrayal of trust. One deserves to be roasted for presence as well as feted for absence.\textsuperscript{1} The character of the problem is indicated by the following recital of many of the concepts that have been used to describe play in this century and in this volume. They are tentatively collected under the heading of each of the seven rhetorics. Obviously the fit is only approximate.\textsuperscript{2}

In addition I must caution that the search for a definition at this time is a search only for metaphors that can act as a rhetoric for what might ultimately become adequate scientific processual accounts. While it is common to call such metaphors hypotheses to dignify the undertaking as a scientific one, the truth of the matter is that what I produce here is a metaphorical mélange, representing the possibility of a truth yet to be discovered. A cynic might say that most of social science is a play of metaphors aspiring to be measurable processes. Since the scholars who create these metaphors hope to take the next steps toward science, we cannot say that they are merely poets or players. Their intentions absolve them from the charge that this is only a language game.

A further point that must be made is that I have already shown in preceding chapters various biases, for example:

1. that play’s definition must be broad rather than narrow, including passive or vicarious forms as well as the active participant forms, including daydreams as well as sports and festivals.
2. that it should apply to animals as well as humans, and children as well as adults.
3. that it should not be defined only in terms of the restricted modern Western values that say it is nonproductive, rational, voluntary, and fun. These are not concepts that can prevail as

\textsuperscript{1}I have had the honor of being roasted on one occasion and feted on another by the Anthropological Association for the Study of Play, and in that sequence—an appropriately ambiguous reception for the author of this book.

\textsuperscript{2}The authorities referred to are strongly associated with the concepts with which they are paired but are not necessarily their originators. Only the first author is mentioned in cases of multiple authorship. The “S-S” references are to neologisms emerging from the present work.
universal, given the larger historical and anthropological evidence to the contrary.
4. that play is not just an attitude or an experience; it is always characterized by its own distinct performances and stylizations.
5. that it can be as momentary as a piece of wit, or can endure as long as the one-year cycles of festivals or the four-year cycles of the Olympics. That it can be spatially either as diffuse as a daydream or as articulate as a sports stadium.
6. that play is like language: a system of communication and expression, not in itself either good or bad.

The contemporary concepts that follow are seldom sufficient to convey the complexity and variability implied by these assertions.

- Progress—Play as adaptation:
  Biological concepts: preparation (Groos), recapitulation (Hall), instinct (McDougall), learning (Thorndike), skill training (P. Smith), metabolic restoration (Hutt), flexibility (Fagen), prax of subroutines (Bruner), neurological fabulation (Sacks), correlator brain model (Edelman), adaptive potentiation (S-S), holistic virtuality (S-S).
  Psychological concepts: pure assimilation (Piaget), zone of proximal development (Vygotsky), transition (Winnicott), subjunctivity (Vaihinger), exploration (Berlyne), mastery (Erikson), divergent thinking (Lieberman), primordial negative (Burke), affect regulation (MacDonald), desire (Hans), enactive subjunctivity (S-S).

- Fate—Play as existential optimism:
  Chance (Pascal), chaos (Gleick), indeterminism (Monod), the play of being (Heidegger), anarchism (Feyerabend), psychic masochism (Bergler), dark play (Schechner), existential optimism (S-S), unrealistic optimism, egocentricity, and lability (Bjorklund), neonatal ludicism (S-S).

- Power—Play as hegemony:
  Adult forms: game theory (Von Neumann), playfighting (Aldis), rough-and-tumble (Panskepp), contest (Huizinga), conflict mediation (Turner), power (Spariosu), serious games (C. C. Abt), models of power (J. M. Roberts), deep play (Geertz), inversion
(Babcock), hegemony (MacAlloon), gamesmanship (Maccoby), hidden transcripts (Scott), subversion (McMahon), agonistics (Loy), models, mimicry, and mockery (Handelman), dialectics (S-S).

Child forms: surplus energy (Schiller), pleasure of being a cause (Groos), willfulness (Nietzsche), compensation and abreaction (Freud), catharsis (Menninger), effectance (White), illicit play (King), hierarchization (Asher), cruel play (S-S), masks (S-S, Kelly-Byrne).

• Identity—Play as social context:
symbolic interactionism (Mead), bonding (Harlow), communitas (Turner), frame analysis (Goffman), intimate play (Betcher), communal play (De Koven), framing, focus, stylization, and intensification (Abrahams), gaming (Hughes), autonomous peer cultures (Corsaro), interdependent or independent social contexts (Greenfield), festival hazing (Noyes), orderly and disorderly genders (Nicolopoulou).

• Imaginary—Play as transformation
Animal forms: repetitive, fragmentary, reordered, reversive, unpredictable, exaggerative, and inhibitive play (Fagen).

Human forms: transformations (H. Schwartzman), vicarious play (Stephenson), dialogic imagination (Bakhtin), pretense (Fein), imagination (J. Singer), symbolic play (Bretherton), manifestation (Spariosu), metexis (Huizinga), play of signifiers (Derrida), improvisation (Sawyer; Drewal), dark and light play (Schechner), metacommunication (Bateson), prototypic self-reflexive paradoxical mode (J. Schwartzman), panoply of tropes (Fernandez), narratological forms (Bruner).

• Self—Play as peak experience or microperformance:
consumer self (Veblen), relaxation (Patrick), arousal (Ellis), flow (Csikszentmihalyi), positive emotional state (Lewis), intrinsic motivation (Rubin), optimism (Vandenbergh), the ludic self (Nardo), autotelia and paratelia (Kerr), ecstatic actions (Fink), affect regulation (McDonald), agentivity (Bruner), performance (Bauman, Garvey, Gerstmyer).

• Frivolity—Play as world upside down:
the trickster (Radin), the fool (Welsford), nonsense (Stewart), grotesque realism (Rabelais), the feast of fools (Cox).
A Rhetoric of Play as Adaptive Variability

What is most striking about the above lists is the multiplicity of the concepts that have been applied to play. If we add the extensive lists of play names in the first chapter, and the seven rhetorics with all their potentiality for further subdivisions and ambiguities of myriad kinds, it is the variability of the play phenomena which most impresses the present author. In looking for what is common to child and adult forms of play, to animal and human forms, to dreams, daydreams, play, games, sports and festivals, it is not hard to reach the conclusion that what they have in common, even cross culturally, is their amazing diversity and variability. The possibility then arises, that it is this variability that is central to the function of play throughout all species. Considering that variation is also a key concept within biological thought, this seems like the most profitable point to begin the inquiry.

A conception which makes such variability central to evolution is that of Stephen Jay Gould who in his recent work Full House (1996b; by which he means the full range, or normal curve of biological variation), cites variability rather than precision of adaptation, as the central characteristic of biological evolution. He writes:

Precise adaptation, with each part finely honed to perform a definite function in an optimal way, can only lead to blind alleys, dead ends, and extinction. In our world of radically and unpredictably changing environments, an evolutionary potential for creative responses requires that organisms possess an opposite set of characteristics usually devalued in our culture: sloppiness, broad potential, quirkiness, unpredictability, and, above all, massive redundancy. The key is flexibility, not admirable precision. (p. 44)

Gould goes on to discuss three basic principles of such evolutionary variability, and although he is not talking about play, the match between his account and contemporary descriptions of play is striking. I intend here to show that the parallel between his scientific discussion of the variable processes in adaptation and the metaphors for play as a model of variability is too close to be ignored—remembering, of course, that both Gould’s account of adaptive reality and my account of play are quite hypothetical. What follows, then, is my rhetoric of
play "borrowed" from Gould, as it relates to his rhetoric of evolution. Gould’s principles of variability as adaptation appear in italics.

1. **Evolution is characterized by quirky shifts and latent potential.** What could be more fundamental in talking about all forms of play than to describe them in terms of the centrality of this notion of quirky shifts? Animal play has been described by many investigators as fragmentary, disorderly, unpredictable, and exaggerated; human dreams and daydreams are said to be bizarre and dissociative; child play has been said to be improvised, vertiginous, and nonsensical; games and sports are conflictful and unpredictable. Festivals are described as given to intensifications of action, crowds, noise, revelry, violence, inebriation, tricksters, clowns, hazing, and multiple other forms of inversion. The rhetorics of progress (skill uncertainty), the imaginary (mere fancy), the self (peak experience), power (unpredictable winners), identity (festival intensity), fate, (taking chances), and frivolity (nonsense) certainly lend themselves readily to this quirky metaphor.

Further support for the argument that play models the centrality of quirkiness can be found in the neurologist Gerald Edelman’s account, in *Bright Air, Brilliant Fire* (1992), of the brain as a constantly diversifying, value-driven, correlator process. In his terms, this associatively quirky process is fundamental to brain activity, not derivative from it, and it applies as well to dreams as to problem solving. Contemporary theoretical play concepts, which one may read as also speaking implicitly to this quirky conception of play’s variability, use such terms for play as pure assimilation, divergent thinking, indeterminism, anarchism, dark play, inversion, the world upside down, order and disorder, transformations, dialogic imagination, the play of signifiers, paradoxical modes, tricksterism, and grotesque realism. Together, they may be interpreted as showing how multiple theorists seek to grasp the essential character of variability for their own theories of play. The variety of their concepts implies that the phenomenon theorists seek to model (play) is itself as centrally mercurial as Gould has suggested the variability in adaptation is.

2. **Redundancy.** Gould’s second principle for describing variability is that of redundancy. Having produced one useful structure, immediately required for adaptation, the organism reproduces a series of similar structures that may have no immediate function and can be exploited for different evolutionary purposes—as occurs, for exam-
ple, most obviously in the cloning processes of cellular division, where the extra copies can be used for other processes. Presumably additional “junk” genes can be used beyond the “blueprint” genes to fulfill the particular requirements in each distinct individual’s emergent development. Humans do not contain anywhere near enough genes to make enough individual cells to create a fully operational brain, so an overabundance of the same or similar cells and synapses is produced, and then the brain has to use them to learn how to make itself work (Kotulak, 1996). This, Gould says, is the principle of having extra capacity or, in his jocular terms, carrying a spare tire.

This kind of proliferation of form is particularly well illustrated in all forms of play, as in the endless reproduction of games of “house” or “trucks”; or in the endless kinds of ball games played by all ages and most cultures; or in card games; or in annual celebrations, parades, parties and festivals. The most obvious modern effects of such redundancy are shown by the replications of all kinds of sports throughout the world in the past hundred years. Whatever such replicable sports are made to mean (in terms, for example, of power and bonding), they are now an international rather than a parochial concern. The same internationalizing of strategy games (chess, bridge) is also taking place. And the replicatory process now occurs with children’s toys, as seen in toy lending libraries and in international consumer marketers’ attempts to produce dolls and other toys that will be acceptable on all continents.

It is possible to argue from all of this that our play redundancies parallel the function of genetic redundancies in their provision of variations available for whatever uses, rhetorical or otherwise, to which the individual or the culture wishes to put them. The simplest sense of play’s variability may be that it exemplifies variability and, as such, is potentially available for transfer to subsequent functions. This would be perhaps a “trickle down” theory of play’s usefulness, a concept I have previously termed “adaptive potentiation” (1975a, 1975b). In what follows, however, I will outline a more central function for play’s variability than this accidental one.

3. **Flexibility.** Third, and most important, Gould sees both quirky variability and multiple redundancy as generated by flexibility. Without flexibility’s having been selected in evolution, the characteristics of quirkiness and redundancy could not have emerged. The best
evidence for the natural selection of flexibility, he says, is the extent to which the length of the neonatal period is correlated with the complexity of mammal growth. Humans are the most vulnerable of species, have the longest period of dependency, and grow the most slowly of all mammals. As Gould says, “We have evolved an extended childhood, presumably for the advantages imparted by prolonged flexibility for learning. And we retain some of this crucial flexibility into an adult stage that, in most mammals, entails rigidification of behavior” (1996b, p. 54). Obviously it would not be hard to defend the position that most forms of play require similarly large amounts of flexibility, both for learning them and for performing them. If play is to be seen as some kind of adaptive variability, Gould’s account provides evolutionary metaphors that certainly have some power. If quirkiness, redundancy, and flexibility are keys to evolution, then finding play to be itself quite quirky, redundant, and flexible certainly suggests that play may have a similar biological base.

My first inclination after playing this metaphoric game with Gould was to leave the matter there. Enough is enough. The notion that play itself is some kind of adaptive variability, and therefore presumably some kind of reinforcement of realistic adaptive variability, is very attractive. One can see the worth of analyzing all kinds of play data in terms of categories of variation yet to be developed. That would be a research novelty, a little bit like David Siegler’s recent suggestion that Piaget’s stages are just another form of essentialism and that what we really need to know is how change actually occurs. Siegler, who also bases his argument on biological evolution, says we need to identify the mechanisms that lead children to select from a variety of available responses those that will solve the problems at hand (Siegler, 1996). I could suggest, likewise, that instead of focusing only on play forms and their normative rules, we need to know what kinds of variability players actually encounter in their playing. Not that this is a new notion to those, such as Linda Hughes, who have been studying “gaming” and games in this way for some time (1983, 1988, 1989, 1991, 1993a, 1993b).

Not being able to leave well enough alone, I came to feel that this adaptive variability account, either as adaptive potentiating or as reinforcement of general adaptability, is still insufficient. I have, therefore, several other suggestions that might fill out this picture of
flexibility and variability. The first is inspired by recent brain imaging technology, the second is from some recent psychological studies of the cognitive behavior of young children, and the third entails a return, finally, to the implications of Darwin's natural selection as the "struggle for survival."

**Brain Imaging Technology**

The key discovery in brain imaging technology, as it relates to the play rhetorics, is that in the neonatal stage, by eight months of age, the infant makes 1,000 trillion synaptic connections, but after that period the synapses attenuate if they are not actually used. By ten years of age, a child typically has only about 500 million connections. Thus the neonate has twice as many brain connections as the grown human being. It is theorized that this is to ensure enough "extra wiring" for adaptation to any kind of environment in which the child is reared. The infant brain's ability to constantly undergo physical and chemical changes as it responds to the environment is taken to suggest enormous plasticity. This synaptic information (initially presented by Peter Huttenlocher of the University of Chicago) means that humans are born with more going for them than they will ever have again, which is the very opposite of the older view that "the brain is a self contained, hard wired unit that learns from a present, unchangeable set of rules" (Kotulak, 1996, p. xii)

All of a sudden I saw in this piece of information another useful metaphor with which to understand the role of play. We could say that just as the brain begins in a state of high potentiality, so does play. The brain has these connections, but unless they are actualized in behavior, most of them will die off. Likewise in play, even when novel connections are actualized, they are still not, at first, the same as everyday reality. Actions do not become everyday reality until there is a rhetoric or practice that accounts for their use and value. Play's function in the early stages of development, therefore, may be to assist the actualization of brain potential without as yet any larger commitment to reality. In this case, its function would be to save, in both brain and behavior, more of the variability that is potentially there than would otherwise be saved if there were no play. Piaget's theory of play is, of course, the very reverse. He says
that it is only after connections are established by real-life accommodation that they are consolidated in play. The present thesis would hold that another play function, perhaps the most important one, may be the actualization of novel connections, and therefore the extension of childhood’s potential variability (Sutton-Smith, 1966a, 1982f).

What the imaging data suggests is that whereas Gould’s triad speaks to the characteristics of play’s variability, information about the evolution of the brain implies a way in which that potential variability is advanced through play. The very fact that play contains so much nonsense, so much replication, and is so flexible certainly suggests that it is a prime domain for the actualization of whatever the brain contains. And for that matter, speaking in behavioral rather than neurological terms, play is typically a primary place for the expression of anything that is humanly imaginable. After all, most fools and comedians have to first convince us that they are only playing before they lay before us their hilarious associations and nefarious interpretations.

Children’s Cognitive Behavior

One can draw other lessons about the neonatal and early childhood character of human flexibility by looking at some of the cognitive work on early childhood potential. Bjorkland and Green (1992) have described the key neonatal cognitive characteristics of children, up to age five years, as those of unrealistic optimism, egocentricity, and reactivity. Children up until about five years of age overestimate their ability to function skillfully, despite continued negative feedback. Furthermore they tend, as Piaget has said, to see things rather selectively, from their own perspective. And they are highly reactive to whatever stimuli are placed before them, regardless of the relevance of those stimuli to whatever else is going on, a characteristic that Heinz Werner spoke of as their lability (1957). Here again I might argue that their persistence in the face of negative feedback, their persistence with their own concerns, and their reactivity to whatever comes their way could all contribute to the actualization of those potential neural connections. Further, while these neonatal characteristics are general in childhood, it is
not hard to insist that they are especially well epitomized by play. Indeed play may be the best exemplar of such characteristics and therefore the best carrier of them and of flexibility. As a footnote, it could be argued that what I might call “neonatal ludicism,” applies as well to the play of older persons, whose play can often also be described as unrealistically optimistic, egocentric, and reactive. Watching eighty-year-olds playing golf on their executive nine-hole courses illustrates the point. Being “number one” in any sport tends to require a similar foolishness.

The Struggle for Survival as the Motivation for Variability

What is lacking to this point in this account of the neonatal grounds for flexibility is much suggestion of relevant motivation. Others have talked of the motivated heart of play as optimism, intrinsic motivation, flow, empowerment, ecstatic performance, effectance, positive emotional states, and arousal, all of which suggest that there may be basic motivational accompaniments to being flexible. These are, however, all terms from this century’s individualistically oriented rhetoric, as I have shown. But if play itself is to be seen as a contribution to the functioning of variability in the natural selection process, as is being touted here, then it behooves one to look deeper into evolutionary accounts of motivation. Remember that in evolutionary theory, processes of variation are supposed to be random, but selection is a matter of life or death.

In evolutionary theory, the concept of “the struggle for survival” hovers in the background as a vague symbol for the bloody extermination and suffering that this whole topic actually requires. As Darwin put it, “Hence there will be necessarily a struggle for existence. Yet this struggle need not be entirely negative, for success is not chance. It is rather a function of the possession of various peculiar, useful features, and the nonpossession of such features by the losers” (Ruse, 1996, p. 139). The importance of variability within this scheme is that it provides alternatives when they are needed because of changes that threaten life at every level. Most of us get a fair diet of this on the Discovery Channel on television (which perhaps should
be called the Darwinian Channel), where producers like to put a modern, gentle twist on these things. Having, for example, shown us a poor sick buffalo pursued for an hour by a pack of wolves and finally pulled to the ground, we are given the evolutionary euphemism; “They have made each other the best of their kind.”

Everyday life for animals, it seems, requires constant concern about predation, food, sex, and exclusion. But if we are to make this natural-selection process applicable to humans in a more general way, beyond their ever-frequent wars (Keeley, 1996) and the eternal battle with the bacter (that is, the bacteria), then we would have to say that the cultural counterpart might be found in our constant struggle for safety, approval, achievement, love, and even significance, which is to invert the Maslowian scheme of things in more mundane terms. The cultural variations that impose themselves in a way that is analogous to the need for natural selection are these thoroughly familiar matters of existential anxiety that have become the obvious subject matter of psychiatry and clinical psychology throughout this century. Darwin himself is said, by the biographer Gruber, to have been in favor of some such broader view of evolution and against the presentation of struggle only in terms of the polarized life or death versions. “Survival depends on the organism re-making itself,” said Darwin (Gruber, 1974, p. 54). “Variation and novelty are not chaotic or unrelated to the organism’s past, but express degrees of freedom characteristic of a particular organization as it stands at one moment in its history” (ibid., p. 249).

Though play may be most labile, it does not seem to be totally neutral. All creatures, animal and human, live with some degree of existential angst, and most of them spend some portion of their existence attempting to secure themselves from this angst by controlling their circumstances. All creatures live in a world of strong feelings and are dominated by those feelings. We constantly seek to manage the variable contingencies of our lives for success over failure, for life over death. Play itself may be a model of just this everyday existentialism. As Edelman says, the metaphor of the brain as a jungle is much more appropriate than the metaphor of the brain as a computer, which is to say that the metaphor of life as a jungle is perhaps more relevant than the metaphor of life as civilization.
Play as a Model of Adaptive Variability

The argument so far is that play variability is analogous to adaptive variability; that play potential is analogous to neural potential; that play's psychological characteristics of unrealistic optimism, egocentricity, and reactivity are analogous to the normal behavior of the very young; and finally that play's engineered predicaments model the struggle for survival. What then follows from this account of cultural natural selection in human affairs is that play, for its part, may be an invention meant to model such natural selection processes. As the renowned biologist Richard Lewontin says, as the human society "arises" out of animal societies, it "transforms" the adaptation it possesses, thereby making new needs (Lewontin, 1977). My theory, then, would be that play, as novel adaptation, may have developed in two stages: the first as a reinforcement of potential synaptic variability through the performance of variable antics (as in animals), and the second as a fuller imitation of the evolutionary process itself, in which the organism models its own biological character. In this higher development, play, as a model of evolutionary selection, engenders variable contingencies (uncertainties and risks) for the purpose of exercising selective control over them in fictive or factual terms. It is a mastery process (as Erikson said) creatively derived from the exigencies of the evolutionary predicament. Considering that Fagen, author of Animal Play Behavior (1980), believes that some higher animals' play resembles our games of chase and escape, king of the hill, follow the leader, tug-of-war, and keep away, it would seem that this kind of cultural invention has also occurred on the animal level.

So in conclusion, I have presented here the view that variability is the key to play, and that structurally play is characterized by quirkiness, redundancy, and flexibility. I have also presented six additional hypothetical formulations about play's biological functionality that I presume may well be complementary. Let us imagine that they proceed as follows, in a quasi-longitudinal fashion. First is the supposition that play as potential behavior may actualize what are otherwise only potential brain and behavior connections. Second, play subsumes those actualizations into a model of the neonatal processes described as unrealistic optimism, egocentricity, and re-
activity, which fade in general behavior following early childhood but are encapsulated in play at all later ages. The third and simplest hypothetical interpretation of play to this point is that play functions by becoming an exemplar of cultural variability, an available alternative for behavior, just as are music, dance, song, and the other arts. These sustain the variability of the human condition and can be real alternatives within it, as in the case of those who become professionals, or even those who simply vitalize their leisure and recovery through the arts. A fourth and equally commonsense possibility is that there is an occasional transfer of play skills to everyday skills, which I have termed adaptive potentiation, or an example of trickle down. Fifth, enclosing all of these, play is conceptualized as a model of the exigent processes of adaptation through the induction of uncertainties and their resolution within the virtual domain. But most speculative of all is the overall claim that play's variability acts as feedback reinforcement of organismic adaptive variability in the real world, which is meant to maintain the flexibility of which Gould speaks. Unfortunately these six hypotheticals are just a beginning. Beyond these biological analogies one has to add a number of other fairly well established psychological characteristics of play that must have also developed along the way: namely, play's metacommunicative characteristics, its performance stylizations, its peculiar intensifications, its enactive subjunctivity, and perhaps even also its structural dialectics, all of which have been discussed in earlier chapters. This heteroglossia of possibilities has a postmodern ring to it, but it undoubtedly still falls far short of a full accounting.

The research implications are that we should study the variations within play in such detail as may allow us to speak more confidently of their functions than we have to date. Those who are progress minded might like to think that there is a virtual smorgasbord of ludic variations that should be available to all of us. They could also see a play socialization curriculum as necessarily providing these learning opportunities for everyone. Others of a more skeptical flavor might be inclined to think of all of this variation as a necessary precondition for having choices, but not, therefore, for predicting that the choices that are made in play, or reinforced in adaptability, will necessarily be successful. This is closer to Gould's kind of evolutionary thinking, which follows the opinion that bio-
logical progress is an accident rather than an inevitability with evolution. That is, play as an exercise in adaptive potentiation is no guarantor of actual progress, apart from that of becoming a player, though that has its satisfactions, as we all know. And most important, without such a repertoire of variations the possibility of adequate adaptation is certainly more limited. In this kind of argument progress becomes just a higher probability of the fuller repertoire of variation.

Finally, I define play as a facsimilization of the struggle for survival as this is broadly rendered by Darwin. Biologically, its function is to reinforce the organism’s variability in the face of rigidifications of successful adaptation (as formulated by Gould). This variability covers the full range of behavior from the actual to the possible. Psychologically, I define play as a virtual simulation characterized by staged contingencies of variation, with opportunities for control engendered by either mastery or further chaos. Clearly the primary motive of players is the stylized performance of existential themes that mimic or mock the uncertainties and risks of survival and, in so doing, engage the propensities of mind, body, and cells in exciting forms of arousal. It is also very interesting to think of play as a lifelong simulation of the key neonatal characteristics of unrealistic optimism, egocentricity, and reactivity, all of which are guarantors of persistence in the face of adversity. I add, however, the final note that, despite my extensive criticisms of the rhetoric of progress, I have now invented yet another form of it, although this time as only the potentiation of adaptive variability.
FOUR

Play Is in Things, Not in You

Play is possible when freedom is limited rather than expanded.  
It is not the opposite of work, nor the opposite of depression.  
Play is deliberately working with the materials we encounter.

Simple, accidental experiences like my daughter’s encounter with the mall underscore a profound truth about fun, something that offers us a way to rescue Mary Poppins’s “snap” and expand it from magic into method. As we already learned, “finding the fun” in an activity like mowing the lawn or navigating the mall is a process of treating the situation as exactly what it is rather than attempting to reject it in favor of a more distracting or entertaining alternative.

You might stop me and object: wasn’t my daughter just avoiding the drudgery of mall transit by finding (or inventing) a substitute? While we were supposed to be progressing through the shopping center, she was instead pursuing an orthogonal end. Parents are accustomed to this sort of sideway, and we usually frame it as a distraction. “Stop dawdling!”

But in truth, my daughter’s playful act interpreted her situation as much as my attempt to rush us through it did. While I was only focused on the goal, she managed to attend to the process. And her experience of this apparently meaningless act was clearly the more fun approach between the two. Whereas I rejected the scenario and attempted to seek escape from it, she stared down her boredom and embraced what emerged beyond it. The freedom of that particular playground came from her willingness to submit to the mall and its materials, rather than from her ingenuity in devising a way to overcome the boredom she found there. When we play, we give ourselves too much credit. Play is the opposite of irony: rather than distancing ourselves from things, in play we draw them close and meld with them. We give ourselves over to them, even, subordinating our own agency to a larger system.

It sounds miserable, but it turns out to be fun. Or more precisely: we do not arrive at fun by expanding our circumstances to allow for less wretched alternatives, but by embracing the wretchedness of the circumstances themselves. We might even go so far as to say that fun comes from wretchedness. Without a starting situation that resists us, it is impossible to produce meaningful, let alone enjoyable, experiences. Fun is impoverishment, blight, and squalor. Fun is the broccoli without the chocolate, once we realize that the broccoli itself is not an end but a resource we can put to use.

Somehow we got the idea that fun refers to enjoyment, and that games offer us special access to that enjoyment. But games and fun are not connected because games are intrinsically entertaining or enjoyable, but because games are already intimately associated with play grounds. Games are experiences we encounter through play.

Play is the act of manipulating something that doesn’t dictate all of its capacities in advance, but that limits its capacities through focus and exclusion. Minecraft asks you to survive in a world made of inhospitable cubes you can use as resources. Candy Crush asks you to solve a puzzle given a limited supply of powers. Golf asks you to get a tiny ball into a slightly larger hole many hundreds of yards away by striking it with a stick.

Despite its intrinsic connection to games, play isn’t limited to them. Play is everywhere, in anything we can operate—espresso machines, lawn mowers, shopping malls, anything. It is not an act of diversion, but a name for the feeling of making something work, of the results produced from interacting with its materials. That’s why we also say that we “play” an instrument or a sport, why we rejoin our children for “playing” with their food, or even why we can talk about sexual self-stimulation as “playing with yourself.”

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As it turns out, this more general notion of play has a long history. The twentieth-century philosopher Jacques Derrida used
the term freeplay to describe the possible perspectives toward cultural works: “by orienting and organizing the coherence of the system, the center of a structure permits the freeplay of its elements inside the total form.”¹ Derrida was mostly interested in the way the manipulation and interpretation of symbolic systems produces meaning (like many of his contemporaries, he called any such system a “text,” whether or not it involved words and language).

His point is that meaning exists only in reference to its contexts. A poem or a painting has specific words or images or forms or pigments, which “center” the structure and form its materials. But the meaning of these “systems,” as he calls them, exists inside another structure, such as the specific community or cultural context in which it is experienced. For example, in 1854, Henry David Thoreau’s book *Walden* endorsed simple living for the sake of self-sufficiency. A century and a half later, *Walden* has become something of a bible to ecological preservationists in the era of climate change. The modern reader can’t help but think of it as a collectivist credo rather than an individualist one.

Derrida’s philosophical system, called deconstruction, gets a bad rap for what some perceive to be a nihilistic, anything-goes attitude about meaning. To its critics, deconstruction is an excuse to make up any story you want about a work of art, and this perceived ability to make-believe is why the philosophical trends of the twentieth century known as postmodernism and poststructuralism are often dismissed as lewd versions of extreme relativism.

But put aside the criticism you’ve heard regarding these names and terms. Derrida teaches a lesson worth learning: a multitude of latent meanings subsist in “texts,” but credible meanings must relate to the text, coupling new observations to it so that those interpretations work like the mechanisms in a machine. A book like *Walden*, for example, can be read as a transcendentalist, American Romantic text circa 1860 or as an ecological text today. For Derrida, play is a name for a text’s ability to bear new meanings for different readers in different contexts. The play theorist Brian Sutton-Smith discusses a similar phenomenon, the “play of light, the play of the waves, the play of components in a bearing case, the inner play of limbs, the play of forces, the play of gnats, even a play on words.”² Sutton-Smith relates this use to the original meaning of the German word for “play,” *Spiel*, as “dance.”

The game designers Katie Salen Tekinbaş and Eric Zimmerman adopt this sense of play too, in their formal definition of the concept, which is really the same as Derrida’s, but without all the philosophical window dressing: “free movement within a more rigid structure.”³ When designing a game, the point is not to make it taste sweet, but to fashion a structure. And when playing a game, the question is not how to overcome that structure, but how to subject oneself to it—like a golfer at Pebble Beach, like Isner and Mahut at Wimbledon, like my daughter at the mall.

Machines and apparatuses are good metaphors for understanding play. When you operate a mechanism like a steering wheel, the device has some “play” built in: a space through which the steering wheel can be turned before the steering shaft couples with and turns the pinion at its end. Likewise, the play in a guitar comes from the manipulation of a set of differently gauged strings held under tension across a fretboard. We certainly manipulate our cars and our guitars, our bodies and our language. But before we can do so, we need some machine or apparatus upon which we can exert force. A playground in which to play.

And when it comes to play, we give ourselves too much credit: the play is in the thing, not in us.

POLICING PLAY

This idea—that play is a property of things rather than an experience had with them—runs against everything we’ve been taught to believe about play. Play is thought to be central to the development of children, to the point that a scare has been brewing over the decline of play in contemporary culture. Writing in *Aeon Magazine*, the psychologist Peter Gray laments the loss of the “hunter-gatherer” education he experienced as a child in the 1950s.⁴ The freedom to explore the outdoors, to discover new ways to make use of time to stave off boredom, and to pursue one’s own chosen interests and media—for Gray, all these activities have been dampened or eliminated, pushed aside by increased structure and oversight in school; highly organized and usually adult-directed activities like sports, Scouts, ballet, and music; and the slow, methodical reduction of the expanse of physical environments to which kids have unfettered access.

As competition for test scores and college entry requirements have swelled, parents, educators, and governments alike have increased the structure of children’s routines, so that the average middle-class kid is scheduled from dawn to dusk and beyond with school, homework, tutoring, and extracurricular activities. The changing global economy has reduced options for viable middle-class careers, making college the only option for upward-mobility (or even just mere stability). Meanwhile, long-term reductions in public funding (in the UK and Europe as much as in the United States) have made college increasingly expensive for ordinary folk, which only further accelerates the fear that kids will miss out on already dwindling future opportunities unless they invest even more time in advanced courses, test preparation, and organized, official-looking extracurricular activities.

Even if kids had time left after all of this regulation, they’re increasingly unable to partake in the world outside their schools.
and homes anyway. The 1950s hunter-gatherer childhood of Gray’s memory is partly a nostalgic myth in the spirit of Thoreau, for one part. For another, kids are largely prohibited from meandering on their own or in groups today. Writing in the Daily Mail, David Derbyshire contrasts a contemporary eight-year-old schoolboy (Edward), with his great-grandfather (George) of the same age. In 1926, George was able to meander some six miles to a pond to fish. Eighty years later, Edward is driven everywhere, even to safe, predetermined venues for bike riding.

This shift didn’t happen all at once. Edward’s grandfather Jack was afforded a mile of freedom from his house at age eight, in the 1950s. His mother, Vicky, was allowed to wander about a half-mile away, to the local pool, in the late 1970s. By 2007, little Ed was permitted to stray less than three hundred yards from his door, as far as the end of the street.

Parental choice—and fear—is to blame, in part. But restrictions like those that sequester Edward have also found their way into previously flexible environments, like schools. Thanks to the pressures of high-stakes standardized testing, overcrowding resulting from reduced tax bases, and reductions in teacher and staff support, some schools have felt forced to institute prison-like regimes. Recess has been reduced or eliminated. Lunch periods have been shortened to allow for multiple sorts of kids to use facilities designed for far fewer students. To maintain timeliness in these new lockups, some schools have mandated silent lunches, because kids eat faster when they are not allowed to socialize.

Not everyone thinks holding kids hostage is good for them, but attempts to return even to the historically modest standards of Edward’s mother’s era pose new challenges. In recent years, attempts to resist the limitations imposed on kids have met with terrifying social and legal consequences. Maryland parents Danielle and Alexander Meitiv describe themselves as proponents of “free-range parenting,” a philosophy of childhood independence that hardly would have needed formalization in great-grandpa George’s day. Among their newly radical acts, in April 2015 the Meitivs allowed their six- and ten-year-old children to walk home from a local playground alone. The police took the children into custody, and Child Protective Services investigated the parents for possible child neglect. It was the family’s second run-in with the authorities on the matter in less than six months; the first time, they were “found responsible for unsubstantiated child neglect”—for allowing their kids to walk home from the park.

The Meitivs became paradigmatic of overboard reactions to even modest freedoms for kids. But they’re hardly alone: thanks to the ubiquity of mobile phones with which to call in “concerns,” mixed with our tendency to be unacquainted with our neighbors, everyone is afraid before they are generous. Irony is a way of life, even for grandmas in suburbia. Combine this anxiety with decades of classroom and television marketing about “stranger danger” (despite a substantial drop in an already very low likelihood of abduction), and Gray’s hunter-gatherer childhood is being policed into oblivion. And not without consequence. Gray correlates reduced opportunities for play over the last half century with rising rates of childhood mental disorders, including depression, anxiety, and suicide, which have increased four- to eightfold since the 1950s.

While a majority of research connects the need for play and exploration to childhood development, other studies have pointed to the need for play among healthy adults as well. Ordinarily, we oppose play and work, committing a fallacy that Stuart Brown, head of the National Institute for Play, calls the “work-play differential.” We think of play as synonymous with leisure, distraction, and waste. And given that we live in a society obsessed with improving efficiency and productivity, it’s no wonder that play, games, fun, and their brethren terrify our culture at its foundation. In a line less quoted but just as quotable as Mary Poppins’s spoonful of sugar, Brian Sutton-Smith enjoins us to believe that the opposite of play is not work, but depression. It’s a sentiment adults would probably like their bosses to believe, as we all try to organize any viable escape from our overtaxed lives in offices and in front of computers.

Brown, a medical doctor with experience studying murderers, argues that a deprivation in play contributes to mental anguish, which in turn leads to homicidal thoughts and actions. As is so popular these days, Brown relies on cognitive explanations to justify the introduction of “play hygiene” to help cure us of our play-deficient lives. Using the evolutionary experience of play in the development of animals—the way creatures test out social behavior through play—Brown argues that play “lights up” the brain both at its anamorphic base and in its human frontal cortex. We err particularly, according to Brown, when we relegate play exclusively to the purview of children. As Sutton-Smith’squip-quoters hope to encourage and as Brown hopes to prove through cognitive science, a dearth of play might not only be annoying or disappointing, but also tragic and even dangerous.

In an age of efficiency, it’s easy to connect the decline of play to the rise of despair. Today, we bring our work home on our smartphones and laptops so that the two lives are increasingly indistinguishable. Even at the office, our actions and activities are monitored and instrumented, whether directly with hard controls like quotas or targets, or through softer ones like open-plan offices, in which everyone’s activities are visible to everyone else. In schools, an almost fanatical obsession with measurement through standardized tests has endorsed new regimens to reduce recesses and other unstructured activities. Teachers are transformed into the same kind of monitored workers that fill cubicles, their performance assessed from afar, out of context. Meanwhile, a paralyzing fear of the very violence and unrest Brown suggests might arise because of the absence of play has only further endorsed the treatment of students and workers as inmates.
A SUPPOSED SALVATION

Johan Huizinga, the early twentieth-century Dutch anthropologist whose endorsement of fun we already encountered, situates play at the very center of human activity. Huizinga sees play as the means through which culture itself is produced rather than an activity of distraction we pursue when we grow weary of work. Man is not primarily a knower (Homo sapiens) nor a creator (Homo faber), but a player—Homo ludens. For Huizinga, play is a free activity separated from ordinary life and done for its own sake. But despite this freedom and separation, play creates order—indeed, play relies on structure in order to produce that order.9

Huizinga shows that the rituals and practices of human culture, from law to religion to war to politics, all rely on the elements of play as fundamentals. In law, for example, the roles of judge or prosecutor involve the adoption of specific garments and accessories not unlike those of the court jester or the theater actor—another domain we describe with the word “play.” The carriage of justice in a trial bears much in common with theater, in fact—it has all the trappings of scripted entertainment, which is part of why we find courtroom television dramas so enjoyable. Legal trials involve battles of wits and verbal performance, they subject the accused and the accuser to the accident of chance, and they take the form of a contest through which a winner and a loser is definitively and unequivocally determined.

If Huizinga is right, then play advocates like Gray and Brown, along with practitioners like great-grandfather George and the Meitivs and their children, are onto something. “When we play,” the play scholar Miguel Sicart summarizes, we “appropriate the world, we make it ours, we express ourselves in it, we make it personal.”10 We need play, Sicart advocates, in order to help us take a distance from life and see it anew. We already embrace play in circumstances of grave consequence, like courtrooms and temples. Why not in neighborhoods and offices too?

But unwittingly, Sicart also puts his finger on the problems with much of the contemporary advocacy for play. Play is undertaken for the sake of the individual or the group or the society. And the playground itself—the forest, the swing set, the conversation, or whatever—always serves as a means to that end. The story of great-grandfather George offers an instructive example. In Ed’s and Vicky’s and Jack’s and George’s cases, the objects of supposed freedom—a fishing pond, a woods, a swimming pool, or a street—are invoked as mechanisms for roaming and its concomitant psychological benefits, the ones Peter Gray and Stuart Brown endorse. The material world, it would seem, is just a pastoral big-box store. A venue for securing materials for incorporation and consumption.

But Huizinga sees play as an experience separate and distinct from ordinary life, one pursued absent material gain. Play in this sense is autotelic, a term for activities pursued for their own ends, rather than as mere means. (Csikszentmihalyi’s flow is often also called autotelic; high-performance, flow states, the theory goes, are easier to achieve for people predisposed toward self-regulated goal setting and pursuit.) It’s tempting to understand play as an activity that tussles the hair of presence-at-hand, rejecting the instrumental, purposeful uses of materials like shopping malls and roads to and from the park or the fishing pond. But that’s not entirely the case. One need not look any further than Gray’s or Brown’s endorsements of play to see that the practice is conducted “for its own sake” only in part. The benefits of play are expressed mostly in terms of their resultant underwriting of mental (and often, physical) healthfulness.

It’s impossible to fully separate ourselves from the things that surround us. Indeed, presence is not a more desirable philosophical orientation for Heidegger (and Derrida, whose philosophy is built atop Heidegger’s), but an error. It is dangerous to demand that everything always be useful, and that its utility be discerned and predicted in advance.

If we advocate for play as such, as do Gray and Brown and Sicart and others, we risk replacing the autotelic experience of play in all its individual diversity with a more instrumental, generic version of play. Play becomes a skill or literacy, akin to critical thinking or problem solving. In addition, play becomes politicized, turned into an ideological talking point meant to oppose the rigid, inflexible regimens of contemporary policy and law. As the Meitivs and the public school silent lunches attest, contemporary law and policy have plenty worth opposing. But too often, play itself becomes a kind of trump card cast against overzealous regulation, so that it risks becoming its own ideology.

Most commonly, play is mustered as a palliative to structure, the supposedly free and open and self-directed nature of play restoring an apparently lost creativity that Edward’s generation needs to regain from George’s. Gray cites an extreme example, the Sudbury Valley School in Massachusetts, at which students from ages four to nineteen are let loose all day, every day, to do whatever they want instead of following coursework, preparing for tests, or queuing up for silent lunches. Here’s Gray selling the idea, and convincingly, too:

To most people, this sounds crazy. How can they learn anything? Yet the school has been in existence for forty-five years now and has many hundreds of graduates, who are doing just fine in the real world, not because their school taught them anything, but because it allowed them to learn whatever they wanted.11
Sudbury Valley is a private school that charges roughly $8,500 per student. It’s not as expensive as the most elite schools, but it does suggest some self-selection among its ranks: wealth is the best predictor of educational success. Notwithstanding the possibly hypocritical fact that the school embraces at least enough formal structure to maintain a ten-acre campus and to charge tuition, the Sudbury model of student-directed learning and governance shares less in common with traditional schooling and more in common with unschooling, an educational philosophy first advanced in the 1970s by the WWII naval veteran turned grade-school teacher John Holt. Unschoolers hold that children possess an innate curiosity and drive, which institutions like formal schools only beat out of them. Thanks to its inherently unstructured nature, unschoolers are often grouped together with homeschoolers in the imagination of the public, even though many homeschoolers maintain an educational regimen as structured as today’s public schools.

As in any community, there are successful unschoolers. Among them is Jedediah Purdy, whose 1999 book For Common Things: Irony, Trust and Commitment in America Today offers a paean to sincerity so mushy it would make even Christy Wampole leer toward contempt. In Marshall Sella’s profile of (an admittedly still very young) Purdy for the New York Times Magazine in 1999, Purdy came across as the Thoreau-endorsable, American woodlands apotheosis of Pasolini’s rhetorical boy whose things make him who he is. Raised in rural West Virginia, “there is no vine that Purdy cannot identify,” wrote Sella. Purdy, born in 1974, was just the right age to take part in the Romantic, self-directed learning that his parents encouraged, sheltered from popular culture and immersed in the purportedly more real reality of woodsheds and hog slaughters.

But how does Purdy’s story end? At thirteen he tried out public school, where his lack of common experiences and cultural references alienated him from his peers. So he attended Exeter, then Harvard, then Yale Law. He is now the Robinson O. Everett Professor of Law at Duke University. Which is not to say that the West Virginia woods are incompatible with Harvard Yard. But if the embrace of play and freedom ends up euphemizing the pursuit of entrenched, monied, polite society, then we should avoid the circumlocution. The best way to eschew irony, perhaps, is to have the luxury to do so.

Still, Gray’s hope for Sudbury and Purdy’s early start as an unschooler hold some truth. A situation so confined and barren that nothing can be manipulated within it is not a playground but a prison. And many of our schools and workplaces do sometimes feel like prisons. But in our rush to reject that imprisonment, we might be overcorrecting. As golf courses and shopping malls and yards and coffee shops all show, playgrounds aren’t places where you can do anything whatsoever. Pure, abstract play is a fantasy. After all, Gray’s endorsement of play in school environments mostly suggests that various levels of structure and organization are available for rearing and educating kids, and that alternatives to total imprisonment might have some merit—hardly a eureka moment for anyone who has discovered Montessori or backyards or 4-H or Lego.

PLAY IS SUBMISSION, NOT LIBERATION

Why insist that we choose between Walden and Walmart? Perhaps our highly regimented lives have made free play seem like an escape hatch from suffocating oppression. And, ironists that we are, we have mated structure (which is considered restrictive and therefore bad) to institutions like schools and businesses, while dreaming that the free-form domain of nature and whim is liberating. Such a move reinforces the work-play differential, treating play as a release valve for labor. But worse: it suggests that no real salvation is ever possible for institutional practices like work and school and errands and yard care and all the other activities that fill most of our waking time.

Adults’ jealousy for children’s play arises from the mistaken assumption that children “do what they want” in the first place. Play advocates make this same mistake when assuming that the practice is de facto subversive. “Play matters,” Miguel Sicart begins one such exhortation, “when it is appropriative, taking over a situation and turning it into a context for play.”13 Toys, Sicart suggests, begin developing this practice. The ball or Frisbee or bicycle “modify the space in which they are used for play.”14 And it’s true: just as my daughter’s mall game modifies the shopping center into a temporary arena, so the Frisbee can turn the backyard into a pitch and the bicycle can turn the trail into a race course.

But are such maneuvers really appropriative? Just as Gray and Brown suggest that play must rescue childhood from the oppression of institutions, Sicart implies that toys issue tiny rebellions, seizing or annexing the otherwise controlled, orchestrated universe and rescuing it for the player, whose heroism finally allows oxygen into the heretofore suffocating tyranny of backyards and roadways. Make sure your neighbors get the memo that their grills and driveways are mere instruments of a spectral, pervasive fascism.

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THE GAME DESIGNER and critic Mary Flanagan holds a similar but even more extreme version of this position. Subversive play, she suggests, invites or requires one to play against the intention and authority of the system. Flanagan suggests the term unplaying—a notion that mirrors unschooling in more than name—for the practice of taking a game or a toy and undermining its intended purposes with alternative ones. While Sicart’s aims are more contemplative, Flanagan embraces a clear directive to unplay in order to subvert the purportedly mainstream (and therefore ostensibly oppressive) properties of traditional games.

Flanagan connects unplaying and subversive play with twentieth-century avant-garde art, which embraced similar political aspirations. In particular, the movement of the 1960s known as Fluxus offers inspiration, partly because it too used games as objects for subversive commentary. Reimagined chess sets were a common trope of Fluxus, for example. The Japanese artist Takako Saito’s sets replace the traditional pieces with unexpected alternatives, such as spice jars or vials of liquor. Instead of recognizing the pieces by their conventional shapes, players must smell or taste them as the game goes on to distinguish them from one another.

But the most famous Fluxus chess set is probably Yoko Ono’s 1966 Play It By Trust, also known as White Chess Set. Both players’ pieces are white, as are all the board’s squares. Such a design was meant to make the two players, who normally symbolize military opponents, indistinguishable. The work has been widely interpreted as an antiwar statement, because the conceit of opposition is undermined once the pieces begin to consort on the field. On the battlefield of humanity, the game implies, violence and opposition are pointless, invented affairs.

But far from undermining chess, Saito’s and Ono’s chess variants mostly serve to demonstrate the flexibility and resilience of the original game. Saito’s Liquor Chess isn’t only an exercise in memorization; it also juxtaposes chess as a test of wits with drunkenness, the easiest and most culturally acceptable way to deliberately undermine mental acuity. You can purchase many varieties of liquor chess at novelty stores and museum shops—the Exeter set’s polite version of beer pong.

As for White Chess Set, it works well as an antiwar sentiment under the critic’s pen or enshrined atop a gallery plinth where it is meant to be looked at rather than played. But in practice, the game offers as much of a depiction of combat as it does of pacifism, thanks to the interpretive play of meanings we learned about from Derrida. White Chess could be seen as a depiction of the fog of war in conventional warfare, for example, or the inability to discern enemy combatants from friends or civilians in guerrilla warfare and non-state-sponsored insurgencies. Or players could abandon the concept of war entirely and enjoy White Chess as a Machiavellian logic puzzle, a metagame for traditional chess, in which the player must persuade or deceive an opponent to acquire control of the most desirable pieces at a given moment.

Materials are harder to undermine and subvert than skin-deep opposition might suggest. True, it’s often appealing to push the boundaries of something, to test its limits. The foolhardy youth who drives too fast to feel the sensation of risk and to give the finger to authority, despite the danger; or the marathon runner who pushes her body to the edge of its abilities in order to increase her future capacity; or even the artist—even Ono or Saito, Rauschenberg or Manzoni—who pushes the limits of recognizable patterns for painting and sculpture in order to make the institutions of art do new tricks.

But these maneuvers ironize more than they subvert. Or better, to think of them as subversive is to contain and sterilize them under the plastic-wrap of commentary or sabotage. White Chess Set undermines neither chess nor war; mostly it succeeds as a static sculpture created by a famous artist. Avant-garde art was the first bastion of irony, and it continues to breed irony.

Likewise, Sicart is wrong about toys like Frisbees and bicycles. To think that toys reconfigure the world around us presumes that the world is somehow already fixed and settled, for one part, and unworthy of our attention, for another. While it might seem like a moral high ground to lament using roads for automobiles rather than bicycles, and lawns for decoration rather than Frisbee, and malls for improvised dancing rather than commerce, reality proves harder to pin down. Just as Walmart proves that the novelty of things might be found in our willingness to commue with them rather than in their intrinsic properties, so toys and art and other supposed disruptions show us an approach to identifying and embracing the worldful attitude more frequently and with greater delight.

THE MAGIC CIRCLE

Johan Huizinga offers a useful, general concept for this approach to physical therapy. His idea is an anthropologist’s technical term for a playground. In his book Homo Ludens, Huizinga has this to say about the nature of play:

All play moves and has its being within a play-ground marked off beforehand either materially or ideally, deliberately or as a matter of course. Just as there is no formal difference between play and ritual, so the “consecrated spot” cannot be formally distinguished from the playground. The arena, the card-table, the magic circle, the temple, the stage, the screen, the tennis court, the court of justice, etc., are all in form and function play-grounds, i.e., forbidden spots, isolated, hedged
round, hallowed, within which special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart.\(^{16}\)

By “play-ground,” Huizinga doesn’t mean the sand-encircled space in the park down the street with the slides and swing sets. This modern notion of the playground as a park-like environment with physical equipment and open spaces for kids didn’t exist until the nineteenth century, when playgrounds first appeared in Europe and America.\(^{17}\) These public- or school-accessible areas were erected for both moral and safety reasons. For one part, the playground was a place where rules, manners, and sportsmanship could be exercised and policized. For another part, public streets, where children had previously played, became feared for breeding hooliganism and grave physical danger, especially after the introduction of the motorcar. Huizinga uses the term much more generally, in a way that applies to any historical period. He’s suggesting that anything whatsoever can be construed as a ground for play, where play becomes possible once the materials at hand are taken seriously and manipulated with deliberateness.

In the middle of this passage Huizinga lists a series of examples of these sorts of deliberately marked-off playgrounds, many of which illustrate his larger argument about play’s central role in the development of human culture: “The arena, the card-table, the magic circle, the temple, the stage, the screen, the tennis court, the court of justice, etc.” Most of these are quite specific, naming particular locations where the stakes of culture play out, so to speak. Gladiatorial combat and sport take place in the arena and the tennis court; gambling at the card table; ritual and religion in the temple; mimicry, representation, escape, and carnival on the stage and screen; justice and corruption, absolution and incarceration in the court.

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But one of these playgrounds is not like the other, and we’ve encountered it before: the magic circle. It too has a specific cultural meaning: it is the ritual space marked out by magicians and sorcerers, such as those who practice Wicca. When used in sorcery, the magic circle has a relation to other sacred traditions, including the Hindu and Buddhist mandala, which is sometimes used as a symbol of a sacred space or to mark out a locus for meditation. But as the most abstract and, arguably, the least familiar of Huizinga’s examples of playgrounds, the magic circle has taken on special significance in game design.

Katie Salen Tekinbasa and Eric Zimmerman adopt the term to refer to the special place in space and time that is created when a game takes place.\(^{18}\) That place could be the hopscotch or foursquare court, or it could mean embracing Suits’s lusory attitude when reconfiguring a field as a pitch for a friendly game of soccer, or it could mean adopting formal rules and regulations, as in the case of a World Cup football match or a family game of Risk.

Among those who make, study, and play games, the “magic circle” has come to signify the boundary between the ordinary world and the game world, and the concept is often used as a tool for discussing the mechanics or ethics of playing a game. For example, does it “break” the magic circle if a player of Words With Friends, the popular smartphone variant of the board game Scrabble, looks up possible plays on an anagram-solving website? The magic circle has also been central to debates about the intermixing of real and virtual worlds. Players of a massive multiplayer online game (MMOG) like World of Warcraft can buy more advanced characters rather than earning them by rising in the ranks through the grind of repetitive progress. What is the relationship between playing the game and the ethics of endorsing or abiding the factory-like conditions in which Chinese workers “manufacture” such characters for sale on the open market?

But in deliberating the pliability and security of the magic circle, game designers have missed a more useful interpretation of Huizinga’s magic circle: it names a generic process of circumscription. The arena and the court and the theater are complex, permanent, and inflexible tools, which, once erected, service specific activities. To bring them about requires great effort. But the “marking off of a sacred space” need not involve landscaping and cement and wood and velvet. In addition to material construction, Huizinga allows for the marking off of a playground to be done “ideally”; that is, as conception rather than construction.

“Magic circle” is perhaps too dramatic a name for the more ordinary process of material or ideal circumscription. That’s why I embrace playground as an alternative. The circumscription of play is really just the context of particular uses or states of things. When my daughter reconfigured the shopping mall to service her ends, she did so by taking a portion of the context around her and drawing a conceptual line around it. On the inside of that line—within the playground—an invisible, imaginary membrane held the tiles, her feet, the crowds, my momentum pulling her, and so on. Outside the circle, everything else still persists, including all the factors that intervene and interfere with her game, vying for her to adjust the shape and position of the membrane and incorporate them.
"When we are playing," Sicart insists, "anything can become a toy." It's a tempting conclusion, because who wouldn't want life to be more playful, more free and liberating? Except the flipside of liberation is imprisonment. One person's liberation becomes another's anguish. The rush-hour drivers who must negotiate with the cyclists "liberating" a road in a city poorly designed and zoned for bicycling. The older couple hoping to use the park's perimeter for leisurely calisthenics who are unexpectedly sideswiped by a flying Frisbee. As we learned from Mary Poppins, turning the world into games (or toys) is a self-defeating goal. Instead, we should strive to encounter any circumstance as what it is rather than believing we can transform it into something it isn't.

***

IN THE KITCHEN just now, my wife gently rejoins our baby daughter, who sits in her high chair eating dinner. Individual, wrinkled green peas dance across her plastic tray as she bats it hard with each fist: Bam! Bam! Bam! The peas dutifully lurch up and to the floor, to the delight of my daughter. "No!" my wife rejoins futilely, as if the baby can understand. "If you're not going to eat the peas, then you're done with dinner." It turns out the baby is done with dinner.

It's one of an endless set of examples of a familiar pattern. "Don't play with your food." Food, after all, is for eating. Not throwing or sculpting or moving around on the plate. At least, such is the primary purpose of food, the purpose that justifies our growing, buying, preparing, and eating it. But then again, as every child and viewer of Close Encounters of the Third Kind knows, food is in fact also for throwing or sculpting or moving around on one's plate. Peas and mashed potatoes and chicken and applesauce invite us to explore their material properties as much as their nutritive ones. The fact that peas fall, that potatoes squish, and that condiments splatter are all features of foodstuffs that cannot be denied, even if they can be regulated via household or cafeteria policing.

Even adults play with their food, once play is understood as the deliberate exploration of something as a playground. We celebrate or lament the mouthfeel of an oyster or a Cabernet. Yes, true, the contexts for appropriate food play might differ for adults, for children, and for babies—and for dogs and birds and outdoor grills, for that matter. The sensation to reject or rejoin an act of physical therapy—"don't play with your food"—is also a reminder that circumscriptions other than the ones that we actively and willingly partake in are possible—and even desirable. They offer invitations to turn ground into new figure, even if just temporarily. Ironic is how we fail to allow an object, event, or situation to be what it is. But play invites us to find new purchase on those situations.

My daughter's food throwing is a nuisance. It's not what food "is for," within the context of a playground that presumes food is for the feeding of a child. But it's also precisely what food is for, especially for a baby. Feeling the texture and viscosity and pliancy of foodstuffs in her hands. Inspecting the colors and shapes. Making contact between squash or blueberry or Barbara's Puffins Cereal and tongue and mouth and teeth, often for the first time. Just as Boniakowski's Cheetos become newly valid when subjected to the ironized transformation into molecular gastronomy, so a child's food play becomes tolerable once presented within the frame of haute cuisine tasting menus or the blather of fine-wine sommelier-dom. But this perspective on food is just another circumscription, one in which working the material of foodstuffs—their feel, texture, shape, color, and arrangement—also welcomes other materials: the expertise of world-class culinary arts, to be sure, but also appeals to social signaling, conspicuous consumption, sophistication, seduction, and all the other exhausts of adult food and drink.

There are differences between my baby playing with her food at the kitchen table and me playing with mine at a Michelin-starred restaurant. But the primary difference is my own willingness to take the latter sort of play as serious and legitimate, and the former type as merely transitional and irritating, a thing to get over rather than to embrace. Ironically, the reverse could as easily be the case, given time. Fast-forward ten years hence, when I attempt to introduce my baby-turned-child to the delights and customs of fine dining—dressing up, using the various tools of a formal place setting, partaking in the various courses of a meal that lasts over hours rather than minutes, and so forth. Now it will be me begging her to play with her food in a different way, an invitation she will find as unfamiliar and unpalatable as I do her blueberry crushing and toast flinging.

EVERYTHING IS AT PLAY, ANYTHING CAN BE PLAYED

Peter Gray and Stuart Brown want to show that play is a necessary activity for regulating cultural contentment. Miguel Sicart wants to show how play can wrest meaning in a culture that is otherwise deadened or inactive, rendering it newly creative and alive. Mary Flanagan hopes to undermine repressive mainstream voices through subversive "unplaying" of specific targets. In each case, play takes on the role of liberation, freeing otherwise subjugated individuals into the comfort of creative self-actualization.
But Huizinga offers a far more mundane and therefore more powerful insight. He contends that play is the manner by which culture itself gets produced. Play is not an alternative to or a respite from work, but the process through which work is done—including the work of play in the sense of leisure and release. Play is not an activity opposed to work or productivity, as our intuition tells us. It is also not an automatically freeing, liberating activity that rejuvenates us from the work of ordinary life in order to return us back to it. Instead, play is a more general concept. It is the act of working a structure, rather than the act of working that structure for the purpose of leisure, distraction, rejuvenation, or even enjoyment.

Even if play produces fun, the basic experience of play is not letting loose or doing whatever you want, but carefully and deliberately working with the materials one finds in a situation. Play is not only fun, not only a child’s activity, but also exploring the free movement present in a system of any kind, where system might refer to a social situation as much as a machine assembly. Play is the process of exploring such a system, whether it be a toy, a game, the form of the sonnet, or the economics of a household. Thinking worldfully, it is better to think of play as a condition of the universe rather than a human activity—everything is “at play.”

And yet the work-play differential still proves a hard habit to kick. People who endorse play and fun as general concepts still hope to lift play from lower to higher cultural status. But in so doing, they rein play back into the corrals from which they hoped to rescue it. The game designer Raph Koster reinterprets fun as a type of cognition and learning: the good feeling we get when we identify patterns and solve problems. That we learn through play is a common sentiment.20 “Play is our brain’s favorite way of learning,” writes the author Diane Ackerman in an aphorism emblazoned in large letters upon a wall in the National Museum of Play in Rochester, New York. Even play proponents like Brown are guilty of recuperating play back into productive service. Just as soon as we utter suspicion of the work-play differential, play gets put back to work, rescuing us from work in order to make us happier and more productive.

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PLAY IS NOT an act of diversion, but the work of working a system, of interacting with the bits of logic within it. Fun is not the effect of enjoyment released by a system, but a nickname for the feeling of operating it, particularly of operating it in a new way, in a way that lets us discover something within it, or to rediscover something we’ve found before. This latter experience is hard to explain, like lightning striking twice; the improbable experience of finding the same permutation in a subsequent run of a complex system. Revisiting the same methods of sexual gratification, or taking the same series of turns through the same sequence of traffic lights. Play is a method for boring through boredom in order to find and experience the deep nature of ordinary things in the universe.

My daughter’s “step on a crack” game clarifies things, because she serves the role of both designer and player: when racing through a crowded and noisy shopping mall, how can the vertiginous experience of being a small person pulled through the wakes of larger people be transformed from nuisance into advantage? By disallowing arbitrary footfalls, by constraining steps within the boundaries of tiles.

When enacted, the result produces an experience not only different from being whisked willy-nilly through the crowd, but also larger than that experience. Suddenly, a series of actions that might otherwise have gone unnoticed become central to her attention: it matters where every step lands, even if the game has no human or machine referee to police the system.

The process of play is one of identifying, manipulating, and responding to those components. Rather than lament the dissatisfaction of being at the mall, of being a small person among giants, and of being subjected to my schedule and my errands, my daughter identified, embraced, and manipulated the materials that surrounded her at that very moment:

The speed of her own forward momentum, as my large hand and adult gait pulled her faster than she was able to keep up, but which connected her to a pace and a direction that she did not and could not choose.

The patterned, rectilinear tiles of the mall floor, large enough that her small feet could fall fully between their edges and large enough that movement between them would require a leap more than a step.

The crowd of other people steering around us as we steered around them, most of them legs and feet from her vantage point, and therefore easy to cast as generic obstacles rather than individuals.

Play entails a paradox: it is an activity of freedom and pleasure and openness and possibility, but it arises from limiting freedoms rather than expanding them. The boundaries of a playground, the contents contained within them. Their structures. Colloquial senses of game, play, and fun would hold that these activities amount to going outside the boundary of normal behavior, of doing whatever you want: “Don’t play with your food” or “stop fooling around.” But in fact the opposite is true: interesting play
experiences arise from more constraints rather than fewer. Erecting barriers and boundaries more clearly delineates a system. As Bernard Suits puts it, play requires its participants to accomplish something “using only means permitted by rules, where the rules prohibit more efficient in favor of less efficient means, and where such rules are accepted just because they make possible such activity.”

Normally, we address a play experience like my daughter’s either as if it were separate from the trip to the mall or as if it were perpetrated in the service of the errand I had dragged her along on. On the one hand, we could construe my daughter’s activity as a distraction from the “real” work of running errands and therefore existing outside the domain of mall going, a play activity meant to release the boredom and unrest of being somewhere unpleasant. On the other hand, we could see her improvised play as a welcome and even a necessary distraction to help facilitate the rest of the afternoon’s errands. The first interpretation assumes the work-play differential—that the work of chores exists nearby but orthogonal to the play that would divert a young child from boredom. The second interpretation invokes the productive repurposing of play as a means to pleasure or sanity, a resource to be put to use in the interest of “real” effort.

The truth is stranger than either option. My daughter’s game isn’t a distraction from errands, nor is it a mechanism to make errands possible. Instead, it’s an activity made out of errands and other things too, like legs and ceramic tiles, in the same way golf is made out of grass and sand and rubber and wood—and leisure and wealth and zoning. A playground.

While Huizinga’s examples of the play element in culture are far weightier than shopping, the profundity of war and politics and the like can hide the ubiquity of play. Play isn’t only an activity whose surprising uses can be found in serious, consequential activity. It is also a condition of the world, everywhere we look, available to us should we choose to see it—and even if we don’t.

PLAY IS THE WORK OF WORKING SOMETHING

An apparatus or experience fashioned by the boundaries of a magic circle is not necessarily a “game” or a “toy.” After all, a highway system or a family budget has as many constraints as Monopoly or Super Mario Bros. Instead of calling everything a game, we should think of everything as playable: capable of being manipulated in an interesting and appealing way within the confines of its constraints. All media are playable when we look at them in the right light. And that light need not entail the total reform of our educational system, as Gray implies, and it need not signal the resolution of insufferable institutional autocracy, as Sicart suggests. Rather, play is the work of operating a subset of the world, one separated from itself via the circumscription of the magic circle.

The playground offers another perspective on the ironioic madness of its mirror image, the protective encasing symbolized by the plastic sofa cover. By enclosing and encapsulating objects of experience, irony protects us from them, but in so doing it removes them from possible experience. Malls and school and food and everything else are transformed into motifs rather than cohorts. The best we can do with them is to emblazon them on T-shirts or tweets or Tumbrs, to use them as catalogs of insufficiency, bestiaries of lost opportunities.

On first blush, ironic circumscription looks similar to tracing the magic circle, to erecting a playground. A thing arises, cheeseburger-flavored Pringles or espresso machines or a Frisbee, and it preoccupies the attention of its observer. That thing is isolated, then contained within the security of irony’s seemingly impregnable blister pack. Inevitably, irony’s makeshift prison doesn’t hold, and both the object and its prison prove untrustworthy, demanding new enclosure. And irony’s gambit continues on ever larger scales, never offering succor but only increasingly larger and more cumbersome enclosures.

But there’s a difference between the ironic and the playful circumscription. The former holds the object at arm’s length—beyond arm’s length, really, far enough to defuse it as a threat, and in so doing shields the ironist from all possible encounter. Irony is the playground circumscribed but then abandoned. Encounter leads to potential disappointment or betrayal. Better to treat everything as a threat, to trust nothing, to experience nothing save involvement with distrust itself. Confinement, regulation, and control characterize ironic circumscription. And like all good prisons, the ironoic’s object of mistrust is caged, isolated from its warden so to hold its savagery at bay. Who knows what potato chips and roadways and lawns might do if unleashed?

By contrast, the playground includes the observer as a member. It fashions the would-be ironist into a participant—whether as operator or observer—but still maintains the tenuousness of that involvement. Like a chalk line on pavement, the playground knows that it is arbitrary and temporary, flexible and negotiable. Play takes ironic detachment and transforms it into the conditions that bring about the experience it makes possible. Play refuses to presume that the golf course or the shopping center is reasonable or even desirable, a legitimate and certain source of basic operation, let alone success or meaning or joy. Instead, it merely asks what might be possible when things like fairways and malls are encountered by human agents.

The playful stance is the opposite of the ironic one: an embrace of the thing in question rather than a rejection of it. But not because play is more earnest or sincere, and not because it represents the free and liberated will of the player, whose volition elects the play experience instead of some other, less desirable labor or chore. For the ironoic, the threat of an object’s
insufficiency produces paralysis. But for the player, this insufficiency is assumed from the start, as a necessary condition of play. Play is impossible without restriction—not doing what you want, but determining what is possible to do given the meager resources provided.

Play and the resulting effect we call fun are not loose human actions and emotions. They are created in conjunction with external objects. To experience fun, we must shift our reference from the joy or enjoyment we have come to expect from play, and instead understand play as a condition of objects and situations. Things are at play more so than we play with them. And when we encounter things that are subject to play, we need not subsume them into the domain of toys or games or playthings or other mere amusements, but we might instead simply allow them to be exactly what they are. Indeed, perhaps viewing them as what they are is the only way we can truly allow objects, situations, events, people, communities, and anything else to produce pleasure. Not by subsuming or capturing them, and not by deluding ourselves into believing that we are exerting our own control, creativity, and disruption over them. But rather by addressing each thing for what it is, while all the while acknowledging that anything is not entirely ours to address in the first place.

If fun is an admiration for the absurd arbitrariness of things, play is the process by which we arrive at that respect. Play is an activity, but even more so it’s a material property of all objects—from guitars to steering columns to malls to lawns to language to, well, games—and fun is a sensual quality that emanates from them when we touch these things in the right way. Discovering, choosing, managing, and living with what’s inside a particular playground—that’s where fun, and where meaning, resides.
First DiGRA conference

Paper
The gaming landscape: A taxonomy for classifying games and simulations

IN:
"LEVEL UP: Digital Games Research Conference"
Edited by Marinka Copier and Joost Raessens.
p. 54-68, 4-6 November 2003
University of Utrecht, The Netherlands.

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The gaming landscape: A taxonomy for classifying games and simulations

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ABSTRACT
Following Huizinga’s view, the play element of culture is emphasized. While playing, by means of rules, the participants in a game interact with one another to impact on the reference system. Thousands of simulation games are available that depict many different areas and purposes of use. The variety of the gaming landscape is illustrated by linking the various foci and areas of interest in one scheme. To see the wood for the trees, the generic model of games is presented, based on the three interconnected building blocks: actors, rules, and resources. I will point out that even if games have similar forms, their purpose, subject matter, content, context of use, and intended audience(s), may be very different. A framework for constructing, deconstructing and classifying games emerges, based on the combination of the three building blocks with elements of a semiotic theory of gaming: syntax, semantics and pragmatics.

Keywords
Actors, rules, resources, faces of knowledge, interaction & acquisition metaphor, syntax, semantics, pragmatics, classification, taxonomy, gaming, simulation.

INTRODUCTION
Human beings are very big-brained animals that show playful behaviour like many other big-brained animals [3], [12]. Their many manifestations and widespread use show that gaming and playing are bound together by an indissoluble tie with human culture [11]. Huizinga stressed in his book “Homo Ludens” the play element of culture, he was not referring to the play element in culture.

As gaming is so ingrained in human culture and nature, the language of gaming whether for fun or for scientific endeavour is similar. This is an advantage and a disadvantage. It is an advantage because everybody understands their general meaning. It is a disadvantage, because in science that meaning is most of the time different from ordinary use. So, there is a real chance that people think they understand each other, because they use similar terms, while actually they are talking about different things. Besides this potential confusion, the variety of appearances of gaming is so bewildering that it is worthwhile to develop schemes that can help us to see the wood for the trees. Therefore, before elaborating on a generic taxonomy, it is appropriate to be aware of those terms in the English language that have similar connotations. These terms are: exercise; play; game; gamble; model; simulation; simulator [16]. They overlap to a certain extent, representing a continuum of products and activities. I will further focus on these terms from the scientific viewpoint on gaming, because according to my view, gaming encompasses the other terms, and provides a common context for education, training and research.
Playing games means being involved in symbolic acts that - dependent on their degree of playfulness - are valued for themselves. Training and education in industrialised societies stress the instrumental utility of games. In such a context, games are used as tools, or means, to achieve well-defined learning goals. Increasingly, computer or video games are being designed for purely entertainment purposes. While in traditional gaming, designers use reference systems of the real world, video game designers envision imaginary worlds that may show little resemblance with our daily experiences.

**THE GAMING LANDSCAPE**

Participating in games implies engaging in embodied experiences. While playing, the participants interact with one another and with the reference system, which can be represented in many different ways such as a board, a computer interface with icons that represent a database, a spreadsheet, an information system, and/or a simulation model. Gaming crosses existing knowledge domains. It is a trans-disciplinary field of research, education and training, and links many areas of enquiry and professional practice (See Table 1).

The field of gaming and simulation is illustrated in Table 1. Each cell represents a particular playing field, covering various forms such as role-plays, board games, computer-assisted and -supported simulation/games, behaviour simulations, mock-ups, etc. Consequently, many playing fields are available, each of them representing specific learning environments, offering a great variety of learning experiences.

**GAMING FOR EDUCATION, TRAINING AND RESEARCH**

Games are used for education, training and research. Video games are mainly designed for entertainment. Marshev and Popov [23] relate the semantics of games with social systems. To understand gaming both from a scientific and practitioners’ point of view, it is worthwhile to elaborate on their context of use.

In education, games help in understanding the relationships between content, process and context of a subject matter. Emphasis is on handling concepts, relations, and sharing of explicit and tacit knowledge. In training, especially in professional training, emphasis is placed on abilities and skills to improve performance. For example, management games are media to address a variety of issues such as, managerial behaviour, business economics, group dynamics, leadership, strategy, and ethics. Trainers raise awareness of key issues, and the players develop strategies for coping with organizational and managerial problems.

Games are social systems. They are also models of existing or imagined social systems, shaped by the players. While playing a game, people apply knowledge and skills to triumph over difficulties set by fellow players or by socio-economic circumstances. They shape organizations and act within the boundaries of organizations, guided by the rules. This applies to small children playing their imaginary worlds, to teenagers having fun with video games, and also to professionals playing with business games. While trying to defeat the odds, players try to gain competence, power, and influence.

Actors constitute systems of interactions. They draw upon rules and resources while functioning in organizations. In a soccer game for example, the players, the coaches and the referees are the main actors. They interact according to the rules. Their resources are the ball, the soccer field, the stadium, etc. While confirming each other's
roles, and making use of the rules and resources, they produce and reproduce the social system concerned (that is, a particular match). By changing the interactions, the rules and/or the resources, they either transform the system or produce a completely new one. They may switch for example to rugby. They can also change position, from inside participant (actor) to outside observer. In this case, they can question the motives and effectiveness of the actors; the rules as applied by the referee; and/or the quality of the resources. That could help to develop strategies for the maintenance or transformation of the social system that is, the game. Underlying this approach to social systems is a notion about terms such as, autopoiesis (self-reproduction), self-reference, and reflexivity (self-awareness) [17].

The communities of gamers such as ISAGA, SAGSET, ABSEL, NASAGA, JASAG, SAGSAGA, DiGRA, etc. represent different gaming cultures. All are involved in pursuing gaming and simulation for research, education and training. All are focussed on learning from and through gaming. Therefore, they need a common framework for advancing the field, and to understand each other and communicate effectively about what they are doing, taking into account that scholars and practitioners usually operate within a small subset of Table 1.

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<th>Areas of application: Reference Systems</th>
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Table 1: Realm of Gaming & Simulation [18]
Due to the great variety of appearances of games and simulations we need to develop a common language, a trans-disciplinary theory of knowledge to be able to develop a meta-discipline. Barth [2] offers an interesting and fruitful approach to that debate. From the perspective of an anthropology of knowledge, he distinguishes three faces of knowledge:

- a substantive corpus of assertions,
- a range of media of representation, and
- a social organization.

They interrelate in particular ways in different traditions of knowledge, and they generate tradition-specific criteria for validity of knowledge-about-the-world. Knowledge, according to Barth, is “a way to understand major aspects of the world, ways to think and feel about the world, and ways to act on it” [2, p4]. Every game is being designed with in mind: a substantive corpus of assertions (rules and resources), a range of media of representation (rules), and a social organization (actors). These faces interrelate in particular ways in different games.

I will paraphrase Barth’s views to make them suitable for gaming. Any game represents a tradition of knowledge. It contains assertions and ideas about aspects of the world. This tradition must be instantiated and communicated in one or several media as a series of partial representations in the form of words, concrete symbols, pointing gestures, actions. It is distributed, communicated, employed and transmitted within a series of instituted social relations. These three aspects of knowledge determine, constrain and enable one another. They are embedded in the play element of culture. To paraphrase Chi-Yue Chiu’s comments on Barth’s paper, “during a game session, meaning is constructed, transmitted and applied in social transactions. These symbolic actions take place among socially situated persons with particular communicative intentions” [4, p.11]. Within such a setting, the interplay between tacit and explicit knowing will bring forward a certain type of cognitivity. Learning has only taken place, if as a result of playing a game, increased cognitivity enhances our understanding of (parts of) the world, our thinking and feeling about the world, and our ways of acting on it.

Media of representation and communication run in the field of gaming and simulation from game boards, paper and pencil, snow cards, and computer interfaces vis-à-vis underlying mathematical models, to web-based multi-media configurations. Different branches of academic knowledge use different media of representation. Mathematical knowledge uses computations, gross anatomy series of atlases, microbiology its technical laboratory equipment and chemical models, geography atlases and scale models, and so on. Barth points out that these representations shape both thought and action and thus the practices of professionals in different disciplines. They shape the style of the game design when designers choose the media or representation in the game. By selecting certain media of representation, game designers construct imagery that affects the learning that is, the construction of new knowledge. In addition to and distinguished from the modes of representation, the organizational face of knowledge determines criteria of validity, trajectories of evolving knowledge resulting from the negotiation of meaning, and forms of coherence that govern knowledge. The organizational face of knowledge in a game results from the systems of interactions between the actors, which are governed by the rules, and constrained the available resources.

Considering the organizational face of knowledge, the idea of duality of structure is relevant. “Interaction is constituted by and in the conduct of subjects; structuration, as the reproduction of practices, refers abstractly to the dynamic process whereby structures come into being. …Social structure is both constituted by human agency and is at the same time the medium of this constitution” [8].
Actors constitute systems of interactions. They draw upon rules and resources while functioning in organizations. By changing the interactions, the rules and/or the resources, actors either transform the system or produce a completely new one. Because of the duality of structure, they can also change position, from inside participant (actor) to outside observer. That could help to develop strategies for the maintenance or transformation of the social system, in our case, the game. Such a transformation will impact on all three faces of knowledge, on the substantive corpus of assertions, the range of media of representation, and the social organization. Such transformations are beyond the scope of rigid rule games, which presume that participants play by the rules without questioning them.

**About learning**

All education and training aim at developing expertise. Five interacting key elements are: meta-cognitive skills, learning skills, thinking skills, knowledge and motivation [28]. These five key elements should be seen from the viewpoint of individuals operating in so-called contextualized environments such as in games. The controversial nature of current learning theories offers an interesting view on the potentials of and problems with interactive learning environments. I will highlight two competing frameworks, the acquisition metaphor versus the interaction metaphor. They implicitly play a key role in understanding the meaning of the five elements pointed out by Sternberg [29]. Although Sfard [27] uses the participation metaphor, in this paper I prefer to use the concept of interaction. I will not elaborate on epistemological and ontological foundations of both learning metaphors.

Sfard has pointed out that since the time of Piaget and Vygotsky, the growth of knowledge in the process of learning has been studied in terms of concept development. The learner is a person who constructs and negotiates meaning. Sfard states: “The language of “knowledge acquisition” and “concept development” makes us think about the human mind as a container to be filled with certain materials and about the learner as becoming an owner of these materials” [27, p5].

The following terms fit into the framework of the acquisition metaphor: knowledge, concepts, conception, notion, misconception, meaning, sense, schema, fact, and representation, material, content. Terms that denote the action to become owner of knowledge are: reception, acquisition, construction, internalisation, development, accumulation, and grasp. Acquired knowledge, like any other commodity, may be applied, transferred and shared with others. The acquisition metaphor is strongly entrenched in the rationalist tradition in science. In this tradition, knowledge is composed of abstract, context-independent, formally interconnected domain-specific concepts [15].

The interaction metaphor has recently started to develop. Rogoff [26] speaks of learning as an apprenticeship in thinking. Sfard signals an extensive change by the fact that, although referring to learning, recent literature does not mention “concept” or “knowledge”. They have been replaced with the noun “knowing”, which indicates action. She states: “The talk about states has been replaced with attention to activities. The image of learning that emerges from this linguistic turn, the permanence of having (knowledge) gives way to the constant flux of doing” [27, p6].

The new set of key words is “practice”, “discourse” and “communication”. They suggest that the learner is a person interested in participation in certain kinds of activities rather than in accumulating private possessions. From the viewpoint of the interaction metaphor, learners contribute to the existence and functioning of a community of practitioners [27]. Greeno [9] defines learning as “improved participation in interactive systems.”
The dilemma of this metaphor is phrased in the question: "How are learners able to build for themselves concepts that seem fully congruent with those of others?" This simple question is difficult to answer. It is out of the scope of this paper to elaborate on it. (More information, see [15, 16, 17, 19, 21]).

Considering the wide variety of games, and areas of application, the gaming landscape is so diverse that investigating questions about learning cannot yet be addressed straightforwardly. Even if games have similar forms, their purpose, subject matter, content, context of use, and intended audiences, may be very different. Questions of learning and knowing through gaming and simulation are not being addressed adequately as long as assessments and evaluations, debriefing included, are limited to the specific game or simulation in hand. Therefore, I have made the following proposition: Studying interactive learning through gaming and simulation can only be productive if a suitable epistemology is available to connect learning through specific games with learning through gaming [21]. The basic question concerns the kinds of learning and knowing that emerge while playing a game, any game. Such learning and knowing should be linked to the play element of culture. It should as well pay attention to the specific learning environments provided. A comprehensive theory about learning and knowing through gaming and simulation is not yet available due to competing epistemologies. Moreover, the community of gamers seems to be more interested in the instrumentality of games that is, in methods and techniques of game design and use. Methodological questions have not yet drawn wide attention.

**STEERING IN SOCIAL SYSTEMS**

Interactive learning environments based on simulation models, view the social system as allopoietic or artificial. The behaviour of such a system is controlled by the function it fulfils in the larger social system and by the input it receives from its environment. It is viewed as an instrument, produced and used by another external system to reach its goals [24].

Interactive learning environments based on the gaming, particularly free-form gaming, view the system as autopoietic. It is not structured by external information it receives, but by its system of interactions. Therefore, the (meta-)cognitive structures used by the system are constructed (produced) by the system itself. Maturana and Varela too reject the concept of knowledge as a representation or image of some external reality. Cognitive interaction between the system and its environment is restricted to triggering of internal processes by external perturbations [10]. Evidently in social systems these internal processes are enacted by the actors, which produce a system of interactions. They form the autopoietic (self-reproducing) forces within the system.

From epistemological point of view, I see a strong link on the one hand between learning according to the acquisition metaphor, allopoietic steering and simulation, and on the other hand between learning according to the interaction metaphor, autopoietic steering and gaming.

Designers of the interactive learning environments have the option to balance the acquisition and interactive metaphor. They can offer learners the possibility for learning concerning terms such as practice, discourse, communication, interaction, and improved participation in interactive systems. They should however keep in mind the limitations of rule-based simulations and games with respect to the self-reproduction of the subsystems of rules and resources. That restriction hampers the actors to distance themselves from the rules and resources to devise strategies for their transformation. That option would provide the conditions for interactive learning environments to become self-organizing [17]. Truly self-organizing learning environments stress that the ideal of objectivity, that is, universal knowledge, and knowledge as accumulation, needs
to be replaced with inter-subjective agreement within a historic community. This notion is the quintessence of the interaction metaphor.

**CLASSIFICATIONS**

In this section I will select several classifications of games to show that different approaches give meaning to different characteristics. For a start, a simple definition is presented. A game is a contest (play) among adversaries (players) operating under constraints (rules) for an objective (winning, victory or payoff) [1].

Ellington et al. [6] identify two essential features for describing games. The exercise, or activity, must involve overt competition between individuals or teams, or between the individuals or teams, which are competing against “nature”. In addition, the exercise must have rules. The players must operate under a set of guidelines specific to the particular game. They relate three related sets of exercises, namely, games, simulations and case studies that partly overlap each other. Based on this scheme, they distinguish the following three pure types and four hybrids:

- pure games
- pure simulations
- pure case studies
- simulation games
- simulated case studies
- games used as case studies
- simulation games used as case studies.

Ellington et al then classify games according to their format, the means through which the game is presented, see Table 2.

<table>
<thead>
<tr>
<th>Psychomotor skill games</th>
<th>(Computer-based) manual games</th>
</tr>
</thead>
<tbody>
<tr>
<td>field games</td>
<td>soccer, baseball, golf, tennis, etc.</td>
</tr>
<tr>
<td>table games</td>
<td>snooker, pool, etc.</td>
</tr>
<tr>
<td>simple manual games</td>
<td>charades, crossword, puzzles, etc.</td>
</tr>
<tr>
<td>card games</td>
<td>bridge etc.</td>
</tr>
<tr>
<td>board games</td>
<td>chess, go, monopoly, etc.</td>
</tr>
<tr>
<td>device-based games</td>
<td>Rubik’s Cube, etc.</td>
</tr>
</tbody>
</table>

Table 2: Classification of games according to format (adapted from Ellington et al. [6])

Caillois [5] developed a classification of games, based on two dimensions. The first one refers to four categories: AGON, ALEA, MIMICRY and ILINX, the second one to the rule base: PAIDA and LUDUS, see Table 3. MIMICRY and ILINX reflect the playfulness of activities, while AGON and ALEA represent mainly gamesmanship.

<p>| PAIDA &lt;------------------------------------------&gt;LUDUS |</p>
<table>
<thead>
<tr>
<th>freedom, free improvisation</th>
<th>rules &amp; conventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGON - races, wrestling -------------------------- soccer, chess</td>
<td></td>
</tr>
<tr>
<td>(competition: equal probability of success)</td>
<td></td>
</tr>
<tr>
<td>ALEA - counting rhymes ---------------------------- lottery</td>
<td></td>
</tr>
<tr>
<td>(luck: players cannot exert any control over outcomes)</td>
<td></td>
</tr>
<tr>
<td>MIMICRY - childish imitations ---------------------- theatre</td>
<td></td>
</tr>
<tr>
<td>(mask: players pretending to be someone else)</td>
<td></td>
</tr>
<tr>
<td>ILINX - merry go round ---------------------------- acrobatics</td>
<td></td>
</tr>
<tr>
<td>(vertigo: attempts to disrupt regular perception patterns)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Classification of games (adapted from Caillois [5])

Shubik [28] has developed the following scheme (see Table 4).
Table 4: Taxonomy of games (adapted from Shubik [28]).

These classifications emphasize the functionality and/or goals of a game. Different gaming formats might have similar functions. Such classifications do not provide valuable information about their architecture, which is a precondition for understanding their differences and commonalities of design. In order to present principles underlying the architecture of games and simulations the following basic form is presented. It is based upon key characteristics of human organisations, and in more general terms, of social systems.

**A GENERIC GAMING AND SIMULATION MODEL**

Games represent social systems in all their variety. Although games and simulations can be very different as regards their format and content, they have in common the following basic form of social systems [15]. Their architecture is defined by three interconnected building blocks:

- Actors
- Rules
- Resources.

In each game, the players (actors) interact with one another, while applying rules, and utilizing resources. General management games model companies that are operating in the same market. The acting teams apply similar rules and apply similar resources to compete with one another. Urban management games, which aim at enhancing policy development and urban planning, can be envisioned to include actors that represent different interests and positions in the political arena. The actors may apply various rules, while having different resources available. On the basis of this generic model, numerous configurations of games and simulations can be described and envisioned.

Marshev and Popov [23] developed a semiotic theory of gaming. They distinguish three viewpoints:

- syntax of a game - arrangement of elements and rules of a game;
- semantics of a game - interpretation and meaning of elements of a game;
- pragmatics of a game - design and use of a game.
By integrating both viewpoints, the emerging framework enables to characterize games and simulation in great detail [16]. It enhances the understanding of commonalities and differences between the design of specific games and simulations.

**A TAXONOMY TO CLASSIFY GAMES**

Combining social systems theory [13, 14, 17] with semiotic theory of gaming [23] offers an integrated framework for understanding the basic elements of gaming. Each game with its specific structure of actors, rules, and resources is a language with its particular syntax, semantics and pragmatics. As a language it conveys and produces meaning and context dependent, situational knowledge. It also shapes the system of interactions and consequently the internal organization of the game. The purpose of a game can be autotelic or allotelic. It is autotelic if the players have the freedom to act according to own goals and sources of motivation. They are free from dependence on authority and be allowed to reason for themselves [25, p.18]. Knowing is gained mainly through interacting. A game is allotelic if the players act according to outside goals and sources of motivation, embedded in the rules. Their activities represent means to some end. They are mainly recipient of information. They depend on the authority of the game facilitator and are forced to reason according to the knowledge provided by the game manuals. Knowledge is mainly gained through acquisition.

**SYNTAX**

The syntax defines the grammatical arrangement of a game.

**Actors**

*Players:* Participants of the social system. The number of people participating in the game can play multiple roles. They shape the social organisation.

*The number of places for actors:* actors are capable of carrying out activities in the game. They can be individual players or teams.

**Rules**

*Manipulation set of the game:* this subset of rules defines the manipulations, the possible moves with the pieces, as transformations of the positions.

*A set of game positions:* the arrangement of the set of pieces at a certain moment in time defines their position in the scheme of the game space. Rules describe the initial subset of positions. Dependent on the type of game, they may also define the intermediate and final subset of positions, including the rules for finishing the game.

Both the game manipulation set and the set of game positions are related to the media of representation.

**Resources**

*Set of pieces to play with:* these pieces symbolize a real or imaginary world.

*Game space:* the pieces and the way they interrelate are defined by the rules. The pieces are allocated in the game space via an initial setting and they change during the process of playing. The set of places is the game space, and the set of places with its structure: the arrangement is the scheme of the game space. The configuration of the game space depends on the substantive corpus of assertions, made by the designer.

*Valuation set:* assessment and valuation of initial, intermediate and final position for each player and team.

**SEMANTICS**

The way a game corresponds with our understanding, with our conceptual frames - the general interpretation - is called the semantics.
Actors
Roles: the ‘role’ is a key term in the semantics of a game. It provides a context for interpreting a game space. It offers a lens and a perspective for interpreting and acting. The role structure gives shape to the theoretical (formal) structure of a social system. Actors take those roles and express them according to formal and informal rules.

Actors take different roles according to the rules. They have available pieces of different types with the positions taken by these pieces. They can make a sequence of moves with these pieces while trying to achieve their goals. They have access to various sorts of information about the game, and during the game.

Rules
Relationships between roles: a game is a symbolic representation of the actor structure of the social system. The relationships show the communication and coordination structure of the social organisation. Who is allowed to interact with whom?
Cultural, socio-economic situations: the placement of pieces according to the scheme of the game space is the position at one moment in time. It is understood as a particular state of the social system. Through that state a particular cultural and socio-economic situation is expressed.
Places for resource allocation: during the game pieces are allocated in the game space. This allocation, from its initial position, can be well-defined by the rules, or is for the players to decide. Initial and intermediate positions are evaluated to make subsequent moves.

Resources
Resources: the symbolic meaning of the pieces in the game space, referring to reality.

PRAGMATICS
The methodology and methods for designing, preparing, conducting and assessing a game comprise the pragmatics of a game. The design process includes the specific arrangement of the rules, the scheme of the game space, the game positions, the actors, their roles, and their correspondence with a symbolic world.
During the preparations, the game operators or facilitators, the players, and the teams are allocated. The materials for the game, the facilities and equipment are prepared. Conducting a game starts with the instructions to the players and proceeds by assisting, guiding the process, and performing an extensive debriefing. The pragmatics are embedded in the macro-cycle of a game session (19).

Actors
Allopoietic vs. autopoietic steering: if the goals of the game are external, as usually happens in professional training, its steering is allopoietic, emphasizing the training of skills. If the goals are autotelic, steering is autopoietic. The resulting game is self-organizing.
Knowledge as acquisition, as interaction: if knowledge transfer is the primary goal, in terms of concepts, cognitive maps etc., the minds of the players are viewed as mental containers. That knowledge needs to be acquired. If knowledge is the result of negotiating meaning between the players, knowledge is the consequence of the system of interactions.

Rules
The team of facilitators: the facilitators are the referees or coaches who act according to the rules.
Format: the format defines the procedure for conducting the game. Games can be open, so-called free-form, or closed, so-called rigid-rule games.
Assessment function: assessing a game, after its final position has been reached, starts with the debriefing and may continue with a thorough evaluation of the subsequent positions of the scheme of the game space, the moves the actors have made and the motives for making those moves.
Resources

*Materials, paraphernalia*: the players receive instruction material, paraphernalia. They may use equipment such as computers. For conducting games appropriate facilities are needed.

Table 5 wraps up this taxonomy, including key aspects related to the specifications of design.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Social System</td>
<td>Syntax</td>
<td>Semantics</td>
<td>Pragmatics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actors</td>
<td>Players</td>
<td>Roles</td>
<td>Allopoietic vs. Autopoietic Steering.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of game places</td>
<td></td>
<td>Knowledge as acquisition as interaction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rules</td>
<td>Game manipulation set: Preparatory rules; Normative rules; Behavioural rules</td>
<td>Relationships between roles</td>
<td>Team of game facilitators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Set of game positions</td>
<td>Cultural, socio-economic situations</td>
<td>Format: rigid-rule vs. free-form</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Final game positions</td>
<td>Evaluation of places for resource allocation, and position within team of players</td>
<td>Assessment functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evaluation functions</td>
<td>Resources</td>
<td>Paraphernalia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Resources</td>
<td>Set of places</td>
<td>Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paraphernalia</td>
<td>Set of places</td>
<td>Facilities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Framework for a taxonomy of gaming (adjusted from [16])

**CLASSIFICATION OF SIMULATION/GAMES**

Based on the building blocks of social systems, from the perspective of model building, it is possible to distinguish between gaming and simulation, particularly computer simulation of social systems. If no actors are involved, two options of simulation are available for modelling rules and resources [14]:

- pure simulation of resource processes with for example input-output models. Rules are rudimentary.
• via rule-based systems, simulation of information feedback systems such as in use with System Dynamics (see Table 6).

If resources are not explicitly defined, only actors and rules are involved. Actors and rigid-rules are the ingredients of theatre. Actors and free-rules shape role-plays (see Table 7).

<table>
<thead>
<tr>
<th>RULES</th>
<th>feedback models--input-output models</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTORS</td>
<td>Theatre--role play</td>
</tr>
</tbody>
</table>

Table 6: Simulation with no actors involved

<table>
<thead>
<tr>
<th>RULES</th>
<th>open</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>RESOURCES</th>
<th>ACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigid-rule games--behavioural simulations--free-form games</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Gaming with no explicit resources

If actors, rules and resources are explicitly defined, then we are in the domain of gaming (see Table 8).

With the framework depicted in Table 5, the variety of entertainment, educational, experimental, research, operational, manual, computer-based, rigid rule and free-form games can be coherently described both for newcomers, practitioners and researchers. From semiotic viewpoint the difference between a computer-based and manual game, such as a board game, is not fundamental. From the perspective of media of representation they make a difference. This is for example the case with the computer-based and board game versions of PERFORM [13, 20]. The image of the games pieces and the game space, and therefore their gaming experience are different. Their symbolic meaning in terms of the substantive corpus of assertions remains the same.

The level of abstraction of the taxonomy presented in Table 5 allows a detailed description of games, with all their variety in appearances. It connects design-in-the-small with design-in-the-large [22].

The taxonomy has been used recently to classify two similar but different games in an arbitration case about intellectual ownership, in designing new games, and in deconstructing existing games to understand their basic architecture. Among professionals and students it has enhanced considerably the mutual understanding of the architecture of the games involved.

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The Game Design Reader
A Rules of Play Anthology

Katie Salen and Eric Zimmerman

Roger Caillois: The Definition of Play, The Classification of Games

The MIT Press
Cambridge, Massachusetts
London, England

book design and photography | Douglas Diaz and Katie Salen
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This book was set in 9-point DIN by Douglas Diaz and Katie Salen and was printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

The Game design reader: a rules of play anthology / edited by Katie Salen and Eric Zimmerman

p.cm.

QA76.76.C672G357 2005

794.8.1536—dc22

10 9 8 7 6 5 4 3 2 1
The Definition of Play and The Classification of Games

Roger Caillios

Context
The ideas that reached fruition in Man, Play and Games began as an appendix to Caillios’ 1959 book Man and the Sacred. Much of Caillios’ work on play and games is a direct critique of Johan Huizinga’s Homo Ludens. In Man, Play and Games, he expands Huizinga’s more contest-oriented notion of play to include a range of cultural forms. Driven by a desire to study play in and of itself, during the two chapters included here Caillios establishes his well-known taxonomy of play forms. In the rest of the book, Caillios applies this taxonomy to play activities from a range of world cultures. “The Definition of Play,” and “The Classification of Games” come from Man, Play and Games, copyright 1958 by Librairie Gallimard. English translation by Meyer Barash, copyright 1961 by the Free Press of Glencoe, Inc. Used with permission of the University of Illinois Press.

Roger Caillios (1913–1978) was a French writer and philosopher whose books ranged on topics from psychoanalysis and sociology to anthropology and art. He was the founding editor of Diegones, the journal of the international Council for Philosophy and Humanistic Studies, and is considered by many to be one of the most influential thinkers on games and play.
The Definition of Play

In 1933, the rector of the University of Leyden, J. Huizinga, chose as the theme of an important oration, "The Cultural Limits of Play and the Serious." He took up and developed this topic in an original and powerful work published in 1938, *Homo Ludens*. This work, although most of its premises are debatable, is nonetheless capable of opening extremely fruitful avenues to research and reflection. In any case, it is permanently to J. Huizinga's credit that he has masterfully analyzed several of the fundamental characteristics of play and has demonstrated the importance of its role in the very development of civilization. First, he sought an exact definition of the essence of play; second, he tried to clarify the role of play present in or animating the essential aspects of all culture: in the arts as in philosophy, in poetry as well as in juridical institutions and even in the etiquette of war.

Huizinga acquitted himself brilliantly in this task, but even if he discovers play in areas where no one before him had done so, he deliberately omits, as obvious, the description and classification of games themselves, since they all respond to the same needs and reflect, without qualification, the same psychological attitude. His work is not a study of games, but an inquiry into the creative quality of the play principle in the domain of culture, and more precisely, of the spirit that rules certain kinds of games—those which are competitive. The examination of the criteria used by Huizinga to demarcate his universe of discourse is helpful in understanding the strange gaps in a study which is in every other way remarkable. Huizinga defines play as follows:

Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside "ordinary" life as being "not serious," but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.¹

Such a definition, in which all the words are important and meaningful, is at the same time too broad and too narrow. It is meritorious and fruitful to have grasped the affinity which exists between play and the secret or mysterious, but this relationship cannot be part
of the definition of play, which is nearly always spectacular or ostentatious. Without doubt, secrecy, mystery, and even travesty can be transformed into play activity, but it must be immediately pointed out that this transformation is necessarily to the detriment of the secret and mysterious, which play exposes, publishes, and somehow expends. In a word, play tends to remove the very nature of the mysterious. On the other hand, when the secret, the mask, or the costume fulfills a sacramental function one can be sure that not play, but an institution is involved. All that is mysterious or make-believe by nature approaches play; moreover, it must be that the function of fiction or diversion is to remove the mystery; i.e. the mystery may no longer be awesome, and the counterfeit may not be a beginning or symptom of metamorphosis and possession.

In the second place, the part of Huizinga’s definition which views play as action denuded of all material interest, simply excludes bets and games of chance—for example, gambling houses, casinos, racetracks, and lotteries—which, for better or worse, occupy an important part in the economy and daily life of various cultures. It is true that the kinds of games are almost infinitely varied, but the constant relationship between chance and profit is very striking. Games of chance played for money have practically no place in Huizinga’s work. Such an omission is not without consequence.

It is certainly much more difficult to establish the cultural functions of games of chance than of competitive games. However, the influence of games of chance is no less considerable, even if deemed unfortunate, and not to consider them leads to a definition of play which affirms or implies the absence of economic interest. Therefore a distinction must be made.

In certain of its manifestations, play is designed to be extremely lucrative or ruinous. This does not preclude the fact that playing for money remains completely unproductive. The sum of the winnings at best would only equal the losses of the other players. Nearly always the winnings are less, because of large overhead, taxes, and the profits of the entrepreneur. He alone does not play, or if he plays he is protected against loss by the law of averages. In effect, he is the only one who cannot take pleasure in gambling.

*Property is exchanged, but no goods are produced.* What is more, this exchange affects only the players, and only to the degree that they accept, through a free decision remade at each game, the probability of such transfer. A characteristic of play, in fact, is that it creates no wealth or goods, thus differing from work or art. At the end of the game, all can and must
start over again at the same point. Nothing has been harvested or manufactured, no masterpiece has been created, no capital has accrued. Play is an occasion of pure waste: waste of time, energy, ingenuity, skill, and often of money for the purchase of gambling equipment or eventually to pay for the establishment. As for the professionals—the boxers, cyclists, jockeys, or actors who earn their living in the ring, track, or hippodrome or on the stage, and who must think in terms of prize, salary, or title—it is clear that they are not players but workers. When they play, it is at some other game.

There is also no doubt that play must be defined as a free and voluntary activity, a source of joy and amusement. A game which one would be forced to play would at once cease being play. It would become constraint, drudgery from which one would strive to be freed. As an obligation or simply an order, it would lose one of its basic characteristics: the fact that the player devotes himself spontaneously to the game, of his free will and for his pleasure, each time completely free to choose retreat, silence, meditation, idle solitude, or creative activity. From this is derived Valéry's proposed definition of play: it occurs when "l'ennui peut délier ce que l'entraîn avait lié." It happens only when the players have a desire to play, and play the most absorbing, exhausting game in order to find diversion, escape from responsibility and routine. Finally and above all, it is necessary that they be free to leave whenever they please, by saying: "I am not playing any more."

In effect, play is essentially a separate occupation, carefully isolated from the rest of life, and generally is engaged in with precise limits of time and place. There is place for play: as needs dictate, the space for hopscotch, the board for checkers or chess, the stadium, the racetrack, the list, the ring, the stage, the arena, etc. Nothing that takes place outside this ideal frontier is relevant. To leave the enclosure by mistake, accident, or necessity, to send the ball out of bounds, may disqualify or entail a penalty.

The game must be taken back within the agreed boundaries. The same is true for time: the game starts and ends at a given signal. Its duration is often fixed in advance. It is improper to abandon or interrupt the game without a major reason [in children's games, crying "I give up," for example]. If there is occasion to do so, the game is prolonged, by agreement between the contestants or by decision of an umpire. In every case, the game's domain is therefore a restricted, closed, protected universe: a pure space.

The confused and intricate laws of ordinary life are replaced, in this fixed space and for this given time, by precise, arbitrary, unexceptionable rules that must be accepted
as such and that govern the correct playing of the game. If the cheat violates the rules, he at least pretends to respect them. He does not discuss them: he takes advantage of the other players’ loyalty to the rules. From this point of view, one must agree with the writers who have stressed the fact that the cheat’s dishonesty does not destroy the game. The game is ruined by the nihilist who denounces the rules as absurd and conventional, who refuses to play because the game is meaningless. His arguments are irrefutable. The game has no other but an intrinsic meaning. That is why its rules are imperative and absolute, beyond discussion. There is no reason for their being as they are, rather than otherwise. Whoever does not accept them as such must deem them manifest folly.

One plays only if and when one wishes to. In this sense, play is free activity. It is also uncertain activity. Doubt must remain until the end, and hinges upon the denouement. In a card game, when the outcome is no longer in doubt, play stops and the players lay down their hands. In a lottery or in roulette, money is placed on a number which may or may not win. In a sports contest, the powers of the contestants must be equated, so that each may have a chance until the end. Every game of skill, by definition, involves the risk for the player of missing his stroke, and the threat of defeat, without which the game would no longer be pleasing. In fact, the game is no longer pleasing to one who, because he is too well trained or skillful, wins effortlessly and infallibly.

An outcome known in advance, with no possibility of error or surprise, clearly leading to an inescapable result, is incompatible with the nature of play. Constant and unpredictable definitions of the situation are necessary, such as are produced by each attack or counterattack in fencing or football, in each return of the tennis ball, or in chess, each time one of the players moves a piece. The game consists of the need to find or continue at once a response which is free within the limits set by the rules. This latitude of the player, this margin accorded to his action is essential to the game and partly explains the pleasure which it excites. It is equally accountable for the remarkable and meaningful uses of the term “play,” such as are reflected in such expressions as the playing of a performer or the play of a gear, to designate in the one case the personal style of an interpreter, in the other the range of movement of the parts of a machine.

Many games do not imply rules. No fixed or rigid rules exist for playing with dolls, for playing soldiers, cops and robbers, horses, locomotives, and airplanes—games, in general, which presuppose free improvisation, and the chief attraction of which lies in the pleasure of
playing a role, of acting as if one were someone or something else, a machine for example. Despite the assertion’s paradoxical character, I will state that in this instance the fiction, the sentiment of as if, replaces and performs the same function as do rules. Rules themselves create fictions. The one who plays chess, prisoner’s base, polo, or baccara, by the very fact of complying with their respective rules, is separated from real life where there is no activity that literally corresponds to any of these games. That is why chess, prisoner’s base, polo, and baccara are played for real. As if is not necessary. On the contrary, each time that play consists in imitating life, the player on the one hand lacks knowledge of how to invent and follow rules that do not exist in reality, and on the other hand the game is accompanied by the knowledge that the required behavior is pretense, or simple mimicry. This awareness of the basic unreality of the assumed behavior is separate from real life and from the arbitrary legislation that defines other games. The equivalence is so precise that the one who breaks up a game, the one who denounces the absurdity of the rules, now becomes the one who breaks the spell, who brutally refuses to acquiesce in the proposed illusion, who reminds the boy that he is not really a detective, pirate, horse, or submarine, or reminds the little girl that she is not rocking a real baby or serving a real meal to real ladies on her miniature dishes.

Thus games are not ruled and make-believe. Rather, they are ruled or make-believe. It is to the point that if a game with rules seems in certain circumstances like a serious activity and is beyond one unfamiliar with the rules, i.e. if it seems to him like real life, this game can at once provide the framework for a diverting make-believe for the confused and curious layman. One easily can conceive of children, in order to imitate adults, blindly manipulating real or imaginary pieces on an imaginary chessboard, and by pleasant example, playing at “playing chess.”

This discussion, intended to define the nature and the largest common denominator of all games, has at the same time the advantage of placing their diversity in relief and enlarging very meaningfully the universe ordinarily explored when games are studied. In particular, these remarks tend to add two new domains to this universe: that of wagers and games of chance, and that of mimicry and interpretation. Yet there remain a number of games and entertainments that still have imperfectly defined characteristics—for example, kite-flying and top-spinning, puzzles such as crossword puzzles, the game of patience, horsemanship, seesaws, and certain carnival attractions. It will be necessary to return to this problem.
But for the present, the preceding analysis permits play to be defined as an activity which is essentially:

1. **Free**: in which playing is not obligatory; if it were, it would at once lose its attractive and joyous quality as diversion;

2. **Separate**: circumscribed within limits of space and time, defined and fixed in advance;

3. **Uncertain**: the course of which cannot be determined, nor the result attained beforehand, and some latitude for innovations being left to the player’s initiative;

4. **Unproductive**: creating neither goods, nor wealth, nor new elements of any kind; and, except for the exchange of property among the players, ending in a situation identical to that prevailing at the beginning of the game;

5. **Governed by rules**: under conventions that suspend ordinary laws, and for the moment establish new legislation, which alone counts;

6. **Make-believe**: accompanied by a special awareness of a second reality or of a free unreality, as against real life.

These diverse qualities are purely formal. They do not prejudge the content of games. Also, the fact that the two last qualities—rules and make-believe—may be related, shows that the intimate nature of the facts that they seek to define implies, perhaps requires, that the latter in their turn be subdivided. This would attempt to take account not of the qualities that are opposed to reality, but of those that are clustered in groups of games with unique, irreducible characteristics.
The Classification of Games

The multitude and infinite variety of games at first causes one to despair of discovering a principle of classification capable of subsuming them under a small number of well-defined categories. Games also possess so many different characteristics that many approaches are possible. Current usage sufficiently demonstrates the degree of hesitance and uncertainty: indeed, several classifications are employed concurrently. To oppose card games to games of skill, or to oppose parlor games to those played in a stadium is meaningless. In effect, the implement used in the game is chosen as a classificatory instrument in one case; in the other, the qualifications required; in a third the number of players and the atmosphere of the game, and lastly the place in which the contest is waged. An additional over-all complication is that the same game can be played alone or with others. A particular game may require several skills simultaneously, or none.

Very different games can be played in the same place. Merry-go-rounds and the diabolo are both open-air amusements. But the child who passively enjoys the pleasure of riding by means of the movement of the carousel is not in the same state of mind as the one who tries as best he can to correctly whirl his diabolo. On the other hand, many games are played without implements or accessories. Also, the same implement can fulfill different functions, depending on the game played. Marbles are generally the equipment for a game of skill, but one of the players can try to guess whether the marbles held in his opponent’s hand are an odd or even number. They thus become part of a game of chance.

This last expression must be clarified. For one thing, it alludes to the fundamental characteristic of a very special kind of game. Whether it be a bet, lottery, roulette, or baccara, it is clear that the player’s attitude is the same. He does nothing, he merely awaits the outcome. The boxer, the runner, and the player of chess or hopscotch, on the contrary, work as hard as they can to win. It matters little that some games are athletic and others intellectual. The player’s attitude is the same: he tries to vanquish a rival operating under the same conditions as himself. It would thus appear justified to contrast games of chance with competitive games. Above all, it becomes tempting to investigate the possibility of discovering other attitudes, no less fundamental, so that the categories for a systematic classification of games can eventually be provided.
After examining different possibilities, I am proposing a division into four main rubrics, depending upon whether, in the games under consideration, the role of competition, chance, simulation, or vertigo is dominant. I call these agôn, alea, mimicry, and illinx, respectively. All four indeed belong to the domain of play. One plays football, billiards, or chess (agôn); roulette or a lottery (alea); pirate, Nero, or Hamlet (mimicry); or one produces in oneself, by a rapid whirling or falling movement, a state of dizziness and disorder (illinx). Even these designations do not cover the entire universe of play. It is divided into quadrants, each governed by an original principle. Each section contains games of the same kind. But inside each section, the different games are arranged in a rank order of progression. They can also be placed on a continuum between two opposite poles. At one extreme an almost indivisible principle, common to diversion, turbulence, free improvisation, and carefree gaiety is dominant. It manifests a kind of uncontrolled fantasy that can be designated by the term paidia. At the opposite extreme, this frolicsome and impulsive exuberance is almost entirely absorbed or disciplined by a complementary, and in some respects inverse, tendency to its anarchic and capricious nature: there is a growing tendency to bind it with arbitrary, imperative, and purposely tedious conventions, to oppose it still more by ceaselessly practicing the most embarrassing chicanery upon it, in order to make it more uncertain of attaining its desired effect. This latter principle is completely impractical, even though it requires an ever greater amount of effort, patience, skill, or ingenuity. I call this second component ludus.

I do not intend, in resorting to these strange concepts, to set up some kind of pedantic, totally meaningless mythology. However, obligated as I am to classify diverse games under the same general category, it seemed to me that the most economical means of doing so was to borrow, from one language or another, the most meaningful and comprehensive term possible, so that each category examined should avoid the possibility of lacking the particular quality on the basis of which the unifying concept was chosen. Also, to the degree that I will try to establish the classification to which I am committed, each concept chosen will not relate too directly to concrete experience, which in turn is to be divided according to an as yet untested principle.

In the same spirit, I am compelled to subsume the games most varied in appearance under the same rubric, in order to better demonstrate their fundamental kinship. I have mixed physical and mental games, those dependent upon force with those requiring skill or reasoning. Within each class, I have not distinguished between children’s and adults’ games, and wherever possible I have sought instances of homologous behavior in the animal world.
The point in doing this was to stress the very principle of the proposed classification. It would be less burdensome if it were perceived that the divisions set up correspond to essential and irreducible impulses.

1. Fundamental Categories

Agôn. A whole group of games would seem to be competitive, that is to say, like a combat in which equality of chances is artificially created, in order that the adversaries should confront each other under ideal conditions, susceptible of giving precise and incontestable value to the winner’s triumph. It is therefore always a question of a rivalry which hinges on a single quality [speed, endurance, strength, memory, skill, ingenuity, etc.], exercised, within defined limits and without outside assistance, in such a way that the winner appears to be better than the loser in a certain category of exploits. Such is the case with sports contests and the reason for their very many subdivisions. Two individuals or two teams are in opposition [polo, tennis, football, boxing, fencing, etc.], or there may be a varying number of contestants [courses of every kind, shooting matches, golf, athletics, etc.]. In the same class belong the games in which, at the outset, the adversaries divide the elements into equal parts and value. The games of checkers, chess, and billiards are perfect examples. The search for equality is so obviously essential to the rivalry that it is re-established by a handicap for players of different classes; that is, within the equality of chances originally established, a secondary inequality, proportionate to the relative powers of the participants, is dealt with. It is significant that such a usage exists in the agôn of a physical character [sports] just as in the more cerebral type [chess games for example, in which the weaker player is given the advantage of a pawn, knight, castle, etc.].

As carefully as one tries to bring it about, absolute equality does not seem to be realizable. Sometimes, as in checkers or chess, the fact of moving first is an advantage, for this priority permits the favored player to occupy key positions or to impose a special strategy. Conversely, in bidding games, such as bridge, the last bidder profits from the clues afforded by the bids of his opponents. Again, at croquet, to be last multiplies the player’s resources. In sports contests, the exposure, the fact of having the sun in front or in back; the wind which aids or hinders one or the other side; the fact, in disputing for positions on a circular track, of finding oneself in the inside or outside lane constitutes a crucial test, a trump or disadvantage whose influence may be considerable. These inevitable imbalances are negated or modified by drawing lots at the beginning, then by strict alternation of favored positions.
The point of the game is for each player to have his superiority in a given area recognized. That is why the practice of agon presupposes sustained attention, appropriate training, assiduous application, and the desire to win. It implies discipline and perseverance. It leaves the champion to his own devices, to evoke the best possible game of which he is capable, and it obliges him to play the game within the fixed limits, and according to the rules applied equally to all, so that in return the victor's superiority will be beyond dispute.

In addition to games, the spirit of agon is found in other cultural phenomena conforming to the game code: in the duel, in the tournament, and in certain constant and noteworthy aspects of so-called courtly war.

In principle, it would seem that agon is unknown among animals, which have no conception of limits or rules, only seeking a brutal victory in merciless combat. It is clear that horse races and cock fights are an exception, for these are conflicts in which men make animals compete in terms of norms that the former alone have set up. Yet, in considering certain facts, it seems that animals already have the competitive urge during encounters where limits are at least implicitly accepted and spontaneously respected, even if rules are lacking. This is notably the case in kittens, puppies, and bear cubs, which take pleasure in knocking each other down yet not hurting each other.

Still more convincing are the habits of bovines, which, standing face to face with heads lowered, try to force each other back. Horses engage in the same kind of friendly dueling: to test their strength, they rear up on their hind legs and press down upon each other with all their vigor and weight, in order to throw their adversaries off balance. In addition, observers have noted numerous games of pursuit that result from a challenge or invitation. The animal that is overtaken has nothing to fear from the victor. The most impressive example is without doubt that of the little ferocious "fighting" willow wrens. "A moist elevation covered with short grass and about two meters in diameter is chosen for the arena," says Karl Groos. The males gather there daily. The first to arrive waits for an adversary, and then the fight begins. The contenders tremble and bow their heads several times. Their feathers bristle. They hurl themselves at each other, beaks advanced, and striking at one another. Never is there any pursuit or conflict outside the space delimited for the journey. That is why it seems legitimate for me to use the term agon for these cases, for the goal of the encounters is not for the antagonist to cause serious injury to his rival, but rather to demonstrate his own superiority. Man merely adds refinement and precision by devising rules.
In children, as soon as the personality begins to assert itself, and before the emergence of regulated competition, unusual challenges are frequent, in which the adversaries try to prove their greater endurance. They are observed competing to see which can stare at the sun, endure tickling, stop breathing, not wink his eye, etc., the longest. Sometimes the stakes are more serious, where it is a question of enduring hunger or else pain in the form of whipping, pinching, stinging, or burning. Then these ascetic games, as they have been called, involve severe ordeals. They anticipate the cruelty and hazing which adolescents must undergo during their initiation. This is a departure from agôn, which soon finds its perfect form, be it in legitimately competitive games and sports, or in those involving feats of prowess (hunting, mountain climbing, crossword puzzles, chess problems, etc.) in which champions, without directly confronting each other, are involved in ceaseless and diffuse competition.

**Alea.** This is the Latin name for the game of dice. I have borrowed it to designate, in contrast to agôn, all games that are based on a decision independent of the player, an outcome over which he has no control, and in which winning is the result of fate rather than triumphing over an adversary. More properly, destiny is the sole artisan of victory, and where there is rivalry, what is meant is that the winner has been more favored by fortune than the loser. Perfect examples of this type are provided by the games of dice, roulette, heads or tails, baccara, lotteries, etc. Here, not only does one refrain from trying to eliminate the injustice of chance, but rather it is the very capriciousness of chance that constitutes the unique appeal of the game.

**Alea** signifies and reveals the favor of destiny. The player is entirely passive; he does not deploy his resources, skill, muscles, or intelligence. All he need do is await, in hope and trembling, the cast of the die. He risks his stake. Fair play, also sought but now taking place under ideal conditions, lies in being compensated exactly in proportion to the risk involved. Every device intended to equalize the competitors' chances is here employed to scrupulously equate risk and profit.

In contrast to agôn, alea negates work, patience, experience, and qualifications. Professionalization, application, and training are eliminated. In one instant, winnings may be wiped out. Alea is total disgrace or absolute favor. It grants the lucky player infinitely more than he could procure by a lifetime of labor, discipline, and fatigue. It seems an insolent and sovereign insult to merit. It supposes on the player's part an attitude exactly opposite to that reflected in agôn. In the latter, his only reliance is upon himself; in the former, he counts on
everything, even the vaguest sign, the slightest outside occurrence, which he immediately takes to be an omen or token—in short, he depends on everything except himself.

_Agôn_ is a vindication of personal responsibility; _alea_ is a negation of the will, a surrender to destiny. Some games, such as dominoes, backgammon, and most card games, combine the two. Chance determines the distribution of the hands dealt to each player, and the players then play the hands that blind luck has assigned to them as best they can. In a game like bridge, it is knowledge and reasoning that constitute the player’s defense, permitting him to play a better game with the cards that he has been given. In games such as poker, it is the qualities of psychological acumen and character that count.

The role of money is also generally more impressive than the role of chance, and therefore is the recourse of the weaker player. The reason for this is clear: _Alea_ does not have the function of causing the more intelligent to win money, but tends rather to abolish natural or acquired individual differences, so that all can be placed on an absolutely equal footing to await the blind verdict of chance.

Since the result of _agôn_ is necessarily uncertain and paradoxically must approximate the effect of pure chance, assuming that the chances of the competitors are as equal as possible, it follows that every encounter with competitive characteristics and ideal rules can become the object of betting, or _alea_, e.g. horse or greyhound races, football, basketball, and cock fights. It even happens that table stakes vary unceasingly during the game, according to the vicissitudes of _agôn_.

Games of chance would seem to be peculiarly human. Animals play games involving competition, stimulation, and excess. K. Groos, especially, offers striking examples of these. In sum, animals, which are very much involved in the immediate and enslaved by their impulses, cannot conceive of an abstract and inanimate power, to whose verdict they would passively submit in advance of the game. To await the decision of destiny passively and deliberately, to risk upon it wealth proportionate to the risk of losing, is an attitude that requires the possibility of foresight, vision, and speculation, for which objective and calculating reflection is needed. Perhaps it is in the degree to which a child approximates an animal that games of chance are not as important to children as to adults. For the child, play is active. In addition, the child is immune to the main attraction of games of chance, deprived as he is of economic independence, since he has no money of his own. Games of chance have no power to thrill him. To be sure, marbles are money to him. However, he counts on his skill rather than on chance to win them.
Agôn and alea imply opposite and somewhat complementary attitudes, but they both
obey the same law—the creation for the players of conditions of pure equality denied them in
real life. For nothing in life is clear, since everything is confused from the very beginning, luck
and merit too. Play, whether agôn or alea, is thus an attempt to substitute perfect situations
for the normal confusion of contemporary life. In games, the role of merit or chance is clear
and indisputable. It is also implied that all must play with exactly the same possibility of prov-
ing their superiority or, on another scale, exactly the same chances of winning. In one way or
another, one escapes the real world and creates another. One can also escape himself and
become another. This is mimicry.

Mimicry. All play presupposes the temporary acceptance, if not of an illusion (indeed this last
word means nothing less than beginning a game: in-lusio), then at least of a closed, conventional,
and, in certain respects, imaginary universe. Play can consist not only of deploying actions or
submitting to one’s fate in an imaginary milieu, but of becoming an illusory character oneself,
and of so behaving. One is thus confronted with a diverse series of manifestations, the common
element of which is that the subject makes believe or makes others believe that he is someone
other than himself. He forgets, disguises, or temporarily sheds his personality in order to
feign another. I prefer to designate these phenomena by the term mimicry, the English word
for mimetism, notably of insects, so that the fundamental, elementary, and quasi-organic
nature of the impulse that stimulates it can be stressed.

The insect world, compared to the human world, seems like the most divergent of
solutions provided by nature. This world is in contrast in all respects to that of man, but it
is no less elaborate, complex, and surprising. Also, it seems legitimate to me at this point
to take account of mimetic phenomena of which insects provide most perplexing examples.
In fact, corresponding to the free, versatile, arbitrary, imperfect, and extremely diversified
behavior of man, there is in animals, especially in insects, the organic, fixed, and absolute
adaptation which characterizes the species and is infinitely and exactly reproduced from
generation to generation in billions of individuals: e.g. the caste system of ants and termites
as against class conflict, and the designs on butterflies’ wings as compared to the history of
painting. Reluctant as one may be to accept this hypothesis, the temerity of which I recognize,
the inexplicable mimetism of insects immediately affords an extraordinary parallel to man’s
pennant for disguising himself, wearing a mask, or playing a part—except that in the insect’s
case the mask or guise becomes part of the body instead of a contrived accessory. But it
serves the same purposes in both cases, viz. to change the wearer’s appearance and to inspire
fear in others.
Among vertebrates, the tendency to imitate first appears as an entirely physical, quasi-irresistible contagion, analogous to the contagion of yawning, running, limping, smiling, or almost any movement. Hudson seems to have proved that a young animal "follows any object that is going away, and flees any approaching object." Just as a lamb is startled and runs if its mother turns around and moves toward the lamb without warning, the lamb trails the man, dog, or horse that it sees moving away. Contagion and imitation are not the same as simulation, but they make possible and give rise to the idea or the taste for mimicry. In birds, this tendency leads to nuptial parades, ceremonies, and exhibitions of vanity in which males or females, as the case may be, indulge with rare application and evident pleasure. As for the oxyrhinous crabs, which plant upon their carapaces any alga or polyp that they can catch, their aptitude for disguise leaves no room for doubt, whatever explanation for the phenomenon may be advanced.

Mimicry and travesty are therefore complementary acts in this kind of play. For children, the aim is to imitate adults. This explains the success of the toy weapons and miniatures which copy the tools, engines, arms, and machines used by adults. The little girl plays her mother's role as cook, laundress, and ironer. The boy makes believe he is a soldier, musketeer, policeman, pirate, cowboy, Martian, etc. An airplane is made by waving his arms and making the noise of a motor. However, acts of mimicry tend to cross the border between childhood and adulthood. They cover to the same degree any distraction, mask, or travesty, in which one participates, and which stresses the very fact that the play is masked or otherwise disguised, and such consequences as ensue. Lastly it is clear that theatrical presentations and dramatic interpretations rightly belong in this category.

The pleasure lies in being or passing for another. But in games the basic intention is not that of deceiving the spectators. The child who is playing train may well refuse to kiss his father while saying to him that one does not embrace locomotives, but he is not trying to persuade his father that he is a real locomotive. At a carnival, the masquerader does not try to make one believe that he is really a marquis, toreador, or Indian, but rather tries to inspire fear and take advantage of the surrounding license, a result of the fact that the mask disguises the conventional self and liberates the true personality. The actor does not try to make believe that he is "really" King Lear or Charles V. It is only the spy and the fugitive who disguise themselves to really deceive because they are not playing.
Activity, imagination, interpretation, and mimicry have hardly any relationship to alea, which requires immobility and the thrill of expectation from the player, but agon is not excluded. I am not thinking of the masqueraders' competition, in which the relationship is obvious. A much more subtle complicity is revealed. For nonparticipants, every agon is a spectacle. Only it is a spectacle which, to be valid, excludes simulation. Great sports events are nevertheless special occasions for mimicry, but it must be recalled that the simulation is now transferred from the participants to the audience. It is not the athletes who mimic, but the spectators. Identification with the champion in itself constitutes mimicry related to that of the reader with the hero of the novel and that of the moviegoer with the film star. To be convinced of this, it is merely necessary to consider the perfectly symmetrical functions of the champion and the stage or screen star. Champions, winners at agon, are the stars of sports contests. Conversely, stars are winners in a more diffuse competition in which the stakes are popular favor. Both receive a large fan-mail, give interviews to an avid press, and sign autographs.

In fact, bicycle races, boxing or wrestling matches, football, tennis, or polo games are intrinsic spectacles, with costumes, solemn overture, appropriate liturgy, and regulated procedures. In a word, these are dramas whose vicissitudes keep the public breathless, and lead to denouements which exalt some and depress others. The nature of these spectacles remains that of an agon, but their outward aspect is that of an exhibition. The audience are not content to encourage the efforts of the athletes or horses of their choice merely by voice and gesture. A physical contagion leads them to assume the position of the men or animals in order to help them, just as the bowler is known to unconsciously incline his body in the direction that he would like the bowling ball to take at the end of its course. Under these conditions, paralleling the spectacle, a competitive mimicry is born in the public, which doubles the true agon of the field or track.

With one exception, mimicry exhibits all the characteristics of play: liberty, convention, suspension of reality, and delimitation of space and time. However, the continuous submission to imperative and precise rules cannot be observed—rules for the dissimulation of reality and the substitution of a second reality. Mimicry is incessant invention. The rule of the game is unique: it consists in the actor's fascinating the spectator, while avoiding an error that might lead the spectator to break the spell. The spectator must lend himself to the illusion without first challenging the decor, mask, or artifice which for a given time he is asked to believe in as more real than reality itself.
The last kind of game includes those which are based on the pursuit of vertigo and which consist of an attempt to momentarily destroy the stability of perception and inflict a kind of voluptuous panic upon an otherwise lucid mind. In all cases, it is a question of surrendering to a kind of spasm, seizure, or shock which destroys reality with sovereign brusqueness.

The disturbance that provokes vertigo is commonly sought for its own sake. I need only cite as examples the actions of whirling dervishes and the Mexican voladores. I choose these purposely, for the former, in technique employed, can be related to certain children’s games, while the latter rather recall the elaborate maneuvers of high-wire acrobatics. They thus touch the two poles of games of vertigo. Dervishes seek ecstasy by whirling about with movements accelerating as the drumbeats become ever more precipitate. Panic and hypnosis are attained by the paroxysm of frenetic, contagious, and shared rotation. In Mexico, the voladores—Huastec or Totonac—climb to the top of a mast sixty-five to one hundred feet high. They are disguised as eagles with false wings hanging from their wrists. The end of a rope is attached to their waists. The rope then passes between their toes in such a way that they can manage their entire descent with head down and arms outstretched. Before reaching the ground, they make many complete turns, thirty according to Torquemada, describing an ever-widening spiral in their downward flight. The ceremony, comprising several flights and beginning at noon, is readily interpreted as a dance of the setting sun, associated with birds, the deified dead. The frequency of accidents has led the Mexican authorities to ban this dangerous exercise.

It is scarcely necessary to invoke these rare and fascinating examples. Every child very well knows that by whirling rapidly he reaches a centrifugal state of flight from which he regains bodily stability and clarity of perception only with difficulty. The child engages in this activity playfully and finds pleasure thereby. An example is the game of teetotum in which the player pivots on one foot as quickly as he is able. Analogously, in the Haitian game of maïs d’or two children hold hands, face to face, their arms extended. With their bodies stiffened and bent backward, and with their feet joined, they turn until they are breathless, so that they will have the pleasure of staggering about after they stop. Comparable sensations are provided by screaming as loud as one can, racing downhill, and tobogganing; in horsemanship, provided that one turns quickly; and in swinging.

Various physical activities also provoke these sensations, such as the tightrope, falling or being projected into space, rapid rotation, sliding, speeding, and acceleration of
vertilinear movement, separately or in combination with gyrating movement. In parallel fashion, there is a vertigo of a moral order, a transport that suddenly seizes the individual. This vertigo is readily linked to the desire for disorder and destruction, a drive which is normally repressed. It is reflected in crude and brutal forms of personality expression. In children, it is especially observed in the games of hot cockles, "winner-take-all," and leapfrog in which they rush and spin pell-mell. In adults, nothing is more revealing of vertigo than the strange excitement that is felt in cutting down the tall prairie flowers with a switch, or in creating an avalanche of the snow on a rooftop, or, better, the intoxication that is experienced in military barracks—for example, in noisily banging garbage cans.

To cover the many varieties of such transport, for a disorder that may take organic or psychological form, I propose using the term *ilinx*, the Greek term for whirlpool, from which is also derived the Greek word for vertigo (*ilingos*).

This pleasure is not unique to man. To begin with, it is appropriate to recall the gyrations of certain mammals, sheep in particular. Even if these are pathological manifestations, they are too significant to be passed over in silence. In addition, examples in which the play element is certain are not lacking. In order to catch their tails dogs will spin around until they fall down. At other times they are seized by a fever for running until they are exhausted. Antelopes, gazelles, and wild horses are often panic-stricken when there is no real danger in the slightest degree to account for it; the impression is of an overbearing contagion to which they surrender in instant compliance.10

Water rats divert themselves by spinning as if they were being drawn by an eddy in a stream. The case of the chamois is even more remarkable. According to Karl Groos, they ascend the glaciers, and with a leap, each in turn slides down a steep slope, while the other chamois watch.

The gibbon chooses a flexible branch and weighs it down until it unbends, thus projecting him into the air. He lands catch as catch can, and he endlessly repeats this useless exercise, inexplicable except in terms of its seductive quality. Birds especially love games of vertigo. They let themselves fall like stones from a great height, then open their wings when they are only a few feet from the ground, thus giving the impression that they are going to be crushed. In the mating season they utilize this heroic flight in order to attract the female. The American nighthawk, described by Audubon, is a virtuoso at these impressive acrobatics.11
Following the teetotum, *maïs d'or*, sliding, horsemanship, and swinging of their childhood, men surrender to the intoxication of many kinds of dance, from the common but insidious giddiness of the waltz to the many mad, tremendous, and convulsive movements of other dances. They derive the same kind of pleasure from the intoxication stimulated by high speed on skis, motorcycles, or in driving sports cars. In order to give this kind of sensation the intensity and brutality capable of shocking adults, powerful machines have had to be invented. Thus it is not surprising that the Industrial Revolution had to take place before vertigo could really become a kind of game. It is now provided for the avid masses by thousands of stimulating contraptions installed at fairs and amusement parks.

These machines would obviously surpass their goals if it were only a question of assaulting the organs of the inner ear, upon which the sense of equilibrium is dependent. But it is the whole body which must submit to such treatment as anyone would fear undergoing, were it not that everybody else was seen struggling to do the same. In fact, it is worth watching people leaving these vertigo-inducing machines. The contraptions turn people pale and dizzy to the point of nausea. They shriek with fright, gasp for breath, and have the terrifying impression of visceral fear and shrinking as if to escape a horrible attack. Moreover the majority of them, before even recovering, are already hastening to the ticket booth in order to buy the right to again experience the same pleasurable torture.

It is necessary to use the word “pleasure,” because one hesitates to call such a transport a mere distraction, corresponding as it does more to a spasm than to an entertainment. In addition, it is important to note that the violence of the shock felt is such that the concessionaires try, in extreme cases, to lure the naive by offering free rides. They deceitfully announce that “this time only” the ride is free, when this is the usual practice. To compensate, the spectators are made to pay for the privilege of calmly observing from a high balcony the terrors of the cooperating or surprised victims, exposed to fearful forces or strange caprices.

It would be rash to draw very precise conclusions on the subject of this curious and cruel assignment of roles. This last is not characteristic of a kind of game, such as is found in boxing, wrestling, and in gladiatorial combat. Essential is the pursuit of this special disorder or sudden panic, which defines the term vertigo, and in the true characteristics of the games associated with it: viz. the freedom to accept or refuse the experience, strict and fixed limits, and separation from the rest of reality. What the experience adds to the spectacle does not diminish but reinforces its character as play.
2. From Turbulence to Rules

Rules are inseparable from play as soon as the latter becomes institutionalized. From this moment on they become part of its nature. They transform it into an instrument of fecund and decisive culture. But a basic freedom is central to play in order to stimulate distraction and fantasy. This liberty is its indispensable motive power and is basic to the most complex and carefully organized forms of play. Such a primary power of improvisation and joy, which I call *paidia*, is allied to the taste for gratuitous difficulty that I propose to call *ludus*, in order to encompass the various games to which, without exaggeration, a civilizing quality can be attributed. In fact, they reflect the moral and intellectual values of a culture, as well as contribute to their refinement and development.

I have chosen the term *paidia* because its root is the word for child, and also because of a desire not to needlessly disconcert the reader by resorting to a term borrowed from an antipodal language. However, the Sanskrit *kredati* and the Chinese *wan* seem both richer and more expressive through the variety and nature of their connotations. It is true that they also present the disadvantages of overabundance—a certain danger of confusion, for one. *Kredati* designates the play of adults, children, and animals. It applies more specifically to gambling, i.e., to the sudden and capricious movements provoked by a superabundance of gaiety and vitality. It applies equally to illicit sex relationships, the rise and fall of waves, and anything that undulates with the wind. The word *wan* is even more explicit, as much for what it defines as for what it avoids defining, i.e. specifying games of skill, competition, simulation, and chance. It manifests many refinements of meaning to which I will have occasion to return.

In view of these relationships and semantic qualifications, what can be the connotations and denotations of the term *paidia*? I shall define it, for my purposes, as a word covering the spontaneous manifestations of the play instinct: a cat entangled in a ball of wool, a dog sniffing, and an infant laughing at his rattle represent the first identifiable examples of this type of activity. It intervenes in every happy exuberance which effects an immediate and disordered agitation, an impulsive and easy recreation, but readily carried to excess, whose impromptu and unruly character remains its essential if not unique reason for being. From somersaults to scribbling, from squabble to uproar, perfectly clear illustrations are not lacking of the comparable symptoms of movements, colors, or noises.

This elementary need for disturbance and tumult first appears as an impulse to touch, grasp, taste, smell, and then drop any accessible object. It readily can become a taste
for destruction and breaking things. It explains the pleasure in endlessly cutting up paper with a pair of scissors, pulling cloth into thread, breaking up a gathering, holding up a queue, disturbing the play or work of others, etc. Soon comes the desire to mystify or to defy by sticking out the tongue or grimacing while seeming to touch or throw the forbidden object. For the child it is a question of expressing himself, of feeling he is the cause, of forcing others to pay attention to him. In this manner, K. Groos recalls the case of a monkey which took pleasure in pulling the tail of a dog that lived with it, each time that the dog seemed to be going to sleep. The primitive joy in destruction and upset has been notably observed by the sister of G. J. Romanes in precise and most meaningful detail.  

The child does not stop at that. He loves to play with his own pain, for example by probing a toothache with his tongue. He also likes to be frightened. He thus looks for a physical illness, limited and controlled, of which he is the cause, or sometimes he seeks an anxiety that he, being the cause, can stop at will. At various points, the fundamental aspects of play are already recognizable, i.e. voluntary, agreed upon, isolated, and regulated activity.

Soon there is born the desire to invent rules, and to abide by them whatever the cost. The child then makes all kinds of bets—which, as has been seen, are the elementary forms of agon—with himself or his friends. He hops, walks backwards with his eyes closed, plays at who can look longest at the sun, and will suffer pain or stand in a painful position.

In general, the first manifestations of paidia have no name and could not have any, precisely because they are not part of any order, distinctive symbolism, or clearly differentiated life that would permit a vocabulary to consecrate their autonomy with a specific term. But as soon as conventions, techniques, and utensils emerge, the first games as such arise with them: e.g. leapfrog, hide and seek, kite-flying, teetotum, sliding, blindman’s buff, and doll-play. At this point the contradictory roads of agon, alea, mimicry, and ilinx begin to bifurcate. At the same time, the pleasure experienced in solving a problem arbitrarily designed for this purpose also intervenes, so that reaching a solution has no other goal than personal satisfaction for its own sake.

This condition, which is ludus proper, is also reflected in different kinds of games, except for those which wholly depend upon the cast of a die. It is complementary to and a refinement of paidia, which it disciplines and enriches. It provides an occasion for training and normally leads to the acquisition of a special skill, a particular mastery of the operation of one or another contraption or the discovery of a satisfactory solution to problems of a more conventional type.
The difference from *agôn* is that in *ludus* the tension and skill of the player are not related to any explicit feeling of emulation or rivalry: the conflict is with the obstacle, not with one or several competitors. On the level of manual dexterity there can be cited games such as cup-and-ball, diabolo, and yo-yo. These simple instruments merely utilize basic natural laws, e.g. gravity and rotation in the case of the yo-yo, where the point is to transform a rectilinear alternating motion into a continuous circular movement. Kite-flying, on the contrary, relies on the exploitation of a specific atmospheric condition. Thanks to this, the player accomplishes a kind of auscultation upon the sky from afar. He projects his presence beyond the limits of his body. Again, the game of blindman's buff offers an opportunity to experience the quality of perception in the absence of sight.\textsuperscript{13} It is readily seen that the possibilities of *ludus* are almost infinite.

Games such as solitaire or the ring puzzle, although part of the same species, already belong to another group of games, since they constantly appeal to a spirit of calculation and contrivance. And lastly, crossword puzzles, mathematical recreations, anagrams, olorhymes\textsuperscript{14} and obscure poetry, addiction to detective stories (trying to identify the culprit), and chess or bridge problems constitute, even in the absence of gadgets, many varieties of the most prevalent and pure forms of *ludus*.

It is common knowledge that what to begin with seems to be a situation susceptible to indefinite repetition turns out to be capable of producing ever new combinations. Thus the player is stimulated to emulate himself, permitting him to take pride in his accomplishment, as against those who share his taste. There is a manifest relationship between *ludus* and *agôn*. In addition, it can happen that the same game may possess both, e.g. chess or bridge.

The combination of *ludus* and *alea* is no less frequent: it is especially recognizable in games of patience, in which ingenious maneuvers have little influence upon the result, and in playing slot machines in which the player can very crudely calculate the impulsion given to the ball at various points in directing its course. In both these examples, chance is still the deciding factor. Moreover, the fact that the player is not completely helpless and that he can at least minimally count on his skill or talent is sufficient reason to link *ludus* with *alea*.\textsuperscript{15}

*Ludus* is also readily compatible with *mimicry*. In the simplest cases, it lends aspects of illusion to construction games such as the animals made out of millet stalks by Dogon children, the cranes or automobiles constructed by fitting together perforated steel parts and pulleys from an Erector set, or the scale-model planes or ships that even adults do not disdain meticulously
constructing. However, it is the theater which provides the basic connection between the two, by disciplining mimicry until it becomes an art rich in a thousand diverse routines, refined techniques, and subtly complex resources. By means of this fortunate development, the cultural fecundity of play is amply demonstrated.

In contrast, just as there could be no relationship between *paidia*, which is tumultuous and exuberant, and *alea*, which is passive anticipation of and mute immobility pending the outcome of the game, there also can be no connection between *ludus*, which is calculation and contrivance, and *ilinx*, which is a pure state of transport. The desire to overcome an obstacle can only emerge to combat vertigo and prevent it from becoming transformed into disorder or panic. It is, therefore, training in self-control, an arduous effort to preserve calm and equilibrium. Far from being compatible with *ilinx*, it provides the discipline needed to neutralize the dangerous effects of *ilinx*, as in mountain climbing or tightrope walking.

*Ludus*, in itself, seems incomplete, a kind of makeshift device intended to allay boredom. One becomes resigned to it while awaiting something preferable, such as the arrival of partners that makes possible the substitution of a contest for this solitary pleasure. Moreover, even in games of skill or contrivance (e.g. patience, crossword and other puzzles) which exclude or regard as undesirable the intervention of another person, *ludus* no less inspires in the player the hope of succeeding the next time when he may obtain a higher score. In this way, the influence of *agon* is again manifested. Indeed, it enriches the pleasure derived from overcoming an arbitrarily chosen obstacle. In fact, even if each of these games is played alone and is not replaced by an openly competitive one, it can easily and quickly be converted into a contest, with or without prizes, such as newspapers organize on occasion.

There is also an aspect of *ludus* that, in my opinion, is explained by the presence of *agon* within it: that is, that it is strongly affected by fashion. The yo-yo, cup-and-ball, diabolo, and ring puzzle appear and disappear as if by magic and soon are replaced by other games. In parallel fashion, the vogues for amusements of a more intellectual nature are no less limited in time; e.g. the rebus, the anagram, the acrostic, and the charade have had their hours. It is probable that crossword puzzles and detective stories will run the same course. Such a phenomenon would be enigmatic if *ludus* were an individual amusement, as seems superficially to be the case. In reality, it is permeated with an atmosphere of competition. It only persists to the degree that the fervor of addicts transforms it into virtual *agon*. When the latter is missing, *ludus* cannot persist independently. In fact, it is not sufficiently supported by the
spirit of organized competition, which is not essential to it, and does not provide the substance for a spectacle capable of attracting crowds. It remains transient and diffuse, or else it risks turning into an obsession for the isolated fanatic who would dedicate himself to it absolutely and in his addiction would increasingly withdraw from society.

Industrial civilization has given birth to a special form of ludus, the hobby, a secondary and gratuitous activity, undertaken and pursued for pleasure, e.g. collecting, unique accomplishments, the pleasure in billiards or inventing gadgets, in a word any occupation that is primarily a compensation for the injury to personality caused by bondage to work of an automatic and picayune character. It has been observed that the hobby of the worker-turned-artisan readily takes the form of constructing complete scale models of the machines in the fabrication of which he is fated to cooperate by always repeating the same movement, an operation demanding no skill or intelligence on his part. He not only avenges himself upon reality, but in a positive and creative way. The hobby is a response to one of the highest functions of the play instinct. It is not surprising that a technical civilization contributes to its development, even to providing compensations for its more brutal aspects. Hobbies reflect the rare qualities that make their development possible.

In a general way, ludus relates to the primitive desire to find diversion and amusement in arbitrary, perpetually recurrent obstacles. Thousands of occasions and devices are invented to satisfy simultaneously the desire for relaxation and the need, of which man cannot be rid, to utilize purposefully the knowledge, experience, and intelligence at his disposal, while disregarding self-control and his capacity for resistance to suffering, fatigue, panic, or intoxication.

What I call ludus stands for the specific element in play the impact and cultural creativity of which seems most impressive. It does not connote a psychological attitude as precise as that of agôn, alea, mimicry or ilinx, but in disciplining the paidia, its general contribution is to give the fundamental categories of play their purity and excellence.

Besides, ludus is not the only conceivable metamorphosis of paidia. A civilization like that of classical China worked out a different destiny for itself. Wisely and circumspectly, Chinese culture is less directed toward purposive innovation. The need for progress and the spirit of enterprise generally seem to them a kind of compulsion that is not particularly creative. Under these conditions the turbulence and surplus of energy characteristic of paidia is channelized in a direction better suited to its supreme values. This is the place to return to the term
wan. According to some, it would etymologically designate the act of indefinitely caressing a piece of jade while polishing it, in order to savor its smoothness or as an accompaniment to reverie. Perhaps this origin clarifies another purpose of paidia. The reservoir of free movement that is part of its original definition seems in this case to be oriented not toward process, calculation, or triumph over difficulties but toward calm, patience, and idle speculation. The term wan basically designates all kinds of semiautomatic activities which leave the mind detached and idle, certain complex games which are part of ludus, and at the same time, nonchalant meditation and lazy contemplation.

Tumult and din are covered by the expression jeou-nao, which means literally "passion-disorder." When joined to the term nao, the term wan connotes any exuberant or joyous behavior. But this term wan must be present. With the character tchouang [to pretend], it means "to find pleasure in simulating." Thus wan coincides fairly exactly with the various possible manifestations of paidia, although when used alone it may designate a particular kind of game. It is not used for competition, dice, or dramatic interpretation. That is to say, it excludes the various kinds of games that I have referred to as institutional.

The latter are designated by more specialized terms. The character hsi corresponds to games of disguise or simulation, covering the domain of the theater and the spectacle. The character choua refers to games involving skill and ability; however, it is also used for contests involving jokes or puns, for fencing, and for perfection in practicing a difficult art. The character teou refers to conflict as such, cock fighting or dueling. It is also used for card games. Lastly, the character tou, not to be applied to children’s games, covers games of chance, feats of daring, bets, and ordeals. It also is the name for blasphemy, for to tempt chance is considered a sacrilegious wager against destiny.

The vast semantic area of the term wan makes it even more deserving of interest. To begin with, it includes child's play and all kinds of carefree and frivolous diversion such as are suggested by the verbs to frolic, to romp, to trifle, etc. It is used to describe casual, abnormal, or strange sex practices. At the same time, it is used for games demanding reflection and forbidding haste, such as chess, checkers, puzzles [tai Kiao], and the game of nine rings. It also comprises the pleasure of appreciating the savor of good food or the bouquet of a wine, the taste for collecting works of art or even appreciating them, voluptuously handling and even fashioning delicate curios, comparable to the Occidental category of the hobby, collecting or puttering. Lastly, the transitory and relaxing sweetness of moonlight is suggested, the pleasure of a boat ride on a limpid lake or the prolonged contemplation of a waterfall.
The example of the word *wan* shows that the destinies of cultures can be read in their games. The preference for *agôn*, *alea*, *mimicry*, or *ilinx* helps decide the future of a civilization. Also, the channeling of the free energy in *paidia* toward invention or contemplation manifests an implicit but fundamental and most significant choice.
Table I. Classification of Games

<table>
<thead>
<tr>
<th>PAIDIA</th>
<th>AGÔN (Competition)</th>
<th>ALEA (Chance)</th>
<th>MIMICRY (Simulation)</th>
<th>ILINX (Vertigo)</th>
</tr>
</thead>
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<tr>
<td>Tumult</td>
<td>Racing</td>
<td>Counting-out</td>
<td>Children's initiations</td>
<td>Children “whirling”</td>
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<tr>
<td>Agitation</td>
<td>Wrestling</td>
<td>rhymes</td>
<td>Games of illusion</td>
<td>Horseback riding</td>
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<td>Immoderate laughter</td>
<td>Etc.</td>
<td>Heads or tails</td>
<td>Tag, Arms</td>
<td>Swinging</td>
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<tr>
<td>Analytics</td>
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<td>Masks, Disguises</td>
<td>Waltzing</td>
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<td>Kite-flying</td>
<td>Boxing, Billiards</td>
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<td>Salitaire</td>
<td>Fencing, Checkers</td>
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<td>Traveling carnivals</td>
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<td>Patience</td>
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<td>Crossword puzzles</td>
<td>Contests, Sports in general</td>
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<td>Mountain climbing</td>
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<tr>
<td>LUDUS</td>
<td></td>
<td></td>
<td>Simple, complex, and continuing lotteries*</td>
<td>Tightrope walking</td>
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<td></td>
<td>Spectacles in general</td>
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</tbody>
</table>

N.B. In each vertical column games are classified in such an order that the paidia element is constantly decreasing while the ludus element is ever increasing.

* A simple lottery consists of the one basic drawing. In a complex lottery there are many possible combinations. A continuing lottery (e.g. Irish Sweepstakes) is one consisting of two or more stages, the winner of the first stage being granted the opportunity to participate in a second lottery. [From correspondence with Caillouis. M.B.]
Notes

1. J. Huizinga, *Homo Ludens* [English translation; New York: Roy Publishers, 1950, p. 13]. On p. 28 there is another definition not quite as eloquent, but less restricted: "Play is a voluntary activity or occupation executed within certain fixed limits of time and place, according to rules freely accepted but absolutely binding, having its aim in itself and accompanied by a feeling of tension, joy, and consciousness that it is different from ordinary life."


4. For example, in the Balearic Islands for jai-alai, and cockfights in the Antilles. It is obvious that it is not necessary to take into account the cash prizes that may motivate jockeys, owners, runners, boxers, football players, or other athletes. These prizes, however substantial, are not relevant to *alea*. They are a reward for a well-fought victory. This recompense for merit has nothing to do with luck or the result of chance, which remain the uncertain monopoly of gamblers; in fact it is the direct opposite.

5. Terrifying examples of mimicry or structural dissimulation among insects [the spectral attitude of the mantis and the fright offered by *Smerinthus ocellata*] will be found in my study entitled "Mimétisme et psychasténie," in *Le Mythe et L'Homme* [Paris, 1938], pp. 101–143. Unfortunately, this study treats the problem with a perspective that today seems fantastic to me. Indeed I no longer view mimetism as a disturbance of space perception and a tendency to return to the inanimate, but rather, as herein proposed, as the insect equivalent of human games of simulation. The examples utilized in *Le Mythe et L'Homme* nevertheless retain their value [translated by M. B. from French text]:

   "In order to protect itself, an inoffensive animal assumes the appearance of a ferocious animal; for example the bee-shaped butterfly *Trachilium* and the wasp *Vespa crabro*; even to the smoky wings, brown feet and antennae, yellow-and-black striped abdomens and thoraxes, and the same impressive noisy flight in broad day. Sometimes the mimetic animal has a further goal. The caterpillar *Choerocampa elpenor*, for example, has two eyelike black-bordered spots on its fourth and fifth segments. When disturbed it retracts its anterior segments. The fourth swells enormously. The effect obtained is the illusion of a snake’s head; a frightening apparition to lizards and small birds [L. Cuénot, *La génèse des espèces animales*, Paris, 1911, pp. 470 and 473]. According to Weismann [Vorträge über Descendenztheorie, Vol. 1, pp. 78–79] *Smerinthus ocellata*, which like all sphinxes at rest hides its lower wings, when in danger suddenly masks them with two large blue eyes on a red background, thus unexpectedly frightening the aggressor. [This terrifying transformation is automatic. It is approximated in cutaneous reflexes which, although they do not extend as far as a change of color designed}
to transform the animal, sometimes result in lending it a terrifying quality. A cat, confronted by a dog, is frightened; its hair stands on end, thus causing the cat to become frightening. Le Dantec by this analogy (Lamarckiens et Darwiniens, 3rd ed., Paris, 1908, p. 139) explains the human phenomenon known as "goose pimples," a common result of extreme fright. Even though rendered dysfunctional by the comparative hairlessness of man, the reflex still persists. This act is accompanied by a kind of nervousness. At rest, the animal resembles a thin, dehydrated leaf. When disturbed, it clings to its perch, extends its antennae, inflates its thorax, retracts its head, exaggerates the curve of its abdomen, while its whole body shakes and shivers. The crisis past, it slowly returns to immobility. Standfuss' experiments have demonstrated the efficacy of this behavior in frightening the tomtit, the robin, the common nightingale and frequently the grey nightingale. (Cf. Standfuss, "Beispiel von Schutz und Trutzfärbung." Mitt. Schweiz. Entomol. Ges., XI [1906], 155–157; P. Vignon, Introduction a la biologie expérimentale, Paris, 1930 (Encycl. Biol., Vol. VIII), p. 356). The moth, with extended wings, seems in fact like the head of an enormous bird of prey....

"Examples of homomorphism are not lacking: the calappes and round pebbles, the chlamys and seeds, the moenas and gravel, the prawns and fucus. The fish Phylopteryx of the Sargasso Sea is only an 'alga cut into the shape of a floating lanner' (L. Murat, Les merveilles du monde animal, 1914, pp. 37–38) like Antennarius and Pterophyene (L. Cuénot, op. cit., p. 453). The polyp retracts its tentacles, crooks its back, and adapts its color so that it resembles a pebble. The white and green lower wings of catocala nupta resemble the umbelliferae. The embossments, nodes, and streaks of the pieridine, Aurora, make it identical with the bark of the poplars on which it lives. The lichens of Lithinus nigrocrisinus of Madagascar and the Flatides cannot be distinguished (ibid., Fig. 114). The extent of mimetism among the mantidae is known. Their paws simulate petals or are rounded into corollae, which resemble flowers, imitating the effects of the wind upon the flowers through a delicate mechanical balance (A. Lefèbvre, Ann. de la Soc. entom. de France, Vol. IV; Léon Binet, La vie de la mante religieuse, Paris, 1931; P. Vignon, op. cit., pp. 374 ff.). Cletus compressus resembles a type of bird dung, and the Ceraxylus laceratus with its foliated, light olive-green excrencences resembles a stick covered with moss. This last insect belongs to the phasmidae family which generally hang from bushes in the forest and have the bizarre habit of letting their paws hang irregularly thus making the error even easier (Alfred R. Wallace, Natural Selection and Tropical Nature, London: Macmillan, 1895, p. 47). To the same family belong even the bacilli which resemble twigs. Cerays and Heteropteryx resemble thorny dehydrated branches; and the membracides, hemiptera of the Tropics, resemble buds or thorns, such as the impressive thorn-shaped insect, Umbonia orozimbo. Measuring worms, erect and rigid, can scarcely be distinguished from bush shoots, equipped as they are with appropriate tegumentary wrinkles. Everyone is familiar with the insect of the genus Phyllium which resembles leaves. From here, the road leads to the perfect homomorphism of
certain butterflies: *Oxydia*, above all, which perches perpendicularly from the tip of a branch, upper wings folded over, so that it looks like a terminal leaf. This guise is accentuated by a thin, dark line continuing across the four wings in such a way that the main vein of a leaf is simulated (Rabaud, *Élémens de biologie générale*, 2nd ed., Paris, 1928, p. 412, Fig. 54).

"Other species are even more perfected, their lower wings being provided with a delicate appendix used as a petiole, thus obtaining 'a foothold in the vegetable world' (Vignon, *loc. cit.*). The total impression of the two wings on each side is that of the lanceolate oval characteristic of the leaf. There is also a longitudinal line, continuing from one wing to the other, a substitute for the median vein of the leaf; 'the organic driving force has had to design and cleverly organize each of the wings so that it should attain a form not self-determined, but through union with the other wing' (ibid.). The main examples are *Coenophlebia archidona* of Central America (Delage and Goldsmith, *Les théories de l'évolution*, Paris, 1909, Fig. 1, p. 74) and the various types of *Kallima* in India and Malaysia."


6. As has been aptly remarked, girls' playthings are designed to imitate practical, realistic, and domestic activities, while those of boys suggest distant, romantic, inaccessible, or even obviously unreal actions.


"The chief of the dance or *K'ohal*, clad in a red and blue tunic, ascends in his turn and sits on the terminal platform. Facing east, he first invokes the benevolent deities, while extending his wings in their direction and using a whistle which imitates the pulsing of eagles. Then he climbs to the top of the mast. Facing the four points of the compass in succession, he offers them a chalice of calabash wrapped in white linen just like a bottle of brandy, from which he sips and spits some more or less vaporized mouthfuls. Once this symbolic offering has been made, he puts on his headdress of red feathers and dances, facing all four directions while beating his wings.

"These ceremonies executed at the summit of the mast mark what the Indians consider the most moving phase of the ritual, because it involves mortal risk. But the next stage of the 'flight' is even more spectacular. The four dancers, attached by the waist, pass underneath the structure, then let themselves go from behind. Thus suspended, they slowly descend to the
ground, describing a grand spiral in proportion to the unrolling of the ropes. The difficult thing for these dancers is to seize this rope between their toes in such a way as to keep their heads down and arms outspread just like descending birds which soar in great circles in the sky. As for the chief, first he waits for some moments, then he lets himself glide along one of the four dancers’ ropes.”


11. Ibid., p. 259.

12. Observation cited by Groos, ibid., pp. 92–93:

   “I notice that the love of mischief is very strong in him. Today he got hold of a wine-glass and an egg cup. The glass he dashed on the floor with all his might and of course broke it. Finding, however, that the egg cup would not break when thrown down, he looked round for some hard substance against which to dash it. The post of the brass bedstead appearing to be suitable for the purpose, he raised the egg cup high above his head and gave it several hard blows. When it was completely smashed he was quite satisfied. He breaks a stick by passing it down between a heavy object and the wall and then hanging onto the end, thus breaking it across the heavy object. He frequently destroys an article of dress by carefully pulling out the threads (thus unraveling it) before he begins to tear it with his teeth in a violent manner.

   “In accordance with his desire for mischief he is, of course, very fond of upsetting things, but he always takes great care that they do not fall on himself. Thus he will pull a chair toward him till it is almost overbalanced, then he intently fixes his eyes on the top bar of the back, and when he sees it coming over his way, darts from underneath and watches the fall with great delight; and similarly with heavier things. There is a washstand, for example, with a heavy marble top, which he has with great labor upset several times, but always without hurting himself.” [G. J. Romanes, Animal Intelligence, New York, D. Appleton & Co., 1897, p. 484.]

13. This had already been observed by Kant. Cf. Y. Hirn, Les jeux d’enfants [French translation; Paris, 1926], p. 63.

14. [Olorimes (in French) are two lines of poetry in which each syllable of the first line rhymes with the corresponding syllable of the second line. Caillous suggested the following couplet from Victor Hugo as an example:

   Gal, amant de la reine, alle, tour magnanime

   Galamment de l’arène à la Tour Magne, a Nimes

From correspondence with Caillous, M. B.]

15. The development of slot machines in the modern world and the fascination or obsessive
behavior that they cause is indeed astonishing. The vogue for playing slot machines is often of unsuspected proportions. It causes true obsessions and sometimes is a contributing factor to a youth’s entire way of life. The following account appeared in the press on March 25, 1957, occasioned by the investigation conducted by the United States Senate that same month:

“Three hundred thousand slot machines manufactured by 15,000 employees in 50 factories, most of which are located in the environs of Chicago, were sold in 1956. These machines are popular not only in Chicago, Kansas City, or Detroit—not to speak of Las Vegas, the capital of gambling—but also in New York. All day and all night in Times Square, the heart of New York, Americans of all ages, from schoolboy to old man, spend their pocket money or weekly pension in an hour, in the vain hope of winning a free game. At 1485 Broadway, ‘Playland’ in gigantic neon letters eclipses the sign of a Chinese restaurant. In an immense room without a door dozens of multicolored slot machines are aligned in perfect order. In front of each machine a comfortable leather stool, reminiscent of the stools in the most elegant bars on the Champs-Elysees, allows the player with enough money to sit for hours. He even has an ash tray and a special place for his hot dog and Coca Cola, the national repast of the poor in the United States, which he can order without budging from his place. With a dime or quarter, he tries to add up enough points to win a carton of cigarettes. In New York State it is illegal to pay off in cash. An infernal din muffles the recorded voice of Louis Armstrong or Elvis Presley which accompanies the efforts of the small-time gamblers. Youths in blue jeans and leather jackets rub shoulders with old ladies in flowered hats. The boys choose the atomic bomber or guided-missile machines and the women put their hand on the ‘love meter’ that reveals whether they are still capable of having a love affair, while little children for a nickel are shaken, almost to the point of heart failure, on a donkey that resembles a zebu. There are also the marines or aviators who listlessly fire revolvers.” [D. Morgaine, translated by M.B.]

The four categories of play are represented: agón and alea involved in most of the machines, mimicry and illusion in the imaginary maneuvering of the atomic bomber or guided missile, ilinx on the shaking dokey.

It is estimated that Americans spend $400 million a year for the sole purpose of projecting nickel-plated balls against luminous blocks through various obstacles. In Japan, after the war, the mania was worse. It is estimated that about 12 per cent of the national budget was swallowed up annually by slot machines. There were some installed even in doctors’ waiting rooms. Even today, in the shadow of the viaducts, in Tokyo, between the trains “is heard the piercing noise of the pachencos, the contraptions in which the player strikes a steel ball which gropingly traverses various tricky obstacles and then is lost forever. An absurd game, in which one can only lose, but which seduces those in whom the fury rages. That is why there are no less than 600,000 pachencos in Japan. I gaze at these rows of dark heads fascinated by a ball that gambols against some nails. The player holds the apparatus in both hands, no doubt so
that his will to win shall pass into the machine. The most compulsive do not even wait for one ball to run its course before hitting another. It is a painful spectacle.” [James de Coquet, *Le Figaro*, Feb. 18, 1957, translated by M.B.]

This seduction is so strong that it contributes to the rise of juvenile delinquency. Thus, in April of 1957, the American newspapers reported the arrest in Brooklyn of a gang of juveniles led by a boy of ten and a girl of twelve. They burglarized neighborhood stores of about one thousand dollars. They were only interested in dimes and nickels, which could be used in slot machines. Bills were used merely for wrapping their loot, and were later thrown away as refuse.

Julius Siegal, in a recent article entitled “The Lure of Pinball” [*Harper’s* 215, No. 1289 [Oct. 1957], 44-47] has tried to explain the incredible fascination of the game. His study emerges as both confession and analysis. After the inevitable allusions to sexual symbolism, the author especially stresses a feeling of victory over modern technology in the pleasure derived from slot machines. The appearance of calculation that the player reflects before projecting the ball has no significance, but to him it seems sublime. “It seems to me that when a pinballer invests his nickel he pits himself—his own skill—against the combined skills of American industry [p. 45].” The game is therefore a kind of competition between individual skill and an immense anonymous mechanism. For one [real] coin, he hopes to win [fictive] million, for scores are always expressed in numbers with multiple zeros.

Finally, the possibility must exist of cheating the apparatus. “Tilt” indicates only an outer limit. This is a delicious menace, an added risk, a kind of secondary game grafted onto the first.

Curiously, Siegal admits that when depressed, he takes a half-hour’s detour in order to find his favorite machine. Then he plays, confident that the game “…assumes positively therapeutic proportions—if I win [p. 46].” He leaves reassured as to his skill and chances of success. His despair is gone, and his aggression has been sublimated.

He deems a player’s behavior at a slot machine to be as revealing of his personality as is the Rorschach test. Each player is generally trying to prove that he can beat the machine on its own ground. He masters the mechanism and amasses an enormous fortune shown in the luminous figures inscribed on the screen. He alone has succeeded, and can renew his exploit at will. “… He has freely expressed his irritation with reality, and made the world behave. All for only a nickel [p. 47].” The responsibility for such an ambitious conclusion is the author’s. What is left is that the inordinate success of slot machines (in which nothing is won but the possibility of playing again) appears to be one of the most disconcerting enigmas posed by contemporary amusements.

16. The Chinese also use the word yeou to designate idling and games in space, especially kite-flying, and also great flights of fancy, mystic journeys of shamans, and the wanderings of ghosts and the damned.
17. Game analogous to ring puzzles: nine links form a chain and are traversed by a rod attached to a base. The point of the game is to unlink them. With experience, one succeeds at it, careful not to call attention to a quite delicate, lengthy, and complicated manipulation where the least error makes it necessary to start again from the beginning.

18. From data provided by Duyvendak in Huizinga (op. cit., p. 32), a study by Chou Ling, the valuable observations of Andre d'Hormon, and Herbert A. Giles' *Chinese-English Dictionary*, 2nd ed. (London, 1912), pp. 510–511 (hsi), 1250 (choua), 1413 (teou), 1452 (wan), 1487–1488 (fou), 1662–1663 (yeou).
As I drove home one sultry July afternoon, I listened to Tony Cox host an episode of National Public Radio’s *Talk of the Nation*. The segment was titled “Writers Reveal Why They Write,” a subject inspired by a *Publishers Weekly* series in which authors mused about their craft. “Writing,” Cox cooed slowly in his introduction, “is a process that can be very hard work. Today, we’re going to talk about writing and why we write.”

Two guests joined the program: the memoir author Ralph Eubanks (*The House at the End of the Road*) and the short-story writer Siobhan Fallon (*You Know When the Men Are Gone*). Not best-selling authors, but successful ones, and in any event writers who had managed to get featured on a national radio program. Wasting little time, Cox got right into it. “Why do you write?” he asked of Eubanks.

“Well,” began Eubanks, “I write because it’s something that’s really very satisfying for me. It’s very gratifying.” Quickly realizing that he’d never make it through the entire segment with milquetoast answers like this, Eubanks cited advice he’d received from the *Washington Post* journalist and National Book Award finalist Paul Hendrickson.

He said first, never forget that someone asked you to tell your story. My first book, *Ever Is a Long Time* and, to a certain extent, *The House at the End of the Road* are both in the memoir genre—so [I’m] feeling very fortunate to be able to tell my story. Not very many people get an opportunity to do that.
And the other thing that he told me is that when you write, you always want to capture the cruel radiance of what is (that’s a quote from Walker Evans). And he said every writer, every artist, wants to capture what is, not what you think it is but what it really is, which means you have to dig very deep into yourself and really pull out some things that are very difficult and sometimes very challenging for you.

And there’s something both emotionally satisfying about it and something that is very physically satisfying when you finally see your work when it comes out in a finished book or when you see the pages at the end of the day.²

These are genuine if somewhat callow remarks. Gratifying though emotional satisfaction may be, surely something more must drive successful writers to write? Things didn’t get much more specific when Fallon entered the conversation.

Well, all writers have that writers’ adage in the back of their mind: always about writing what you know. And when I was writing this collection [You Know When the Men Are Gone], I was writing about the world that I was living in, which I think is sort of a unique one, and it’s living on a military post and the world of or the military community. . . . I just felt like when people think military, they get this visual of an American soldier, and it’s easy to sort of forget the families that all are standing behind that soldier and his mother and father and spouse or children or his, you know, if it’s a female soldier, her husband. And, I don’t know, I thought it was fascinating and wanted to explore that.³

Host and guests covered a range of other trite techniques, from carrying a notebook to record thoughts that would otherwise flit away, to the feeling of terror on seeing the blank page, to the sense of elation that comes from filling it. Overall, platitudes filled the segment: “It’s like a journey, then, isn’t it?” asked Cox. “I think it’s being courageous and not being afraid to put something down on the page,” offered Eubanks. Creative advice ought to be practical and concrete,
but the host and guests of *Talk of the Nation* couldn’t seem to pierce the veil on their own faces.

Mere bromide was not the problem with “Writers Reveal Why They Write.” Clichés also bear truth, after all. No, the problem lies in the fact that writing was an arbitrary inscriptive method in the context of the show. Cox may as well have posed the question “Why do you paint?” or even “Why do you bake?” and the conversation wouldn’t have changed much:

Like, making myself sit down and forcing myself to bake is difficult, but once I get started, it’s just a gorgeous feeling. It’s sort of like working out. I know that’s a silly analogy, but I feel like they’re endorphins.⁴

The real question is subtly different: why do you write *instead of doing something else*, like filmmaking or macramé or sumi-e or welding or papercraft or gardening? Certainly particular materials afford and constrain different kinds of expression, but why should it be obvious that the choice of writing over another way of inscribing and disseminating ideas is a standard, or even desirable, one?

Natural talent may partly explain why one might choose to become a novelist instead of a musician or a painter, but talent itself—whatever indeed constitutes it—is likely unconcerned with material form. Happenstance has a greater role to play in an individual’s creative fortunes. And such serendipity isn’t limited to one’s natural gifts; it also extends to the accident of timing. My own interest in creating and critiquing videogames, for example, is surely more a product of the circumstances in which I happen to live than it is in some inveterate natural ability to manipulate systems that themselves are mere accidents of human discovery and exploitation. Jared Diamond gets it right in his account of material history: the major events and innovations of human progress are the likely outcomes of material conditions, not the product of acute, individual genius.⁵

Still, writing is indeed a creative act recognized among many others. Even if NPR offered no insight on the matter that hot summer afternoon, we can understand intuitively that some people become writers while others become phlebotomists. However, there is one
profession in which writing is not only the assumed method of creativity but practically the only one: the scholar.

For humanists, including philosophers and critics of all stripes, writing is literally the only way to scholarly productivity. One’s career is measured in books and articles: publications counted on curricula vitae, citations of those publications in other written matter measured, and on and on. Smart and devoted and self-effacing though we may often be, scholars tend to overlook the unseen assumptions that underlie their professional activities.

Indeed, when philosophers and critics gather together, whether formally for conferences or by invitation for lectures, they still commit their work to writing, often reading esoteric and inscrutable prose aloud before an audience struggling to follow, heads in hands. In the humanities in particular (unlike the sciences), the academic conference is often understood as an opportunity to test out ideas in front of an audience. Those ideas will, inevitably, become professionally valid only if written down. And when published, they are printed and bound not to be read but merely to have been written. The dodgy marketing of university presses and the massive costs of journals make written scholarship increasingly inaccessible even to scholars, and publication therefore serves as professional endorsement rather than as a process by which works are made public. A few reviews earn merit enough for a positive assessment. Rinse and repeat for tenure, and again for promotion.

Even given trends in digital publishing and online distribution, including blogs and open access presses, questions about the material form of published work go unasked and unanswered. The answer is obvious: writing, always writing. Critics and philosophers will wax grandiose over Jacques Derrida’s “definitive” critique of the primacy of speech over writing, writing over speech, only to insist that real scholarship is written scholarship. Is there any other kind?

But the privilege of writing isn’t limited to the liberal arts. Even in science and engineering, writing casts a pallid shadow over experimentation and construction. Take the chemist who synthesizes a new polymer or the engineer who develops it into a practical and affordable building material. The results of their efforts remain invalid
and unaccountable until they are “written up” for publication in the proceedings of an annual field convention or a “top-tier” journal, entry into which confers the chevrons of rank on the researcher.

There’s good scholarly reason to prefer the formality of written matter. The standards of quality, validity, and relevance of academic work are highly valued, and it’s the job of peer review to set and uphold the bar for quality, honesty, and noteworthiness. Transparency is a virtue: findings, methods, data, and other raw materials must be made available during peer review to allow an impartial jury to assess the methods and results independently. When it goes well, this process helps ensure that scholarship maintains its Enlightenment ideal of disinterest and progress, rather than fall prey to nepotism and commercialism. These are worthwhile goals, even if contemporary peer review doesn’t always embody the egalitarian rectitude to which it aspires.

An obvious question, then: must scholarly productivity take written form? Is writing the most efficient and appropriate material for judging academic work? If the answer is yes, it is so only by convention. The merit of writing as the foundation of scholarly productivity is just as arbitrary as the factors that led Eubanks and Fallon to become writers—the truth is, they (and we) did so by happenstance.

The scholar’s obsession with writing creates numerous problems, but two in particular deserve attention and redress. First, academics aren’t even good writers. Our tendency toward obfuscation, disconnection, jargon, and overall incomprehensibility is legendary. As the novelist James Wood puts it in his review of The Oxford English Literary History,

The very thing that most matters to writers, the first question they ask of a work—is it any good?—is often largely irrelevant to university teachers. Writers are intensely interested in what might be called aesthetic success: they have to be, because in order to create something successful one must learn about other people’s successful creations. To the academy, much of this value-chat looks like, and can indeed be, mere impressionism.
The perturbed prose so common to philosophers, critical theorists, and literary critics offers itself up as an easy target, but it’s not alone. Many scholars write poorly just to ape their heroes, thinkers whose thought evolved during the tumultuous linguistic turn of the last century.

A more prosaic and less-charged example of bad writing comes in the form of chaff: the myriad instances of “in many ways” and “could we not suggest that” and “is it not the case that” that litter academic prose. David Morris gives it the apt name “academic mumblespeak,” noting how adeptly these bad habits simulate “a sentiment of precision while, at best, delaying the moment when the writer actually has to be precise.” Suffice it to say that academics cannot cite some deeply tended adeptness with the written word in defense of their obsession with it as a sole form of output.

Second, writing is dangerous for philosophy—and for serious scholarly practice in general. It’s not because writing breaks from its origins as Plato would have it, but because writing is only one form of being. The long-standing assumption that we relate to the world only through language is a particularly fetid, if still bafflingly popular, opinion. But so long as we pay attention only to language, we underwrite our ignorance of everything else. Levi Bryant puts it this way:

If it is the signifier that falls into the marked space of your distinction, you’ll only ever be able to talk about talk and indicate signs and signifiers. The differences made by light bulbs, fiber optic cables, climate change, and cane toads will be invisible to you and you’ll be awash in texts, believing that these things exhaust the really real.

Bryant suggests that our work need not exclude signs, narrative, and discourse, but that we ought also to approach the nonsemiotic world “on its own terms as best we can.” Scientists and engineers may enjoy a greater opportunity to pursue extralinguistic pursuits than do humanists, but since all work inevitably pledges fealty to the written word, none are safe. When we spend all of our time reading and writing words—or plotting to do so—we miss opportunities to visit the great outdoors.
Among the consequences of semiotic obsession is an overabundant fixation on argumentation, such that pedantry replaces curiosity. Richard Rorty adeptly explains this phenomenon in his 1996 American Philosophical Association response to Marjorie Greene’s *Philosophical Testament*.

For [many philosophers] “doing philosophy” is primarily a matter of spotting weaknesses in arguments, as opposed to hoping that the next book you read will contain an imaginative, illuminating redescription of how things hang together. Many of our colleagues think that one counts as doing philosophy if one finds a flaw in an argument put forward in a philosophical book or article, and that one is a good philosopher if one is quick to find such flaws and skillful at exhibiting them.¹⁰

There’s a fictional character in *The Simpsons* known as Comic Book Guy. Offering sarcastic quips about his favorite comics and television shows, he epitomizes the nerd-pedant who splits every last hair in his pop cultural fare. Besides serving as a send-up of the quintessential comic book/Dungeons and Dragons geek, Comic Book Guy also lampoons the nitpickery of the Internet, where everyone critiques every detail of everything all the time. But beyond those obvious references, Comic Book Guy also serves as a condemnation-by-proxy of most academics. We are insufferable pettifogs who listen or read first to find fault and only later to seek insight, if ever. “Discourse” is not a term for conversation but the brand-name for a device used to manufacture petty snipes—about the etymology of a word, or the truth value of a proposition, or the unexpected exclusion of a favorite theorist. It is perhaps no accident that among the general public, one finds behavior most similar to academic punctiliousness on the Internet, where all ideas, interchanges, and actions are strained through the sieve of language.

There is another way.

If a physician is someone who practices medicine, perhaps a metaphysician ought be someone who practices ontology. Just as one would likely not trust a doctor who had only read and written journal
articles about medicine to explain the particular curiosities of one’s body, so one ought not trust a metaphysician who had only read and written books about the nature of the universe. As Don Ihde puts it, “Without entering into the doing, the basic thrust and import of phenomenology is likely to be misunderstood at the least or missed at the most.” Yet ironically, Ihde is forced to explain such a sentiment in a book, just as I am here. What else can be done?

In his book *Shop Class as Soulcraft*, Matthew B. Crawford explains why, after earning a PhD from the University of Chicago in political philosophy, he gave up a white-collar career at a Washington think tank to become a motorcycle mechanic:

Aristotle begins his *Metaphysics* with the observation that “all human beings by nature desire to know.” I have argued that real knowledge arises through confrontations with real things. Work, then, offers a broadly available premonition of philosophy. Its value, however, does not lie solely in pointing to some more rarefied experience. Rather, in the best cases, work may itself approach the good sought in philosophy, understood as a way of life.

For Crawford, knowledge and labor are not opposites but two sides of the same coin—alternatives for one another. He invites us to see that philosophy is a *practice* as much as a theory. Like mechanics, philosophers ought to get their hands dirty. Not just dirty with logic or mathematics, in the way Bertrand Russell and Alfred North Whitehead’s *Principia Mathematica* investigates the logicist view of mathematics by doing mathematics, but dirty with grease and panko bread crumbs and formaldehyde. I give the name *carpentry* to this practice of constructing artifacts as a philosophical practice.

**MAKING THINGS**

Making things is hard. Whether it’s a cabinet, a software program, or a motorcycle, simply getting something to work at the most basic level is nearly impossible. (Indeed, a great deal of Crawford’s book is devoted to accounts of his challenging exploits repairing motorcycles.) Carpentry might offer a more rigorous kind of philosophical creativ-
Carpentry precisely because it rejects the correlationist agenda by definition, refusing to address only the human reader’s ability to pass eyeballs over words and intellect over notions they contain. Sure, written matter is subject to the material constraints of the page, the printing press, the publishing company, and related matters, but those factors exert minimal force on the content of a written philosophy. While a few exceptions exist (Jacques Derrida’s *Glas*, perhaps, or the Nietzschean aphorism, or the propositional structure of Baruch Spinoza’s *Ethics* or Ludwig Wittgenstein’s *Tractatus*), philosophical works generally do not perpetrate their philosophical positions through their form as books. The carpenter, by contrast, must contend with the material resistance of his or her chosen form, making the object itself become the philosophy.

Some people become writers, others jewelers, others motorcycle mechanics. Similarly, philosophical creativity can take many forms, and each philosopher’s approach to carpentry will differ. In addition to increasing the variety, playfulness, and earnestness of discourse, carpentry has the added benefit of inviting thinkers to exercise and develop their natural talents in a manner akin to Heideggerian dwelling. In doing so, as Iain Thomson suggests, “we come to understand and experience entities as being richer in meaning than we are capable of doing justice to conceptually.”

In the context of alien phenomenology, “carpentry” borrows from two sources. First, it extends the ordinary sense of woodcraft to any material whatsoever—to do carpentry is to make anything, but to make it in earnest, with one’s own hands, like a cabinetmaker. Second, it folds into this act of construction Graham Harman’s philosophical sense of “the carpentry of things,” an idea Harman borrowed in turn from Alphonso Lingis. Both Lingis and Harman use that phrase to refer to how things fashion one another and the world at large. Blending these two notions, carpentry entails making things that explain how things make their world. Like scientific experiments and engineering prototypes, the stuffs produced by carpentry are not mere accidents, waypoints on the way to something else. Instead, they are themselves earnest entries into philosophical discourse.

Computer software is one of the things I make, so it stands to
reason that my examples will come from that arena. I offer two cases of philosophical software carpentry that are particularly relevant in the present discussion, for they implement principles discussed in this book: they’re ontographical tools meant to characterize the diversity of being.

When Bruno Latour composes his litanies, he does so, of course, by hand. Take a typical example:

Try to make sense of these series: sunspots, thalwegs, antibodies, carbon spectra; fish, trimmed hedges, desert scenery; “le petit pan de mur jaune,” mountain landscapes in India ink, a forest of transepts; lions that the night turns into men, mother goddesses in ivory, totems of ebony.

See? We cannot reduce the number or heterogeneity of alliances in this way. *Natures* mingle with one another and with “us” so thoroughly that we cannot hope to separate them and discover clear, unique origins to their powers.¹⁵

This particular litany is a lovely one, full of surprising and counterintuitive units that deeply resist corroborating one another. But the lesson Latour draws from them is somewhat undermined by the manual, human nature of their selection: in some way, the nonsensical aspect of this litany is compromised by the fact that it had to be assembled by a human being. It’s not enough to undermine the claim that no simple reduction can explain the objects together; nevertheless, alternative methods of demonstrating the irreduction might be philosophically desirable.

Enter the *Latour Litanizer*, a machine I constructed to produce ontographs in the form of Latour litanies. It’s a simple device, but an effective one. Wikipedia, the online, user-edited encyclopedia, is built atop the wiki software platform MediaWiki. The software was originally created with Wikipedia in mind, but it has since been adapted into a general-purpose authoring and editing platform—a wiki anybody can install and use.¹⁶ Among MediaWiki’s features is a “random article” function, which pulls up a page chosen at random from the stock of articles in the wiki’s database. Given Wikipedia’s large number of entries—English-language articles alone
number well into the millions—accessing the random article function reliably yields a page that one is unlikely to have seen before or even considered.\textsuperscript{17}

The MediaWiki platform also offers an API, or application programming interface. An API allows a programmer to access parts of a software system’s behavior from a program outside it. Some APIs are local (e.g., the APIs in an operating system like Windows or Mac OS that allow an application programmer to render user interfaces or access file management routines). Others, like the MediaWiki API, allow remote procedure calls from afar. Among the functions provided by this API is the ability to access the “random article” feature, which returns a title and a URL (among other metadata) when queried.

The \textit{Latour Litanizer} executes queries against this API and assembles the results into a list with linked object names, one not dissimilar to the sort found in Latour’s writings. Each time it’s run, the \textit{Latour Litanizer} returns a fresh, new litany. Some examples:


RK Jugović, Quirinius, Rozalin, Lublin Voivodeship, Christiana, Delaware

Buddha Tooth Relic Temple and Museum, Lealt Valley Diatomite Railway, Railway Protection Force Academy, Ereğli, Konya

Saint-Vincent-de-Salers, Food Lion, Dragović, Battle of Cienfuegos, Precipitation, Sitka Pioneer Home, Alma—Marceau (Paris Métro), Thomas Mor Timotheos

Brazilian Antarctica, S. Eugene Poteat, Comiskey Park, Seneca Waterways Council, Winifred Gérin, Euchrysopsosiris, Scott C. Black, Catocala fulminea

Aidan Mitchell, Kiss Me, Baby, List of Statutory Instruments of the United Kingdom, 1951, Edson Cordeiro, Tom Webster
(cartoonist), Hal Winkler, Anglican Diocese of Saldanha Bay, 2006 Wimbledon Championships—Women’s Doubles

Ove, Air-Sea War—Battle (Videopac game), Augustinerkirche (Munich), Eaten Alive!, Emilio Kosterlitzky, Jetairfly destinations, Stuart Phelps, Adelaide of Holland

Argiope bruennichi, Free rider problem, Pershing LLC, Christian Reif

In these lists we find people, places, organizations, ideas, fictions, groups, media, durations, and even other lists. By divorcing the author and reader from the selection process, the litanizer amplifies both the variety of types of units that exist and the variety of alliances between them. The diversity and density of tiny ontology seeps out from these litanies, both individually and (especially) when taken together.

Yet the principal virtue of the Latour Litanizer is also impossible to reproduce in print: the rapidness and diversity of its results. The software itself is incredibly simple to operate: a litany is loaded, and a button press calls forth another, which appears in a matter of moments. Not only does the diversity and detachment of being intensify with each fresh litany, but those very qualities also invite further exploration through the link, which leads the reader to a detailed discussion of the object in question at Wikipedia. As anyone who has ever used that website can attest, its value comes less from its ability to achieve Diderotian universal knowledge and more from its willingness to allow anything inside, no matter its apparent validity, relevance, or even truth value.

Consider a second, related example of simple software carpentry. In April 2010 I hosted the first OOO symposium at Georgia Tech. As a part of the preparations, I created a website to promote the event. In addition to the expected features of a conference website, such as location, speakers, abstracts, schedule, and so forth, I also constructed a visual version of the Latour Litanizer. I had originally intended it to be little more than an evocative decoration, but it quickly proved its mettle as a philosophical device.

Unlike the litanizer, the “image toy” (I never gave it a proper
name) had a more specific purpose: to illustrate the diversity of objects by demonstrating individual examples one at a time. A large portion of the website was devoted to an image of an object, and each time the page loaded, a new one would be revealed (Figure 5 offers an illustration). As a web viewer browsed through the site reading about the conference details, one small cross-section of the variety of being would unfurl.

Wikipedia is built of words, not images, so a different platform was necessary. I opted for Flickr, another user-contributed, web-based service with millions of individual entries. Furthermore, just any image wouldn’t be satisfactory for the image toy to do its job.

**Figure 5.** A detail from the website for the first Object Oriented Ontology symposium, held at Georgia Tech on April 23, 2010. The heavy rail transit train is one of millions of images that might appear when the page is loaded. Try it yourself at http://ooo.gatech.edu.
Many, perhaps most, images on the Flickr service depict people and scenes—the usual portraits and landscapes captured by amateur photographers. I wanted things, but things of myriad types.

When users upload images into the Flickr database, they have the option of tagging them with keywords to describe their contents. The results aren’t always complete, but they offer a better account of the subject of an image than otherwise would be possible on such a large scale. Like MediaWiki, Flickr also exposes an API for external programmatic access of its databases, so my system simply needed to query for particular tags. Somewhat arbitrarily, I chose the words “object,” “thing,” and “stuff,” discovering that these terms proved general enough to yield a wide range of different objects: a ferris wheel, a bale of hay, a railroad trellis, a circuit board, a cat, a box of files, a drainage pipe, a thatch umbrella, a lantern.

The results were aesthetically satisfactory for the purpose I had in mind. But an unexpected outcome of the image toy proved that the tool offered philosophical leverage that might have gone otherwise unseen.

The trouble started when Bryant, one of the symposium speakers, related to me that a (female) colleague had showed the site to her (female) dean—at a women’s college, no less. The image that apparently popped up was a woman in a bunny suit. I never saw the image, nor did Bryant (given the millions of photos on Flickr, it’s unlikely that the same one will be drawn twice), but the dean drew the conclusion that object-oriented ontology was all about objectification (I’m told that she asked why Playboy bunnies would be featured at a philosophy conference). Given the apparently objectified woman right there on the webpage, the impression was an understandable one, even if unintended (and certainly unsupported by OOO thought itself). Like the litanizer, the image toy includes a button to load another image, but some website viewers didn’t see it, or didn’t partake. By convention, website visitors expect a conference webpage to be static and to present its content in full all at once. Seeing the website as a justification of sexist objectification was an unfortunate but understandable interpretation.

Given the charged nature of the subject—a sexist “toy” on a website about an ontology conference organized by and featuring 89
percent white men—it would have been tempting to shut down the feature entirely or to eviscerate its uncertainty and replace it with a dozen carefully suggested stock images, specimens guaranteed not to ruffle feathers. But to do so would destroy the gadget’s ontographical power, reducing it to but a visual flourish. Initially I resisted, changing nothing.

But, as anyone who has used the Internet knows all too well, the web is chock-full of just the sort of objectifying images exemplified by the woman in the bunny suit. Something would have to be done lest the spirit of tiny ontology risk misinterpretation. I relented, changing the search query I executed against the Flickr database:

```
options.Tags = "(object OR thing OR stuff) AND NOT (sexy OR woman OR girl)"
```

This alteration solved the problem, but as the Boolean criteria above suggest, the change also risks excluding a whole category of units from the realm of being! Are women or girls or sexiness to have no ontological place alongside chipmunks, lighthouses, and galoshes?

The promotional and aesthetic accomplishments of the image toy are clear enough. But its philosophical accomplishment comes from the question it poses about the challenge flat ontology and feminism pose to one another. On the one hand, being is unconcerned with issues of gender, performance, and its associated human politics; indeed, tiny ontology invites all beings to partake of the same ontological status, precisely the same fundamental position as many theorists would take on matters of identity politics. But on the other hand, the baggage of worldly stuff still exerts a political challenge on human experience that cannot be satisfactorily dismissed with the simple mantra of tiny ontology. The OOO symposium website’s image toy hardly attempts to answer these questions, but it does pose them in a unique way thanks to carpentry.

It might seem silly to talk about making things as if it’s a new idea. Designers, engineers, artists, and other folks make things all the time. But philosophers don’t; they only make books like this one. Even Wittgenstein didn’t seem to think of the famous Viennese
townhouse he helped design as the practice of philosophical architecture, despite his search for a philosophy without statements and claims and arguments.

**PHILOSOPHICAL LAB EQUIPMENT**

Let’s draw a distinction: unlike tools and art, philosophical carpentry is *built with philosophy in mind*: it may serve myriad other productive and aesthetic purposes, breaking with its origins and entering into dissemination like anything else, but it’s first constructed as a theory, or an experiment, or a question—one that can be operated. Carpentry is philosophical lab equipment.  

Carpentry can serve a general philosophical purpose, but it presents a particularly fertile opportunity to pursue alien phenomenology. The experiences of things can be characterized only by tracing the exhaust of their effects on the surrounding world and speculating about the coupling between that black noise and the experiences internal to an object. Language is one tool we can use to describe this relationship, but it is *only* one tool, and we ought not feel limited by it.

The phenomenologist who performs carpentry creates a machine that tries to replicate the unit operation of another’s experience. Like a space probe sent out to record, process, and report information, the alien phenomenologist’s carpentry seeks to capture and characterize an experience it can never fully understand, offering a rendering satisfactory enough to allow the artifact’s operator to gain some insight into an alien thing’s experience. Again I turn to computation for examples.

Nick Montfort and I have endorsed the coupling between material constraint, creativity, and culture under the name “platform studies,” a mode of analysis that explores how understanding a computer platform is vital to a critique of the particular works, genres, or categories of creative production built on top of it. For example, the nature of the Atari Video Computer System’s (VCS) graphics registers constrained Warren Robinett’s adaptation of Willie Crowther and Don Woods’s text-based *Colossal Cave* into the graphical adventure game *Adventure*, in doing so establishing the conventions of the genre. In platform studies, we shift that focus more intensely toward hardware and software as actors.
Just as the painting infects our material understanding of the photograph, so the influence of photography and cinema on television can cloud our understanding of how computers construct visual images. This confusion is understandable; after all, the television seems to be the same sort of device as that on which most computer images are displayed. It is tempting to imagine that an image like the seemingly simple combination of mazes and abstract tanks in the Atari VCS game *Combat* is drawn like a painting or a photograph. In fact, the computer’s perception of its world is even less like the canvas or celluloid, let alone the human eyeball or optic nerve.

The earliest examples of computer graphics were produced on oscilloscopes, not on televisions. Like a television, an oscilloscope constructs an image by firing an electron beam at the phosphor-coated surface of the display. An oscilloscope features an electron gun that can be moved arbitrarily across the display’s surface. In 1958 Willy Higginbotham created a simple tennis game he called *Tennis for Two* that uses an oscilloscope as its display. *Spacewar!*, created at MIT in 1962, employs a similar type of monitor, as does the coin-op classic *Asteroids*, although in a larger enclosure, sometimes called an XY display, a vector display, or a random-scan display. To construct an image on an XY display, the electron beam moves to a particular orientation within the tube, turns the beam on, then moves to another location, creating a line between the two with the beam’s electron emissions. Each gesture must be created rapidly, before the phosphor burns off. Different phosphor qualities create different appearances on the tube’s surface, and the beam’s strength can sometimes be adjusted to provide more or less luminescence. From the perspective of human inscription, constructing a frame of *Asteroids* is more like drawing than like photography or cinema—or perhaps more like cuneiform inscription. But from the perspective of the evacuated glass envelope that is the monitor, it is an experience more akin to a laser light show or a rave.

An ordinary television picture of the 1970s and 1980s is displayed by a cathode ray tube (CRT). Like an oscilloscope, the CRT fires patterns of electrons at a phosphorescent screen, which glows to create the visible picture. But unlike an oscilloscope, the screen image on a television is not drawn all at once like quill on parchment but in individual scan lines, each of which is created as the electron gun passes
from side to side across the screen. After each line the beam turns off, and the gun resets its position at the start of the next line. It continues this process for as many scan lines as the TV image requires. Then it turns off again and resets its position at the start of the screen (see Figure 6 for a comparison).

Most modern computer systems offer a frame buffer, a space in memory to which the programmer can write graphics information for one entire screen. In a framebuffered graphics system, the computer’s video hardware automates the process of translating the information in memory for display on the screen. But in an unusual move driven by numerous design factors, including the high cost of memory, the bare-bones television interface adapter (TIA) graphics chip in the 1977 Atari VCS makes complex seemingly basic tasks like drawing the game’s screen.

The Atari does not provide services such as frame buffering for graphics rendering. The machine isn’t even equipped with enough memory to store an entire screen’s worth of data, just 128 bytes total. Additionally, the interface between the processor and the television is not automated, as it is in a frame-buffered graphics system. A running Atari VCS program involves an interface between ROM data, processor state, and graphics–sound interface during every moment of every line of the television display.
From a human perspective, we can render metaphorisms of the “notes” of TIA gestures. Atari VCS players see the same sorts of images that they would have come to expect from television broadcasts—the sense of a moving image like film. But the Atari VCS itself doesn’t ever perceive an entire screen’s worth of graphical data in one fell swoop. It apprehends only the syncopations of changes in registers. Its components see things still differently:

The 6502 processor encounters an instruction read sequentially from program flow, performing a lookup to execute a mathematical operation.

The TIA modulates electrical signals when its internal clock prompts it to witness a change on one of its input registers.

The RF conversion box coupled to console and television transmutes an endless stream of data into radio frequency.

Yet what do these descriptions really suggest? However appealing and familiar the usual means of doing philosophy might be, another possible method involves a more hands-on approach, manipulating or vivisecting the objects to be analyzed, mad scientist–like, in the hopes of discovering their secrets.

I created a simple artifact to attempt this feat, another example of carpentry, but this one is a tool for metaphorism. The program, which I call *I am TIA*, approximates the TIA’s view of the world through the lens of a standard two-dimensional computer display. Since the TIA is synchronized to the electron gun of the television picture, instead of seeing the entire screen all at once, the TIA determines which of its objects sits atop the current position of the display and modulates its color output accordingly. Once the programmer synchronizes the game’s instructions with the television’s vertical blank, the TIA takes care of reading the background, playfield, and sprite patterns and colors currently set in its internal registers, converting them into a signal.

*I am TIA* is meant to characterize the experience of the television interface adapter, metaphorizing it for human grasp. When the pro-
gram runs, it interprets screens of the videogame *Combat*, rendering only the modulated color the TIA calculates and sends to the RF adapter at a given time. Instead of seeing an entire television picture worth of image, the human operator of *I am TIA* sees only the single hue currently processed by the TIA, based on its position on the screen (Plate 7). Since the electron gun burns an entire picture into the phosphor of the television sixty times a second, the program is slowed down considerably. This rendering not only spares its human viewer seizure but also highlights the rate of chromatic experience native to the microchip, which alters its signals in time with the electron beam rather than the human eye, stopping regularly to await its position to reset to the next scan line position. In doing so, *I am TIA* also underscores part of the chip's experience that would never be graspable through human interface with the Atari: the TIA and electron beam must switch off during the television’s horizontal and vertical blanks—the period when the beam resets to start a new line or a new screen.

While these moments are purely momentary in real time, when experienced through the decelerated, metaphorical lens of *I am TIA*, strange moments of black silence interrupt the characteristically bright colors of an Atari image. Time moves forward in syncopated bursts of inbound bits and bursts of signal, then of color from joystick to motherboard to television. Despite the fact that the machine must manually synchronize itself to the television display at 60 Hz, it has no concept of a screen’s worth of image. It perceives only a miasma of instruction, data, color, darkness.

Other works of alien phenomenal carpentry exist, too, even if they don’t explicitly frame themselves in that way. Consider Ben Fry’s *Deconstructulator*.\(^{22}\) The program is a modification of a Nintendo Entertainment System (NES) emulator, which runs any NES ROM as if it were being played on the original hardware. On the periphery, the system depicts the current state of the machine’s sprite memory in ROM, sprite data in video memory, and current palette registers, which are mapped via keys to the indexed values in the sprites themselves (Figure 7). These update over time as the state of the machine changes while the user plays. While *I am TIA* metaphorizes only one component of the Atari VCS console, *Deconstructula-
tor offers an operational, exploded view of the entire NES memory architecture, particularly its sprite and palette systems. From a carpenter’s perspective, the result opens the hidden file drawers of the NES cartridge, depicting its contents and revealing how the machine manipulates the game’s contents within the limitations of its memory constraints.

Even without the fancy packaging of Deconstructulator, source code itself often offers inroads in alien phenomenology—particularly when carpentered to reveal the internal experiences of withdrawn units. Firebug is a Firefox web browser plug-in that allows the programmer or ordinary user to monitor and display the internal states of the web browser’s rendering and behavior system as a page is displayed. Once installed, the tool allows a user to view the HTML that corresponds with a selected visual element on the screen, to reveal and modify the style information (or CSS) that tells the browser which colors, fonts, layout styles, and positions to use for objects on the page, to overlay rectilinear grids to reveal the internal metrics of

![Figure 7](image)

**Figure 7.** Ben Fry’s Deconstructulator offers an operational exploded view of the Nintendo Entertainment System. In this image, sprite memory appears on the left. Color sets, half a byte in size, colorize the sprites—the active sets appear below the Super Mario Bros. screen. At right, the machine’s current memory configuration is displayed, including all the sprites and their associated color sets.
a webpage, to review the network activity and duration required to fetch and retrieve every object needed for the page, to debug scripts and show the runtime values of active variables, to reveal the internal object structure of the page within the document object model (DOM) used for both stylesheet rendering and scripted behavior, and so forth.

ALIEN PROBES

But a much more sustained and deliberate example of computational carpentry that performs alien phenomenology can be found in *Tableau Machine*, a nonhuman social actor created by Mario Romero, Zachary Pousman, and Michael Mateas. In 1998 researchers at Georgia Tech began constructing an “Aware Home,” a real residence just north of campus that was outfitted with devices, screens, interfaces, cameras, and sensors. Its initial investigators posed the question, “Is it possible to create a home environment that is aware of its occupants’ whereabouts and activities?” It’s an inquiry with an assumption: that the only thing a home can do is to serve its human occupants. As Romero and colleagues put it, research in ubiquitous computing and ambient intelligence “remains rooted in an information access and task-support where the goal is long term active reflection on everyday activity, enjoyment and pleasure.”

In response to this limitation, Romero, Pousman, and Mateas propose an “alien presence,” a computational agent that senses and interprets the state of an environment (in this case a home) and reports its experience in the form of abstract art. An alien presence, they argue, “does not try to mimic human perception and interpretation, but rather to open a non-human, alien perspective onto everyday activity.”

*Tableau Machine* attempts to represent the perceptual apparatus of the entire house by harnessing the Aware Home’s array of cameras, divided into regions, and interpreting the changing images with computer vision algorithms that measure motion in those regions. Instead of predicting or encouraging particular behaviors on the part of individual human actors in the home, as other ubiquitous computing efforts have attempted, *Tableau Machine*’s system interpolates the accumulation and release of motion, which its creators characterize as social energy, social density, and social flow. And rather than
depict this information in a one-to-one fashion meant for human legibility, as an information visualization might do, *Tableau Machine* renders the home’s perception as an occasionally changing work of abstract art shown on a plasma display mounted in the home (as if it were a painting or television). The images that appear on that screen follow the general style of fauvism or postimpressionism, but they do not attempt to simulate the style of any particular artist or artistic movement (see Plates 8a and 8b for examples).

*Tableau Machine* takes for granted that the home itself is a unit, one distinct from but inclusive of its kitchen, living room, dining room, and hallways. Its creators surmise that the home can perceive, but they add an additional presumption: a home’s perception is unfathomable by its human occupants. Instead of understanding it, the best we can do is trace the edges of its dark noise, producing a caricature of its experience in a form we can recognize. In *Tableau Machine*’s case, the rendition is literally caricature, that of abstract art.

*Tableau Machine* does not try to improve the function of the home or the providence of its occupants. Instead, it hopes only “to encourage engaging conversations and reflections by opening unusual viewpoints into everyday life.”28 That said, Romero, Pousman, and Mateas don’t take *Tableau Machine* far into the great outdoors as they might, conceding that it “characterizes human activity.”29 The project’s context may help explain that misstep; after all, the three documented the project for publication in the prestigious proceedings of the Association of Computing Machinery Computer-Human Interaction conference (yet another example of the predominance of writing in scholarship, even when the scholarly object is an apparatus). Human–Computer Interaction (HCI) concerns itself with human-computer relations, not computer-computer relations—or house-computer relations, for that matter. Despite its technical tenor, computing is just as correlationist a field as everything else, obsessed with human goals and experiences.

When allowed to break free of this context, it’s clear that *Tableau Machine* is something quite different: it’s an alien probe that turns us into the aliens, gathering data from a strange visual field, analyzing it according to a curious and unfathomable internal logic, and reporting back its distorted impressions of our extraterrestrial world, just as
a robotic space probe might collect radio signals, process radiation signatures, and present an earnest yet inevitably erroneous account of life in the universe.

A field study conducted by Tableau Machine’s creators proves the point. They installed the object in three homes in the Atlanta area, effectively transforming the residences of ordinary families into cyborg homes. Tableau Machine remained for six to eight weeks in each house, during which time the occupants reported engaging deeply with the curious artifact. Some of these observations were more about engineering than about perception, such as discovering through experimentation that the same domestic states would never generate precisely the same abstract images. But others saw the abstract images Tableau Machine produced as interpretations of the way their respective homes perceive:

Near the beginning of the deployment, B2 (the mother) began to describe images as being views of the house, either from above or from other perspectives. Other householders followed along in this reasoning, and pointed out clusters that were “the kitchen table” or “the hallway.” As the deployment progressed, B householders began to see individuals in the images, and to draw parallels between activities (such as a boisterous dinner) and the images (a large round shape full of messy shapes on top, including a set of lines that formed something resembling a fork). The family was quite enamored with this image, and others that represented moments around the house. In the last week, Betty found an image that looked like a smiling face, which she took (or pretended to take) as an image of her husband cooking at the stove. At the interview she was very proud of the printout and asked if she could keep it. She hung this picture on the refrigerator.

To be sure, this and other impressions of Tableau Machine clearly reveal attempts at anthropomorphism on the part of the family. But as Jane Bennett predicts, such an attitude helps deliver the home’s residents out of anthropocentrism. While the mother remains concerned about the members of her family, their activities, and their welfare, her experience of domesticity is nevertheless expanded,
such that the perception of the house itself has become a part of her sympathies.

Latour Litanizer, I am TIA, Deconstructulator, Firebug, and Tableau Machine are artifacts of alien phenomenology. Rudimentary perhaps, but concrete, unburdened by theoretical affectation. These examples show how speculation might be used in an applied fashion. They also show that the job of the alien phenomenologist might have as much or more to do with experimentation and construction as it does with writing or speaking. One form of carpentry involves constructing artifacts that illustrate the perspectives of objects.

The relationships between memory addresses and ROM data, or webpages and markup, or households and electronic paintings offer but a few examples of the object perceptions carpentry can reveal. For other things also take place at this very moment, adding themselves and their kindred to the volcanoes, hookahs, muskets, gearshifts, gypsum, and soups that have arisen. Here are some that interest me, but yours will surely vary:

An electron strikes phosphor, lighting a speck on a fluorescent tube that glows and fades.

A metal catch closes a circuit on silicon, whose state a processor bitwise compares to a charge on another wafer.

An I/O bus pushes an OpenGL instruction into the onboard memory of a video card, whose GPU runs matrix operations into the video memory soldered to its board.

Carpentry’s implications for weird realism in general might be even more surprising: the philosopher-programmer is joined by the philosopher-geologist, the philosopher-chef, the philosopher-astronomer, the philosopher-mechanic. The “carpentry of things,” one of Harman’s synonyms for object-oriented philosophy, might be a job description, not just a metaphor.

**A NEW RADICALISM**

In a discussion of Whitehead’s take on creativity, Steven Meyer reminds us that the former’s writing shares a quality with poetry: “In inventing creativity, Whitehead was doing what poets are best known
for doing: naming things that do not already have names, or—what comes to the same thing—giving a new name to something and thereby transforming it.” Meyer also reminds us of one of Whitehead’s famous aphorisms, the kind that makes him the most quoted and the least cited of philosophers: “In the real world it is more important that a proposition be interesting than that it be true.”

Latour offers his own version of this injunction: “Standing by what is written on a sheet of paper alone is a risky trade. However this trade is no more miraculous than that of the painter, the seaman, the tightrope walker, or the banker.” Knowledge, he concludes, “does not exist. . . . Despite all claims to the contrary, crafts hold the key to knowledge.”

Yet once we are done nodding earnestly at Whitehead and Latour, what do we do? We return to our libraries and our word processors. We refine our diction and insert more endnotes. We apply “rigor,” the scholarly version of Tinker Bell’s fairy dust, in adequate quantities to stave off interest while cheating death. For too long, being “radical” in philosophy has meant writing and talking incessantly, theorizing ideas so big that they can never be concretized but only marked with threatening definite articles (“the political,” “the other,” “the neighbor,” “the animal”). For too long, philosophers have spun waste like a goldfish’s sphincter, rather than spinning yarn like a charka. Whether or not the real radical philosophers march or protest or run for office in addition to writing inscrutable tomes—this is a question we can, perhaps, leave aside. Real radicals, we might conclude, make things. Examples aren’t hard to find, and some even come from scholars who might be willing to call themselves philosophers.

Meanwhile once more, at the Genoa-based brand consultancy Urustar, designers recast and condense hundreds of pages of my books into playable pixel art.

Meanwhile, at NYU, Alex Galloway implements a computer version of Guy Debord’s Le Jeu de la Guerre, revealing in the process that Debord and his partner Alice Becker Ho misapplied their own rules in their book about the game.

Meanwhile, at Fergus Henderson’s London restaurant St. John, the chef practices philosophy of “nose to tail eating,” rescuing neglected cuts of meat and offal for innovative preparations.
Meanwhile, in the courtyard of the Skiles classroom on the Georgia Tech campus, my colleague Hugh Crawford directs his Special Topics in Literature and Culture class in the construction of a full-size wooden hut as a part of their study of Henry David Thoreau’s *Walden.*

These examples do more than put theory into practice; they also represent practice as theory. It’s not that writing cannot be interesting. Rather, we might consider that writing *is not the only* method of engendering interest.

If we take vicarious causation seriously, if we believe that things never really interact with one another, but only fuse or connect in a locally conceptual fashion, then the only access any object has to any other is conceptual. When people or toothbrushes or siroccos make sense of encountered objects, they do so through metaphor. As Whitehead and Latour suggest, this process requires creative effort, challenging OOO to become craftsmanship, challenging us to learn a trade. We tend to think of creativity as construction, the assembly of something new out of known parts. A novel is made of words and ink and paper, a painting of pigments and canvas and medium, a philosophy of maxims and arguments and evidence, a house of studs and sheetrock and pipes. Perhaps in the future, following Crawford’s example, radical philosophers will raise not their fists but their hammers.

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To link to this article: http://dx.doi.org/10.1080/01972243.2011.583819
PERSPECTIVE


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This article provides an overview of a series of experiments in what the author calls critical making, a mode of materially productive engagement that is intended to bridge the gap between creative physical and conceptual exploration. Although they share much in common with forms of design and art practice, the goal of these events is primarily focused on using material production—making things—as part of an explicit practice of concept elaboration within the social study of technology.

Keywords information technology, innovation, making, social theory

The article is organized into three sections. In the first section I describe the origins of the project and its connections to similar modes of material/conceptual engagement, including critical design and constructivist pedagogies. Ultimately, while noting similarities to these modes of practice, I see the intention of critical making projects as somewhat different in its explicit mappings between scholarly research on critical social issues and design methodologies and its intention of furthering critical knowledge through joint material production. In the second section, I provide more details about critical making as a specific research and pedagogical strategy, examining its origins in a series of conference workshops that I held in Amsterdam and London. Through these empirical examples I describe some of the challenges and successes that I have had, and, in particular, the role of experience and investment in making critical knowledge relevant. In the third section, I describe more generally some of the reasons critical making provides a necessary adjunct to current and future critical research on computing technologies and lay out a tentative theoretical framework for organizing and relating its results to wider scholarly work. Finally, I end by reflecting on the connections between criticality and innovation, tentatively suggesting that these modes of engagement are more similar than have traditionally been thought.

ORIGINS OF CRITICAL MAKING

“Go and look again at the roses. You will understand now that yours is unique in all the world. Then come back to say goodbye to me, and I will make you a present of a secret.”

The little prince went away, to look again at the roses. (Saint Exupery 1971, 86)

Studying the relationship between technologies and social life has proven to be a somewhat difficult task. On the one hand, critical social scholars have long argued that technological developments inhibit human action, “technicizing the life-world” and causing the diversity of human behaviors to be reduced to the ordered circuits and pathways of some sort of gigantic machine。(Marcuse 1941, 1964; Ellul 1964). On the other hand, other theorists have described technologies as essentially liberating, using, in particular, developments in information technology to support their arguments (Gilder 1989; Mitchell 1996). Recent scholarship in interdisciplinary fields such as science and...
technology studies tends to balance these more essentialist positions, indicating the co-creation of technologies with social order (MacKenzie et al. 1985; Bijker et al. 1992; Latour 1996; Haraway 1991). However, deterministic positions maintain a strong foothold on a common-sense understanding of how technology and society is related.

This is somewhat surprising, given that our lived experiences with technologies never quite mirror the overly optimistic or pessimistic descriptions of their effects. The freedoms and the open possibilities of Web 2.0 publishing technologies seem overstated when one faces banal online entertainment news sites, or the blank screen of blog software interfaces. But then, the limitations placed on us by Adobe or Apple’s digital rights management systems often do not feel quite as limiting as critical legal voices presuppose.

We might put this down to a lack of knowledge in both cases. On the one hand, our inability to feel the optimism and freedoms of the Web may be due to our lack of technical knowledge as to the workings of online content management systems. On the other hand, our lack of sensitivity to issues of digital rights may be due to our ignorance of our own legal rights and thus our ignorance of how these rights are being technically constrained. However true this might be, our sense is that this issue is related to a deeper disconnect between conceptual understandings of technological objects and our material experiences with them. In other words, it seems that when one uses technologies he or she remains aware of their nuanced relationship to society, while when one theorizes about them they seem much more “brittle” and inflexible (Ackerman 2000). I explore this issue in more detail in the last section; it is important to set this out as the main “meta” question driving our research. Briefly put, the issue I want to understand is the seeming disconnect between deterministic, conceptual understandings of the role of technology in social life, and the more material and nuanced understanding of how one relates to them. Our goal is therefore to use material forms of engagement with technologies to supplement and extend critical reflection and, in doing so, to reconnect our lived experiences with technologies to social and conceptual critique.

Critical Making

The use of the term critical making to describe our work signals a desire to theoretically and pragmatically connect two modes of engagement with the world that are often held separate—critical thinking, typically understood as conceptually and linguistically based, and physical “making,” goal-based material work.

A critical making project involves three stages, analytically though not functionally separable. The project may start from any of these. One stage involves the review of relevant literature and compilation of useful concepts and theories. This is mined for specific ideas that can be metaphorically “mapped” to material prototypes, and explored through fabrication. In another stage, groups of scholars, students, and/or stakeholders jointly design and build technical prototypes. Rather than being purposive or fully functional devices, prototype development is used to extend knowledge and skills in relevant technical areas as well as to provide the means for conceptual exploration. A third stage involves an iterative process of reconfiguration and conversation, and reflection begins. This process involves wrestling with the technical prototypes, exploring the various configurations and alternative possibilities, and using them to express, critique, and extend relevant concepts, theories, and models.

With its emphasis on critique and expression rather than technical sophistication and function, critical making has much in common with conceptual art and design practice, as well as recent work in the area of human-computer interaction (HCI). Relevant examples include critical design (Dunne 2005), critical technical practice (Agre 1997), and reflective practice (Sengers et al. 2005). However, critical making differs from these practices in its focus on the constructive process as the site for analysis and its explicit connections to specific scholarly literature. Critical making emphasizes the shared acts of making rather than the evocative object. The final prototypes are not intended to be displayed and to speak for themselves. Instead, they are considered a means to an end, and achieve value through the act of shared construction, joint conversation, and reflection. Therefore, while critical making organizes its efforts around the making of material objects, devices themselves are not the ultimate goal. Instead, through the sharing of results and an ongoing critical analysis of materials, designs, constraints, and outcomes, participants in critical making exercises together perform a practice-based engagement with pragmatic and theoretical issues. Our sense is that this method can be particularly useful around “wicked problems” (Rittel et al. 1973; Coyne 2004)—issues in which no consensus exists with regard to problem definition, let alone potential solutions. Using a shared process of making as a common space for experimentation encourages the development of a collective frame while allowing disciplinary and epistemic differences to be both highlighted and hopefully overcome.

Critical Design

In this article, I emphasize the connection between critical reflection on social and organizational issues and provide mappings between scholarship in these areas and specific joint, hands-on prototyping projects. Critical making is thus similar to “critical design” and the other previously mentioned design strategies in its explicit focus on
transforming the imagination and opening up reflexive perspectives to designers.

However, unlike these approaches, my main goal is not to create objects that in their apprehension open new visions and possibilities for observers. Instead, while physical prototypes are constructed and shared with others, our main focus is on the act of shared construction itself as an activity and a site for enhancing and extending conceptual understandings of critical sociotechnical issues. I share aspects of this focus with researchers such as Agre (1997), Boehm (2008), DiSalvo (2008), Dourish (2001), Eisenberg and Beuchley (2008), and Sengers (2008). I therefore situate myself within the area of “design-oriented research” rather than “research-oriented design,” following Fallman’s (2007) distinction. The closest connection is to constructionist forms of learning in that the process of making is as important as the results.

**Constructivist and Constructionist Pedagogies**

It is important to distinguish constructivism (Dewey 1938; Vygotsky 1978; Piaget 1953, 1955, 1970; Bruner 1961) from constructionism. (Papert 1980; Papert et al. 1998; Knorr-Cetina 1997) While both emphasize lived, individual, socially embedded experience as key to the learning process, constructionism emphasizes the importance of actively making things. And although constructivism as pedagogy has a long tradition within the social and humanities education, constructionism has been less applied outside of the fields of math, engineering, and the sciences. Specifically, critical making draws upon three specific aspects of Papert’s vision of constructionism. First, Papert incorporates the emotional dimension of learning, noting that the assimilation of new models of the world always involves endowing new understandings with a “positive, affectual tone” (Papert et al. 1998). The importance of affectual relations in meaning-making has also been emphasized in Knorr-Cetina’s work (1997) on the relationship between scientists and the “epistemic objects” with which they work. For us, affect serves as a way to begin to understand the importance of personal investment in linking conceptual understandings of technology’s potential and its problems to everyday experience. Second, Papert emphasizes the use of transitional objects—gears, computers, other physical objects—as a way of connecting the sensorimotor “body knowledge” of a learner to more abstract understandings. Here, he emphasizes that these objects do not just serve to “illustrate” concepts but act as means for projecting oneself into an abstraction. For Papert (and for us) using “computers as material” rather than as a tutor or a tool for doing other work references this role of the computer as a transitional object. Third, Papert, referencing Hawkins (1965) notes the importance of “messing about” with computers in order to overcome the “rigid style of work” typically associated with them.

I concur and have organized our critical making exercises (described later) in an open way in order to allow new perspectives to emerge.

Similar to Papert’s vision, my goal is to make concepts more apprehendable, to bring them in ways to the body, not only the brain, and to leverage student and researchers personal experiences to make new connections between the lived space of the body and the conceptual space of scholarly knowledge. However, I differ from traditional constructionist exercises in focusing on social concepts and scholarly work, rather than math, science, or engineering.

**EVOLUTION OF CRITICAL MAKING**

“You are not at all like my rose,” he said. “As yet you are nothing. No one has tamed you, and you have tamed no one. You are like my fox when I first knew him. He was only a fox like a hundred thousand other foxes. But I have made him my friend, and now he is unique in all the world.” (Saint Exupery 1971, 86–87)

**RCA/Imperial Event: Systems of Learning**

Initial impetus for incorporating material production into critical analysis came from our observation of interaction design students at the Umea Institute of Design. Their methods of developing designs often involved very individual forms of exploration and its articulation through a variety of communicative objects including visual, textual, and material forms. I were struck by the ways these objects served both group and individual functions—students used them to communicate and exchange ideas with other designers, but also as a means for personal exploration and remembering. For some of these students, visual and textual forms dominated, but for others, more material prototyping served as a way of substantively (literally) extending their reflections and thoughts, rethinking previously held ideas, as well as serving as a focus for joint discussion and debate. The use of objects to enhance communication and cognition and simultaneously maintain community is well known within both the design communities and the social sciences and humanities more broadly (Hutchins 1995; Star et al. 1989), as well as in a science or engineering context (Rheinberger 1997; Knorr-Cetina 2000). However, using shared practices of making to enhance critical discussion or social research has been infrequently applied and little studied. I decided to use an invited talk for the joint Royal College of Art (RCA) and Imperial College Systems of Learning colloquium series to explore this potential.

The RCA/Imperial talk was on the debate between advocates and critics of distance learning techniques within university education. My sense was that this debate has
stalled, with critics claiming that distance education technologies lacked the sociality of face-to-face interactions and thus turned education into a content delivery system and advocates claiming that these issues had been or would be solved by higher bandwidths, new interfaces, or other novel technological developments. Rather than attempt to prove or disprove these positions, I decided to facilitate a conversation by using a shared making experience to break the proverbial ice, generate rapport, and in general create conditions for an open and honest exchange.

I started the one-and-a-half-hour session with a brief description and overview of the debate. After some brief conversation, I helped the participants organize into teams and provided each with some small vibrating motors (typically found in pagers and cell phones), batteries, tape, glue, toothbrushes, and other craft materials. I described the general notion of a drawbot (figure 1) and “bristlebot” in particular, a type of robot that achieved its movement through the vibration of toothbrush bristles against a surface, and pointed each team toward online resources that would help them build one. After some encouragement, the participants began to construct individual machines, referring to both the online and offline resources. Periodically, over the following forty minutes I interrupted the teams to ask them to reflect on the kinds of help they were getting from digital resources, what help they received from their teammates and others in the room, and how the materials themselves informed their decisions. After they finished and showed off the results of their work, I proceeded to raise the topic of distance education and asked the participants to reflect on how their recent experience informed their judgment or perspective. A quick review of the participants found that few of them had changed their position and that the majority of them, while enjoying the experience, had trouble mapping what they had just done to the critical issues involved.

Although certainly not the success I had hoped for, the event in London served to deepen my thinking on methods of critical making. The first insight involved decisions about what was intended to be made in the constructive exercise. One hypothesis I had was that the lack of connection between the object to be made (bristlebot) and the topic under discussion (distance education) made it extremely difficult for participants to map their conceptual and their material explorations. This meant both that discussion was not facilitated and conceptual understandings were not deepened, but also that participants had trouble investing in the experience. My second and related insight was that individual investment in the object of construction was a key component in critical making. Although I am not entirely sure why, it seemed as if participants did not invest in the object of their shared work, and they had trouble mapping their personal experiences to the critical issues being addressed. These two insights formed important conditions for the creation of our next critical making session.

**Flwr Pwr, Walled Garden: Amsterdam**

A conference held in Amsterdam was the site for our next experiment in critical making. I were invited by Virtueel Platform, an organization tasked by the Dutch government with facilitating crossdisciplinary discussions between media arts and design organizations, to contribute to a two-day conference on issues related to Web 2.0 developments. The main concern of the overall conference was the issue of so-called “walled gardens”—did closed Web 2.0 network applications such as Facebook constitute “free riding” and the extraction of value from the network as a whole? The idea for our contribution, what I called the “Flwr Pwr” workshop, was to create a shared construction exercise that could facilitate and inform discussions around the rise of proprietary and closed “walled gardens” on the Internet and provide some common ground for thinking through the social issues involved. More abstractly, the flwr workshop was intended to explore some of the limits of abstract notions of “network” and the ways this notion tends to presuppose discrete, homogeneous, equal agents working within a space of pure and perfect communication.

The “flwr pwr” critical making scenario involved the construction of a physical type of cellular automata. Using pre-assembled and coded components, workshop participants constructed simple electronic agents called “flwrs” that “talked” and “listened” to one another using infrared communication, and displayed the results via preset series
of colored, blinking lights (figure 2). Each flwr started with a unique pattern and a specific amount of “energy,” a variable that decremented a certain amount each cycle. When this value reached zero the flwr “died.” The flwrs had three separate modes: They could transmit their pattern, listen for other patterns, or do nothing. Transmitting cost additional energy while receiving others patterns could potentially cause the receiver to change to the new pattern and to gain energy. Each flwr could therefore be configured in various ways—to transmit more (and use more energy), or to be more open to receive others’ patterns. These behaviors effected each agent’s individual survival as well as the survival of the network as a whole.

The flwr “cell”s were constructed using the arduino microcontroller and development environment. A simple wiring harness was made, consisting of a programmable RGB LED (red-green-blue light-emitting diode), an infrared LED, and an infrared receiver. Workshop participants could then build custom enclosures made from craft materials, insert the wiring harness and arduino, and program the resulting custom object by plugging it via USB into a laptop computer. The physicality and individualistic construction of the flwr “cell” made the resulting network different from traditional cellular automata in that communication within the network was not “pure,” nor were individual agents homogeneous. As our goal was not simulation or predictability, I assumed the incommensurability of agents and imperfect communication to be a resource rather than a problem—an assumption I talk about more fully later.

The objectives of the workshop were to use the flwrs, the shared experience of making, configuring, and reconfiguring them, and the interactions I observed between them to explore the themes of the conference. Of particular interest to us was to think through some of the structural characteristics of network technologies and the possibility of individual agency and emergence within them. To cast light on these issues I adopted various concepts from critical literature on information and social organization and made metaphoric linkages between these concepts and particular configurations of the flwrs receiving and transmitting behaviors. In particular, I singled out three concepts and metaphorically “mapped” these to specific ways to configure the actions of the flwrs. These included the idea of generalized exchange and gift economies (Kollock 1999; Mauss 1990), the notion of the information commons (Benkler 2006; Hardin 1969), and a concept of information “neighborhoods” extended from the work of Jacobs (1992). For each of these, a specific code subroutine was written as a way of metaphorically operationalizing these concepts. For example, if the flwrs were configured to use the “gift economy” subroutine, all patterns received from other flwrs would cause the receiver to change to the received pattern and gain energy. If configured to use the “information commons” routine, only patterns flwrs did not currently display would count. And if “information neighborhoods” was chosen, then only patterns that had not been held for the last four times would be processed and the rest would be ignored. By changing variables in the code and including or excluding these particular
subroutines, workshop participants could set up their flwrs to communicate differently.

We started the session by briefly outlining some of the goals already described, in particular the idea that the building process would help us think through different social theories about networks. As I noted the different ways to configure the flwrs, I briefly described some of the social theories noted earlier and linked them to the ways the code subroutines metaphorically operationalized these theories. I was careful here to emphasize the metaphoric nature of this operationalization, stating explicitly that the code behaviors were reductive insubstantiations of the complex human activities the theories were intended to generalize. Also, I noted that the flwrs were not intended to be a simulation of social activity but instead acted as a diagrammatic representation (figure 3).

Following this brief overview, I encouraged participants to install the necessary arduino software, to familiarize themselves with the microcontroller and the provided wiring harness, and to examine the precoded flwr software. Following some discussion, the participants began to install requisite software, to play with the hardware and the flwr code, and to use available craft materials to construct their individual flwrs. Despite the differing levels of existing technical knowledge among participants, everyone seemed to quickly engage in the activity and had little difficulty constructing and coding their own individual flwr (figure 4).

In other work (Ratto & Hockema 2009) I have described more fully the outcomes of the workshop. For this article, a few aspects are most relevant. First, the deliberate linking of social theories and technical systems worked well, with the language of the various social theories providing resources for participants to describe relations they observed between flwrs. For example, I started by encouraging the participants to set their flwrs to use the “gift economy” subroutine and to try and maximize the longevity of their flwr. Predictably, many of the participants configured their flwrs to transmit very little and to spend most of the time listening for others’ transmissions. Equally predictably, this rapidly caused the overall network to “die” as individual flwrs lost energy. This encouraged a conversation about the notion of “generalized exchange” and the reciprocity of the “gift,” language that was quickly appropriated by the participants in describing their flwrs’ behaviors. Equally, and somewhat more surprisingly, this also engendered a conversation about the dependency of the success of the flwr network on interactions that were external to it, namely, the negotiations of participants as to how much each flwr should listen and how much it should broadcast in order for it to be a “responsible” member. The moral rather than functional dimension of this and later debates among the group helped overcome doubts I held as to the reductive aspect of the theory-technology mapping (more on this later).

Similarly, I was struck by the sense of investment each participant felt for his or her flwr. Soon after building them and putting them into “dialogue” with other flwrs, participants began to call them “aggressive” or “passive” and to give them characteristic descriptions such as “grazer,” “carnivore,” or “immortal.” Rather than see these as mistaken anthropomorphisms, our sense is that these descriptions reveal an affectual relationship to each flwr and a strong desire to understand what participants saw as their “motivations.” One reason for such language was the ways
in which each flwr “pushed back” on the behaviors coded into them by participants. As noted earlier, the physicality of the agents and the ways in which they were individually crafted meant that their behaviors did not always entirely match what their creators coded—the flwrs were unique and the ways in which they communicated were not always predictable. Some flwrs, for instance, were excellent broadcasters and, given similar configurations, would quickly overwhelm and dominate all the other flwrs in the network. Others seemed shy and hesitant to accept the patterns of others. This language—dominate, shy, hesitant—was often used despite clear acknowledgment that such behaviors came from intended and unintended choices they had made in physical construction, the location of the infrared LED or receiver, or the power of the battery—emerging, as it were, from the bodies of the flwrs. In this sense, the heterogeneity of the flwrs served as a resource for relating the larger social experiences of the participants to the flwr garden. I discuss this issue in the final section.

In preparing for this event, two concerns were raised by colleagues: one, that the reductive nature of this mapping would cause participants to “technologize” the complexity of the social theories and turn them into stepwise operationalizations; or two, that the running of the flwrs would be seen as a simulation of social life and that the observed behaviors and results would be thus understood as being predictive of human social life. Our sense is that the framing and ongoing discussion about the limitations of both theory and technology and, more importantly, the material experience of engaging with those limitations help defray both risks. However, and this is more problematic, it remained (and remains) quite easy for external viewers to misunderstand either the intention of the exercise or the relevance of its results without extended commentary such as this article. What makes the flwr project understandable is making. Without material engagement in the project of building and configuring a flwr it is easy to view the resultant objects as an interesting (or uninteresting) illustration of technical possibilities or of social theory but ultimately limited in their ability to innovate either one. In one way this is true—neither the technologies nor the social theorizing that emerged from the flwr project could separately be considered novel or innovative. However, the ability of the participants to engage with the social theories presented to them and to develop and share new understandings was intimately related to the joint conceptual and materially productive work. Future critical making experiments will push this envelope further.2

**FUTURE POTENTIAL OF CRITICAL MAKING**

“What is essential is invisible to the eye,” the little prince repeated, so that he would be sure to remember.

“It is the time you have wasted for your rose that makes your rose so important.”

“It is the time I have wasted for my rose—” said the little prince, so that he would be sure to remember.

“Men have forgotten this truth,” said the fox. “But you must not forget it. You become responsible, forever, for what you have tamed. You are responsible for your rose . . .”

“I am responsible for my rose,” the little prince repeated, so that he would be sure to remember. (Saint Exupéry 1971, 87)

In the previous sections, I have attempted to contextualize critical making as a mode of engagement. Although I have only just begun to experiment, I hope the empirical examples described here demonstrate some of the potential value of relinking conceptual and material work. Obviously, there are a number of important issues, first of which is the balancing act that must occur between technical and social scholarly expertise. Obviously, I see this issue as at least partially the result of patterns of disciplinary difference which maintain the separation of the technical from the social. Nonetheless, currently the distance between these two areas of knowledge remains vast—often even within the geography of the university campus. However, there is an important need for critical makers that can reintegrate technical and social work and thereby innovate both. One development that mitigates the difficulty of the technologies involved is open-source hardware and software and the communities of artists, designers, and engineers that provide support. Our flwr project made much use of the arduino environment and its communities, in main part because of the access to technical knowledge they facilitated. Our intention is to continue using such resources, given their potential to innovate not just who can use complex computer technologies but also how they might be used.

Let me end by explaining the quotations from de Saint Exupéry’s *The Little Prince* that have preceded each section.3 They speak to what I have detailed as an important component in critical making, namely, the role of investment in connecting lived experience to critical perspectives. The quotes tell the story of the little prince’s recognition (with the help of the fox) that caring—not just in terms of feeling but also in terms of applied, responsible work—is what makes objects in his life come to have meaning for him. Caring, in the sense used in *The Little Prince*, means more than just “caring about”—it means “caring for.” This distinction is one I see as exceedingly relevant for linking conceptual knowledge and our daily experience. “Caring for” seems a necessary step toward reconnecting society and technology.
In the preceding descriptions I have shown the importance of investment for the critical making exercises. I hypothesized that a lack of investment made it difficult for the participants in the London exercise to engage—in other words, to “care for” the critical matter at hand, even though their attendance at the colloquia demonstrated some “caring about” issues of distance education. It is important to note that this was due to a lack of deliberate mapping between the making assignment—building robots—and the critical issue. Participants found it difficult to link their experience of building the robots to the issues of distance education and thereby had trouble investing in either during the course of the exercise.

Conversely, investment in the Amsterdam exercise was high, in part because of the deliberate, though reductive, mapping between social theory, which gave us a conceptual grasp on the critical issue of “walled gardens,” and the applied, hands-on work of building and configuring the flwrs and the flwr network. The ways that the flwrs “pushed back” and did not always do exactly what their authors intended, rather than being an issue, gave added weight to the relationship between person and technology and in some ways encouraged the “messing about” that Papert (1998) and Hawkins (1965) found so important.

Another way to consider this issue is to relate it to what Latour has called “matters of fact” versus “matters of concern” (Latour 2005). For Latour, the gap between these two “matters” lies in a false modernist distinction between the material stable relations of the natural, unreconstructed fact (over which I appear to have no control) and aspects of the world that are or should be our concern (Latour 2008). I might argue that conceptual but deterministic social theories treat technologies as “matters of fact” and therefore as a backdrop to the indeterminacy of social action. While I might “care about” their “effects,” they are not properly our concern—not something I should “care for.”

In recent work, Latour has used the extension of design to more and more domains to argue that people are increasingly recognizing the “designed” rather than “discovered” quality of artefacts, a recognition that reopens them:

“When things are taken has having been well or badly designed then they no longer appear as matters of fact. So as their appearance as matters of fact weakens, their place among the many matters of concern that are at issue is strengthened. (Latour 2008)

This is an aspect of our work that I would like to highlight. Ultimately, critical making is about turning the relationship between technology and society from a “matter of fact” into a “matter of concern.” I see this as requiring personal investment, a “caring for” that is not typically part of either technical or social scholarly education and have tried to draw out some of the aspects of what this might both theoretically and materially require through both our experiments in critical making and the brief reflections in this article. There are two final points I want to make.

Future Work

First, although my focus has been on how critical making can deepen conceptual understandings, I also see it as a possible venue for technical innovation. One insight I have had is that the practices and modes of engagement that are typically called “critical” and those that are equated with creativity and innovation are quite similar. This seems worthy of more deliberate analysis, given the equating of criticality to destructive and innovation to constructive work that tends to be the norm within many (but by no means all) technical environments. Obviously, this is not much of an insight, given the prevalence of the phrase “constructive criticism.” Still, I hope in future work to more explicitly examine this connection at the level of practice.

Second, while I have mainly spoken about overcoming the divide between technical and social scholarly work and education, I also see much need to overcome more tenuous but by no means less restrictive divides within social science and the humanities. In the end, the divide between theories and scholars that address “enacted” relations between humans and their environment (Bruner 1961; Noe 2006; Varela et al. 1993) and scholars and theories that focus on more critical transactional and systematic societal and institutional relations (Marcuse 1964; Castells 2000; Robertson 1992) makes it extremely difficult to relate critical theory to a more individual level of daily life. This separation is in no small way due to the differing “matters of concern” between these scholars and the institutional, disciplinary contexts within which they work. Our hope is that critical making can both help reconnect the material/conceptual domains necessary to connect technical and social work, and also serve as a new trajectory for re-relating the differing dimensions of our relations to objects that are currently divided among various social science disciplines.

NOTES

1. For a more complete bibliography to the foundational texts of constructionist approaches, see http://ocw.mit.edu/OcwWeb/Media-Arts-and-Sciences/MAS-962Spring-2003/Readings/index.htm
2. A recent university MA course developed by the author has attempted to push this envelope further, mapping specific making exercises to critical information issues such as digital rights management.
and information visibility and public space. The results of this work will be detailed in future writing.

3. I thank Stephen Hockema for directing me to these quotations

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Alexander R. Galloway

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With the progressive arrival of new forms of media over the last century or so and perhaps earlier there appears a sort of lag time, call it the “thirty-year rule,” starting from the invention of a medium and ending at its ascent to proper and widespread functioning in culture at large. This can be said of film, from its birth at the end of the nineteenth century up to the blossoming of classical film form in the 1930s, or of the Internet with its long period of relatively hidden formation during the 1970s and 1980s only to erupt on the popular stage in the mid-1990s. And we can certainly say the same thing today about video games: what started as a primitive pastime in the 1960s has through the present day experienced its own evolution from a simple to a more sophisticated aesthetic logic, such that one might predict a coming golden age for video games into the next decade not unlike what film experienced in the late 1930s and 1940s.¹ Games like Final Fantasy X or Grand Theft Auto III signal the beginning of this new golden age. Still, video games reside today in a distinctly lowbrow corner of contemporary society and thus have yet to be held aloft as an art form on par with those of the highest cultural production.
This strikes me as particularly attractive, for one may approach video games today as a type of beautifully undisturbed processing of contemporary life, as yet unmarred by bourgeois exegeses of the format.

But how may one critically approach these video games, these uniquely algorithmic cultural objects? Certainly they would have something revealing to say about life inside today’s global informatic networks. They might even suggest a new approach to critical interpretation itself, one that is as computercentric as its object of study. Philippe Sollers wrote in 1967 that interpretation concerns “The punctuation, the scanning, the spatialization of texts”; a year later Roland Barthes put it like this: “the space of writing is to be scanned, not pierced.” And a few years later, Jameson adopted a similar vocabulary: “Allegorical interpretation is a type of scanning that, moving back and forth across the text, readjusts its terms in constant modification of a type quite different from our stereotypes of some static or medieval or biblical decoding.” Not coincidentally, these three borrow vocabulary from the realm of electronic machines—the “scanning” of electrons inside a television’s screen, or even the scanner/parser modules of a computer compiler—to describe a more contemporary, informatic mode of cultural analysis and interpretation.

Indeed, this same “digitization” of allegorical interpretation, if one may call it that, is evident in film criticism of the 1970s and 1980s, concurrent with the emergence of consumer video machines and the first personal computers. This discourse was inaugurated by the 1970 analysis of John Ford’s Young Mr. Lincoln written by the editors of Cahiers du cinéma. Their reading is aimed at classical Hollywood films, so it has a certain critical relationship to ideology and formal hegemony. Yet they clearly state that their technique is neither an interpretation (getting out something already in the film) nor a demystification (digging through manifest meaning to get at latent meaning).

We refuse to look for “depth,” to go from the “literal meaning” to some “secret meaning”; we are not content with what it says (what it intends to say). . . . What will be attempted here through a rescansion of these films in a process of active reading, is to make them say what they have to say within what they leave unsaid, to reveal their constituent lacks; these are neither faults in the work . . . nor a deception on the part of the author. . . . They are structuring absences.
The influence of computers and informatic networks, of what Gene Youngblood in the same year called the “intermedia network,” on the Cahiers mentality is unmistakable. Their approach is not a commentary on the inner workings of the cinematic text—as an earlier mode of allegorical interpretation would have required—but a rereading, a rescanning, and ultimately a word processing of the film itself. The Cahiers style of analysis is what one might term a “horizontal” allegory. It scans the surfaces of texts looking for new interpretive patterns. These patterns are, in essence, allegorical, but they no longer observe the division between what Jameson called the negative hermeneutic of ideology critique on the one hand and the positive hermeneutic of utopian collectivism on the other. This is the crucial point: scanning is wholly different from demystifying. And as two different techniques for interpretation, they are indicative of two very different political and social realities: computerized versus noncomputerized.

Some of Deleuze’s later writings are helpful in understanding the division between these two realities. In his “Postscript on Control Societies,” a short work from 1990, Deleuze defines two historical periods: first, the “disciplinary societies” of modernity, growing out of the rule of the sovereign, into the “vast spaces of enclosure,” the social castings and bodily molds that Michel Foucault has described so well; and second, what Deleuze terms the “societies of control” that inhabit the late twentieth century—these are based around what he calls logics of “modulation” and the “ultrarapid forms of free-floating control.” While the disciplinary societies of high modernity were characterized by more physical semiotic constructs such as the signature and the document, today’s societies of control are characterized by immaterial ones such as the password and the computer. These control societies are characterized by the networks of genetic science and computers, but also by much more conventional network forms. In each case, though, Deleuze points out how the principle of organization in computer networks has shifted away from confinement and enclosure toward a seemingly infinite extension of controlled mobility:

A control is not a discipline. In making freeways, for example, you don’t enclose people but instead multiply the means of control. I am not saying that this is the freeway’s exclusive purpose, but that people
can drive infinitely and “freely” without being at all confined yet while still being perfectly controlled. This is our future.\(^7\)

Whether it is an information superhighway or a plain old freeway, what Deleuze defines as control is key to understanding how computerized information societies function. It is part of a larger shift in social life, characterized by a movement away from central bureaucracies and vertical hierarchies toward a broad network of autonomous social actors. As the architect Branden Hookway writes:

The shift is occurring across the spectrum of information technologies as we move from models of the global application of intelligence, with their universality and frictionless dispersal, to one of local applications, where intelligence is site-specific and fluid.\(^8\)

This shift toward a control society has also been documented in such varied texts as those of sociologist Manuel Castells, Hakim Bey, and the Italian autonomist political movement of the 1970s. Even harsh critics of this shift, such as Nick Dyer-Witheford (author of *Cyber-Marx*), surely admit that the shift is taking place. It is part of a larger process of postmodernization that is happening the world over.

What are the symptoms of this social transformation? They are seen whenever a company like Microsoft outsources a call center from Redmond to Bangalore, or in the new medical surveillance networks scanning global health databases for the next outbreak of SARS. Even today’s military has redefined itself around network- and computer-centric modes of operation: pilot interfaces for remotely operated Predator aircraft mimic computer game interfaces; captains in the U.S. Army learn wartime tactics through video games like *Full Spectrum Command*, a training tool jointly developed by the American and Singaporean militaries; in the military’s Future Combat Systems initiative, computer networks themselves are classified as weapons systems.

But these symptoms are mere indices for deeper social maladies, many of which fall outside the realm of the machine altogether—even if they are ultimately exacerbated by it. For while Bangalore may be booming, it is an island of exception inside a country still struggling with the challenges of postcolonialism and unequal modernization. Computers have a knack for accentuating social injustice, for
widening the gap between the rich and the poor (as the economists have well documented). Thus the claims I make here about the relationship between video games and the contemporary political situation refer specifically to the social imaginary of the wired world and how the various structures of organization and regulation within it are repurposed into the formal grammar of the medium.

As Jameson illustrates in *Signatures of the Visible*, the translation of political realities into film has a somewhat complicated track record, for mainstream cinema generally deals with the problem of politics not in fact by solving it but by sublimating it. Fifty years ago, Hitchcock showed the plodding, unfeeling machinations of the criminal justice system in his film *The Wrong Man*. Today the police are not removed from the crime film genre, far from it, but their micromovements of bureaucratic command and control are gone. The political sleight of hand of mainstream cinema is that the audience is rarely shown the boring minutiae of discipline and confinement that constitute the various apparatuses of control in contemporary societies. This is precisely why Jameson’s interpretive method is so successful. Another example: in John Woo’s *The Killer*, not only is the killer above the law (or, more precisely, outside it), but so is the cop, both literally in his final bloody act of extrajudicial vengeance and also figuratively in that one never sees the cuffings, the bookings, the indictments, the court appearances, and all the other details of modern criminality and confinement depicted in *The Wrong Man*. Films like *Bad Boys 2* or *Heat* do the same thing. In fact, most cop flicks eschew this type of representation, rising above the profession, as it were, to convey other things (justice, friendship, honor, or what have you). In other words, discipline and confinement, as a modern control apparatus, are rarely represented today, except when, in singular instances like the Rodney King tape, they erupt onto the screen in gory detail (having first erupted from the bounds of film itself and penetrated the altogether different medium of video). Instead, discipline and confinement are upstaged by other matters, sublimated into other representational forms. The accurate representation of political control is thus eclipsed in much of the cinema (requiring, Jameson teaches us, allegorical interpretation to bring it back to the fore), which is unfortunate, because despite its unsexy screen presence, informative
control is precisely the most important thing to show on the screen if one wishes to allegorize political power today.

Now, what is so interesting about video games is that they essentially invert film’s political conundrum, leading to almost exactly the opposite scenario. Video games don’t attempt to hide informatic control; they flaunt it. Look to the auteur work of game designers like Hideo Kojima, Yu Suzuki, or Sid Meier. In the work of Meier, the gamer is not simply playing this or that historical simulation. The gamer is instead learning, internalizing, and becoming intimate with a massive, multipart, global algorithm. To play the game means to play

*Civilization III*, Firaxis Games, 2001
the code of the game. To win means to know the system. And thus to interpret a game means to interpret its algorithm (to discover its parallel “allegorithm”).

So today there is a twin transformation: from the modern cinema to the contemporary video game, but also from traditional allegory to what I am calling horizontal or “control” allegory. I suggest that video games are, at their structural core, in direct synchronization with the political realities of the informatic age. If Meier’s work is about anything, it is about information society itself. It is about knowing systems and knowing code, or, I should say, knowing the system and knowing the code. “The way computer games teach structures of thought,”
writes Ted Friedman on Meier’s game series *Civilization*, “is by getting you to internalize the logic of the program. To win, you can’t just do whatever you want. You have to figure out what will work within the rules of the game. You must learn to predict the consequences of each move, and anticipate the computer’s response. Eventually, your decisions become intuitive, as smooth and rapid-fire as the computer’s own machinations.” Meier makes no effort to hide this essential characteristic behind a veil, either, as would popular cinema. The massive electronic network of command and control that I have elsewhere called “protocol” is precisely the visible, active, essential, and core ingredient of Meier’s work in particular and video games in general. You can’t miss it. Lev Manovich agrees with Friedman: “[Games] demand that a player can execute an algorithm in order to win. As the player proceeds through the game, she gradually discovers the rules that operate in the universe constructed by this game. She learns its hidden logic—in short, its algorithm.”

So while games have linear narratives that may appear in broad arcs from beginning to end, or may appear in cinematic segues and interludes, they also have nonlinear narratives that must unfold in algorithmic form during gameplay. In this sense, video games deliver to the player the power relationships of informatic media firsthand, choreographed into a multivalent cluster of play activities. In fact, in their very core, video games do nothing but present contemporary political realities in relatively unmediated form. They solve the problem of political control, not by sublimating it as does the cinema, but by *making it coterminous with the entire game*, and in this way video games achieve a unique type of political transparency.

Buckminster Fuller articulated the systemic, geopolitical characteristics of gaming decades before in his “World Game” and World Design Initiative of the 1960s. The World Game was to be played on a massive “stretched out football field sized world map.” The game map was “wired throughout so that mini-bulbs, installed all over its surface, could be lighted by the computer at appropriate points to show various, accurately positioned, proportional data regarding world conditions, events, and resources.” Fuller’s game was a global resource management simulation, not unlike Meier’s *Civilization*. But the object of Fuller’s game was “to explore for ways to make it possible for
anybody and everybody in the human family to enjoy the total earth without any human interfering with any other human and without any human gaining advantage at the expense of another.” While Fuller’s game follows the same logic of Civilization or other global algorithm games, his political goals were decidedly more progressive, as he showed in a jab at the American mathematician John von Neumann: “In playing the game I propose that we set up a different system of games from that of Dr. John Von Neumann whose ‘Theory of Games’ was always predicated upon one side losing 100 percent. His game theory is called ‘Drop Dead.’ In our World Game we propose to explore and test by assimilated adoption various schemes of ‘How to Make the World Work.’ To win the World Game everybody must be made physically successful. Everybody must win.”

So, broadly speaking, there is an extramedium shift in which films about the absence of control have been replaced by games that fetishize control. But there is simultaneously an intermedium shift, happening predominantly within the cinema. What Jameson called the conspiracy film of the 1970s (All the President’s Men, The Parallax View) became no longer emblematic at the start of the new millennium. Instead,
films of epistemological reversal have become prominent, mutating out of the old whodunit genre. David Fincher is the contemporary counterpart to Alan Pakula in this regard, with *The Game* and *Fight Club* as masterpieces of epistemological reversal, but one need only point to the preponderance of other films grounded in mind-bending trickery of reality and illusion (*Jagged Edge*, *The Usual Suspects*, *The Matrix*, *The Cell*, *eXistenZ*, *The Sixth Sense*, *Wild Things*, and so on, or even with games like Hideo Kojima’s *Metal Gear* series) to see how the cinema has been delivered from the oppression of unlocatable capitalism (as in Jameson’s view) only to be sentenced to a new oppression of disingenuous informatics. For every moment that the conspiracy film rehashes the traumas of capitalism in the other-form of monumental modern architecture, as with the Space Needle at the start of *The Parallax View*, the knowledge-reversal film aims at doling out data to the audience, but only to show at the last minute how everything was otherwise. The digital can’t exert control with architecture, so it does it with information. The genre offers a type of epistemological challenge to the audience: follow a roller coaster of reversals and revelations, and the viewer will eventually achieve informatic truth in the end. I see this fetishization of the “knowledge triumph” as a sort of informatization of the conspiracy film described by Jameson.

But back to video games and how exactly the operator “plays the algorithm.” This happens most vividly in many console games, in which intricate combinations of buttons must be executed with precise timing to accomplish something in the game. Indeed, games like...
Tekken or Tony Hawk’s Pro Skater hinge on the operator’s ability to motor-memorize button combinations for specific moves. The algorithms for such moves are usually documented in the game sleeve by using a coded notation similar to tablature for music (“Up + X-X-O” on a PlayStation controller, for example). Newcomers to such games are often derided as mere “button mashers.” But in a broader sense, let us return to Sid Meier and see what it means to play the algorithm at the macro level.

**Ideological Critique**

After the initial experience of playing Civilization there are perhaps three successive phases that one passes through on the road to critiquing this particularly loaded cultural artifact. The first phase is often an immense chasm of pessimism arising from the fear that Civilization in particular and video games in general are somehow immune to meaningful interpretation, that they are somehow outside criticism. Yes, games are about algorithms, but what exactly does that matter when it comes to cultural critique? Perhaps video games have no politics? This was, most likely, the same sensation faced by others attempting to critique hitherto mystified artifacts of popular culture—Janice Radway with the romance novel, Dick Hebdige with punk style, or Roland Barthes with the striptease. Often it is precisely those places in culture that appear politically innocent that are at the end of the day the most politically charged. Step two, then, consists of the slow process of ideological critique using the telltale clues contained in the game to connect it with larger social processes. (Here is where Caillois, presented in chapter 1 as essentially apolitical, returns with a penetrative observation about the inherent political potential of games, vis-à-vis the question of demystification and institutional critique. Reacting to Huizinga, Caillois writes that “without doubt, secrecy, mystery, and even travesty can be transformed into play activity, but it must be immediately pointed out that this transformation is necessarily to the detriment of the secret and mysterious, which play exposes, publishes, and somehow expends. In a word, play tends to remove the very nature of the mysterious. On the other hand, when the secret, the mask, or the costume fulfills a sacramental function
one can be sure that not play, but an institution is involved.")\textsuperscript{12} Critiquing the ideological content of video games is what Katie Salen and Eric Zimmerman, following Brian Sutton-Smith on play, refer to as the “cultural rhetoric” of games.\textsuperscript{13} For Civilization, the political histories of state and national powers coupled with the rise of the information society seem particularly apropos. One might then construct a vast ideological critique of the game, focusing on its explicit logocentrism, its nationalism and imperialism, its expansionist logic, as well as its implicit racism and classism.

Just as medieval scholars used the existence of contradiction in a text as indication of the existence of allegory, so Civilization has within it many contradictions that suggest such an allegorical interpretation. One example is the explicit mixing of ahistorical logic, such as the founding of a market economy in a place called “London” in 4000 BC, with the historical logic of scientific knowledge accumulation or cultural development. Another is the strange mixing of isometric perspective for the foreground and traditional perspective for the background in the “City View.”

The expansionist logic of the game is signified both visually and spatially. “At the beginning of the game,” Friedman writes, “almost all of the map is black; you don’t get to learn what’s out there until one of your units has explored the area. Gradually, as you expand your empire and send out scouting parties, the landscape is revealed.”\textsuperscript{14} These specific conventions within both the narrative and the visual signification of the game therefore reward expansionism, even require it. Meier’s Alpha Centauri mimics these semiotic conventions but ups the ante by positioning the player in the ultimate expansionist haven, outer space. This has the added bonus of eliminating concerns about the politics of expansionist narratives, for, one assumes, it is easier to rationalize killing anonymous alien life-forms in Alpha Centauri than it is killing Zulus in Civilization III. Expansionism has, historically, always had close links with racism; the expansionism of the colonial period of modernity, for example, was rooted in a specific philosophy about the superiority of European culture, religion, and so on, over that of the Asiatic, African, and American native peoples. Again we turn to Meier, who further developed his expansionist vision in 1994 with Colonization, a politically dubious game modeled on the software
engine used in Civilization and set in the period between the discovery of the New World and the American Revolution. The American Indians in this game follow a less-than-flattering historical stereotype, both in their onscreen depiction and in terms of the characteristics and abilities they are granted as part of the algorithm. Later, in Civilization III, Meier expanded his stereotyping to include sixteen historical identities, from the Aztecs and the Babylonians to the French and the Russians. In this game, one learns that the Aztecs are “religious” but not “industrious,” characteristics that affect their various proclivities in the gamic algorithm, while the Romans are “militaristic” but, most curiously, not “expansionist.” Of course, this sort of typing is but a few keystrokes away from a world in which blacks are “athletic” and women are “emotional.” That the game tactfully avoids these more blatant offenses does not exempt it from endorsing a logic that prizes the classification of humans into types and the normative labeling of those types.

Worse than attributing a specific characteristic to a specific racial or national group is the fact that ideological models such as these ignore the complexity, variation, and rich diversity of human life at many
levels: the Civilization III algorithm ignores change over time (Tsarist Russia versus Soviet Russia); it erases any number of other peoples existing throughout history the Inuit, the Irish, and on and on; it conflates a civilization with a specific national or tribal identity and ignores questions of hybridity and diaspora such as those of African Americans or Jews. In short, it transposes the many-layered quality of social life to an inflexible, reductive algorithm for “civilization”—a process not dissimilar to what Marxists call reification, only updated for the digital age. (The reason for doing this is, of course, a practical one: to create balanced gameplay, game designers require an array of variables that can be tweaked and tuned across the various environments and characters.) And while one needs no further proof of the game’s dubious political assumptions, I might point out that the game is also a folly of logocentrism; it is structured around a quest for knowledge, with all human thought broken down into neatly packaged discoveries that are arranged in a branching time line where one discovery is a precondition for the next. But so much for ideological scrutiny.
Informatic Critique

In conjunction with these manifest political investigations, the third step is to elaborate a formal critique rooted in the core principles of informatics that serve as the foundation of the gaming format. The principles adopted by Manovich in *The Language of New Media* might be a good place to begin: numerical representation, modularity, automation, variability, and transcoding. But to state this would simply be to state the obvious, that *Civilization* is new media. The claim that *Civilization* is a control allegory is to say something different: that the game plays the very codes of informatic control today. So what are the core principles of informatic control? Beyond Manovich, I would supplement the discussion with an analysis of what are called the protocols of digital technology. The Internet protocols, for example, consist of approximately three thousand technical documents.
published to date outlining the necessary design specifications for specific technologies like the Internet Protocol (IP) or Hypertext Markup Language (HTML). These documents are called RFCs (Request for Comments). The expression “request for comments” derives from a memorandum titled “Host Software” sent by Steve Crocker on April 7, 1969 (which is known today as RFC number 1) and is indicative of the collaborative, open nature of protocol authorship (one is reminded of Deleuze’s “freeways”). Called “the primary documentation of the Internet,” these technical memorandums detail the vast majority of standards and protocols used today on game consoles like the Xbox as well as other types of networked computers.

Flexibility is one of the core political principles of informatic control, described both by Deleuze in his theorization of “control society” and by computer scientists like Crocker. The principle derives from the scientist Paul Baran’s pioneering work on distributed networks, which prizes flexibility as a strategy for avoiding technical failure at the system level. Flexibility is still one of the core principles of Internet protocol design, perhaps best illustrated by the routing functionality of IP, which is able to move information through networks in an ad hoc, adaptable manner. The concept of flexibility is also central to the new information economies, powering innovations in fulfillment, customization, and other aspects of what is known as “flexible accumulation.” While it might appear liberating or utopian, don’t be fooled; flexibility is one of the founding principles of global informatic control. It is to the control society what discipline was to a previous one.

Flexibility is allegorically repurposed in Civilization via the use of various sliders and parameters to regulate flow and create systemic equilibrium. All elements in the game are put in quantitative, dynamic relationships with each other, such that a “Cultural Victory” conclusion of the game is differentiated from a “Conquest Victory” conclusion only through slight differences in the two algorithms for winning. The game is able to adjust and compensate for whatever outcome the operator pursues. Various coefficients and formulas (the delightfully named “Governor governor,” for example) are tweaked to achieve balance in gameplay.

What flexibility allows for is universal standardization (another crucial principle of informatic control). If diverse technical systems
are flexible enough to accommodate massive contingency, then the result is a more robust system that can subsume all comers under the larger mantle of continuity and universalism. The Internet protocol white papers say it all: “Be conservative in what you do, be liberal in what you accept from others.” The goal of total subsumption goes hand in hand with informatic control. The massive “making equivalent” in Civilization—the making equivalent of different government types (the most delicious detail in early versions of Meier’s game is the pull-down menu option for starting a revolution), of different victory options, of formulaically equating n number of happy citizens with the availability of luxuries, and so on—is, in this sense, an allegorical reprocessing of the universal standardizations that go into the creation of informatic networks today. In Meier, game studies looks more like game theory.

In contrast to my previous ideological concerns, the point now is not whether the Civilization algorithm embodies a specific ideology of “soft” racism, or even whether it embodies the core principles of new media adopted from Manovich, but whether it embodies the logic of informatic control itself. Other simulations let the gamer play the
logic of a plane (Flight Simulator, or Meier’s own flying games from the 1980s), the logic of a car (Gran Turismo), or what have you. But with Civilization, Meier has simulated the total logic of informatics itself.

But now we are at an impasse, for the more one allegorizes informatic control in Civilization, the more my previous comments about ideology start to unravel. And the more one tries to pin down the ideological critique, the more one sees that such a critique is undermined by the existence of something altogether different from ideology: informatic code. So where the ideological critique succeeds, it fails. Instead of offering better clues, the ideological critique (traditional allegory) is undermined by its own revelation of the protocological critique (control allegory). In video games, at least, one trumps the other. Consider my previous claims about Meier’s construction of racial and national identity: the more one examines the actual construction of racial and national identity in the game, the more one sees that identity itself is an entirely codified affair within the logic of the software. Identity is a data type, a mathematical variable. The construction of identity in Civilization gains momentum from offline racial typing, to be sure, but then moves further to a specifically informatic mode of cybernetic typing: capture, transcoding, statistical analysis, quantitative profiling (behavioral or biological), keying attributes to specific numeric variables, and so on. This is similar to what Manovich calls the logic of selection—or what Lisa Nakamura calls “menu-driven identities”—only now Manovich’s pick-and-choose, window-shopper logic of graphical interfaces governs a rather distinct set of human identity attributes. As Nakamura laments, “Who can—or wants to—claim a perfectly pure, legible identity that can be fully expressed by a decision tree designed by a corporation?” So the skin tone parameters for player character construction in everything from Sissyfight to World of Warcraft are not an index for older, offline constructions of race and identity, although they are a direct extension of this larger social history, but instead an index for the very dominance of informatic organization and how it has entirely overhauled, revolutionized, and recolonized the function of identity. In Civilization, identity is modular, instrumental, typed, numerical, algorithmic. To use history as another example: the more one begins to think that Civilization is about a certain ideological interpretation of his-
tory (neoconservative, reactionary, or what have you), or even that it creates a computer-generated “history effect,” the more one realizes that it is about the absence of history altogether, or rather, the transcoding of history into specific mathematical models. History is what hurts, wrote Jameson—history is the slow, negotiated struggle of individuals together with others in their material reality. The modeling of history in computer code, even using Meier’s sophisticated algorithms, can only ever be a reductive exercise of capture and transcoding. So “history” in *Civilization* is precisely the opposite of history, not because the game fetishizes the imperial perspective, but because the diachronic details of lived life are replaced by the synchronic homogeneity of code pure and simple. It is a new sort of fetish altogether. (To be entirely clear: mine is an argument about informatic control, not about ideology; a politically progressive “*People’s Civilization*” game, à la Howard Zinn, would beg the same critique.) Thus the logic of informatics and horizontality is privileged over the logic of ideology and verticality in this game, as it mostly likely is in all video games in varying degrees.

So this is not unique to *Civilization*. The other great simulation game that has risen above the limitations of the genre is *The Sims*, but instead of seizing on the totality of informatic control as a theme, this game does the reverse, diving down into the banality of technology, the muted horrors of a life lived as an algorithm. As I have alluded to in Jameson, the depth model in traditional allegorical interpretation is a sublimation of the separation felt by the viewer between his or her experience of consuming the media and the potentially liberating political value of that media. But video games abandon this dissatisfying model of deferral, epitomizing instead the flatness of control allegory by unifying the act of playing the game with an immediate political experience. In other words, *The Sims* is a game that delivers its own political critique up front as part of the gameplay. There is no need for the critic to unpack the game later. The boredom, the sterility, the uselessness, and the futility of contemporary life appear precisely through those things that represent them best: a middle-class suburban house, an Ikea catalog of personal possessions, crappy food and even less appetizing music, the same dozen mindless tasks over and over—how can one craft a better critique of contemporary
life? This is the politically dubious, but nonetheless revealing, quality of play identified by Adorno in the supplement to his Aesthetic Theory: “Playful forms are without exception forms of repetition”; “In art, play is from the outset disciplinary.”

As an entire genre, the first-person shooter also illustrates this type of allegorical interpretation of info-politics. Dash the naysayers, the shooter is an allegory of liberation pure and simple. This complicated genre is uncomplicated. There can be no better format for encoding and reprocessing the unvarnished exertion of affective force. I think of Unreal Tournament or Counter-Strike as the final realization of André Breton’s dream of the purest surrealist act: the desire to burst into the street with a pistol, firing quickly and blindly at anyone complicit with what he called “the petty system of debasement and cretinization.” The shooter as genre and the shooter as act are bound together in an intimate unity. The shooter is not a stand-in for activity. It is activity. (Just as the game is not a stand-in for informatics but is informatics.) The experience of the shooter is a “smooth” experience, to use Deleuze and Guattari’s term, whereby its various components have yet to be stratified and differentiated, as text on one side and reading or looking on the other. In this sense, the aesthetics of gaming often lack any sort of deep representation (to the extent that representation requires both meaning and the encoding of meaning in material form). Allegory has collapsed back to a singularity in gaming. In fact, the redundancy in the vocabulary says it all: “the cultural logic of informatics.” The activity of gaming, which, as I’ve stressed over and over, only ever comes into being when the game is actually played, is an undivided act wherein meaning and doing transpire in the same gamic gesture.

A Theory of Pretending

This last point may be recontextualized through a fundamental observation about video games made at the outset of this book, that games let one act. In fact, they require it; video games are actions. Now, following the definition of literary allegory as “other-speak,” I must define the gamic allegory: it is “other-act.” The interpretation of gamic acts, then, should be thought of as the creation of a secondary discourse
narrating a series of “other-acts.” A century ago, Maurice Blondel suggested the word “allergy,” following his theory of “coaction” or “another’s action.”21 Blondel’s use of the term assumes the existence of more than one individual, yet it is still an interesting influence because of his focus on parallel actions. Coaction proper in the context of video gaming would mean something like multiplayer action, which itself would need to be supplemented with a reading of the allegorical multiact. Either way, the interpretation of gamic acts is the process of understanding what it means to do something and mean something else. It is a science of the “as if.” The customary definition of allegory as “extended metaphor” should, for games, be changed to “enacted metaphor.” (In fact, for their active duality, zeugma or syllepsis are even more evocative figures of speech.) When one plays Civilization, there is one action taking place, but there is more than one significant action taking place. This is the parallelism necessitated by allegory. The first half of the parallelism is the actual playing of the game, but the other is the playing of informatics. For video games, one needs a theory of pretending, but only in the most positive sense of the term, as a theory of actions that have multiple meanings.

Again, Bateson: “The playful nip denotes the bite, but it does not denote what would be denoted by the bite.”22 So the roll of control allegory is—methodologically but not structurally—to see the nip and process neither the nip nor the bite, but instead what the bite denotes. I say methodologically but not structurally because there is no camouflage here: the playful video game may metacommunicate “this is play,” but it can never avoid also being informatic control.

In this sense, I suggest that the game critic should be concerned not only with the interpretation of linguistic signs, as in literary studies or film theory, but also with the interpretation of polyvalent doing. This has always been an exciting terrain for hermeneutics, albeit less well traveled, and in it one must interpret material action instead of keeping to the relatively safe haven of textual analysis.

The critical terrain has likewise shrunk in the age of interactive media from a two-way relationship involving the text and the reader-as-critic to a singular moment involving the gamer (the doer) in the act of gameplay. The game-as-text is now wholly subsumed within the category of the gamer, for he or she creates the gamic text by doing.
This explains the tendency toward control allegory in informatic culture. The primary authors are missing from this formula not because I wish to debase the growing auteur status of game designers, nothing of the sort, but simply because they are no longer directly involved in the moment of interpretation—but this has been the case in interpretive studies for many decades now.

Here, then, are the two allegorical modes compared side by side. Traditional or “deep” allegory seems to have its center of gravity in the early to mid-twentieth century and particularly in the cinematic form (à la Jameson), while control allegory finds its proper consummation in new media in general and video games in particular.

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Video games are allegories for our contemporary life under the protocological network of continuous informatic control. In fact, the more emancipating games seem to be as a medium, substituting activity for passivity or a branching narrative for a linear one, the more they are in fact hiding the fundamental social transformation into informatics that has affected the globe during recent decades. In modernity, ideology was an instrument of power, but in postmodernity ideology is a decoy, as I hope to have shown with the game Civilization. So a game’s revealing is also a rewriting (a lateral step, not a forward one). A game’s celebration of the end of ideological manipulation is also a new manipulation, only this time using wholly different diagrams of command and control.

In sum, with the appearance of informatic reprocessing as text—in the style of Sid Meier, but also in everything from turntablism to net.art—allegory no longer consists of a text and another text, but of an enacted text and another enacted text, such that we must now say: to do allegory means to playact, not, as Frye wrote, to allegorize means to write commentary. And hence Deleuze: “The philosopher creates. He doesn’t reflect.”
Critical Gaming: Interactive History and Virtual Heritage

Erik Champion
Chapter 1
Digital Humanities and the Limits of Text

Names are important and definitions are important; the mission and goals of digital humanities will see course numbers, grant applications, centres and careers rise or fail. So I can appreciate the reasons behind the burgeoning literature attempting to define digital humanities (Cohen et al., 2011; Terras et al., 2013). Digital humanities (DH) is a big business, at least in terms of grants, novelty, media releases and career promotion.

While many proponents of DH talk of it as a broad church or even as a tent, I tend to view it more as a campsite, where positions and prime spots are visibly or surreptitiously contested and fought over under the veneer of collegial agreement. In particular, some definitions of DH worry me. There has long been a debate on what exactly DH is, but in 2012 I was struck by Dave Parry’s succinct bifurcation of DH. In his chapter ‘The Digital Humanities or a Digital Humanism’ in Debates in the Digital Humanities (Gold, 2012), Parry raises the controversial question as to whether DH would be best considered as the application of computing or an inquiry into how digital media has irrevocably changed the humanities (Parry, 2012).

More recently, I have moved away from taking an either/or position; I believe that DH at a fundamental level considers how to integrate computing with humanities and attempts to understand how both computing and humanities must change. It needs to do so in order to best meld two quite different approaches together. What does worry me here is a subtle suggestion running through some texts that DH are primarily or uniquely or best viewed as computing services and tools applied to the digitalization and processing of text or literature (Baldwin, 2013). For various significant reasons that will hopefully become abundantly clear, a perspective arguing that humanities is primarily or fundamentally text-based would be mistaken, and such a viewpoint would impact negatively on the development of both non-text-based and text-based DH.

I have four reasons to be concerned with any idea that DH is primarily text-based (and in particular not related to visualization). Some might argue that there is a clear separation between written language and images, that to be a humanist or a humanistic scholar (which are not the same thing), one has to have high levels of literacy, that non-text-based media is not part of DH, or that visualization cannot provide suitably scholarly arguments.

In my opinion, visualization projects are typically missing or downplayed. This concern might seem a little paranoid; clearly, there are presentations on visualizations at DH conferences. So here are some examples of what appears to me to be a text bias. The index to the book Debating The Digital Humanities: A Reader lists a ‘visual turn’ on page 179. Yet turning to pages 178–179, you will find that Patrik Svensson’s chapter actually decries the lack of reference to visual media projects or to multimedia in general (Svensson, 2013). As Svensson points out, the field of humanities computing has focused on the textual, but this does not mean that other projects were not developed. To quote from Hannah Gillow, who was critiquing Stephen Marce’s article ‘Literature is Not Data: Against Digital Humanities’ (Gillow, 2013):
The first problem with this article is the title itself. In the best interpretation possible, the title suggests that Digital Humanities is limited to text mining and textual studies. Worst case, it suggests that digital humanities’ only purpose is reclassifying all literature as simply data.

As we are well aware, both these statements are patently untrue. Digital Humanities encompasses an incredibly vast amount of categories, textual studies being only one of them.

While Marce would be well within his grounds to point out the frequent hype that purports to be DH, to lambast the entire movement through attacking straw men does seem to be a step too far. However, the problem is more insidious than the opinion of just one critic. The low regard in which visualization is held seems to be shared by some of the academic press. For example, according to Lev Manovich (2012), the ‘Cambridge University Press Author Guide’ suggests that authors avoid illustrations as they will detract from the main argument.¹

You might counter that DH derives from the humanities computing field, which is itself heavily indebted to text-based research. After all, Susan Hockey wrote the following in her chapter ‘The History of Humanities Computing’ in one of the first definitive books on DH (Schreibman et al., 2004):

Applications involving textual sources have taken center stage within the development of humanities computing as defined by its major publications and thus it is inevitable that this essay concentrates on this area.
(Hockey, 2004, p. 4)

On first reading, this seems reasonable. Yet one of the major journals listed was known at the time as Literary and Linguistic Computing. Weren’t there great advances in archaeological computing at the same time, which were not necessarily text-based? Yes there were, but they weren’t published in that particular journal.

More subtly, various ontologies for directories of DH tools and methods in European projects (such as DARIAH and NeDiMAH) and in American or international projects (such as DiRT Bamboo, currently known as DiRT) are heavily influenced by the ontology of DH as developed at the University of Oxford. This in turn was based on the scholarly ontology devised by John Unsworth (2007). The University of Oxford definition of DH, at least on its webpage (undated), is text-based and desk-based. Its http://digital.humanities.ox.ac.uk/Support/whatarethedh.aspx page says that, amongst other new advantages, DH offers ‘new desktop working environments’ and ‘new ways of representing data’.
Where is visualization as a research tool in its own right? Can’t visualization actually create new research questions? Why must working environments be desktop-based? Must all humanists have a digital version of a horizontal writing surface? I would suggest that there are two main reasons for this: non-text-based humanities publish in other journals and present at other conferences; and many traditional humanities departments do not necessarily have access to or are even aware of the potential relevance of virtual reality and other non-desktop-based digital environments.

An example of visualization as research is the use of CAT scans to create a 3D model of a mummy without opening the sarcophagus, the Pausiris mummy projection created by Paul Bourke and Peter Morse for the Museum of New and Old Art (MONA), Hobart, Tasmania. There are two cabinets in the room. One cabinet contains the real Pausiris mummy (unopened) and the other the digital interpretation (Figure 1.1). Paul Bourke describes the museum exhibit on his website (Bourke, 2011):

The digital representation reveals the interior of the mummy casket, slowly peeling away the casket and wrappings. One approaches the two display cabinets by walking on stepping stones, the room is flooded by black dyed water.

In many examples in archaeology, you can only see the artefact from visualization, be it the fall of light on a statue at solstice, the clap that creates the sound of a bird as acoustically reflected by Mayan temples, or the simulation itself; in many cases, we cannot see the object with the naked eye in the real world – it has to be re-created or projected for us. Another example would be augmented reality, augmenting artefacts with knowledge that is no longer part of the physical object, such as the EU CHESS project, which will be discussed in Chapter 3.
A simple if cheeky test is to ask someone what the acronym ‘VRE’ stands for. If they say Virtual Research Environment (VRE), they are probably a European-based DH researcher; if they say Virtual Reality Environment, they are probably involved in a visualization-related field, but they don’t have to be computer programmers (Das et al., 1993), they could be architects and designers or archaeologists (Acevedo et al., 2001; Slator et al., 2001), or they could be researchers in the area of tourism (Gurau, 2007) or educational design and psychology (Patera et al., 2008).

I have great respect for many of the DH projects at Oxford, and this approach to DH is an interesting one; those at Oxford did not create a DH centre, nor did they label certain people as ‘Digital Humanists’. Instead, they provide support and facilities in DH for any academic with DH needs. And I agree with the below statement on their website:

Doing digital humanities does not necessarily mean becoming a technology specialist, but it does entail gaining some idea of the relevant technologies and exchanging expertise with technologists. Exchange is the key term: the digital humanities are most successful where there is a two-way collaboration between scholars and technologists, not where either side is merely at the service of the other.

DH revolves around not just what we can do with a million books, but also what the community can do with humanities; we require collaborative frameworks, tool-making systems and spaces (Factor, 2011; Kelly, 2014). We now have a near-instant audience (Elliott and Gilles, 2009) and even if technology can get in the way (Hitchcock, 2012,
American Academy of Arts and Sciences, n.d.), academics no longer have to wait years for people to read their books – academics and non-academics can now build infrastructure frameworks that allow others to build on and extend academic output. Social media has turned a comparatively one-way process of scholarly dissemination into an interactive circle. This is the revolution; we have moved beyond traditional research publications and beyond tools (that virtually make books and their successors) towards tools that allow people to make, share and collaborate on their own books (or whatever the media or even objects might be).

Considering that academia is supposedly concerned with the dissemination of knowledge, especially critical awareness of knowledge, communality, public accessibility and public visibility could easily be improved, even if Gibbs (2011) argued that public levels of complaints are very low. In the book Digital Humanities in Practice (Warwick et al., 2012) and on the related blog (Warwick, n.d.), Warwick, Terras and Nyhann have decried the lack of public dissemination of DH projects. In his 2010 blog post ‘What is Digital Humanities’ (2010), Matthew Kirschenbaum remarked:

> Whatever else it might be then, the digital humanities today is about a scholarship (and a pedagogy) that is publicly visible in ways to which we are generally unaccustomed, a scholarship and pedagogy that are bound up with infrastructure in ways that are deeper and more explicit than we are generally accustomed to, a scholarship and pedagogy that are collaborative and depend on networks of people and that live an active 24/7 life online.
> Isn’t that something you want in your English department?

Digital humanities require more than the mere act of people coming together, they also require space that helps bring people and new ideas together. For example, Kelly noted (2014):

> Therefore, if we are going to do digital right in our departments, we need to create collaborative spaces where the making of digital history can happen.

Even if we manage to create the right sort of collaboration spaces, we also need to tackle the problem of literacy, digital literacy and digital fluency (Resnick, 2002). Despite my rather utopian talk of a revolution in scholarly discourse, not all can read. A concern or predilection with text-based material is obstructing us from communicating with a wider audience. Multimedia, visualizations and sensory interfaces can communicate across a wider swathe of the world’s population. And although literacy is increasing, technology is further creating a fundamental divide between those who can read and write and those who cannot. UNESCO (2014) reported:

> Over 84 per cent of the world’s adults are now literate, according to the latest data from UNESCO’s Institute for Statistics (UIS). This represents an eight percentage point increase since 1990, but it still leaves some 774 million adults who cannot read or write … Literacy also remains a persistent problem in developed countries. According to the Organisation for Economic Cooperation and Development (OECD), one in five young people in Europe had poor literacy skills in 2009, and some 160 million adults in OECD countries were functionally illiterate. This means that they do not have the skills needed to function in today’s environments such as the ability to fill out forms, follow instructions, read a map, or help with their children with homework … ‘This situation is exacerbated by the rise of new technologies and modern knowledge societies that make the ability to read and write all the more essential’, said UNESCO Director-General Irina Bokova in her message for International Literacy Day.

Historically, the distinction between text and symbol has been blurred, from early European languages to Asian languages and as part of world history in general. For example, writing has been discovered in China that is 5,000 years old (Tang, 2013). Only this ‘primitive writing … [lies] … somewhere between symbols and words’. This
language exists, in other words, when five or six of the symbols are combined; they are no longer symbols, but words.

The alphabets for many modern languages were originally derived from images. Even today, language is geographically influenced, according to Mark et al. (1989, p. 4):

Whereas human senses operate in very similar ways, regardless of culture or language, human perception (that is, the mental interpretation of sensory inputs) is influenced by language and interpretive image schemas (see Lakoff, 1987, and Johnson, 1988). The title of Leonard Talmy’s (1983) seminal paper on this subject, ‘How Language Structures Space’, expresses this position very well … Depending on the situation, human languages may use gestalt reference frames, based on inherent properties of the ground or reference object, or canonical reference frames, based on the speakers’ or listeners’ viewpoint. There also are cross-linguistic and cross-cultural differences in reference frames; a good example is the common use of radial rather than Cartesian orientation systems by island-dwellers.

Even cave paintings were spatially planned – they were placed near resonant locations in the caves, and the density of the pictures appears to be ‘proportional to the intensity of that spot’s resonance’ (Viegas, 2008; Brown, 2012): Cave paintings happened tens of thousands of years ago, so why are they still relevant? The answer is that they show the long-term association between image, space and meaning.

A contextual appreciation of Mayan ‘writing’ would necessitate understanding the essential link between image, glyph, building, space and audience. Their most sacred inscriptions were designed to showcase the noble and priestly class while hiding secret information from the public below. In a sense, the temples were both books and billboards, the layering of floor and paint (plaster) related to the spirituality of the city and ruler. Even books until the last few hundred years were heavily illustrated; audiences are even today not fully literate, and many find images much quicker and easier to understand than text. Are they to be shut out of the garden of the humanities?

So visualization is an extremely significant aspect of DH, and writers such as Burdick et al. (2012, p. 122) seem to agree with me:

[C]ontemporary Digital Humanities marks a move beyond a privileging of the textual, emphasizing graphical methods of knowledge production and organization, design as an integral component of re-search, transmedia crisscrossings, and an expanded concept of the sensorium of humanistic knowledge. It is also characterized by an intensified focus on the building of transferrable tools, environments, and platforms for collaborative scholarly work and by an emphasis upon curation as a defining feature of scholarly practice … The desktop environment – with its graphical user interface, real-time WYSIWYG tool-kit, and evolution from command lines to icons and window-based frames – not only vastly expanded the corpus of born-digital documents but also ushered in the gradual integration of audio, video, and graphics.

I agree that the World Wide Web in combination with the Internet – they are not actually the same thing – has forced us to look at documentation and the office in ever-new ways. One can argue over the importance of the World Wide Web in the integration of multimedia, but one cannot archive the Internet as a collection of text-only documents because then it is no longer the Internet.

While I have emphasized the visual contribution of DH, visualization can include other media, such as sound (Brown, 2012):

Humanity’s fascination with sound runs deep. In Utah’s Horseshoe Canyon, ancient people drew artwork where echoes are loudest. Around the world, Stone Age artists typically painted in caverns with the greatest reverberation … ‘Such resonant spaces inspire singing’, Lubman said. Paleolithic musicians may have used caves to amplify and focus music, just as choirs use vaulted churches today.
So if humanities are multimodal, then DH should be multimodal. Some of the most famous and far-reaching DH-related projects could not be considered text-based, for example, the Spatial History Project (http://humanexperience.stanford.edu/digital_humanities):

The project brings together scholars working on projects at the intersection of geography and history using Geographic Information Systems (GIS) in their research. The overarching goal of the Spatial History Project is to create dynamic, interactive tools that can be used across the spectrum ... to enable the creation of new knowledge and understanding of historical change in space and time and the possibilities for our present and future that may be found in the past.

Another example is the Pelagios project (http://pelagios-project.blogspot.co.uk/p/partners.html):

Pelagios is a collective of projects connected by a shared vision of a world – most eloquently described in Tom Elliott’s article ‘Digital Geography and Classics’ – in which the geography of the past is every bit as interconnected, interactive and interesting as the present. Each project represents a different perspective on our shared history, whether map, text or archaeological record, but as a group we believe passionately that the combination of all of our contributions is enormously more valuable than the sum of its parts.

And archaeologists are visual people. Their research explorations are often done with their visual imagination, even if this is not obvious in their publications. For example, according to the historian Robin Fleming (Graham, 2013):

The field archaeologists that I know all have this incredible visual imagination, and they can look at a site that’s only from the ground down, excavate it out, and see what it looked like. Which is something historians just can’t do. I have no visual imagination at all. So archaeologists do those things, but they’re not interested in looking – most of them, anyway – at the kind of range of archeological material being pulled out of the ground, against the background of the kinds of questions that drive historians, and writing a compelling story about the lived experience of people of the past.

In his blog post ‘The Digital Humanities is About Breaking Stuff’, Jason Stommel (2014) wrote that now we combine film and media: ‘Our apparatuses for media-consumption juxtapose digital media, literature, and film: Now, we watch Ridley Scott’s Alien in a window alongside Twitter and Facebook. Film no longer exists as a medium distinct from these other media.’ I disagree, as would others; just as film cannot be reduced to mere text and ‘we cannot mistakenly reduce a moving image work to its dialogue’ (Mittel, 2012), we have not yet fully integrated these new types of media with film.

One distinction made between the humanities and DH is that the latter reveals process rather than just product (Stommel, 2014). Indeed, one of the great dangers to producing DH is the phenomenon coyly referred to as the ‘managerial humanities’ (Allington, 2013; Nowviskie, 2013) where administration rather than creation and evaluation is predominant. A manager of a DH centre said at the Digital Humanities Congress in Sheffield in 2013 that a digital humanist was someone writing a grant application or applying for a promotion. Now they need to talk to ministers, influence policy, develop social impact and quote numbers rather than users.

So who are the humanities for? In 2012, at the Digital Humanities: Now and Beyond symposium at Aalborg University in Denmark, John Naughton (Emeritus Professor of the Public Understanding of Technology at the Open University) said even though he was from the sciences and was not a humanist, he loved the poetry of T.S. Eliot. Why would a professor feel compelled to say that he was not a humanist? Does one need to be a Professor of Literature to be part of the humanities or to appreciate literature? There may
well be many artists and writers who write in particular for the academics – and certainly Eliot, Joyce and others are not famous for accessibility – but there were many more who wrote directly of and to the general public, and many of them had little time for academics.

There is much discussion of what is or are the digital humanities, but no discussion of what is/are the humanities. Speaking after Professor Naughton, I suggested we should have at least a working definition of the humanities in order to have an understanding of the parameters of the DH. My suggestion was that the humanities should investigate the values and meanings that define culture and society.

This suggestion is based on the premise that critical thinking is essential to much of the humanities and seems to be backed up by the thinking of many famous humanities professors (Fitzpatrick, 2011), their faculties (Stanford University, n.d.) and learned societies (American Academy of Arts and Sciences, 2014). I mentioned in my brief talk referred to above that critical thinking does not always happen in science or in engineering, but what I should have mentioned is that it does not necessarily happen in the humanities either. Indeed, the humanities do not have an exclusive call on critical thinking, but my – perhaps contentious – call is that when scientists are utilizing critical thinking, they are likely to be employing aspects of the humanities (as an academic discipline).

This is why I regarded Leibniz, Pascale and Descartes as humanists; they were indeed scientists (and great ones), but their use of critical thinking as philosophers also marked them as part of the humanities. Less contentious, hopefully, is my claim that the humanities (as academic disciplines) should critically think through the values and meanings that define culture and society. When a scientist critically thinks through the issues and implications of science as it may or will impact on cultures and societies, they are thus not just critically thinking, they are also thinking as humanists.

Critical thinking is an ideal that animates many courses in the humanities (Johns Hopkins University, n.d.), but its impact and import is wider. Mark Kingwell (2012) succinctly articulated the wide-ranging significance of critical thinking:

We say this a lot but don’t do much about it. Here’s what we need: courses in informal logic, so students can recognize fallacies in public discourse; in economic theory, since economists think they rule the world, and politicians believe them; and in computer programming, because you can’t see the biases of the system unless you know how it was coded. The widespread view that technology is value-neutral, inevitable and always here to help needs to be exposed as the dangerous ideology it is.

Part of the confusion may be in thinking that the term ‘humanities’ refers to simply and exclusively those who study the humanities from within academic disciplines. It is a peculiar aspect of the English language that those who study the humanities are actually studying those who do not necessarily create, but who talk and write about those who create. Conrad Fiedler (1957), a nineteenth-century philosopher of art, would have been furious. He continually asserted, and I think with some justification, that many of the art historians and philosophers of art made so little headway in the understanding of art because they mistook categorization for the experience of art as art.

Who is a philosopher? An academic in a philosophy department or someone who writes books in their spare time? Before you answer this question with the former option,
consider the sad story of the person who failed to get royal approval for their chosen career of astronomy and wrote books instead, after their tutoring job (Kant) or their school teaching job (mathematics teacher Hegel, and Wittgenstein, trained in engineering) or a person who paid the bills by being a watchmaker and never joined an academy (Spinoza). There may have been a Plato without a Socrates, but it is surely worth considering the possibility that Plato would have had far less impact if Socrates had only concentrated on his original profession of sculpture.

I once enrolled in a postgraduate philosophy course on Wittgenstein and we spent most of our time discussing people who argued about Wittgenstein’s *Philosophical Investigations*, not the book itself. The academics in philosophy who argued about Wittgenstein may indeed be philosophers and may indeed be humanists (they are typically in the Faculty of Humanities), but I would be loath to include them as humanists and yet not include Kant, Hegel, Schopenhauer, Nietzsche (a philologist if we are to be technical), Leibniz, Pascale, Descartes and of course Wittgenstein (his passport said he was an architect).

In short, humanists do not have to be academics, and you do not have to be an academic to appreciate the humanities. Some people might even argue that academia can get in the way of appreciating the humanities, I recall a Professor of Architecture once commenting that architects don’t get the time to appreciate architectural beauty as they are so often wondering how things were designed just so rather than sitting back and enjoying the space as an architectural experience in itself.

And where are the artists and designers? I am fully and often painfully aware of the battle between the faculties, between humanities and fine arts (and design) over who can use the arts for course titles, but even when we talk of DH encompassing the social sciences, or arts, there seems to be very little involvement from them.

As for other fields, even as recently as 21 March 2014 (the day before I wrote this passage), a keynote speaker to Digital Humanities Australia 2014 asked how many philosophers were in the room. Only one person put up their hand. Archivists and archaeologists from both hemispheres have often told me they feel removed from humanities meetings and infrastructures, for while there is increasing publication and presentation of visualization in DH conferences, it is typically visualization of text and word repetition.

Yet archives are not just text and the DH encompasses research projects that are collaborative and. Even the book itself is a material, embodied experience. The research of the University of Dundee’s Poetry Beyond Text Project group is further evidence of the importance of image to the literature (University of Dundee, n.d.):

The CRs [co-researchers] rated works in which they felt the text and image mutually enhanced one another more highly than works which they felt were ‘fragmented’ or disjunctive. For one CR, who gave both works 10 out of 10, the idea of how text and image worked together was pivotal to her discussion of each work and something that she explored in detail.

Literature itself is linked to both the image (Theibault, 2012) and to materiality (Rudy, 2011); the materiality of Icelandic sagas and runic inscriptions are considered by various scholars to be essential properties (Jesch, 2013). So my question to those who think that DH is primarily about text is to ask them what is left in the humanities if the arts and
social sciences are excluded? You cannot comprehensively teach and research Freud without understanding his relation to Nietzsche, or understand Nietzsche’s belief that he was a scientist and philologist without reviewing his research into the environmental physics of Helmholtz, or his background work in the etymology of ancient Greek architecture and performing arts. Even Immanuel Kant, in his attempt to understand aesthetic judgment and notions of the sublime, was compelled to give examples of sacred architecture (the Temple of Isis) and the decorative arts (for example, the Maori tattoo).

Literature is also inextricably linked to rhythm and movement. Politics and the brainwashing effect of nationalistic marches are related to an understanding of movement (Turner and Pöppel, 1988), and musical appreciation is heavily affected both by our mammalian heritage (Panksepp and Bernatzky, 2002) and by the body in space (Sacks, 2007; Thomas, 2013). Music is not actually a completely removed, abstract experience after all. The importance of our body and our genetic heritage is not a recent phenomenon; Professor Iegor Reznikoff hypothesized the possibility that ‘all of today’s music could have resulted from an ingrained human memory of the acoustical properties of caves’ (Viegas, 2008).

So, the humanities are not merely multimodal but are also embodied experiences. The objects in and on which the humanities are described, critiqued and preserved are more than just holders for text; they are essential artefacts, which give researchers essential clues in the interpretation of text and author. Material objects are not merely brute objects; they are symbolic as well. Archaeologists and anthropologists understand this. Consider ethnography and the cultural meaning of indigenous people – they too have a history, and even if it is not written in a conventional sense, it can also be inscribed, although it is often inscribed into the lived and symbolic world (McDonald and Veth, 2013).

If history is only that which has been written, then many cultures are excluded. Most worryingly, while the American public appear to be warming to the notion of the ‘past’, they are not warming to the word ‘history’ (Rosenzweig and Thelen, 2000). Neither the output of the public nor the output of the intellectual must be written down in order to be part our cultural memory. Even if Socrates’ Dialogues (known today as a method or genre: Socratic dialogue) were not later written down by Plato, they would still be part of the humanities and of our cultural heritage.

Part of the complexity here arises from the notion of culture, which seems to function as both noun and verb, as a marker of ‘primitive’ societies, as popular culture or even as sophisticated ‘high class’ culture. If culture is the framework that interlinks external cognitive artefacts, it is also an escape, a direction, a path and a portal. So culture needs a context and it requires a constant questioning and redirecting.

As Kathleen Fitzpatrick (2011) remarked: ‘In fact, the best scholarship is always creative, and the best production is always critically aware. The Digital Humanities seems another space within the academy where the divide between making and interpreting might be bridged in productive ways.’ My one deviation from the sentiment behind the above quote is to point out that the humanities are not solely created, experienced, funded and understood within the professional and institutional ‘academy’ of the humanities. Such an understanding of the humanities would be historically, intellectually and culturally impoverished. Indeed, it may be logistically, ethically and commercially fatal (Nowviskie,
Even if you agree with me that the humanities are inherently a project of critical thinking and that the arts can be considered part of the humanities, you may not wish to support the idea that visualization can lead to scholarly arguments. And if this criticism is correct and if games are primarily visualizations, it may be hard for me to argue that games can be a critical enterprise. And yes, I could argue that some if not all games can be critiqued from a literary viewpoint, but then the multimodality of games does not proffer anything particularly interesting about games as a scholarly medium.

Visualization can be reflective and critical (Dörk et al., 2013):

The notions of casual [21] and vernacular [26] visualizations highlight non-traditional uses and origins of information visualizations. In both cases, the purpose of visualization is not so much to gain ‘analytic insight’, but rather to get a heightened recognition of an issue, awareness about an online community’s shared resources, or even reflection about oneself.

According to Martyn Jessop (2008), digital visualization is more than just an illustration; it is also a scholarly methodology. Visualization is promoted at Stanford University’s Digital Humanities workshops as both a tool and an argument (Robichaud and Blevins, 2011). Visualization workshops are becoming popular fixtures at DH workshops (Milner, 2014) and conferences (Weingart, 2013, 2014); some recent conference papers even promote the use of ‘persuasive visualisations’ (Hann, 2008). Archival organizations now offer tools to help humanities scholars to visualize new research questions: ‘By replacing information with image, we can often see a different story hidden in the data’ (Tocewicz, 2014). However, the challenge of adopting visualizations to the strategies of humanities is not always clear-cut, especially given that visualizations in the humanities tend to prefer to cover as many interpretations as possible (Sinclair et al., 2013).

On the other hand, Van den Braak et al. (2006) have indicated that some studies show that visualization tools have helped scholarly arguments. The Network for Digital Methods in the Arts and Humanities (NeDiMAH)’s specialist Information Visualization group, one of a number of European research infrastructure groups, has written on its website (http://www.nedimah.eu/workgroups/information-visualisation) that: ‘Visualisation refers to techniques used to summarize, present and enact rich materials visually, and is becoming increasingly important as an integrated part of the research processes in the humanities.’ Even at the government level, the relationship between visualization and story-telling is being promoted to enhance public communication (Lindquist, 2011):

Story-telling enhances visualizations. There is widespread acknowledgement that even the best visualizations require parallel story-telling in order to draw out interesting facts and interesting issues. The audiences for visualizations are human: needing context, narrative, and often a guide to parse information.

Hence, visualization is an ally of story-telling, not a competitor. There should be no surprise that visualization is required for specialist areas such as spatial history, but how many historians and scholars from the wider group of humanities understand that visualization can itself be the research? In his essay ‘What is Spatial History?’ (2010), Richard White complained that colleagues from other fields do not understand the importance of map-making itself as research:

[Vis]ualization and spatial history are not about producing illustrations or maps to communicate things that you have discovered by other means. It is a means of doing research; it generates questions that might otherwise
Summary

I mentioned and then rejected four possible claims that the DH is primarily text-based, that non-text-based media is in general not part of the principle remit of DH, that there is a clear separation between written language and images, and that humanities is not related to visualization and that visualization cannot provide suitable scholarly arguments.

My response to these claims has been as follows: historically text has not lived in a hermetically sealed well all by itself; a world with literature but without the arts is intellectually and experientially impoverished, critical thinking and critical literacy extend beyond the reading and writing of text, and therefore visualization can make scholarly arguments. Utopia is still a few traffic lights down the road – there is still work to be done to show how DH, digital media and especially computer games are open to scholarly investigations and critical insights.

Computer gaming can touch on and investigate the wider spectrum of issues and research questions in the humanities that are relevant both to scholars and to the general public. That said, I am not convinced that the ideological aspects of computer games have been fully developed, and these issues need further clarification in order for us to grasp the value, promise and problematic natures of game-based learning applied to interactive history and digital heritage.

As Jerome McGann (2002) warned us:

[T]he general field of humanities education and scholarship will not take the use of digital technology seriously until one demonstrates how its tools improve the ways we explore and explain aesthetic works – until, that is, they expand our interpretational procedures.

The above goal is the goal of the following chapters. To paraphrase the words of the 43rd President of the United States of America, George W. Bush, we have a job to do.

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Chapter 2
Game-based Learning and the Digital Humanities

In this chapter I will outline several important features of games that distinguish them from typical computer software. Unfortunately, many of these features are also not common in education, and the development of games for education promises great benefits, but these benefits have often been hard to measure or to replicate. In Chapter 1, I argued that the digital humanities is more than text, while here I will provide three examples that both indicate the difficulties of conveying heritage and history through games and digital environments, and feature attempts to incorporate more material and embodied experiences of text. I will also table some popular game genres that may be suitable for portraying digital heritage and interactive history.

Computer Games are Not Efficient Pieces of Software

Virtual environment designers have recently become very interested in computer games and why they have succeeded so well when conventional virtual environments have not. There has also been a boom in game design studies, to the extent that computer game design academics have agreed that the field requires more rigorous criticism and evaluation.

Surely the latest academic research is required to explain why people want to play computer games, as game technology is advancing all the time? I am not convinced. Could traditional human–computer interaction (HCI) help create more enjoyable virtual environments or games? No, I don’t think this is necessarily true either. My reason for both my answers is due to a paper I read some years ago by Thomas Malone (1982). This paper, entitled ‘Heuristics for Designing Enjoyable User Interfaces: Lessons from Computer Games’, was written nearly a quarter of a century ago, yet it has only recently resurfaced in the papers and theses of current game researchers.

This paper was an attempt to understand why games are ‘captivating’ and how they can be ‘used to make other user interfaces interesting and enjoyable to use’. In order to answer this question, Malone set up three empirical studies (but only describes two) and takes away ‘motivational features’ to see which features add the most to captivation. He asked eight groups of 10 students to play a computer game (called ‘Darts’) and then another game (‘Hangman’), but with one of eight features missing. He recorded how long played each the game (completion time), their personal opinions (as to which game they preferred) and their gender. The results indicated that fantasy was more important than feedback (as long as it is appropriate to its audience). A preference for fantasy over performance feedback may surprise some, but it did not surprise me, for games are designed to appeal to the imagination rather than to get a job done.

I was particularly interested by this simple method of evaluation. When I wished to evaluate the user experience of virtual environments, I was faced with choosing people to compare two virtual environments against each other (subjective preference), or to
compare the task performance of two different user groups in two different environments. With the first method, people typically lack experience in judging virtual environments against each other as it is such a new technology, while with the second method, I had to pray that that the testers’ relevant demographic factors would be spread relatively evenly across the two groups.

In his second study, using a similar method, Malone found that explicit goals, scorekeeping, audio effects and randomness were particularly important. These two studies were then followed in the paper by his claim that challenge, fantasy and curiosity were the important ingredients that make games captivating and fun to use.

Malone explained that HCI traditionally seeks to improve software that is easy to learn and easy to master, but notes that the founder of Atari said that games are designed to be easy to learn but difficult to master. Malone argued that computer games are more like toys than other software applications, which in turn are more like tools. Unlike shopping webpages or software designed for office use, games have goals, but they do not have to have clear outcomes. However, they do incorporate challenge and fantasy, and stimulate curiosity.

Malone defined challenge as involving ‘a goal whose outcome is uncertain’, as there are often variable difficulty levels or multiple goals (potentially distributed over different levels). Fantasy incorporates emotionally appealing features or well-mapped cognitive metaphors. He considered curiosity to be an ‘optimal level of information complexity’. It may incorporate randomness or contextual humour.

Malone was perceptive enough to realize that challenge is not merely about making things difficult, but also making these barriers tantalizing to solve. When I evaluated over 80 people and how they learn about the original inhabitants through exploring virtual reconstructions of archaeological sites, I asked the users if the environments were challenging without realizing this subtle distinction. The users were confused as to whether I meant challenging as in ‘this is difficult, I am not sure I can or want to complete it’, or ‘this is really testing me but I really don’t want to do anything else until I crack it’. This second meaning of challenging is an important feature of a successful game; it affords hard fun.

Gestalt theory seems to be behind Malone’s concept of curiosity as a motivating feature of games: he suggested that users want to have ‘well-formed knowledge structures’. Computer games deliberately suggest such knowledge, but present the ‘knowledge structure’ as incomplete, inconspicuous or unparsimonious (by this I think he means that games provide red herrings or an overflow of potential clues).

Fantasy is the concept that I am least convinced by, not because it is not an important part of computer games, but because I am not convinced that we can create a successful sense of fantasy merely through creating emotional triggers, connotations and metaphors directed towards specific audiences. The fantasy element of complex game-worlds is not so easily circumscribed by heuristics, just as Malone did not convincingly explain why the boys rather than girls enjoyed the digital fantasy of popping balloons, or how this trait could best be used in designing future games.

For example, two of the most popular computer games have been ‘The Elder Scrolls
IV: Oblivion’ (a single-player medieval-style quest fantasy for game consoles and computers) and ‘World of Warcraft’ (an online multiplayer role-playing fantasy). The degree to which players can choose their character attributes allows them to undertake the game using a myriad of skills and strategies in order to solve a variety of challenges. They do not buy these games because the games are programmed to have conditions and triggers, and they do not play these games because the games are rule-based systems; they play them because the games challenge them to change the world and to explore how these character roles embody and express aspects of their own personality.

What is also striking about these games is how they can motivate people without explicitly showing them what lies ahead. These games are mysterious knowledge structures that loom out of the dark, closed portals surrounded by long-lost instructions, or meeting grounds of conflict and competition where players do not actually know what happens next, only that there is the possibility of eventual success.

More recent publications, such as a doctoral thesis by Federoff (2002), and other papers (Desurvire et al., 2004; Jörgensen, 2004; Shneiderman, 2004) have stressed the importance of Malone’s paper in explaining the unique features of games, how they differ in the way they are experienced from other types of software, and how a new set of heuristics is needed to address these specific game features. Knickmeyer and Materas (2005) have described how the coding scheme of ‘Façade’, an interactive narrative game, was inspired by Malone’s three categories.

While I teach games design, my research is on developing and improving virtual environments in which people can learn more about the real world, especially history, heritage, and and cultural perspectives, such as the intrinsic worth of individual viewpoints, character motivations, traditions, rituals, mythologies and communal beliefs. The more enjoyable these virtual environments are, the more likely it is that users will learn and be interested in learning.

Malone’s paper has reminded me that my quest is to create more challenging environments (and challenge in the sense of a difficulty people wish to face, not wish to avoid). It has reinforced for me a subtle gap between games and other software in terms of the way in which HCI could or should be used. And it has reminded me that using the latest technology or quoting the latest research does not automatically mean that the essential questions are being addressed.

I suspect Malone’s work has resurfaced for at least two important reasons. First, writers have been arguing over the defining features of games, as they are attempting to build a critical research area that can describe and prescribe how to design games and how to improve them. Second, Malone’s way of evaluating games is component-based rather than essence-based, so may offer flexibility over theories defining games as ‘games must have X’. In non-essentialist definitions, games may need to have certain features, but they do not need to have every single one of these features at the same time in order to be games. This may explain why games have so far been so hard to define in terms of essence.

**Computer Games as Rule-based Formal Systems**

Juul (2003) defined a game as ‘a rule-based formal system with a variable and quantifiable
outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable’.

Where is the *fun* in that? A definition of computer games as systems does not address why users find games enjoyable. Despite appearing in relatively recent publications, such an essentialist definition does not directly lead us to producing better games that users enjoy more. Malone’s paper reminds us that games are not played *because* they are systems, so defining computer games in terms of rule-based systems does not shed any light on the user experience. If games are systems, they are *fun-generating* systems.

In addition, the huge recent popularity of online multiplayer worlds cannot be explained purely in terms of usefulness or usability. Many of these games are crying out for help from HCI specialists to design improved interfaces and do not necessarily create entirely new forms of narrative or cinematic innovation, and yet they are still commercial successes.

In his 2011 book *Half-Real* (2011, p. 1), Juul wrote that: ‘In having fictional worlds, video games deviate from traditional non-electronic games that are mostly abstract, and this is part of the newness of video games. The interaction between game rules and game fiction is one of the most important features of video games.’ I cannot say I am convinced – fantasy is a part of non-electronic games and has been for decades if not for centuries. What is so distinct about computer games? And is this fictional world so widespread in digital games as opposed to non-digital games? How much of a fictional world does ‘Tetris’ contain? Surely a live action role-playing (LARP) game contains more of a fictional world?

Examining the seven most famous theories of definitions of games and merging them in a classical theory of games (2011, pp. 30–36), Juul argues that a game is first a rule-based formal system; it has variable and quantifiable outcomes; where different outcomes are assigned different values; the player exerts effort in order to influence the outcome; the player feels emotionally attached to the outcome; and the consequences of the activity are optional and negotiable. I note here that the first four theories (from Huizinga, Caillois, Suits, Avedon and Sutton-Smith) are about games, while the last three (Crawford, Kelley, Salen and Zimmerman) are computer game designers.

However Juul seems to stress the universality and comprehensiveness of these six features to such an extent that he later rejects any ‘boundary cases’ which do not have all six features – for example: ‘This game model is the basis upon which all games are constructed’ (2011, p. 7). And then he writes that the ‘German philosopher Wittgenstein’ had used ‘the concept of games for building his philosophy of language, and games were singled out as an exemplary case of something that could not be defined or narrowed down’ (2011, p. 8). Wittgenstein was actually Austrian and his famous book *Philosophical Investigations* used games as an example of the fluid nature of language. Thus, calling games ‘exemplary’ might be strictly true, but a little misleading. The shifting meanings of the word ‘game’ did not build Wittgenstein’s philosophy of language, but was merely an example.

More importantly, in the writings of Juul and other theorists, games in general are
continually made out to be unique and incredibly significant, but their writings run the risk of over-emphasizing the importance and significance of computer games per se. Games are hugely important to culture and society, but the value and usefulness of computer games may vary wildly. Even animals learn through games. While games are a vital part of social learning for humans as well, we don’t need to fanatically push the usefulness of computer games. It would be better to understand and apply games where they are most effective and most needed.

In the case of *Half-Real*, the emphasis on computer games as rule-based systems leads Juul to state that: ‘It is also the well-structured character of games that have made them into a stable of artificial intelligence research’ (2011, p. 8). Herein appears a contradiction – games are hard to define, apparently, but are also well structured? It might be logically consistent if games are rule-based systems, but isn’t there more than that to games? Juul does quote Hughes that as each player may have a different experience, games are more than rules. For games include gameplay, exploration, challenge and reward. Some games afford emergence, while others are genuine sandbox worlds (open worlds); if they are ‘well structured’, this would surely constrain emergence and discovery. Juul himself raised this question in another paper (2002): ‘How can something made from simple rules present challenges that extend beyond the rules?’ So games are more than rules!

I view the definition of games as rule-based systems as being too simplistic. There are the operational rules that allow computers to compute, the imagined world rules of the designer, the code that is coded by the programmer, the apparent rules that the player perceives as to the fictional world of the game, and what actually takes place (the rules that are actually triggered and calculated). An example might be a glitch, a bug appears in the running of the computer game, the code is diverted or corrupted, the fictional world is misrepresented to the player, or the player’s input appears to create emergent results, or the player believes the results of the glitch show new or previously unseen rules to this fictional game-world. In other worlds, the procedural code that runs the computer and the computer game may never be directly appreciated or even perceived by the player. So saying a game is a rule-based system is not saying how the game is perceived to be a game by the player.

Juul is also critical of the theory of Roger Caillois. For example, he notes that Ilinx (vertigo) ‘is but a single example of the infinite number of different types of experiences that a game can give’ (2002, p. 10). I have to disagree; I think Ilinx is a very important feature of games and is often missing from computer games. This will be of significance when we look at simulations of heritage and history in the following chapters. Part of Juul’s criticism of Caillois is that Caillois (2001, pp. 8–9) says games are either rule-based or make-believe; Juul of course believes that games are both rules and fiction (hence the title of his book). My suspicion is that Caillois meant that one has to follow ‘rules’ in a game, and they are either cultural/mythical, according to local conventions or the rules have to be directly made up. I am not sure that Caillois stipulates that games cannot have both rules and a fictional world.

*Games are Hard Fun*

Like Malone, James Gee reiterates that games are ‘hard fun’, but also that games are
successful because game designers also have to learn the hard way; success in game design is through trial and error, ensuring that the very design of the game helps people learn them in a challenging but enjoyable way. Their income depends on it. Gee said: ‘If people cannot learn to play a company’s games, the company goes broke. So game designers have no choice, they have to make games that are very good at getting themselves learned’ (2007, p. 2).

The above seems obvious to me, but Gee also goes on to say something rather fascinating. He argues that games are good ‘if you act like a game designer while you play the game’ (2007, p. 8). Obviously I agree with Gee that thinking and talking about games is important – one should not read or play games uncritically – but I wonder if one has to think like a designer to enjoy a game. In my experience, if you design objects, events and spaces so that people have to think like you to have ‘good experiences’, then much of the richness and the variety of potential experiences have been lost.

A potential confusion in reading Gee’s work is that he emphasizes the advantages possible with games as if they are inherent in all games. For example, he has written that ‘good games are problem solving spaces that create deep learning’ and that ‘good video games are hard work and deep fun. So is good learning in other contexts’ (2007, p. 10).

Does that mean that to be good, a video game has to be all of the below?:

1. Hard work.
2. Deep fun.
3. Provide ‘good learning’ for other contexts, i.e. transferrable knowledge.

‘Tetris’, ‘Pac-Man’ and ‘Space Invaders’ are often considered to be good games, but I am not convinced that they fulfil all three of the above criteria.

And yet it would seem that good games must always create ‘deep learning’ and if games are sometimes tools, then they must always be ‘new tools for letting people understand from the inside out the worlds other people inhabit or worlds no one has seen yet’ (Gee, 2007, p. 7).

If games were always new tools that generated deep learning and reflection, I would not have to write this book! Unfortunately, Gee seems to be conflating the apparent potential of computer games with the current state of computer games. Another writer, actually inspired by Gee, has been critiqued in a similar manner. The book reviewer Dennis J. Seese (2012) criticized the author Jeremiah McCall (2011) for preaching to the converted and for not fully explaining the criteria by which a simulation game should be incorporated into the classroom.

Returning to Gee, I believe he is on stronger ground when he investigates the power of games as simulations. Gee argued that ‘mind is a simulator’ (2007, p. 2) and that a game as a simulation will ‘prepare them for action they need and want to take in order to accomplish their goals’. He also wrote that games act as: ‘Action-and-goal-directed preparations for, and simulations of, embodied experience … a) they distribute intelligence via the creation of smart tools and b) they allow for the creation of “cross-functional affiliation”, particularly important form of collaboration in the modern world’ (Gee, 2007, p. 150).
Kim Sterelny’s (2004) description of ‘external cognitive artefacts’ sounds similar to Gee’s talk of ‘smart tools’. Gee’s ‘cross-functional affiliation’ observation may also hold for massive multiplayer online games. However, the description of many games as affording ‘smart tools’ does not necessarily mean that all good games should have such affordances. Gee (2007) also claimed that good games allow for horizontal learning and vertical learning. Horizontal learning is an interesting concept; people can stay at certain levels, until they are comfortable with skills and knowledge, before they level up.

**Game are More than Systemic Artificial Conflicts**

The following definition of a game by Salen and Zimmerman (2003, p. 80) is probably the most famous game definition in contemporary game studies:

A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.

Salen and Zimmerman talk of a magic circle that separates (but not always clearly) the boundaries of a game from the real world, but games do not have to involve explicit conflict. And a conflict in the game does not have to stay ‘artificial’. Simulated conflict could become real and actual. Does that mean that the game is no longer a game? Possibly.

Salen and Zimmerman’s definition also discounts games that may never have a final outcome (such as cricket) and does not incorporate the importance of strategy. Rules do not encapsulate games; they may be necessary components, but there may be games entered where the rules on entry are redefined while playing.

Here is my working definition of a game (different to Salen and Zimmerman): *a game is a challenge that offers up the possibility of temporary or permanent tactical resolution without harmful outcomes to the real-world situation of the participant.*

Actually, my definition is also missing a vital component of games – engagement: *a game is an engaging challenge that offers up the possibility of temporary or permanent tactical resolution without harmful outcomes to the real-world situation of the participant.*

One could easily question my working definition. It may not appear to be exacting enough; it seems to treat all games as challenge when the challenge element is not necessarily of the same importance in all games, and it emphasizes tactics when not all games require changing tactics and strategies. My response would be that if the game does not offer strategic resolution, then it is no longer offering a full and rich game – it is almost a game-shell or a game-vehicle. The procedures are the same, but the gameplay is no longer enjoyable and engaging. That said, for many virtual heritage projects, the location and audience may be museum-specific, so the duration and complexity of the experience may have to be reduced.

Thus, Sid Meier’s definition appeals to me: ‘A game is a series of interesting choices.’ The fuller quote is: ‘According to Sid Meier, a [good] game is a series of interesting choices. In an interesting choice, no single option is clearly better than the other options, the options are not equally attractive, and the player must be able to make an informed choice’ (Rollings, 2003, pp. 200–201)
However, this explanation has its critics. Juul (2011) says that by ‘interesting choices’, Meier meant mental challenges of high quality, which Juul rebuts by pointing out that not all games are mental challenges of high quality. However, is that what Meier meant? I personally think that the concepts of engagement, strategy and agency are all succinctly referred to in Meier’s statement. He was not, in my opinion, stating that a high-quality mental challenge is the necessary and sufficient attribute of games (Bateman, 2008). He was instead trying to suggest that non-interesting choices are the bane of good game design. One counter-argument might be that ‘Snakes & Ladders’ is a game, but does not offer choice (unless you count how a dice is thrown as constituting a choice).

**Games: Advantages and Disadvantages**

Marshall McLuhan once wrote that: ‘Anyone who thinks there is a difference between education and entertainment doesn’t know the first thing about either’ (McLuhan, 1967). Recent reports have provided substantial evidence for the benefits of games (Oliver et al., 2011; Clark et al., 2014) and other publications have provided some evidence for the usefulness of games (Schrier, 2014) in both the classroom (Jameson, 2014; Lester et al., 2014) and the museum (Rowe et al., 2014).

Yet for all the literature on serious games and game-based learning, there are few explicit examples of transferable and useful skills learnt in serious games (Egenfeldt-Nielsen, 2007). Game-based learning still requires expertise in instructional design (Wouters and van Oostendorp, 2013) and increasing the motivation of learners beyond that achievable by conventional instructional media is not trivial (Wouters et al., 2013). Despite this, more and more people are beginning to see electronic games as a viable vehicle for learning (Dondlinger, 2007; Anderson et al., 2010).

Seymour Papert (1998) made some prescient observations in his article ‘Does Easy Do it? Children, Games, and Learning’, backed a decade later by James Gee (2007). Games are not fun because they are easy; they are fun because they are difficult to learn. Creating something that is easy is not making something engaging. In addition, Papert thinks that educational games that hide their true intention are misleading, if not immoral. Although I like the term ‘games by stealth’, I sympathize. Why hide the true nature of the games? What message do we send if learning must be disguised – can it never be undertaken voluntarily?

Further, games allow and in fact demand agency and effort from the player, and provide clear feedback and reward systems. Therefore, Papert encourages two things: conversation between the players and encouraging them to ‘become game designers themselves’.

Finally, Papert responds to an angry instructional designer calling him out to name that games that help one learn and exactly what are these ‘specific learning skills’ that he talked about. He replied: ‘The most important learning skills that I see children getting from games are those that support the empowering sense of taking charge of their own learning.’ Yet this does not directly answer the question. My question to Papert is: where and when does this happen outside of games; when is this meta-skill or meta-confidence translated into non-game domains, such as the real world? I agree with Papert that this is the goal; I just see little proof of it in educational games.
Shavian Monsters

‘Shavian monsters’ is an expression borrowed from Papert that is in turn borrowed from George Bernard Shaw. Papert wrote that:

Most of what goes under the name ‘edutainment’ reminds me of George Bernard Shaw’s response to a famous beauty who speculated on the marvelous child they could have together: ‘With your brains and my looks …’ He retorted, ‘But what if the child had my looks and your brains?’ (1998)

So the Shavian monsters are those games that combine the worst of both worlds (that is, entertainment and education). Meetings in ‘Second Life’ likewise remind me of Shavian monsters. You sit down (so you cannot wander around) and you cannot easily follow who is talking and you don’t know where people are looking or what they think of the dialogue (unless they are responding next). ‘Second Life’ meetings seem to have all the boring attributes of real-world meetings and none of the affordances of human contact that help me keep track of the conversation and the responses of those attending (Figure 2.1).

Figure 2.1  A Meeting in ‘Second Life’

Epistemic Games

The first chapter in the edited book *The Design and Use of Simulation Games in Education* (Shelton and Wiley, 2007), entitled ‘In Praise of Epistemology’, argues for epistemic games, which the writer David Shaffer defines as ‘a game that requires you to think about the world’. He uses a real-world classroom debating game to show how students can be engaged by history and can learn to develop better critical and communicational skills. He also makes the interesting observation that the skill of professional historians in knowing which sources are more accurate than others is not assimilated by the students, but the chapter does not clarify how computer games can pass on such knowledge. The assertion that the debating game could easily transfer to a computer game setting is also not proven. To take one example from Hubert Dreyfus’ (2001) controversial book *On the Internet*, surely the spontaneity and physical presence of real-time debating combatants is not such an easy task to replicate via a computer?
While I have enjoyed Shaffer’s writing, I still cannot see how the musings in the above chapter are directly and effectively translated into educational computer games and simulations. I would also take him to task for his use of the word ‘epistemic’: epistemology is the (philosophical) study of what constitutes beliefs and knowledge, but ‘episteme’ merely means a belief or piece of knowledge, so I would argue that ‘epistemic’ by itself does not equate to affording reflection on a purported belief system (which is the type of game I believe the author wishes to promote). Epistemic is too specialized a word; I suspect the required term is somewhat closer to ‘thought-provoking’.

**Gamification**

One of the most lucid descriptions of gamification is in a workshop call for papers by the Art & Civic Media Lab of Leuphana University (Fuchs, 2013). Explained as the use of game-based rules structures and interfaces by corporations ‘to manage and control brand-communities and to create value’, this definition reveals both the attraction of gamification to business and the derision it has received from many game designers and academics (Bogost, 2011; Deterding et al., 2011; Fuchs, 2014).

Gamification can be viewed as the addition to websites and learning environments of quantifiable actions that can be ranked and processed (and information stored), with immediate and vastly exaggerated feedback, and graphically designed in the idiom of well-known computer game genres. Task performance can be graphically rewarded and socially shared, and proponents have argued that gamification can provide deeper, richer and more engaging learning (Betts et al., 2013; Schoech et al., 2013; Hamari et al., 2014).

Although gamification might be of benefit for websites and repetitive work-based interfaces, some of the media promoting gamification should be treated with caution. For example, a blog article in *eCampus news* suggests that gamification (‘the use of game design elements in non-game contexts’) is a proven success story. While this may be true, the article cites a reference provided by a game-based learning company, the very sort of company that stands to make money from gamification (Stansbury, 2013).

The article also outlines three important elements of gamification: progression (incremental feedback and rewards); investment (achievements and social rewards); and ‘cascading information’ (various streaming and increasing-in-complexity rewards and opportunities). The definition is not highly revealing. To filter information is the mark of well-thought-out software, providing social recognition is an aspect of social media, and feedback on performance is a feature of games and instructional media in general. These features may be good guidelines for designing engaging software and websites, but they are not the fundamental features of games per se.

Most definitions that we considered in Chapter 1 would hold that a game is in essence an activity that:

1. has some goal in mind, the player works to achieve;
2. has systematic or emergent rules; and
3. is considered a form of play or competition.

The first feature does not seem to be a required aspect in gamification, but the other two
features are relevant. While these criteria describe ‘skill and drill’ types of games, many of today’s digital games are far more complex, providing an interactive narrative in which the player must test hypotheses, synthesize knowledge, and respond to the unexpected (Dondlinger, 2007).

Games don’t have to explicitly provide the rules; part of the challenge might be to find them and predict what will happen next according to the player’s understanding of what the rules are. One issue, though (especially if we are going to avoid the traditional game’s clear reward and feedback system), is how the player will understand the historical appropriateness of their actions and performance, and whether their understanding is ‘on the right track’, understanding the priorities, the possibilities, the dead ends, the goals and how to complete them. What would ‘achievement’ mean to the player?

**Procedural Rhetoric**

While Michael Mateas has spoken of procedural literacy, and before him Janet Murray said that one feature of digital games was that they are procedural, Ian Bogost is probably most famously associated with this phrase. Bogost defined procedural rhetoric as ‘a practice of using processes persuasively’. In *Persuasive Games* (2007, p. 8), he used the example of the book *Guns, Germs, and Steel* and declared ‘Such an approach to history goes far beyond the relation between contemporaneous events, asking us to consider the systems that produce those events.’ I mention this here not only as a historical example, but also to wonder if this is an important sub-criterion in procedural design. Should the player be led to ‘consider the system that produces those events’ as well?

Gonzalo Frasca, a collaborator and colleague of Bogost, had a similar phrase, simulation rhetoric (‘simulations can express messages in ways that narrative simply cannot, and vice versa’). Frasca’s chapter (2003) has a powerful message: understand simulation rhetoric as soon as you can, because advergames will definitely explore and exploit simulation rhetoric with or without you. I should however note that in his later book *Unit Operations*, Bogost defines simulation differently: ‘A simulation is the gap between the rule-based representation of a source system and a user’s subjectivity’ (2008, p. 107).

While procedural rhetoric combines a humanities discipline with something that is obviously a key component of games, and even though it appears to have special importance for serious games, I still have reservations. Bogost himself raises the first potential flaw: he admits that for many people, rhetoric has a negative connotation. In the book *Arguing Well*, John Shand declared that: ‘Logic must be sharply distinguished from what might generally be called rhetoric … rhetoric is not committed to using good arguments’ (2002, p. 23). On the other hand, Aiken and Talisse (2014) argue that we should not just argue from reason – we should also know how to engage with others when we argue.

I am not convinced that the rules of the game are the rules of the designer or even the rules of the player. The negotiations, changes and misunderstandings by the player as to what the rules are exactly are in my opinion important and creative parts of games and, by extension, computer games. While it might be reasonable to think that if the essence of the game is rules, it is another thing entirely to not even contemplate the possibility that a
rule-based system could be random, changing or open to change by the player. Mary Flanagan’s book *Critical Play* (2013) looks at critical gameplay as wilful subversion of the rules and she provides avant-garde art as exemplars (see also her earlier paper: Flanagan, 2010).

There have been other criticisms of the theory of procedural rhetoric. In the *Game Studies* article ‘Against Procedurality’ (2011), Miguel Sicart wrote: ‘Proceduralists claim that players, by reconstructing the meaning embedded in the rules, are persuaded by virtue of the games’ procedural nature.’ Sicart argued that meaning is more than just the learning of rules through play; the value of gameplay becomes subservient, and if rules are all that matters, why should the designers have to explain them?

This leads me to another question. Computers follow procedure and designers design procedures (and please note that Bogost carefully explains that procedural rhetoric is not referring directly to programming). So how does or how can the player know that the system of rules that they may have a mental model of is the system of rules intended by the designer or the system of rules followed by the computer? And just because computers work by computation, by processing, does that mean that the definition, the essence and the ideal of gameplay is to follow and comprehend this system of rules? To enjoy stage magic, must we know where the hidden trapdoors are?

I have another concern here (depending on whether we are supposed to question the system of rules). Adherence at the altar of ‘procedural rhetoric’, whether intended by Bogost or not, can lead to people thinking that the designer’s idea of the game rules are what matters. If so, we will have debates invoking the ‘Intentional Fallacy’ and the ‘death of the Author’ will be resurrected, only this time the debates will be over computer games, not literature. For rhetoric involves the art of persuading, not necessarily the art of opening up games as vehicles of critical discourse.

There has also been some criticism of Bogost’s other (but related) book, *Unit Operations*. For example, Alex Wade wrote that the ‘description of ancient videogames Pong and Combat as games with “tennislike attributes” … stretches the membrane of the operation of units beyond perspicuity and into the realm of fiction’ (2007, p. 183). I am not so concerned with individual errors or stretched analogies in the books, but I am perplexed as to how unit operations and procedural rhetoric can be or should be employed, although other critics (such as Short, 2008) might disagree, suggesting it is unclear but potentially still very useful. While Bogost seems to be saying that we have to understand procedural rhetoric, other critics and game designers do not seem sure as to how they can implement these theoretical notions. In an otherwise complementary review of *Unit Operations*, Zach Whalen (2006) wrote that ‘I’m eager to try my own hand at unit analysis, but I’m not sure how to proceed’.

When I consider the application of procedural rhetoric to interactive history and to virtual heritage, I am also perplexed as to where and how I could usefully leverage these theories. I am not interested in seeing unit operations in literature and I am not interested in borrowing from principles of advergames; perhaps the field of serious games, heritage and history is still so new that we need a far simpler applied and easily verifiable theory?

*Are We Designing for Digital Natives?*
I have not yet considered the audience, and they are no doubt a changing phenomenon. For example, the term ‘digital natives’ has been bandied about over the last 10 or 15 years. Are recent generations so technologically advanced that education has to be completely rewritten to accommodate them? Must games be used everywhere to connect with the new generation’s ‘digital native’ minds? According to investigations that seem thorough and genuinely investigative (Bennett et al., 2008; Jones and Shao, 2011), it appears that the answer is no. For example, Bennett et al. (2008, p. 775) wrote in their abstract:

The idea that a new generation of students is entering the education system has excited recent attention among educators and education commentators. Termed ‘digital natives’ or the ‘Net generation’, these young people are said to have been immersed in technology all their lives, imbuing them with sophisticated technical skills and learning preferences for which traditional education is unprepared. Grand claims are being made about the nature of this generational change and about the urgent necessity for educational reform in response. A sense of impending crisis pervades this debate. However, the actual situation is far from clear … We argue that rather than being empirically and theoretically informed, the debate can be likened to an academic form of a ‘moral panic’. We propose that a more measured and disinterested approach is now required to investigate ‘digital natives’ and their implications for education.

Jones and Shao (2011) are even more direct; they state that there is no such clear generational divide, ICT skills vary widely and students are not automatically experts or even frequent users of ‘Blogs, Wikis and 3D Virtual Worlds’. I agree and would add that digital literacy is not the same as digital fluency. In the more specific area of games (and game design), I have met and taught many students who do not play games or follow game design; some of them were enrolled in my game design class and initially said they did not play games because they did not like them (and yet they still managed to pass).

What is digital fluency? Resnick (2002) argues that digital fluency is knowing how to construct things of significance with these tools. Belshaw (2012) suggested eight digital literacy concepts: cultural (what is the context of experience?); cognitive (how is the mind expanded?); constructive (what is new in such construction?); communicative (how is communication enhanced?); confident (how is failure addressed constructively?); creative (how can we move beyond the canon?); critical (how are conventions critically addressed?); and civic (how is a civil society developed?).

Digital literacy is much more complex than was initially trumpeted, and digital fluency is particularly important in game design and critical gameplay. How would we conceptualize digital fluency as regards interactive history and virtual heritage game-based interaction? Could we honestly claim that the general public have acquired it? Could we even claim that designers of these projects have created the learning platforms by which such digital fluency is possible?

**Game-based Learning and Simulated Culture**

The above theories have been well cited and explored for understanding games and game design. In the latter case, they have also been used for the study of game-based learning (Serious Games, etc.). However they have not been widely used for games employed for either interactive history or for digital heritage. As Flanagan wrote: ‘Whatever their message, serious games are amongst the most challenging games to design’ (2013, p. 249).

In the following three case studies, I will provide examples of problems I uncovered in designing components of virtual worlds for cultural exchange and game-based interaction.
(or virtual environments more generally) for heritage and history-based content. These problems need fixing, but the above theories are either inadequate to deal with the problems directly or perhaps we need a new and topic-specific theory.

I would also argue that the current types of interaction available in games are not particularly suited to studying heritage and history. Table 2.1 below is a tabulation of the more famous game series that have interaction modes and aims that may be of some relevance to our design intentions.

### Table 2.1 Games and Interaction

<table>
<thead>
<tr>
<th>Type of game</th>
<th>Closest examples in available games</th>
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</thead>
<tbody>
<tr>
<td>Tourist game: aim to enjoy life of site from a safe and comfortable distance.</td>
<td>The relatively new travel game genre, like ‘A Quiet Weekend in Capri’ (2004), could be considered as puzzle games as they have a game mode and a sightseeing mode.</td>
</tr>
<tr>
<td>Puzzle Games: puzzle detection games aim to find what happened by examining material remains, material changes, epigraphy, etc. while minimizing damage to local artefacts. On the other hand, puzzle escape games aim to complete tasks using local affordances and artefacts.</td>
<td>Archaeologist learning about a past culture, for example, ArcDig. Perhaps murder mysteries or interactive fiction comes closest. The information is prescriptive, but the way in which information is synthesized is like creative detective work. The ‘Qin: Tomb of the Middle Kingdom’ game (1995, 1997) required the player to escape the Forbidden City by solving puzzles. ‘Myst’ (1993–2005) is probably the most famous. Or a 3D adventure game, such as the ‘Tomb Raider’ series (1996–ongoing) reflects a similar goal: reach objective by ‘reading’ site without personal health being adversely damaged. ‘Civilization’ (1991–ongoing), ‘Age of Empires’ (1991–ongoing), ‘Tribal Trouble’ (2005–ongoing), ‘Pharaoh’ (1999) and the ‘Caesar’ series (1992–2006).</td>
</tr>
<tr>
<td>Historical strategic battle games: avoid being killed, take over territory, military strategies learnt.</td>
<td>The ‘Assassin’s Creed’ series (2007–ongoing) is primarily a combat game with extraneous dialogue relating to historical information and some military-style missions.</td>
</tr>
<tr>
<td>Historical combat games (need to get close to opponent).</td>
<td>‘L.A. Noire’ (2011) (although you have to investigate before shooting) is a realistic re-creation of late 1940s Los Angeles, using aerial photographs.</td>
</tr>
<tr>
<td>Historical shooter games (could add to combat games).</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Control games: aim to control or overcome inhabitants and other creatures.</td>
<td>‘The Sims’ series (2000–2011) and also ‘Spore’, although it is also a very unusual form of resource game/simulation.</td>
</tr>
</tbody>
</table>

The above table is not a hard-and-fast classification; I am merely trying to understand how the interaction relates to learning and the learning mechanics that arise from the game mechanics. You might notice I do not list have the ‘Warcraft’ series (1997–ongoing) in the above table; it seems to be used as a real-time strategy game, or as a role-playing game, or even as something else, depending on the version and the audience. The online ‘World of Warcraft’ versions can also be used for machinima (as can at least some versions of Warcraft).
radiant textuality

literature after the world wide web

jerome mcgann

palgrave
Chapter 6

Visible and Invisible Books in N-Dimensional Space

Let us not generalize about exceptional cases, that is all I ask: yet my character is in the order of possible things. No doubt between the two furthest limits of your literature, as you understand it, and mine, there is an infinity of intermediate points, and it would be easy to multiply divisions; but there would be no point at all in that, and there would be the danger of narrowing and falsifying an eminently philosophical conception, which ceases to be rational, unless it is taken as it was conceived, that is, expansively.

—Lautréamont, Maldoror, Book 5

All the news organs have picked up the story:

After five centuries of virtually uncontested sway, the Book seems to be facing a serious threat to its power. Informed sources report a large computerized force continues its sweep through traditional centers of bookish institutional control. Resistance has been fierce in certain quarters, and vast areas remain wholly under Book authority. Spokesmen from both sides describe the situation as volatile. It has been reliably reported that major centers of Book power throughout the country have been voluntarily joining forces with the Electronic invaders. According to leader of the patriotic militias, Sven Birkerts . . .

That kind of report shapes much of the public discussion about the relation of books and an array of new computer-based tools generically
named hypertext and hypermedia. Nor is there any doubt that we are, at this millennial moment, passing through the first stages of a major shift in how we think about and manage texts, images, and their vehicular forms. From a literary person’s point of view, the relevance of these changes can appear purely marginal: for whatever happens in the future, whatever new electronic poetry or fiction gets produced, the literature we inherit (to this date) is and will always be bookish.

Which is true—although that truth underscores what is crucial in all these events from the scholar’s point of view: We no longer have to use books to analyze and study other books or texts. That simple fact carries immense, even catastrophic, significance.

Trying to think clearly in this kind of volatile situation is not easy. In fact, after working for most of a decade implementing The Rossetti Archive, I began to see some simple but fundamental truths about books, digital tools, and what we might think about or expect of them. These simplicities are what we should be caring about now. Simplicities and solidarities. For digital and bibliographical forms of thought and expression stand in a mutually critical relation to each other. Or at least they seem so—have been so—in my experience.

Let me start, then, with a fundamental misconception: that a digital field is prima facie more complex and more powerful than a bibliographical one. A moment’s reflection spoils that thought, as it should. The fields simply manage knowledge and intellectual inquiry at different scalar levels. Our worlds are differently constituted by spoons on one hand and by steamshovels on the other. Nor is one instrument “better” or more powerful. They do different things. Right now and in the foreseeable future, books do a number of things much better than computers. There is no comparison, for example, between the complexity and richness of paper-based fictional works, on one hand, and their digital counterparts—hypermedia fiction—on the other. Nor does the difference simply measure a difference of writing skill—Italo Calvino, say, versus Stuart Moulthrop. The history of the book medium and the development of fictional conventions within that medium have evolved an extraordinarily nuanced and flexible set of tools for the imagination. The truth is that the hypermedia powers of the book, in this area of expression if not prima facie, far outstrip the available resources of digital instruments.

But the latter, even in this moment of their earliest history, confidently declare and establish their authority in other areas of knowledge processing and communication. A like situation emerged in the fifteenth century with the invention of movable type. The printed book quickly supplanted
the manuscript as a primary vehicle for storing, retrieving, and transmitting information. On the other hand, even the finest early printed books—and there are many such—lack the expressive and intellectual resources available to works produced in the manuscript tradition. That clear deficiency, needless to say, did not hinder the development of printed works—on the contrary, it inspired and promoted that development.

Today we stand in a similar set of circumstances. The significance of the changes being wrought through digitization became widely apparent in 1993 when W3 broke across the scene. That event brought the clear realization that a new textual condition was at hand and that traditional literary and textual studies had an enormous stake in it. One could now see quite clearly that digitization was both the medium and the message concealed in the crisis that had been developing in literary and cultural studies since the mid-1960s.

Why? Because the web exposes how the technology of archival and bibliographical exchanges can be radically expanded in both spatial and temporal terms. Scholars can interact with each other anywhere in the world, can exchange their work in various new ways, and can access materials located in remote locations. They can also execute remarkable new critical transformations of their subject matter, thus opening unexpected opportunities for investigations of many kinds, bibliocritical as well as interpretational.

We are thus entering a period when the entirety of our received cultural archive of materials, not least of all our books and manuscripts, will have to be reconceived. The initial stages of this reconception, which is well underway, have been largely confined to work with archives and libraries, whose holdings are being digitally repossessed in many new ways. And since these depositories are the ground of all traditional scholarly work, these institutional changes will have—are already having—radical effects. This is very much a material revolution, and in negotiating it we all—not least of all traditional scholars—would do well to recall Marx's eleventh thesis on Feuerbach, which has acquired interesting new meanings beyond those originally conceived by Marx: "The philosophers have only interpreted the world in various ways; the point, however, is to change it."

Information scientists and systems engineers will be (already are) much involved with these changes. But it is the literary scholar, the musicologist, the art historian, etc. who have the most intimate understanding of our inherited cultural materials. Hence the importance that traditional scholars gain a theoretical grasp and, perhaps even more important, practical experience in using these new tools and languages. For "theory" in this volatile
historical (and historic) situation will have little force or purchase if it isn’t grounded in practice.

My special interests as an educator, a writer, and a scholar have brought me to engage the authority of our new digital tools. As already noted, we undertook the development of The Rossetti Archive in 1993 as an experimental effort to exploit the special powers of digital technology—specifically, to try to design a model for a critical edition that would overcome certain of the key limitations of critical editions organized in book form. Scholars need tools that can efficiently manage large bodies of related literary and artistic objects. This is exactly what the traditional critical edition does. But it’s clear, prima facie, that digital tools can execute many of the tasks of scholarly editing much better, much more thoroughly, and much more precisely, than books can.

For instance, in certain important respects even works of imagination will and should be treated as we might treat ordinary “material objects” like (say) screwdrivers or business records. The corpus of Rossetti’s visual and textual works is very large and its interrelations are very complex. Simply building a scholarly space that facilitates accessing these material objects for study and analysis, including complex kinds of comparative study and analysis, is a very useful thing to do. We see this in such splendid constructions as The Perseus Project or any of the electronic archives being developed, for instance, at IATH—electronic tools centered in the works of Blake, Dante, Dickinson, Rossetti, Whitman. In certain ways digital space is much richer and more flexible than bibliographical space. So in 1993 we set out to explore and exploit that space by building The Rossetti Archive, and after seven years’ work we aren’t unhappy with the results. No paper-based book or set of books could have done what The Rossetti Archive offers to scholars. The book medium is physically incapable of the kinds of storing, integrating, and accessing operations we had held out as a basic scholarly demand for the archive.

This situation does not portend the death of the book and its typographical world. It does mean, however, that one heretofore central function of book technology will be taken over by these electronic media. Think about what books do. Like computerized information tools, the book performs two basic functions: It is a medium of data storage and transmission; and it is an engine for constructing simulations. That first is an informational, the second an aesthetic function. Computers will displace—are already displacing—most of the information functions of our bibliographical tools. The aesthetic function of books will remain, how-
ever, and it’s clear to me that they will prove indispensable in this respect. This result is inevitable for an apparently paradoxical reason. As digital tools and environments develop, we grow increasingly aware of their aesthetic functions and of the importance of those functions. We appear to be passing from a bibliographical to an “Interface Culture.” Indeed, the aesthetic resources of digital tools appear so vast and synaesthetic that our bibliographical anxieties might easily grow more acute in face of them. The truth is, however, that we have much to learn from those older, more highly evolved forms of textuality that are now being joined and modified by our new media. Not since the first period of its emergence has the study of the book been a more imperative need.

How do we exploit the aesthetic resources of digital media? The question brings to mind Edward Tufte’s work. Tufte is interested in the ways inventive people have used paper instruments to organize and elucidate various kinds of information. Of course his interest in aesthetic form is explicitly in its vehicular function with respect to information: How do we design pagespace in order to facilitate a clear transmission of data? His work makes no investigation into the semiosis of aesthetic form as such. Nonetheless, his studies underscore an important set of metaquestions that are too rarely asked: What is a page, what is a book, what are their parts, how do they function?

From the outset of my work with digital media I’ve been most interested in aesthetic works and the critical understanding of their cultural meanings. I began work on The Rossetti Archive because it was clear to me how digital tools brought great practical advantages over paper-based critical editions. The new engines could handle, in full and unabridged forms, vast amounts of data—far more than any book or reasonable set of books. They could also handle different kinds and forms of material data—not just textual, but visual and auditory as well. These capacities made it possible to edit critically certain works that could not be adequately handled in a paper medium: the works of Rossetti, of course, but also those of Burns, of Blake, of Dickinson. Digital tools also exposed the critical deficiencies of the paper-based medium as such. Any kind of performative work—dramatic works, for example, and pre-eminently Shakespeare’s dramas—gets more or less radically occluded when forced into a bookish representation. These differentials led to what I regarded at the time as an important general insight into books, computers, and their scholarly relation. I got a lot of satisfaction out of writing, in 1993, the following dicta:
When we use books to study books, or hard copy texts to analyze other hard copy texts, the scale of the tools seriously limits the possible results. In studying the physical world, for example, it makes a great difference if the level of the analysis is experiential (direct) or mathematical (abstract). In a similar way, electronic tools in literary studies don't simply provide a new point of view on the materials, they lift one's general level of attention to a higher order.¹

While I wouldn't dissent from those sentences today, when I wrote them I was certainly unaware of much that they implied. My own levels of attention would be considerably raised as we undertook to implement the logical design of The Rossetti Archive between 1993 and 1997.

Some of these matters I have already discussed—for example, the dysfunction that arises when one tries to use standard markup forms, SGML and all its derivatives, to elucidate the functional structures of imaginative works.² The recursive patterns that constitute an essential—probably the essential—feature of poetry and imaginative works in general cannot be marked, least of all captured, by SGML and its offspring. At first we engaged this dysfunction as a set of practical problems for building, or modifying our original plans for, The Rossetti Archive. But this deep asymmetry between our primary bibliographical data and our digital tools forced us to realize that we would not get very far with our practical problems if we didn't begin to think more rigorously about a pair of difficult elementary questions—questions that we had hitherto treated far too casually, as if they did not involve problems, for us at any rate, at all.

Here are the questions. First, what is a literary work, what are its parts, how do they function? We assumed we knew how to answer such questions, but our attempts to translate our bibliographical materials into coded instructions showed us that we didn't. (The principle here is simple and known to every teacher: If you can't explain what you know to someone else so that they also understand, you don't really know what you think you know.) Second, what constitutes a critical representation of a literary work, and how does such a representation function? With one notable exception, every critical method and theory known to me assumes that the measure of critical adequacy is the degree of equivalence that can be produced between the object of critical attention and the critical representation of that object.³ As we kept building The Rossetti Archive the flaw in that traditional understanding became more and more clear. A hypermedia work by choice and definition, the archive therefore obligated us to integrate in a critical way both textual and visual materials. Our efforts were continually
frustrated, however, because while digital texts lie open to automated search and analysis, digital images do not. Consequently, our critical commentaries never adequately reflected the reality we knew was there. Indeed, so far as the mirror of representation was concerned, much of that reality might as well have been a large population of vampires.

Consequently, a major part of our work with *The Rossetti Archive* became focused on basic theoretical problems about literary and aesthetic works and the material nexus of their social and historical forms and determinations. As I have argued in Part II of this book, however, “adequacy” in a critical representation cannot be measured by a scale of equivalence. A true critical representation does not accurately (so to speak) mirror its object; it consciously (so to speak) deforms its object. The critical act therefore involves no more (and no less) than a certain perspective on the object, its acuity of perception being a function of its self-conscious understanding of its own powers and limitations. As della Volpe shows, it stands in a dialectical relation to its object, which must always be a transcendental object so far as any act of critical perception is concerned. This transcendental condition is a necessity because the object perpetually shifts and mutates under the influence of its perceivers. The critical act is a kind of conversation being carried on in the midst of many like and impinging conversations, all of which might at any point be joined by or merge into any of the others.

Aesthetic forms recreate—they “stage” or simulate—a world of primary human intercourse and conversation. As with their reciprocating critical reflections, they manipulate their perceptual fields to generate certain dominant rhetorics or surface patterns that will organize and complicate our understandings. An important critical maneuver, then, involves dislocating or “deforming” those dominant patterns so as to open doors of perception toward new opportunities and points of view. A dominant self-representation of *Paradise Lost* is to “justify the ways of God to men.” That famous dislocater of texts, William Blake, accepted the literality of Milton’s text but utterly deformed its meanings, as it were: to Blake, the words “justify,” “God,” and “men” signify in ways that Milton could hardly have imagined. The all but complete inversion that Blake’s interpretive moves bring to Milton highlights one of the most important features of imaginative works: that they are incommensurate with themselves at all points.

The Blake/Milton relation highlights the general relation that critical deformations bear to aesthetic incommensurability. Blake knew very well that he had deformed the great Puritan, who was also his master spirit. Blake’s works are what he called “Buildings of Los(5),” consciously written
under the rubric “I must create a system or be enslaved by another man’s.” That famous declaration draws on a peculiar Blake lexicon, however, in which the word “create” and its cognates are synonymous with the word “error.” This is why Blake will speak of “Error or Creation” and go on to assert that “Error is Created Truth is Eternal.” His brief epic Milton is a deformed reading of Paradise Lost and Paradise Regained. Its acuity—that is to say, its power to elucidate Milton’s work—is a direct function of the “errors” that it deliberately creates in relation to that work.

Critical deformations can be usefully undertaken either randomly or according to a set of pre-arranged protocols. I have found, for example, that when certain of the standard filter protocols in Adobe Photoshop are applied to paintings—D. G. Rossetti’s paintings, for instance—interesting structural features get exposed to view. Using the edging protocol to make arbitrary transformations of a number of Rossetti’s pictures revealed, for example, that many of the pictures, and almost all of his famous portraits of women, are dominated by patterns of interlocking vortices and spirals. He plays numerous variations on these patterns, which are evidently the result of conscious purpose. This key structural feature of Rossetti’s pictorial work has not been previously noticed or commented upon. It is a feature that leaps into prominence when these random deformations are passed through the pictures.

We now see that a useful set of image-editing operations could be established that would have two important critical functions: first, to expose characteristic formal features of pictorial works; and second, to release perception from the spell of precisely those kinds of characteristic formal patterns and open a perception of different arrangements and patterns. For the truth about works of art—textual, pictorial, auditory—is that they are, in Tufte’s word, “multivariate.”

There is an interesting moral to the story I’ve just told about critical reading as a deformance procedure. Although I’ve been familiar with the idea since at least the mid-1960s, when I first read Galvano della Volpe and when my lifelong interest in Blake’s work began, I did not come to realize its claim to generality until I encountered the recalcitrance of digital images. Unlike language objects, once a visual object—a painting or drawing or photograph—is digitally reconstituted, it resists further moves to mirror or translate it. Playing and doodling with digital images in Adobe Photoshop one day—it happened casually and with no deliberate goal in mind—I suddenly saw that the resistance of the image was in fact a critical opportunity and not an impasse at all.

That realization brought additional unexpected consequences for the
way we were conceiving *The Rossetti Archive's* digital texts and the problems we were having in marking them for automated computational analysis. We knew from the outset of the project that digital images stood apart from the computational resources of the new technology and we came quickly to realize how difficult it would be, except in the most elementary ways, to integrate automated text analysis into the information contained in digitized images. But it was dismaying to discover how much of Rossetti's poetry—how much of his strictly textual work—escaped our powers to represent it critically.

Our failures with implementing some of the goals of *The Rossetti Archive* were bringing a series of paradoxical clarities not only about our digital tools but even more about the works those tools were trying to reconstitute. We realized that we were making inadequate assumptions about such works, and that we were using tools designed through those assumptions. That realization turned us back to reconsider the logical and ontological status of the original works. I am convinced none of us will get very far with our new digital tools unless we first undertake a thorough reconsideration of this kind.

First of all, a little history. The discipline of humanities computing developed in the field of linguistics, where scholars realized that computers would be extremely useful for carrying out automated pattern searches across large bodies of linguistic data. As a consequence, the textual corpus, even if it was in *fact* a poetical corpus, was framed for computational purposes as if it were informational or expository. Consequently, the tools that emerged to mark electronic texts for search and analysis also assumed that their object would be the exposure of the informational content and expository structure of the text.

The problem is that poetical works, insofar as they are poetical, are not expository or informational. Because works of imagination are built as complex nets of repetition and variation, they are rich in what informational models of textuality label "noise." No poem can exist without systems of "overlapping structure," and the more developed the poetical text, the more complex are those systems of recursion. So it is that in a poetic field no unit can be assumed to be self-identical. The logic of the poem is only frameable in some kind of paradoxical articulation such as: "a equals a if and only if a does not equal a."

Let me illustrate the truth of that formulation with a couple of very traditional interpretive examples. I'll begin with a famous sonnet by Gerard Manley Hopkins that illustrates in a dramatic way how textual objects of this kind are not self-identical.
As Kingfishers Catch Fire

As kingfishers catch fire, dragonflies draw flame;
As tumbled over rim in roundy wells
Stones ring; like each tucked string tells, each hung bell's
Bow swung finds tongue to fling out broad its name;
Each mortal thing does one thing and the same:
Deals out that being indoors each one dwells;
Selves—goes itself; myself it speaks and spells,
Crying What I do is me: for that I came.
I say more: the just man justices;
Keeps grace: that keeps all his goings graces;
Acts in God's eye what in God's eye he is—
Christ—for Christ plays in ten thousand places,
Lovely in limbs, and lovely in eyes not his
To the Father through the features of men's faces.

The first statement in this text offers a paradigm of its duplicities. The word "As" here operates simultaneously in a formal and in a temporal sense (so here it means both "Just as" or "In just the way that" and also "While" or "At the same time as"). The repetition of the word in line 2 underscores its variational possibilities because the poem's second statement introduces an altogether new grammar. Then comes what at first might be taken for a synonym of "As," the word "like," which introduces the sonnet's third syntactic unit (running from the third word of line 3 through line 4). This unit of syntax appears to have the same general form as the sonnet's opening unit, but when we press it more closely we watch it shapeshift into a new and unexpected grammar. Once again the move comes through duplicitous word usage. The word "like" here functions simultaneously as a conjunction (a synonym for "as"), as an adverb (meaning "alike"), and as a noun (in the sense of "kind," as in the word "mankind").

There's nothing unusual about this passage from Hopkins. Poets do this kind of thing all the time, it is the very essence of poetical textuality. I choose the passage not exactly randomly, however, but because its complexities are so apparent and so dramatic. In four lines an amazing kind of textual metastasis has unfolded and I have not even come close to an adequate exegesis of what is happening here. The phrase "catch fire," for example, normally suggests—as our dictionaries tell us—a passive eventuality, but in this case a feedback loop causes another textual metamorphosis, so that the word "catch" turns active, as if this kingfisher were catching
fire as it hunts and catches fish. This transformation occurs because the phrase is affected retroactively, as it were, by the syntactic rhymes that immediately follow the phrase in the next two lines ("kingfishers catch fire," "dragonflies draw flame," "stones ring").

Imaginative textual objects regularly work through these kinds of transformations, feedback loops, and complex repetitions. All are forms or types of what we call "rhymes," that staple poetic device illustrating the algorithm I set out above: "a equals a if and only if a does not equal a."

The nonhierarchical character of these transformations and rhymings emerges very clearly in the sestet of this sonnet. Look carefully at lines 12–14. The word "plays," probably the pivotal word in the poem, involves a most cunning kind of textual wit. It conceals a pun whose "other meaning," so to speak, is "prays." Why is this so? Because the word is syntactically linked to a predicate complement that only comes to us in the final line, in the phrase "To the Father." The text of the poem generates the literal phrase "plays... To the Father." The oddness of that phrase doesn't reach us until we have transacted the hiatus of line 13, however, when we suddenly realize that the text has been (mis)leading us to reconstitute the phrase into something more linguistically apt. No one reading such a phrase in the poem's plain context of religious usages can fail to hear the absent but secretly prepared alternative phrase: "prays... To the Father." This is simultaneously a playful and a prayerful text.

But the text has not finished with its games of self-generation and self-transformation. For the play/pray wordgame regenerates itself yet again in a kind of conceptual metatext: The word "prays" means as well "praise." The poem as a whole is a kind of playful prayer of praise "for" Christ and "To" the Father, the word "Christ" being here the text's key figure of individuality, or what Hopkins called "selving."

In all this commentary I've tried to keep my remarks free from any kind of thematic or ideological references. Everything I've talked about has to do with Hopkins's text as a functioning sign system, a structure of signifiers and signifieds. I've done this not because I think "meaning" in a referential sense isn't a crucial part of every textual field, but because I want to demonstrate how full of meaningful activities these fields are even when their referentialities are held in abeyance. (And if we inquired into the acoustic features of the sonnet—a central concern for Hopkins in all his work—we would open up a new world of complex and interlaced relations.)

Look again at line 12 of the sonnet and think about how it prepares us to register the word game that only gets fully exposed in line 14. In line 12 Hopkins has made a text that our mouths will find difficult to transact:
“Christ—for Christ plays.” The problem comes as we try to negotiate a passage from those three r’s to the l in “plays.” Our mouths would find it easier to read “prays” here rather than “plays,” we have to make some physical and mental effort to ensure that we get the given phonetic sequence right. The effort is a perceptual signal that our bodies will not let our minds forget when we come to line 14. And we are prepared for this exercise with r’s and l’s because the sonnet in fact opens its textual field in line 1 with a major deployment of just those phonetic signs.

What is this kind of text, really? First of all, it is both—and simultaneously—a perceptual and a conceptual event. Informational texts seek to minimize their perceptual features in the belief that texts calling attention to their vehicular forms interfere with the transmission of their ideas. The textuality of poetry reminds us of the intimate part that phonetics play in the signifying operations of language. It also reminds us of a second important feature of text: that while it may deploy ordered, even hierarchical, structures of ideas, its object (as it were) is to play with and within such structures and not be consumed by them. Are there such things as pure, nonlanguaged “ideas”? Perhaps. However that may be, when ideas function textually, they commit themselves to fields of perception as well as to systems of conception. So in the case of this sonnet we will want to see that while Hopkins’s Scotist ideas play throughout the text and even comprise its argument, the sonnet is not comprehended in those ideas or reducible to a Scotist description or exposition. No textual event—not the Scotist word “Selves,” not even the word “Christ”—is ever self-identical or self-transparent. Most especially is this true for imaginative texts—where alone we will see an effort to exploit the full resources of textuality.

Let me point out one other feature of this text, a moment of its physical visibility that we may hardly recognize as a visible thing. The wordplay realized in line 14 (Plays/Prays . . . to the Father”) would fail in its remarkable effect were it not for the hiatus in lines 12–13, a hiatus that is constructed as a visible space and a temporal rhythm. I leave for another occasion any discussion of that temporal rhythm and its perceptual character because I want to concentrate here on the visible forms being deployed.

We tend not to notice an elementary fact about printed or scripted texts: that they are constituted from a complex series of marked and unmarked spaces. The most noticeable are the larger regular units—the lines, the paragraphs, or (in verse) the stanzas, as well as the spaces between them. Every one of these spatial units, as well as all the others on a page or in a book, offer themselves as opportunities for nonlexical expression. For a helpful comparison think of the cartoon strip with its sequence of frames
separated by gutters. The force of cartoon narrative is always a function of the energy generated in those gutters, where the work’s inexplicit but crucial relations are solicited in the reader’s imagination. Ballad poems regularly treat their stanzas in exactly the same way, and all good writers learn to exploit the spatial fields of their texts. A procedural gap organizes the continuous play of differences between the physical lines of a poetic form and the grammatical order playing in the form. The divisions in long poems and prose fictions create opportunities for building relational nets across the framed areas of the text.

It is highly significant that readers of books move from recto to verso, that their field of awareness continually shifts from page to “opening” (i.e., the space made by a facing verso/recto), and that the size of the book—length, breadth, and thickness—helps to determine our reader’s perceptions at every point. Texts are not laid out flat on plane pages, and if I were to open the subjects of typefaces or calligraphic forms, of ink, of paper, and of the various ways marks can be scripted or printed, the multivariate manifold of the book would be easily recognized. Entering those subjects shows why a fine press book is not just another pretty face—at least not the ones that have given thought to themselves. When William Morris re-issued The House of Life, his friend Rossetti’s masterwork, as a Kelmscott Press book, the point was to help readers perceive the sonnets more thoroughly than they might in the previous trade editions. The Kelmscott edition rad-
ically alters the spatiotemporal field of the sonnet sequence. It is nothing less than what we would now call a new “reading” of the sequence.

But even these examples can be misleading if they suggest that bibliographical space is a matter of solid geometry. To help dispel that possible illusion I offer the example of a seventeenth-century poem titled “To the Post Boy.” This example comes to shift our angle of focus, so to speak, and to expose networks of dispersed visibilities.

To the Post Boy

Son of A whore God dam you can you tell
A Peerless Peer the Readiest way to Hell?
Ive out swilld Baccus sworn of my own make
Oaths wod fright furies and make Pluto quake.
Ive swied more whores more ways than Sodoms walls
Ere knew or the College of Romes Cardinalls.
Witness Heroick scars, look here nere go
Seer cloaths and ulcers from the top to toe.
Frighted at my own mischieves I have fled
And bravely left my lifes defender dead.
Broke houses to break chastity and died
That floor with murder which my lust denied.
Pox on it why do I speak of these poor things?
I have blasphemed my god and libelled Kings;
The readiest way to Hell come quick—
Boy nere stirr
The readiest way my Lords by Rochester.

This work illustrates another mode of textual instability operating at a
translinguistic level. The issue gets focused as a problem of attribution:
We aren't sure who authored this work, and the uncertainty affects every
aspect of the poem's textuality. Most of the primary textual witnesses—
late-seventeenth- and early-eighteenth-century manuscripts and printed
texts—assign the poem to Rochester, hence seeing it as an astonishing
piece of self-directed satire perhaps designed to frustrate and undermine
his enemies and their literary devices. The dialogue-poem would show that
Rochester could write satire, even against himself, that none of his antagonists could match.

But certain early witnesses, as well as some later scholars, don't read the
poem as Rochester's but as the work of one of his enemies.

The issue, on current evidence, is in fact undecidable, although scholarly
opinion today inclines toward favoring Rochester's authorship. (Not very
long ago opinion went the other way.)

The poem therefore gets framed in three optional ways: as Rochester's
work, as the work of someone else satirizing Rochester, and as a kind of
duck-rabbit lying open to either and both readings simultaneously. Those
frames, we want to remember, are part of the textuality of the work and
they are deeply imbedded. But they run through the text in visibilities that
extend far beyond what we might register as the work's plane or solid
geometries. Indeed, they only appear as bibliographical and manuscript
data scattered in disparate and disjunct materials—documents now housed
separately in many libraries (the British Library; the Victoria and Albert
Museum; Ohio State University library; the Österreichische Nationalbibliotek, Vienna; and the Bodleian). In those documents and their complex
interfaces we trace out that crucial and fundamental feature of every text:
its transmission history—which is to say, we trace out the remains of those
earliest readers who half perceived and half created this text.
Every document, every moment in every document, conceals (or reveals) an indeterminate set of interfaces that open into alternate spaces and temporal relations.

Traditional criticism will engage this kind of radiant textuality more as a problem of context than a problem of text, and we have no reason to fault that way of seeing the matter. But as the word itself suggests, "context" is a cognate of text, and not in any abstract Barthesian sense. We construct the poem's context, for example, by searching out the meanings marked in the physical witnesses that bring the poem to us. We read those witnesses with scrupulous attention, that is to say, we make our detailed way through the looking glass of the book and thence to the endless reaches of the Library of Babel, where every text is catalogued and multiply cross-referenced. In making this journey we are driven far out into the deep space, as we say these days, occupied by our orbiting texts. There objects pivot about many different points and poles. The objects themselves shapeshift continually and the pivots move, drift, shiver, and even dissolve away. Those transformations occur because "the text" is always a negotiated text, half perceived and half created by those who engage with it.

For several centuries—but only for several centuries—our models for knowing have been "scientific" and were cast in informational and expository forms. Those forms do not normally cultivate self-reflection, however deeply they may reflect upon matters they set apart from themselves to observe and interrogate, and least of all do they practice self-reflection on their medium of exchange. But that kind of reflection is precisely what happens in imaginative work, where the medium is always the message, whatever else may be the subjects of the work.

Let's look at one other example—a short passage of four lines in one of the most famous poems in our canon of English verse. This is the opening of the second stanza of Keats's "Ode on a Grecian Urn."

Heard melodies are sweet, but those unheard
Are sweeter; therefore, ye soft pipes, play on;
Not to the sensual ear, but, more endear'd,
Pipe to the spirit ditties of no tone:

I want to focus on one aspect of these lines—the game of wit that carries the argument for the existence of "unheard" melodies. Keats is of course making a general allusion to the ancient idea that the phenomenal world is governed by a "music of the spheres," a system of transcendental and ulti-
mately mathematical relations. This music, Keats's poem argues, is present and operating in the very poem he is writing and we are reading. In the poem we don't "hear" the melodies, we see them. Keats accomplishes this remarkable effect by exploiting some of his text's elementary bibliographical features. The words "unheard," "ear," and "endear'd" are rhyme words, as are the words "on" and "[no] tone." The fact that the phonemes of the end rhymes (lines 1 and 3 and 2 and 4) are different amounts to a figural representation of an unheard melody—as if the phonemic equivalent of these morphemic equivalences existed elsewhere, in some other musical order where "unheard," "ear," and "endear'd," or "on" and "tone," would all be (so to speak) perfect rhymes.

Note further how this particular effect is a function of the general material form of the stanza. Read at another another scale—recall the discussion in the last chapter of Byron's "To the Po"—we realize in a general way how that form might serve other functions: for example, how the stanza is in itself, and irrespective of its words, a narrativizing unit. The evolved set of conventions for coding verse in typographical space offer great resources to the artistic imagination bent upon developing complex autopoietic forms. Historical circumstances enrich the possibilities even further. Shakespeare's sonnets, for example, and Elizabethan poetry in general, develop remarkable effects by exploiting a nonstandardized orthographical situation. Or consider Emily Dickinson and the dazzling games she plays with the material forms of scripted letters. The poem beginning "Many a phrase has the English language" is particularly arresting. In one important perspective, for example, it is a poem "about" "the English language" in its special American dialect. To define her exposition—the poem is an exposition—Dickinson plays various games with codes of orthography and the bibliographical codes for representing verse.9

The passage from Keats foregrounds another matter of great importance. We do well to point out the symmetry Keats develops between these material forms of code and the signifieds that these forms attend upon—the poem's subject matter or thematic content, as we say. But note the asymmetry that leaps into play through the rhymes dominating the integrity of the third line. "Ear" and "endear'd" rhyme with each other for no apparent cognitive "reason," they develop what Susan Howe would call a "sumptuary value." Read at the scale of the "unheard," "ear/endear'd" textual unit, the rhyme words in line 3 comprise a symmetrical form, as we have seen. But the "law" of the line unit forces the two words into another relational order within line 3, where we (now, also) read them only in rela-
tion to each other. Seeing/hearing that particular rhyme unit we suddenly become aware that the text’s phonemic arrangements and its thematic arrangements may as easily run cooperatively as independently, may merge into simultaneous symmetries and asymmetries.

The line exhibits in the clearest way what I mean by a quantum poetics. Aesthetic space is organized like quantum space, where the “identity” of the elements making up the space are perceived to shift and change, even reverse themselves, when measures of attention move across discrete quantum levels. The effect is especially notable because of the linguistic possibilities we can’t fail to register in the word “endear’d” itself, at yet another change of scale. The words “end” and “ear” emerge full of sight and sound, if not fury, but signifying. . . . what exactly? The text begins to spin off in a local moment of “wild surmise” as the word’s letters dance their strange arrangements and forms.

Note that if we pursued the other notable tripartite rhyme unit in this passage—the words “on,” “no,” and “tone”—we would arrive at a similar set of observations. Indeed, the distinctive set of symmetries/asymmetries we might observe and track between this pair of triple rhymes exhibits yet another quantum measurement of the verse. The moral? Nothing in this space is self-identical as such.

Content in poesis thus tends to involve more broadly “semiotic” rather than narrowly “linguistic” materials. The perceptual features of text are as apt for expressive purposes as the semantic, syntactic, and rhetorical features—at least so far as the poets and readers who make such texts are concerned. Every feature represents a determinate field of textual action, and while any one field might (or might not) individually (abstractly) be organized in a hierarchical form, the recursive interplay of the fields appears topological rather than hierarchic. The organization is more like a mobile with a shifting set of poles and hinge points carrying a variety of objects, many of an “opposite and discordant” character, as Coleridge might say.

Considered strictly in terms of bibliographical codes, then, poetical works epitomize a crucial expressive feature of textuality in general: that it can be seen to organize itself in terms of various relational segmentations and metasegmentations. Some elementary segmentations are sentences, paragraphs, chapters; in verse, lines, inter- and intralinear forms (rhyme, for example, and metrical forms), stanzas, cantos; in the page, the opening, the book. These segmentations may be usefully traced to the level of the individual character and, in general, to font and typeface design. Then, attend-
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ing to different kinds and scales of segmentations—recall the example of Rochester above, and the Byron illustrations in the last chapter—we trace out further types of metasegmentations.

All of this phenomena exhibits quantum behavior. We distinguish a structure of relational segmentation in any text, but in autopoeic forms we observe as well that the segments and their relations cannot be read as self-identical. They mutate into different symmetries and asymmetries.

Which brings me back to Edward Tufte and the opening sentence of his influential book *Envisioning Information* (1990):

> Even though we navigate daily through a perceptual world of three spatial dimensions and reason occasionally about higher dimensional arenas with mathematical ease, the world portrayed on our information displays is caught up in the two-dimensionality of the endless flatlands of paper and video screen." (12)

So acute and arresting is Tufte's appreciation of textual graphics that we tend to pass over a crucial piece of misinformation that his work has envisioned. Despite what he says, we do not "navigate daily through a perceptual world of three spatial dimensions," although it is true that we often think we do and even represent ourselves as doing so. Nor are we doomed, when we transact our books and our monitors, to "the two-dimensionality of the endless flatlands of paper and video screen." Even our daily movements are "multivariate" and n-dimensional, and when we imagine ourselves passing through a world of three dimensions we are merely surrendering to a certain type of perceptual filter. It is a filter regularly exposed and repudiated by an imagination like William Blake's, as my epigraph suggests. *Every* page, even a blank page, even a page of George W. Bush's ignorant and vapid prose, is n-dimensional. The issue is, how clearly has that n-dimensional space of the page—its "multivariate" character—been marked and released?

To see that truth about paperspace seems to me especially useful in an age fascinated to distraction by the hyperrepresentational power of digital technology. We want to remember that books possess exactly the same powers, and we want to remember not simply to indulge a farewell *nostalgia* at the twilight of the book. One of the great tasks lying ahead is the critical and editorial reconstitution of our inherited cultural archive in digital forms. We need to learn to do this because we don't as yet know how. Furthermore, we scholars need to learn because it is going to be done, if not
by us, then by others. We are the natural heirs to this task because it is we who know most about books.

When we study the world of books with computers we have much to learn from our subjects. In crucial ways, for instance, a desk strewn with a scholar's materials is far more efficient as a workspace—far more hypertextual—than the most powerful workstation, screen-bound, you can buy. Or consider this: If these new machines can deliver stunning images to our view, the only images they understand are their own electronic constructions. Original objects—visual, audible—remain deeply mysterious to a computer. If a computer serves up, say, a facsimile of Rossetti's painting *The Blessed Damozel*, its most effective means for understanding that image—for analyzing it—are through sets of so-called metadata, that is, logical descriptions introduced into the electronic structure in textual form. Even when (some would say "if") that limitation gets transcended, logical ordering through metadata will never *not* be a part of computerized scholarship of literary works. The objects of study demand it—just as the physical sciences, for all their use of mathematical models, cannot do without empirical investigations.

And there are more serious problems. Scholars are interested in books and texts as they are works of "literature" and imagination, but those who design computerized tools sometimes seriously misunderstand their primary materials. So far as I can see, nearly all the leading design models for the scholarly treatment of imaginative works operate from a naïve distinction between a text's "form" and "content." So in a recent essay the brilliant computer-text theorist Steven DeRose writes that "A book is 'the same' if reprinted from quarto to octavo and from Garamond 24 to Times 12 in all but a few senses." Andus and the fifteenth-century humanist printers knew better (and so, I am sure, does DeRose). Those "few senses" are never nontrivial, and in many cases—a list is too easy to develop—they carry the most profound kinds of "content."

DeRose's ill-judged remark is commonplace truth among those who are making decisions about how to design scholarly tools for the computerized study of literary works. Poems, for example, are inherently non-hierarchical structures that promote attention to varying and overlapping sets of textual designs, both linguistic and bibliographical. But the computerized structures being imagined for studying these complex forms approach them as if they were expository, as if their "information" were indexable, as if the works were not made from zeugmas and puns, metaphors and intertexts, as if the textual structure were composed of self-
identical elements. Some textual information in poems is indexable, but nearly everything most salient about them is polyvalent. So far as imaginative works are concerned the equation remains: "a equals a if and only if a does not equal a."

Not to despair, however. Like the appearance of the codex nearly 2,000 years ago, like the advent of printing in the fifteenth century, the computer comes bearing great promise to literary scholars.

"But will we be assimilated? Is resistance futile?" There are no aliens here, no struggle between books and computers. From now on scholarship will have both, willy-nilly. The question is—the choice is—whether those with an intimate appreciation of literary works will become actively involved in designing new sets of tools for studying them.
Since the 1990s, the extraordinary impact of individuals affiliated with the arts starting “grassroots wildfires” and “building guerilla technologies” in their quest for creative intervention has flourished onscreen. That context is important for this phenomenon is obvious. Computer games are more profitable and popular than ever before and have become a major cultural medium crossing a wide range of social, economic, age, and gender categories. Indeed, from casual games played on the Internet to large-scale stand-alone games like *The Sims*, *Metal Gear*, *Bioshock*, or *Grand Theft Auto*, or the millions of players in massively multiplayer online role-playing games (MMORPGs), the popularity of computer games suggests a “revolution” measurable in terms of financial, social, and cultural impact.¹ As a cultural medium, games carry embedded beliefs within their systems of representation and their structures, whether game designers intend these ideologies or not. In media effects research, this is referred to as “incidental learning” from media messages. For example, *The Sims* computer game is said to teach consumer consumption, a fundamental value of capitalism. Sims players are encouraged, even required, to earn money so they can spend and acquire goods. *Grand Theft Auto* was not created as an educational game, but nonetheless does impart a world view, and while the game portrays its world as physically similar to our own—setting one of its stories and action in the city of Miami, for example, and presenting humanoid avatars as characters—the game world’s value system is put forward as one of success achieved through violence, rewarding criminal behavior and reinforcing racial and gender stereotypes. Many scholars, game makers, and consumers observe that computer games can embody antagonistic and antisocial themes including theft, violence and gore, cruelty, problematic representations of the body in terms of gender and race, and even viciously competitive approaches to winning as a primary game goal.² While these practices are, of course, not the case for all games, related issues arise in a significant number of popular games and frequently overwhelm other,
Chapter 7

subtler interactions and representations. At the same time, artists continue to use games to take on social and cultural issues. Although much of contemporary play takes place online and onscreen in commercial environments, an exploration of computer-based artists’ games is essential to understanding the complete picture of contemporary critical play.

As mentioned earlier, the popularity of online networks, peer-to-peer exchange, and games have made playculture itself into a type of revolution. However, as formative cultural artifacts, games and game cultures are problematic. First, the computer games industry around the world is not inherently diverse. In the United States, for instance, the statistics in the game industry mirror those in other computer-related fields, and the demographic of the games workforce—the people who make the games—reflects the overall, limited expertise of the general public in computer languages and technologies. The number of women enrolled in computer science degrees has, surprisingly, declined considerably in the last twenty years.1 Black and Hispanic Americans represent a small percentage of all computer systems analysts and computer scientists working in the field, and well under 10 percent of programmers.4 The inequities that result are troubling, especially at a time when computers have become central to most disciplines and when computer games are emerging as a dominant medium. Researchers have described the dearth of diversity in technology professions as a social justice issue.5 As noted by many industry insiders, the vast majority of technology companies that produce games do not target women or people of color as players.6 Therefore, as gaming drives the development of new technology, and new technologies are made by a consistently similar demographic, the cycle of technological innovation and games entertainment remains fairly consistent. This has the unfortunate affect of keeping high-tech domains primarily white, primarily male, and primarily profit driven.

Therefore, commercial, masculine computer artifacts have taken pride of place in contemporary culture, whereas noncommercial technology tools, including artistic games, are relatively rare. Artist Martha Rosler argues, “Art with a political face typically gains visibility during periods of social upheaval.”7 The information revolution continues to be a disruption of older, more traditional modes of production and labor. With this change have come both an inscription of new technologies across more traditional roles, and also a significant movement towards the monitoring and control of the individual. This technological adoption and adaptation creates a continued disparity in working conditions, privacy, privileges, and wages, even in Western high tech arenas.8 The computer is a portal to digital culture; however, it is more than a tool. Technological literacy and competence are essential to disadvantaged groups, which are once again in an unequal position in terms of experience and ranking in key
fields. Artists and activists tend to be the ones who uncover such realities experientially, sometimes by playfully making work that comments on technology itself.

At the same time, within the culture of computer games, race, ethnicity, language, and identity relations including gender emerge as complex and contradictory. According to a recent Pew Research study, game playing is universal among young people. Women also do play games, yet this play emerges differently than the play of their male counterparts. Women are perceived to be the primary audience for casual games, for example. In Western countries, computer games are still perceived as an arena created by and for white men, with women comprising approximately 10 percent of the game development workforce in the United States. Current trends indicate that those who label themselves as gamers are moving out of the PC game market and onto consoles, while female players and those new to gaming, such as older age groups, may be migrating to the PC for casual games, to cell phones, Wii-style systems, and handheld devices for play across mobile technologies. An entirely new group of adult female gamers emerged to play online social games such as *The Sims Online*, *EverQuest*, *Uru*, and *World of Warcraft*. Games that depict everyday activities such as communication, social negotiation, caring for elements or characters that are part of a game world, or stabilizing precarious situations have become extremely popular with female players. In 2003, for example, it was a novelty to have more than one hundred thousand simultaneous players in an online game, but this happened in the game *EverQuest*; subsequently, the massive multiplayer *World of Warcraft* claimed a total of ten million users signed on in 2008 and broke *EverQuest*’s simultaneous player records.

Despite contradictions in data, there is evidence that women constitute either the largest, or second-largest, group of online gamers. The largest group has been cited as women aged thirty-five to forty-nine. Games journalist Kris Oser notes that women players, however, are still almost an invisible constituency to advertisers and game designers. While the statistics show us that women are increasingly playing games, few are envisioning and constructing these software environments. On top of these industry figures, few contemporary artists engaged with games are women.

Despite the probable social benefits that could result, game designers have yet to grapple with the full range of inequities ingrained in the player categories and game models exhibited in most of today’s games. Possible overcategorization or reductionism from such classifications—for example, which designers are included under the rubric of “activist games”—is worth risking should such research provide for useful discussions, the design of alternate subject positions, new possibilities of agency, a revitalization of authorship, the promotion of equity, or other redefinitions of the cultural constructs currently embedded in digital environments.
In a further complication, the lack of diversity in the creative documentation by those at work in these movements makes it challenging to trace any historical practices that lie on the fringes of the accepted art world. Other than Alison Knowles’s *House of Dust* (1967), for example, there may be no earlier accounts of the development of full-blown computer games by women until *Mystery House*, an interactive narrative game by Roberta and Ken Williams and the first computer game to incorporate graphics of any kind (1980). In addition, there is poor representation of artists of color in these art movements, and a lack of designers, scientists, and others of color in contemporary gaming culture. Female artists and scientists, as well as artists and scientists of color, have certainly been involved in the major art and technology movements in the twentieth century—or have worked in parallel to them. More documentation and inspection is needed to broaden the way in which their recorded histories are shaped. The dearth of women and people of color represented in art history needs to become part of the investigation in critical practice.

Given the limitations outlined, the artists’ work explored here, historic and contemporary, responds to the commercial ubiquity of play. At the moment, computer and locative games are especially prominent aspects of playculture. From war simulations to Bulletin Board System style chess to 3D computer games, digital technology has been inherently bound with interactivity and diversion, and artists who engage in computer-based creation and critique represent the majority of contemporary examples of critical play. Questions surrounding participatory play and multiuser participation within the creation and reception of artistic, game-related works should, therefore, at least be introduced. Players of popular games may reskin, redesign, and indeed, reissue scenarios in online game environments such as *Second Life*. Music fans may download, upload, mix, and remix popular and independent music. The web can continue to provide a unique space where mainstream meets cult interests, creating subspecializations and massively multiplayer environs numbering in the millions of players. But, are artist-produced computer games, as systems, reinventing how these practices and their artifacts, how the culture, are constituted? What are the social ramifications of artist-produced computer games? How are these ramifications playing out? Above all, by what means do such works achieve in terms of critical discussion, dialogue, or interaction?

First, artists’ games by definition take an “outsider” stance in relation to a popular, commercial games culture. This position itself suggests alternate readings of contemporary issues in electronic media and offers the possibility of commentary on social experiences such as discrimination, violence, and aging that traditional gaming culture either avoids or unabashedly marks with stereotypes. With her low-tech
game projects, California artist Natalie Bookchin uses humor, low-tech graphics, and juxtaposition to place the player in various difficult, challenging, or paradoxical situations. Bookchin’s use of both political and personal stories emphasizes ideas about the exterior and interior worlds of a game.

Best known of Bookchin’s gaming works is her influential narrative project *The Intruder* (1998–1999). Working from a short story by Jorge Luis Borges, “La intrusa,” the game takes the participant through ten arcade-style games as a means of interactively conveying the narrative. Readers or “players” interact with the simple arcade puzzles to advance the plot. Text and spoken-word narration, of a sort, emerge as players engage in what presents itself as a classic arcade system.

“La intrusa” was first printed in the third edition of *El Aleph* (1966) and was later included the volume *El informe de Brodie* (1970). As in the original Borges story, the game too is set in the 1890s. Cristián and Eduardo Nilsen, two close brothers known for their fierce behavior, both fall in love with the same woman, and decide to share their intimate relationship with her. The woman, named Juliana, is later perceived to come between the violent brothers, causing emotional conflict. The narrative is distributed across a series of mini-games. Encountering and defeating, or outthinking, the small games that lie along the narrative path enables the player to move the story forward (figure 7.1). With each game move, the player earns a sentence or phrase. Players learn about the brothers’ relationship, their history, and their fights over Juliana. As the narrative progresses, things become more complicated. When the brothers
decide that Juliana is getting in the way of their close relationship, they have her pack up her meager belongings in a bucket and sell her to a whorehouse.

This part of The Intruder may help game designers explore levels of abstraction and narrative that become a part of any critical game. Rather than set the game in the whorehouse, or depict the two brothers with Juliana’s belongings, the image onscreen is abstracted in space and situation to feature simple elements of the narrative like the text, the belongings of the character, the props from the story, and the upfront images of a nude woman.

As The Intruder begins, players are presented with the image of a woman’s bare underside situated over a bucket (figure 7.2). In this game, it is the woman’s body that literally produces the story, as though the story was a kind of birth. The female body also produces trinkets the player must catch while maneuvering the bucket. This loaded image represents several narrative layers: Juliana’s meager possessions, her own status as a possession of men, and the value of the woman’s body as replaceable in the narrative, to be exchanged for her sales price to the whorehouse.
Rather than a celebration of the brothers’ fraternity, or an inscription of a “cult of masculinity,” a growing feeling of helplessness engulfs players of *The Intruder*. The narrative is dark, brutal, and compelling, but Juliana, so important to the story, is rife with mystery. She cannot speak. Who is she? What does she look like? Bookchin removes the character’s last name to further impersonalize her in the telling.

In another mini-game in the same story collection, Juliana emerges as a silent, pixilated figure. Players immediately know this figure to be Juliana, yet she is never given dialogue or a voice. As the story unfolds around her, the Juliana character becomes a mere blocky shadow produced by the men’s desire. The game’s aesthetic further supports this narrative evolution. While the background graphic is somewhat detailed, in a high-contrast photograph of a rustic street, the closer human figure is obliterated in chunky pixels. Game players maneuver Juliana down the street, causing her to run or jump, and eventually advancing the narrative when the character falls into the traps set for her. These are inevitable. Juliana’s possible actions and the meaningful choices that players make along with this character are irrelevant. Participants must oblige this framework to continue the narrative.

The story and the interaction in *The Intruder* may appear at odds with each other until the players understand the futility of Juliana’s agency. The set of games are designed to establish a gap between successfully advancing the story and compromising the safety and well-being of the character. The disjunction between interaction and narrative is deliberate, a gap that could be a site for critique or irony. To activist designers, irony is one of many strategies of critical play.

In *The Intruder*, Bookchin’s low-tech graphic style and her narrator’s solemn reading ironically subvert the arcade-game art concept. While the story itself is written by a Latino, the pieces excerpted into the games are narrated, when there is voice at all, by a Latina. Since the narrative involves the control of a Latina character, having a Latina both participate in the narrative and refute, or at least cause us to reflect upon the issue of voice by reading the text aloud, is an important aspect of the artwork. Here, Bookchin not only unplays game conventions—for example, the narrative advances when Juliana falls into the hole, which, in other games, would represent failure or restarting—she also rewrites questions of authority, identity, and representation in games through the confusion of narrative voice. This rewriting is particularly evident in the position of a game player versus that of a reader. Game players participate in the construction and evolution of narrative in different ways than in traditional textual forms. *The Intruder* narrative grows to become particularly effective and poignant because players, the once-“innocent” (perhaps) readers of text, now
find themselves actually participating in the abuse of Juliana in the interactive format of the game.

What is most striking about *The Intruder* as an interactive work is not the assembly of cute, fun games and their blatant, funny sound effects, but rather how those cute, fun games implicate the participant within what is actually a very dark narrative. The full implications of game interaction style in relation to the narrative become stronger when one takes an actual player into account. *The Intruder* positions users in a precarious and uncomfortable place, rather than the typical “command post” position of power most computer gaming examples provide for players. Software theorist Chris Chesher (2003) explores this unquestioned positioning of power in his work on game interfaces: “The cursor is not telling me something, but indicating that it is listening for my command.”

Players are almost always constructed as powerful agents, superheroes, or even gods. Additional implications of this positioning for the male player or, at least, a male gaze come to the fore given the current focus of much of the games industry. “Control,” Chesher notes, “undermines the liberal notions of privacy based on the inviolability of the subject. It changes what a subject is.”

The complication of Borges’s text and the critique of woman’s position emerge from the “overpowering” control a player must enact to win in this system. The final game in the set transforms the implications of all of the previous games into an indictment. The player takes part in a “fugitive”-style scenario in which he or she guides crosshairs over a pixilated, natural landscape graphic (figure 7.3). The point of view from the crosshairs and the sound of a helicopter let us know we are indeed the hunters and that there is also someone or something to be hunted, in other words, a victim. To complete *The Intruder*’s disturbing narrative, we must aim and “shoot at” a fugitive figure below who, metaphorically at least, must be Juliana. In return, players earn their “reward,” the story’s end. Bookchin’s *Intruder* design invokes violence against the lone female character. Perhaps this paradoxical involvement is a stronger indictment of violence in computer games, or perhaps it should be read as a metaphorical critique of the larger technologically influenced culture to which women do not yet substantially contribute.

Bookchin’s next game, *Metapet* (2002), is an online simulation game that examines the line between work and play (figure 7.4). In the *Metapet* simulation, players create virtual workers of the future in biotech corporations, specifically one fictional company called STAR DNA. The player’s task is to try to help employee characters, who are seated at their desks in a work environment no doubt familiar to many of the game’s players. Employees who can be trained to work more efficiently are

Figure 7.4
allowed to climb the corporate ladder. As a tongue-in-cheek critique, this game allows users to examine worker roles within corporate hierarchies. The game also touches on the constant presence of the network, and the addiction to maintenance brought forth by email, online dating, blogging, social networks, instant messages, voicemail, news feeds, and games like *The Sims*. Activities in *Metapet* include the workers’ constant checking, tweaking, and maintenance tasks as they care for workplace systems. These matters reflect the themes of networked culture inherited from both domestic practices and from the daily grind among the lower echelons of the information technology workplace. In *Metapet*, players are constantly reminded of the ubiquitous presence of the network and of the constant upkeep they themselves do at terminals throughout the day.

Manuel Castells, in his book *The Rise of the Network Society* (1996), notes that the change in the ways technological processes have become organized originates at the shift from surplus value and economic growth to data and knowledge economies. Bookchin’s work makes apparent this economic flow, and goes on to ask, “But at what cost?” The workers at STAR DNA are themselves products of genetic manipulation, optimized for multitasking performance. The network as a conceptual structure plays a vital role in the formation of Bookchin’s work and in many other kinds of Internet art, engaging with systems of information and communication and allowing us to examine links and structures that shape our experience of computer-mediated culture.

In other examples of critical play, computer-based gaming projects may delve into the meaning of identity in culture or more concrete subthemes, such as “woman in games” or “human versus machine.” The issues brought forth by the duality between body and mind are in some ways celebrated by games, where the agency of the physical body only now is beginning to approximate the agency of the virtual. Human computer-interface designer Joy Mountford observed that as “the computer stares back at you, it sees you as one eye and one finger.” In other words, computer interfaces are still designed as if players and users themselves are only partly bodied, or even disembodied. The relationship of the body to the mind, and now to the network, must be better articulated beyond various forms of utopian rhetoric, particularly in the era of the “social networks” frenzy, where ranges of intimacy and knowledge are set computationally, and often by systems designers, rather than by participants. Here, it is worthwhile to remind ourselves that, as architect Karen Franck notes, we “construct what we know, and these constructions are deeply influenced by our early experiences and by the nature of our underlying relationship to the world.” This is true for purely digital experiences as well as for hybrid or physical manifestations of play.
Games that Play Themselves

The computer game is the paradigm for the critical play of other artists as well. Eddo Stern’s work flourishes at the intersection of game-related art and technology works. Dealing with system-on-system interactions and game-related interactions, Stern’s remarkable range of projects has helped define the field of new media art, and larger art and technology practices. His *Dark Game* (2006) is a videogame prototype in which two rivals are deprived of their sight. Like his *Tekken Torture Tournament* (2001), where the injuries of the virtual characters are translated to the physical players, *Dark Game* demonstrates the link between virtual actions and the players’ own bodies. *Cockfight Arena* (2001), perhaps the most whimsical of Stern’s works, consisted of a performance in which players work to control their avatar on the screen while wearing feathered chicken suits embedded with sensors. When Stern’s work borders, or crosses into, the absurd, the resulting players’ actions are most pleasing. The work unabashedly explores masculinity and power issues within commercial games, taking the manifestation of machismo posturing and “the fight” among players to their extremes.

In *Best . . . Flame War . . . Ever* (2007), Stern documented and interpreted heated online arguments as animated collaged characters speaking the dialog. In *RUNNERS: Wolfenstein* (2002), Stern inverted the destruction of World War II by allowing Israeli players to invade Nazi Germany. In addition to large-scale political issues, Stern investigates the mundane everyday experiences of his players. *Fort Paladin: America’s Army* (2003) is a Fisher Price–styled castle that houses the game America’s Army (figure 7.5). Robotic “fingers” play the game manically and repeatedly, like a human player might have to do to stay on top of the game. The game’s play features a repetitive scene: the same character launches the same grenade attack on the same nonplayer characters, or NPCs, and then spawns the same new NPC soldiers to kill again, in an endless loop. By letting the game play itself, Stern’s theories on play and his practice highlight the futility of agency in closed systems. Stern also exposes the iconography of games as fetish items and as forms of cultural shorthand. Demonstrating technical, conceptual, and aesthetic aspects of the work at all times, Stern questions what it means to play critically, opting at times for a system to play itself, as it understands its own rules best.

A Race of Races

In a comment on scientific perspectives and categorization, games and play are also used in the work of Paul Vanouse. One Vanouse work in particular, *The Relative Vélocité*
Inscription Device (RVID) (2002) is particularly important (figure 7.6). In this installation, which consists of a computer-controlled separation gel and DNA and displays, Vanouse runs a live scientific experiment wherein four separate DNA samples from each member of his multiracial Jamaican American family are literally raced in a portable lab. The family members’ DNA samples travel slowly, and in addition to the race action, viewers can read a eugenics treatise that explores the historic positioning of racial identification practices. Vanouse posits, “In 1960, my ‘brown’ mother emigrated to the US from Jamaica, and met my ‘white’ father. Why is my skin color lighter than my sister’s?” With this simple demonstration, Vanouse’s project critically examines the genetics behind even small variations in skin color and the ways in which those variations are transmitted. Vanouse’s intention is not to literalize the genetic variations among mother, father, sister and brother, but to question the validity of such choice in what he calls “scientific spectacles.” The project also brings forward our unease as spectators with regard to our own genetic and racial identity.

Figure 7.5
Eddo Stern’s castle-like Fort Paladin.
Citing the ambitious Human Genome project in his work, as well as past research artifacts like the 1929 tract “Race Crossing in Jamaica,” a three-year study exploring the “problem of race crossing” during a time of racial separatist doctrines, Vanouse is keen to problematize the scientific process on a fundamental level. Vanouse’s work then embodies critiques of science first launched by the Austrian philosopher Ludwig Wittgenstein in his depiction of language as a game capable of representing a system of knowledge, which was later more specifically developed by the American Thomas Kuhn, whose ideas about the nature of the social knowledge produced by science, including the theory that science is inherently political, are well documented. Kuhn’s belief is that science is a game, or is at least modeled on a game metaphor, and that this game, like other social practices, constitutes primarily a language game of power, legibility, and control in the Wittgensteinian sense. If the very working of society is a network of language games, science, with its hyperspecialized language, its particular knowledge, and specific community of authority, must therefore be a subset of such a game, where truth is relative, and where what constitutes fact is instead relative to
one’s subjectivity. Kuhn’s creation of the concept of the “paradigm shift,” a dynamic that models how scientists move from doubt, or even disdain, to consideration and finally acceptance and enthusiasm for new theories reveals the rules by which science operates and delineates how as a system of knowledge, science relies on social and psychological factors.

In terms of critical play, Vanouse reskins the simple interactive display of the race much like a game show from the 1970s invites players to guess the prices of goods or to wager on the success of randomly playable elements (figure 7.7). Even a scientific visualization would both simplify and posit as incorrect assumptions about content. He also unplays the “game” of science, questioning its validity.

Social and psychological factors are key to the work of Wafaa Bilal, an Iraqi-born American artist and U.S. citizen. Bilal’s work explores the position of the Iraqi civilian through technologically mediated games. In May 2007, Bilal confined himself in the Flatfile Galleries in Chicago for thirty days under twenty-four-hour webcam surveillance to raise awareness about the everyday life of Iraqi citizens and the home confinement they face on a daily basis due to violence and surveillance in their cities.
and towns. Titled *Domestic Tension*, this work allowed members of the public to visit Bilal’s project website, watch him via webcam, and shoot him with a remote-controlled paintball gun (figure 7.8).

The work is one of the strongest anti–Iraq war statements made during the conflict, and was followed in over one hundred and thirty countries around the globe. During the month-long exhibition, the site received eighty million hits, and sixty thousand paintballs were shot. The work also featured various forms of player subversion, such as the ability to “unplay” the scenario overall. Several viewers acted by forming “protective groups like the VIRTUAL human shield [sic] SHIELD, who take turns aiming the gun away from Bilal around the clock.” Anonymous comments on popular aggregate sites such as Digg.com noted during the event that the exhibition was “one step closer to stabbing people in the face over the internet.” Another commenter said: “I think the most disturbing part of this exhibit is one of the comments in the chat room. ‘Do we get to shoot more if we donate?’”

Bilal’s incorporation of a mediated-game interface provoked viewers to interaction, encouraging participants to “Shoot an Iraqi.” Bilal, who left Iraq due to imprisonment
and torture during the last Iraq regime because he himself had made anti-Hussein artworks, would conceivably be the last person to face U.S. censorship due to questions of political loyalty. But this was not the case. In 2007, Bilal decided to recreate the 2003 game *Quest for Saddam* as a way to voice a critique of U.S. policies in the Middle East. The original game, using the *Duke Nukem* 3D game engine, asked players to fight generic “Iraqi” soldiers, and to find and kill Saddam Hussein, Iraq’s leader from 1979 to 2003. The game was created by United American Committee Chairman Jesse Petrilla. This first *Quest for Saddam* was reskinned as a “hunt” for George H. W. Bush by the Global Islamic Media Front, a group said to be related to Al Qaeda. Their game, *The Night of Bush Capturing* was hacked by Bilal so that the artist could put his own, more nuanced spin on this epic conflict, in terms of both the actual war and the video game battle.

In *The Night of Bush Capturing: A Virtual Jihadi*, Bilal places himself as a character in the hacked Al Qaeda version of the Petrilla game. The Bilal game narrative is part autobiographical and part fiction: after learning of the real-life death of his brother in the Iraq war, Bilal is recruited by Al Qaeda to join the hunt for Bush. Bilal intends for the work to communicate both the racism and hatred embedded in U.S. games such as *Quest for Saddam* or *America’s Army*. He also aims to demonstrate the difficulty Iraqi citizens face and their vulnerability during recruitment for violent groups such as Al Qaeda, maintaining that ordinary Iraqis have little to show for their “freedom” but incredible loss and violence. “This artwork is meant to bring attention to the vulnerability of Iraqi civilians, to the travesties of the current war, and to expose racist generalizations and profiling. Similar games such as ‘Quest for Saddam’ or ‘America’s Army’ promote stereotypical, singular perspectives. My artwork inverts these assumptions, and ultimately demonstrates the vulnerability to recruitment by violent groups like Al Qaeda because of the U.S. occupation of Iraq.”

Bilal undertook the game modification while a resident visiting artist at Rensselaer Polytechnic Institute in Troy, New York. But close to the time of the scheduled exhibition opening, the school shut down the show. It moved to an alternate art space, and this too was shut down, by representatives of the city government for “code violations.” Although Bilal’s presence was welcome on campus, and his exhibition themes well known, suddenly the artist’s work was perceived as too controversial to support. Bilal believes that during “these difficult times, when we are at war with another nation, it is our duty as artists and citizens to improvise strategies of engagement for dialogue.”
In 2003, the NewsGaming.com team lead by Gonzalo Frasca launched *September 12th: A Toy World* as a reaction to, and criticism of, U.S. policies in the fight on global terrorism (figure 7.9). Named to invoke the World Trade Center bombings of 2001, *September 12th* is a simulation that uses video game technology to model the obvious paradox in the American–Middle East conflict: the problematic inevitability of collateral damage suffered in the standard “combat models” of fighting terrorism. *September 12th* is an interactive toy world that provides “a simple model” players can use “to explore some aspects of the war on terror.”¹ In some ways, the experience is a reskinned version of a classic *SimCity* game, with a highly reduced set of player options.

In *September 12th*, players are presented an isometric view of a bustling town and market, where terrorists and civilians intermingle, and a simple choice: fire or don’t fire. The view offers a “big picture” of a presumably Middle Eastern city. The player’s only available action is to manipulate crosshairs over the view, clicking to fire missiles from far away onto the village. If a player chooses to fire her missiles at the terrorists in the
market, she will quickly find that it is nearly impossible to hit them. The missile will, however, destroy buildings and kill innocent civilians. Shooting again and again is permitted in intervals and only generates more rubble, more mayhem in the village, and more suffering. Civilians left alive after each missile attack weep and mourn the loss of the dead. Soon after, the embittered survivors become terrorists themselves through a shift in animation. If the player keeps firing, in just a few minutes the marketplace will be destroyed and only terrorists will be left to run through the ruins. Described as a simulation on its start page, *September 12th* has no win-or-lose state. Since there is no goal, there can be no obstacles to that goal and so the game has no inherent conflict, except that which might arise in players themselves. Even a simple illusion of a win state cannot be maintained in a game that openly declares it has no end and can’t be won. The lack of an opponent makes conflict or balance irrelevant. The game does not involve any form of progression. There is no learning curve. However, *September 12th* possesses many qualities of both a game and an artwork: it has a clearly defined set of cause-and-effect actions the player can choose to pursue, and the world thoughtfully models a problematic situation that might also classify it as a game for social change. It is also successful at providing a safe way to experience reality, or in this case, a possible playing out of choices which might create a reality. Since the results of the simulation are less harsh than the real situation the game is modeling, with no actual lives lost and no actual terrorists created, the overall effect is what game scholar Chris Crawford labels emotional content: “A game creates a subjective and deliberately simplified representation of emotional reality,” something easily accomplished in a simulation that draws its content from a current situation in the real world.

To game designer Frasca, the task was to demonstrate that destruction of cities and high civilian casualties can only cultivate a climate of resentment, vengeance, and hatred that can spawn new enemies. In short, violence breeds violence. In this way, the *Sims* aspect of the work is rewritten into a futile cycle: players do not work for character happiness and can do nothing to make the lives of the characters better or more productive. Frasca explored different techniques to convey the act of turning regular villagers into terrorists. “What I wanted to show is simply this circle of terror that seems to not have an ending. We tried a traditional morph between the two characters, but we felt it was not clear enough. The technique that we ended up with flashes back and forth between the two characters, and I think it works pretty well.” Frasca noted that all the responses to the game were positive, even among Arabs in the United States. Is the *September 12th* simulation a comment on the term “terrorism” itself? Absolutely. However, in *September 12th*, the message is not only that violence produces more violence but also that the work behind developing the software allows those who engage
with the simple simulation to actively participate in creating meaning. This act, to players, is fundamentally different from reading a static text or visual representation. Another project, Frasca’s game *Madrid*, is a response to the Madrid bombings of 2004. During the rush-hour peak on March 11, three days before a Spanish general election, ten coordinated explosions went off on Madrid’s commuter train lines, killing one hundred and ninety-one people and wounding over seventeen hundred and fifty-five others; responsibility for the event was attributed to an Al Qaeda–style terrorist group. Working as a memorial, Frasca’s *Madrid* is subtle, using suggestion and simple design to attract players and open up the tragedy of the bombings for remembrance and dialogue. The instructions and the game play are simple: the player only needs to maintain the light of the candles held by drawn characters in an act of remembrance. *Madrid* includes a light meter that tracks player process, but, ultimately, the player cannot move back and forth quickly enough to keep all of the candles lit. In many ways the game starts off as a work of mourning, but works to question the very act of staging a memorial for a tragedy, as well as to comment on human memory itself. The game also serves the needs of an activist community around the world.

Jamie Antonisse, Devon Johnson, Chris Baily, Joey Orton, and Brittany Pirello created the game *Hush* in 2008 to explore the 1994 civil war and genocide in Rwanda. Called a rhythm game by bloggers, and a concentration game by players, *Hush* uses the 1994 Rwandan civil war as the setting for a challenging scenario. Players play as Liliane and the goal is to keep Liliane’s baby quiet in order to prevent mother and child from being captured by the Hutu patrol (figure 7.10). The “lullaby” is appealing, consisting of falling letters of words related to the calming of the child. The letters of the word appear quietly on the screen, and must be matched on the keyboard by the player precisely at the point they appear their brightest.

The initial concept for the game was created in a critical play brainstorming exercise for the Values at Play project, an effort of artists and humanists to reflect further on human values in games. Antonisse and Johnson state: “The idea for Hush was actually born out of a Values at Play exercise: We had to create a game from a randomly chosen game mechanic and game theme, and we drew “Singing” and “Human Rights.” The contrast between these two cards posed a challenge and yielded many unconventional ideas, including the core concept for *Hush*. One of the things that attracted us to the concept is that the player isn’t viewing this horrific event from a distance and attempting to “solve the problem”; they are immersed in the moment, experiencing the terror of a Hutu raid. It’s also important that even though the player is not in a position of power, the player still has the noble goal of saving a child.
Game play in *Hush* is quick, but the experience is immersive, with the matching, timed game mechanic requiring full concentration. The game soundtrack convincingly conveys the conflict between staying calm and a surrounding world of mayhem and violence. To game scholar Ian Bogost, “*Hush* offers a glimpse, as it were, of how vignette might be used successfully in games . . . as a vignette of a situation in mid-90s civil war-torn Rwanda, the game is compelling,” for the “anxiety of literal death contradicts the core mechanic’s demand for calm, but in a surprising and satisfying way, like chili in chocolate. The increasingly harsh sound of a baby’s cry that comes with failure attenuates the player’s anxiety, further underscoring the tension at work in this grave scenario.”

Most important, *Hush* explores subjectivity. It is the strength of the belief in a position, from which an experiential “truth” emerges, that helps this game move from a broad statement to a personally moving experience. We can look to the ideas behind standpoint epistemology that open up the possibilities to use games as an approach against power and oppression. Here, Braidotti’s notion of radical forms of reembodiment can work in a game; even though the body is not visibly acting a scene to
an observer, the participant is bodily engaged. While lived experiences culminate in a variety of complex physical, social, and philosophical realities, even simple games such as *Hush* can provide an emotionally complex slice of an experience, and present a layered, “nomadic” perspective by shifting from player, to character, to world citizen and more.

**The Rise of Serious Games**

Artistic interventions in the form of games arise from a number of intentions, including social critique, a need for solidarity and action among participants, and the impulse to stage large-scale games in order to disrupt political scenarios or daily life. Some of those making video games, as we have seen, can be identified as artists. Bookchin, Stern, Vanouse, Bilal, and Schleiner have provided compelling activist models. Bookchin reskins games in light of critique by using existing narrative. Stern rewrites how games work and adds to their complexity. Vanouse brings in a critique of larger epistemological concerns through a look at scientific discourse and classically styled games. Bilal changes the stakes of a game, crossing lines not only in representation but also in national and international comfort levels, ethnic stereotypes, and the power of institutions and the state. Even earlier examples such as Schleiner offer historical precedents for projects that move primarily into the realm of activism. In all cases, digital worlds are enormous sites for the import of content from the real world. These can include social interactions and social constructions like racism and sexism, which can prevail inside particular types of game frameworks.

The examples discussed in the rest of this chapter are described by the terms *serious games*, *games for change*, or *social impact games*. The debate regarding the general use of these terms must be noted. Different groups favor different categorical labels. Games scholar Woods argues that serious games are the goal of those within the game industry for the future of games, noting that many developers wish to create “serious” content or experiences that are typically represented within traditional narrative forms such as books or film. Though these lines are not fixed and easily definable, most in the community understand serious games to be those primarily within the domain of education or military applications. Such games might focus on training for service, disaster relief, hazardous occupations, crime, the redesign of public spaces such as transit systems and parks, or the creation of frameworks for team building.

On the other hand, games for change or social impact games are understood as those that address social concerns more broadly. These might include poverty, racism, bias and discrimination, war and peace, or human rights through education and outreach. There is a fast-growing collection of computer-based games designed to
educate on matters relating to environmental concerns, human rights abuse, worker's issues, land use, and other social ills. These games are often created to address real-world issues or to raise awareness and foster critical thinking. Both categories of games integrate real-world data and stories, focus on education and public opinion, and aim to provide an alternative to existing media on such issues.\textsuperscript{36}

Many social impact games use video game technology in innovative and novel ways in order to convey their messages, but in the end bear little resemblance to existing mainstream video games. This relationship is an interesting one to explore. In his 1984 book, \textit{The Art of Computer Game Design}, Chris Crawford, perhaps prematurely, provided a definition of what games are and how they should be designed. He identifies four elements common to all games: representation, interaction, conflict, and safety. Of the four, the ideas of conflict and safety are the most useful in distinguishing a game from a simulation or other interactive media forms. To Crawford and other game designers, even a social impact game would require conflict:

Conflict arises naturally from the interaction in a game. The player is actively pursuing some goal. Obstacles prevent him from easily achieving this goal. If the obstacles are passive or static, the challenge is a puzzle or athletic challenge. If they are active or dynamic, if they purposefully respond to the player, the challenge is a game. However, active, responsive, purposeful obstacles require an intelligent agent. If that intelligent agent actively blocks the player's attempts to reach his goals, conflict between the player and the agent is inevitable. Thus, conflict is fundamental to all games.\textsuperscript{37}

The absolute insistence on conflict can emerge to be more interesting and subtle. The conflict in \textit{Madrid}, for example, lies in the player's abilities given an impossible task. In \textit{September 12}, conflict is in the player choice itself. Primarily in reference to social activist games, game scholar Shuen-shing Lee refers to these as “you-never-win” games. Lee's theory would be extraordinary familiar to a Fluxus game maker, for art games have a long history of circumventing win and loss states for other themes. Yet in games that attempt to appeal to the vast majority of conventional game players, or those interested in activism without a radical edge, Lee builds on notions from scholars like Janet Murray and offers literature for a model, connecting games for change to the dramatic form of tragedy, where the player is not meant to win because that is what maintains the tragic form.\textsuperscript{38} This idea builds on Frasca's approach. In his now classic “Video Games of the Oppressed,” Frasca points to the playwright Bertolt Brecht's critical play with Aristotelian drama, insisting that actors and audiences remain aware that what they see and engage in is a simulation and that they are
present to provide a critical view. Frasca also mentions Augusto Boal’s “Theatre of the Oppressed,” which strove to tear or break down the fourth wall between subject and viewer.

These theories are important to understanding the strategies behind social impact games. The simulative nature of a game creates an environment where a game becomes a venue for those otherwise uninterested in experimental art per se to think through and challenge the heady ideas of society and culture.

In 2006, MIT and other organizations launched a nationwide student competition with the goal of linking technology to the genocide in Darfur, Sudan. The winning entry, *Darfur Is Dying*, was conceived and developed by a group of students from the University of Southern California and was launched to critical acclaim. *Darfur Is Dying* is an online game designed to raise awareness of the three million people in refugee camps. The game is intended to function as a call for aid, intervention, and progressive legislation. The game is also designed to empower students and others to become involved in actions that could stop an international crisis.\(^{49}\) Players in the game, described by the makers as “a window” onto the experience of the refugees, must keep their refugee camp functioning in light of the danger of invasion by Sudanese government-backed militia, the Janjaweed.

A simulation-style game, *Darfur Is Dying* places the player in the perspective of a displaced Darfuri refugee. Initially, players each choose a character from a wide range of age and gender, and then begin to forage. The first goal is to leave camp and fetch water. But it is a long run to get water in the barren desert—five kilometers—and the magnitude of the mission soon becomes clear to the player. Armed militia groups patrol the land, and players must guide their game characters to hide when appropriate behind scrub or boulders. If the character is caught, a text screen ends the play and makes a point on the crisis: “You will likely become one of the hundreds of thousands of people already lost to the humanitarian crisis” or “Girls in Darfur face abuse, rape, and kidnapping by the Janjaweed. If she succeeds in fetching water, the girl can bring more water back than a smaller boy, but less than an adult.”\(^{50}\) If the players’ characters survive this game level, they move on to help the camp manage small plots of land and gardens by collecting water, building shelters, and harvesting food.

*Darfur Is Dying* plays much like a traditional action game. The refugee characters negotiate danger, forage for water, and rebuild their village in order to accomplish a clearly defined goal: survival for one week. The game’s players become steadily more skillful at guiding their characters to avoid and prevent danger as time progresses, so the game has a smooth learning curve. The challenges that are presented entail
relatively simple navigation and limited artificial intelligence. Game enemies exist in endless numbers and will deliberately move toward their intended targets via the shortest possible route. Conflict emerges as the player’s Darfuri refugee struggles to avoid capture or murder by the Janjaweed militia. The game maintains the illusion of winnability by defining a reasonable win state and providing a means to this end.

The complication comes in when the camp is successfully established, for a healthy camp attracts raiders. Given this event, the player must pay for her own success, rebuilding the village after attacks, and continuing to collect water, harvest gardens for food, and stave off disease by visiting the clinic when it receives new supplies. Exploring the village reveals information about the general state of the Darfuri people and the tragic events that lead a refugee to the camp in the first place. While *Darfur Is Dying* allows players to safely experience the trauma of being a displaced Darfuri refugee, the game is so closely tied to real people and events that it unsettles the player and disturbs her sense of comfort. Hovering over huts in the refugee camp, text reveals chilling personal accounts of real refugees. The *Take Action Now* button on the interface has a real-world effect by offering players the chance to write or email the U.S. president, petition Congress to support the Darfur Peace and Accountability Act, or email the game to others to spread information about the Darfur situation.

Unlike mainstream games, *Darfur Is Dying* sobers feelings of accomplishment, and allows players to feel the distance between a game and the real-world situation. It can be argued that *Darfur Is Dying* is another “you-never-win” game, for surviving for one week does not resolve the conflict in the game or in the world around us. If one survives the game in character, he or she will succeed in the digital version of the Darfur universe, but no further. Games that inform do not end the real conflict. Perhaps, however, we may design games that have more and more global influence or even enact changes in education, fundraising, or work through play.

Other artists and activists have looked to games as a means to building support for a cause. The *Peter Packet* game was created by NetAid, a nonprofit organization whose aim is to eliminate poverty, and by Cisco, a technology company (figure 7.11). NetAid designed *Peter Packet* so that U.S. players could learn about children in less developed countries, and send superhero Peter Packet to move messages on the Internet to those in need. The game explores issues of education, clean drinking water, and AIDS in Haiti, India, and Zimbabwe through the use of computers and specifically, the Internet. Players help Peter Packet dodge viruses and hackers in order to help in-game characters communicate with international contacts such as teacher organizations. By
interacting, these players not only learn about computer networking such as routing messages but also gain awareness about contemporary situations regarding technology, education, health, and poverty around the world. The game also offers players and their friends a chance to learn more about fundraising and taking action to help in the related causes.51

If games are supposed to be a source of entertainment, should they also attempt to enhance critical thinking as well as address social and political issues? Peter Packet has critical content, with relatively straightforward arcade game play, but games such as Darfur Is Dying and September 12th are appropriate or alter established gaming models in an effort to send a message or affect change.52 These games are infused with socio-political criticism in their quest for digital activism.53 They challenge the notion that games must be only entertaining and fun, and offer alternative goals such as meditative play or, as in the case of these two examples, out-of-game engagement, with or without the often trivial pleasures offered by industry standards.54 In his article “Videogames of the Oppressed,” Frasca writes, “The goal of these games is not to find appropriate solutions, but rather to trigger discussions. . . . It would not matter if the games could not simulate the situation with realistic accuracy. Instead, games would
work as metonyms that could guide discussions and serve to explore alternative ways of dealing with real life issues.  

Along these lines, Persuasive Games created the “game for change” or a game engaged in raising awareness about social or political issues titled *Oil God*, which puts the player in the position of a god, complete with a moveable “God-hand” as the cursor, in a simplified version of the popular PC game *Black and White*. Players attempt to raise the price of oil to a certain level by starting wars, causing natural disasters, and altering national political and economic systems through political change and civil war (see figure 7.12).

Presuming that many players wish to be god, the game is predicated on the perhaps cynical belief that players will subscribe to the favored game strategies for the subversive pleasure of profit, endorsing military coups for financial game, and even directing aliens to kill and probe large segments of the civilian population. In *Oil God*, information about how various stimuli will affect oil prices is withheld, and it appears impossible for the player to discern which nasty actions benefit prices more than others. Starting wars usually seems to increase oil prices, and it is clear that directing damage at regions and nations with oil seems to keep oil prices at a premium. While Persuasive Games calls this work a “news” game, *Oil God* in fact abstracts the factors
that influence oil prices in order to make critical comments on the potentially devious strategies of oil cartels and corporations. *Oil God* aims to educate players about complex economic systems through simulation, fantasy, and humor, and while it succeeds in fulfilling fantasy and providing humor, it is not the equivalent of a “news” game, where at least factual elements or systems would function, and while *September 12th* is an example of Lee’s “you-never-win” concept, *Oil God* is a cynical “you-always-win” game, proving games for change can relate closely to artists’ game work, while strategies among artists and activists can diverge dramatically.

Whatever their message, serious games are among the most challenging games to design. These play spaces must retain all the elements that make a game enjoyable while effectively communicating their message. Either component can be lost in the attempt to manifest the other, resulting in a game that is dull and didactic, or entertaining but hollow. In the worst case, the results are both dull and hollow. Games are frameworks that designers can use to model the complexity of the problems that face the world and make them easier for the players to comprehend. By creating a simulated environment, the player is able to step away and think critically about those problems. Frasca refers to these games as a “trigger of discussion,” and existing social activist games work largely on that level. They are not necessarily meant to be fun, though fun may be a side effect, and are rather meant to make people think. Like other designers of critical play, social activist designers can approach serious issues through games. In some cases, a game may provide the safest outlet available for exploring devastating problems and conflicts.
Play is grounded in the concept of possibility.

—Mihaly Csikszentmihalyi and Stith Bennett, “An Exploratory Model of Play”

Whether it is their capacity to stimulate participation in an Internet-connected age or their role as a platform for entertainment, intervention, authorship, and subversion, computer games—indeed, all games—are highly relevant to the twenty-first-century imagination. Games have also constituted a significant component of arts practice for almost a century. While the central parts of this book engaged with historical questions surrounding critical play and artistic approaches to play and game design, an investigation of the design methodologies informing critical play should begin by defining the context in which many games are now made.

If, as according to Bennett and Csikszentmihalyi, “Play is grounded in the concept of possibility,” then critical play is the avant-garde of games as a medium. But where is play critical? When assessed in terms of criticality, a wealth of questions arises concerning the way games actually function. The last chapters have provided theories, approaches, and examples to help address some important questions: Can games be activist? Does play raise critical awareness or does it minimize its effects? What is the role of the arts in games, and can methods derived from artists make a difference? Can the various methods of creation followed by the artists discussed in prior chapters offer novel approaches to actively reshaping everyday playculture?

Marshall McLuhan was ahead of his time in understanding that “Art, like games or popular arts, and like media of communication, has the power to impose its own assumptions by setting the human community into new relationships and postures.”  From doll play to wordplay, from Simultanism to various Surrealist games, there is a good deal of evidence that the processes of artists in pursuit of critical play can offer research methods, actions, and play situations, whether sites or collections of one of
more actions, that are adaptable to present concerns. The critical play method I propose here should provide an effective model for designers and artists to use to engage in, and encourage, critical play in both game making and game playing. Critical play can and should be included in the traditional game design process. By proposing this design model and creating games with this set of strategies, it is hoped that other practitioners, artists, designers, scientists, and researchers will be able to question and elucidate many of the so-called “norms” embedded in our current play frameworks and technology practices, ultimately including a more diverse set of voices in the game design community and a wider spectrum of game experiences.

Why Care about Methods?
On first glance, it can be difficult to see how artists working in a very different place and time would have significant manners, modes, and processes that inform game making today. Computer games are often discussed as an exciting new medium, but its ties to prior forms of play are not automatic. To the typical gamer, computer games are not obviously aligned with such concerns as ancient divination, psychoanalysis, utopian tax laws, environmentalism, or social protest. In the case of activist gaming, perhaps it is thought that the goals of the designer are “real,” and therefore can be best achieved with more direct approaches to the making. For example, a designer may wish to make a project concerning a local food bank. Typical disciplinary research would encounter particular truths and strands of information, rather than an artistic aesthetic.

However, if we look to the fundamental reasons for why we play, the connection between artistic methods, activism, and game design becomes clear. There is something about designing play, especially the process of conceptualizing and making games, that requires an attention to possibility. As in art, the creation of play and games necessitates rule making at a fundamental level. Even simple role-playing activities, or playing house, both seemingly limitless open-play scenarios, include implicit or explicit rules that establish behavior, possible actions, environments, and the safe zone for play itself. Due to the systemic nature of both the product and the process, game makers use particular repeatable processes, or methods. Like activists, game designers also follow an overall scheme of investigation or research, creating processes to address specific concerns and ideas. In addition, the creation of rules of operation makes interesting constraints to provoke innovation in both the designer’s process and the player’s role.

As game design matures, and as games themselves become more ubiquitous and more meaningful to culture, there is a growing need for designers to approach the
creative process with increased awareness and responsibility to be inclusive, fair, and cater to a variety of play styles. Computer games, especially networked computer games, have become often-used and “public” social spaces. As such, they must be seen as spaces of translation, already transformed by game designers and the growing numbers of game players: international, transbordered, fluid. However, this international significance brings ever more importance to what those games are designed to be, what one does in them, and how play is constructed within them. Political change once occurred in the public space of the street, town square, and the plaza. Many games, some of the type geographer Gillian Rose labels “non-real,” are significant because now, more than ever, electronic games constitute cultural spaces.

Furthermore, as a site for production and consumption of culture, community, language, commerce, work, and leisure, playculture is what can be termed a “thirdspace,” which Homi Bhabha in The Location of Culture calls the space of subversion, hybridity, and blasphemy. In fact, Bhabha argues that hybridity and cultural translation are in themselves subversive ideas, and therefore must be the place where binary divisions are challenged. Urban planner Edward Soja argues that all spaces are “thirddspaces” which are lived and imagined spaces in between empirical or the previously understood geographies and physical forms of “firstspace” and the conceptual, ideological, or semiotic spaces of representation and mental forms of “secondspace.” Thirdspace is the site for play and struggle. Players may eschew binary oppositions and allow for the possibility of a subject to be simultaneously in several spatialities. As Soja points out, spaces are socially produced (1996) and thirddspaces are the only sites that contain the possibility for social and political transformation (1999). As Anne-Marie Schleiner notes, “Instead of replicating the binary logic of the shooter genre, of Cowboys and Indians, of the football game, if the US government borrowed tactics from real time strategy gamers or RPGers, we might be looking at a different global response.”

If we think of games as presenting the possibility of the thirdspace, a social space with its own social relations, struggles, and symbolic boundaries, it is within this thirdspace that we must envision the more diverse and equity-promoting style of activity I call critical play. Following the line of work inspired by Langdon Winner’s well-known assertion that artifacts “have” politics, and building on my own theory-practice research in this area, I’ve come to realize that the methods followed by practitioners, whether consciously evaluated or not, are key to the meaning emerging from a game. Researchers studying social and philosophical dimensions of technologies have used a variety of terms to label and extend Winner’s ideas, such as the “embeddedness” of values in technology, or the “play” of the values in a game. Systems other than games
are influenced by ideology as well: technologies such as search engines, medical systems, and file-sharing software are designed with different models of human behavior, motivation, privacy of information, and the like. Perhaps even more than these “tools,” games are simultaneously systems of information, cultural products, and manifestations of cultural practice. On some level, systems such as games must, due to the conditions of their creation, represent cultural norms and biases in their realization. These results can go, and have gone, completely unacknowledged. Game makers and artists work in a certain time, place, and situation. Many work in a particular medium and genre. Others must contend with definite pressures and practical realities. In a further complication of these realities, what is distinctive about play is that one cannot always easily see that a clear boundary exists between it and social reality, or rather, see that play uses the tools of everyday reality in its construction.

Although artists’ play continues to create new meaning, to challenge existing power relations, and to align with activist/interventionist strategies, postmodern culture and the technological revolution may have changed histories, social relations, markets, and home life in deep and profound ways. Globalization and its effects may produce or reinscribe problematic ideologies into technological artifacts such as computer games. Given these conditions, along with the fact that any creative act is complex and usually generates unintended consequences, the game creation process must mature to allow constant review and much more “reflection.”

The Critical Play Method

Based on the needs of game design and the importance of iteration, the ideas from over a century of artists’ games can prove useful to making radically different games. But first, it is important to see how designers are making games today. Here are the rough steps in the cyclical development process called “iterative” design:

- *Set a design goal (also known as a mission statement).* The designer sets the goals necessary for the project.
- *Develop the minimum rules and assets necessary for the goal.* The game designers rough out a framework for play, including the types of tokens, characters, props, and so on.
- *Develop a playable prototype.* The game idea is mocked up. This is most efficiently done on paper or by acting it out during the early stages of design.
- *Play test.* Various players try the game and evaluate it, finding dead ends and boring sections, and exploring the types of difficulty associated with the various tasks.
• **Revise.** Revising or elaborating on the goal, the players offer feedback, and the designers revamp the game system to improve it.

• **Repeat.** The preceding steps in the process are repeated to make sure the game is engrossing and playable before it “ships” or is posted to a website.

The traditional model contains concrete steps toward realizing a particular design by iterating it until core elements and concepts have been adequately matched by game elements and mechanics. Generally, a designer or a design team may choose to iterate one small design goal, a subset of a particular game, or they may choose to iterate the entire game system in some skeletal form (see figure 8.1). The model is scalable to many types of play and development.

I wish to appraise this process in light of the myriad critical approaches to projects included in this book. Part of this process is a constant reflection on the humanistic themes, or values, during design. At least one designer, Donald Schön, refers to a “reflective practice” as a methodology and encourages makers to step outside their processes to “see the big picture.” For Schön, it is important that the experiments do

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**Figure 8.1**

Mary Flanagan, model of iterative design process.
not “confirm” an “answer” to a challenge, but affirm that challenge instead. Schön's approach avoids the traditional goal of a final, or definitive, resolution and involves shaping and altering priorities as a result of findings. Schön notes, “It is the logic of affirmation which sets the boundaries of experimental rigor.” Other reflective frameworks, such as the “critical technical practice,” which is advanced primarily by computer science practitioners working on artificial intelligence, have similar aims. A growing number of designers are committing to the notion of a continuing dialogue between values and practice. In sum, reflective practice encourages designers and technologists to verify that both their design goals and their values goals are supported.

Any game design heuristic, however, would be ill conceived without either accompanying an existing creative process or being able to conceivably work in an existing design context. If many game designers practice an iterative model of design, then these ideas must integrate. The critical play process might therefore look like this:

The iterative cycle would do better to become more open, more reflective at this point in the evolution of playculture, given the long history of the technical benefits, increases in inclusion, and widening of social discourse achieved by alternate design methods. For example, in my own research into play systems, I have noted a number of ways in which girls participating in play environments, such as their long history of doll play, worked against these systems, and how players in popular computer culture use intervention or subversion in games as a play method. Feminist criticism and practice has played an important role in informing such disruptions with technology, as well as examining how power relationships are upheld and how intervention is orchestrated. Leading technologist and game designer Brenda Laurel has noted, “Culture workers at their best make just such conscious interventions—mindfully creating technologies that cause us to produce new myths, and mindfully making art that influences the shape of technology.” The disruption of contemporary games, whether through play, or preferably, through original designs that eschew the embedded interaction styles of current computer games may offer models for other emerging practices in playculture. Designer actions are powerful sites of empowerment for giving a voice to marginalized groups.

But a critical design methodology requires the shifting of authority and power relations more toward a nonhierarchical, participatory exchange. While the games made might disrupt the existing social realities offered by most popular games, they also disrupt the design process itself. Instead of compliance to a pattern whereby the usual designers develop the usual ideas through the usual stages for the usual players, what is needed now is a model that will augment these practical but limited stages of the design process in a way that addresses intervention, disruption, and social issues.
and goals alongside of, or even as, design goals embedded into the mechanic and game elements.

Here I would like to propose a different model, one that approaches critical play. The critical play method (figure 8.2) introduces several crucial elements into the iterative model. \(^{12}\) Human concerns, identifiable as principles, values, or concepts, become a fundamental part of the process. While moving through the stages of the Critical Play Method, the artist, activist, or designer can reflect upon the state of his project and see if the design continues to meet the base goals set initially for the research:

- **Set a design goal/mission statement and values goals.** The designer sets the goals necessary for the project to create meaningful play, and sets one or more equally weighted values goals.
- **Develop rules and constraints that support values.** The game designers rough out a framework for play, including the types of tokens, characters, props, etc. necessary to support the game’s values and play.
• *Design for many different play styles.* The designer could, for example, provide for a noncompetitive type of play alongside a competitive play scenario. The designer should design for subversion of the system and other means by which play can emerge.

• *Develop a playable prototype.* The idea is mocked up on paper or by acting it out during the early stages of design.

• *Play test with diverse audiences.* Designers need to get out of the studio or laboratory and play test with a wide-ranging audience, making sure to play with nontraditional gamers. Various players test the game for dead ends and dull sections, and types and levels of task difficulty.

• *Verify values and revise goals.* Designers evaluate the game through the play tests and player comments. They verify that the values goals emerge through play, and revise goals and add or drop options based on feedback to ensure an engaging game and support the project values.

• *Repeat.* This process is repeated to make sure the game supports the values it set out to frame and support, as well as provide an engrossing and playable experience. These two criteria for success must be measured in each iterative cycle.

Within the critical play method, difference and value are fundamental concerns. Testing with paper, performance, or electronic prototypes should prove to be an especially important means of verifying that design decisions agreed upon during the process, such as equity in power relations or enhancing diversity; the system should adequately handle the complexities of critical play principles. In such testing, it is necessary to determine not only that a particular feature or idea was successfully implemented in a technical component but also that its implementation did not detract from prior decisions that were functional, interactive, or conceptual in nature.

The iterative design process is well known; research has shown that iterative cycles can help designers facilitate feedback, including the discussion and evaluation of embedded social issues, while keeping the creation of a game more dynamic. For artists making games, this approach is useful too. The cyclical nature of the creative process can serve as a parallel studio practice and involve the community with which the artist wishes to engage. After all, games are dynamic systems.

In making anything, however, there tends to be a gap between what was intended and what actually is created. Here, a critical play perspective engages a diverse audience of testers to ensure that the particular aspects of the project that are informed by conceptual, thematic, and technological factors continue to “say the same thing” once the project is finished. This agreement to examine the “doing” of “practice” can be of
use in the laboratories of artists as well as those of independent designers interested in politics or social justice.

The critical play method may also assist those in mainstream game development innovate by suggesting radical, fresh ways of playing. Significant innovations in the design of games can be made by changing design and development methodologies currently used by companies, teams, and individuals and by incorporating artists’ and activist approaches along with methods such as iterative design. Games are artifacts of historic and cultural importance, but they are also something beyond artifact in that games also function as a set of activities that carry conventions like audience role, interaction, currency, and exchange. There are systematic causal correspondences between particular design features in games that indicate specific social conceptualizations and outcomes.

**Design Actions and Design Methods**

Deleuze argues that as people, we “normally perceive only clichés. But, if our sensory-motor schemata jam or break, then a different type of image can appear: a pure optical-sound image, the whole image without metaphor, brings out the thing in itself, literally, in its excess of horror or beauty, in its radical or unjustifiable character.”

For art to move beyond cliché, Deleuze believes it must engage with a set of strategies “to show how and in what sense” an image means x or y to wrest the image away from the danger of cliché. Therefore, one of the most important frameworks critical play can provide is a range of examples that show what artists have done in their creation of games and play. Throughout this book, I’ve examined the ways artists have used doll play, instructions, obnoxious language, tactile letters, street text, and maps in their games to pose questions. Other practices, like Boal’s “Theater of the Oppressed,” offer further insights on ways to move both the game developer and the game player beyond “normalcy.” Each chapter of this book can be used to generate strategies meant to inspire other artists, designers, and innovators. From chapter 4 alone, the tactics include:

- writing commands or instructions
- using obnoxious language
- making humans into puppets
- making computer programs that write poems
- making words tactile
- creating instruction paintings
- making palindromes
• shifting points of view
• creating sound poetry
• making text that is a street intervention
• skywriting

I also have explored some noteworthy methods for the production of games. These have included:

• Simultanism, a method defined as a telescoping of time
• free verse/free visual verse
• automatism
• the drift, derive, detournement, and psychogeography

These methods preserve what has been accomplished in critical play and will, in turn, help designers examine “what’s out there” in contemporary circles, providing a vocabulary for existent techniques that risk going unnoticed. But while play, art, and politics are intertwined, the ways in which designers and artists can intervene currently remain in the affordances of these fields. As Jacques Rancière notes, “The arts only ever lend to projects of domination or emancipation what they are able to lend to them, that is to say, quite simply, what they have in common with them: bodily positions and movements, functions of speech, the parceling out of the visible and invisible.”

Shifts in Play
In addition, criticality in play can be fostered in order to question certain aspects of game content, or certain aspects of play’s scenario function, many of which might otherwise be simply assumed necessary. Guattari, for one, calls on the arts to produce a “refoundation of the problematic of subjectivity,” wanting to bring to forward “a partial subjectivity—pre-personal, polyphonic, collective, and machinic.” In a similar vein, Yale professor James C. Scott writes about subjugated persons and how the subjugated public resists power (1990). He examines the spaces where those dominated can express their “hidden transcript,” or offset narrative, one that serves to critique those in power. It is easy to see that games provide one such outlet. An effort to reveal or make visible these “hidden transcripts” that often lie among the “official transcripts” of power relations parallels the investigations of many players and artists in a variety of milieus. Is this not the essence of unplaying? If Sutton-Smith is correct in asserting that much of what children do in play serves as compensation for
their general life conditions, then the hidden transcript played by those who are far from empowered can perhaps communicate to game designers important strategies through which games can expose, validate, or celebrate these equally valid modes of discourse. In turn, players may use this information and their experiences to alter the social institutions we live by. Using the critical play method, the role of the designer can widen to include an analytical framework for comprehension or analysis, characterized by a careful examination of social, cultural, political, or even personal themes that function as alternates to popular play spaces.

The challenge, then, is to find ways to make interesting, complex play environments using the intricacies of critical thinking and to encourage designers to offer many possibilities in games, for a wide range of players, with a wide range of interests and social roles. We can manifest a different future. It is not enough to simply call for change and then hope for the best; we need interventions at the level of popular culture.

Too often social challenges are presented in overwhelming or depressing ways. Most players are not attracted to overly didactic communication. After all, play occurs only when players feel comfortable. Play is, by definition, a safety space. If a designer or artist can make safe spaces that allow the negotiation of real-world concepts, issues, and ideas, then a game can be successful in facilitating the exploration of innovative solutions for apparently intractable problems. Play offers a way to capture player interest without sacrificing the process of thinking through problems that are organized subjectively. Games engineer subjectivity because they create, or rather they are, both affective and relational systems, both for the designer and for the player. Critical play is not about making experts, but about designing spaces where diverse minds feel comfortable enough to take part in the discovery of solutions. Derived from artists’ creative processes, investigations, and practical work, critical play is to popular computer games what performance art once was to the traditional, well-made stage play. As in that earlier shift, critical play demands a new awareness of design values and power relations, a recognition of audience and player diversities, a refocusing on the relational and performative as opposed to the object, and a continued and sustained appreciation of the subversive. Critical play is also a new discipline of theory and practice that embodies a set of methods and actions. The critical play method is intended as a tool for future game makers, play designers, and scholars. The desired results are new games that innovate due to their critical approach, games that instill the ability to think critically during and after play.

Just as artists have long experimented with such transcripts and have worked to integrate social concerns in their work, game designers have the option to open up,
experiment with, unplay, reskin, and rewrite the hidden transcripts so tenaciously rooted in the systems of our world. As we have seen, social climates and technological changes have greatly affected play environments on an everyday level. Shifts in play have historically mirrored shifts in technology and these shifts in technology signal shifts in societal norms. With groups tired of isolation and longing for community, the rise of massively multiplayer online role-playing games and social networks have provided a few ways to relink communities. The continuing popularity of Come Out and Play events in major global cities demonstrates that the public wants to play, and play outside, because of what games are: creative, collective, and social reactions to the dominant practices and beliefs of any culture. From these simple examples, it is possible to see how games in and of themselves function as a social technology. Games distill or abstract the everyday actions of players. Games also imprint our culture with the motives and values of their designers. Above all, a game is an opportunity, an easy-to-understand instrument by which context is defamiliarized just enough to allow what Huizinga famously refers to as his “a magic circle” of play to occur.
Values at Play in Digital Games

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The MIT Press
Cambridge, Massachusetts
London, England
1 Groundwork for Values in Games

All games express and embody human values. From notions of fairness to deep-seated ideas about the human condition, games provide a compelling arena where humans play out their beliefs and ideas. To anthropologists, games are paradigmatic among human practices and rituals. From the misty origins of the classic Go game in Asia to the more recent evolution of chess and online games such as World of Warcraft (Blizzard Entertainment 2004), games can serve as cultural snapshots; they capture beliefs from a particular time and place and offer ways to understand what a given group of people believes and values. These beliefs may be made visible on the surface (through game characters or other visual features), and they may be expressed through a game’s many elements (such as point of view, actions, and hardware). A player’s available choices can express a particular understanding of the world, such as the extent to which fate either is in the hands of individuals or societies or is subject to the uncontrollable forces of nature and serendipity. Many elements of games reveal the underlying beliefs and values of their designers and players. Further, because games are engaging and reach deep parts of the human psyche, they may not only reflect and express but also activate these beliefs and values in powerful ways.

We propose three key reasons why it’s important to study values in games. First, the study of games enriches our understanding of how deep-seated sociocultural patterns are materialized in terms of participation, play, and communication. Second, the growth in digital media and expanding cultural significance of games constitutes both an opportunity and responsibility for the design community to reflect on the values that are expressed in games. Third, games have emerged as the media paradigm of the twenty-first century, surpassing film and television in popularity; they have the power to shape work, learning, health care, and more.

Why are there so many games being produced and sold right now? Technology has advanced to the point where digital games can flourish in
myriad forms and give players true agency in complex digital playspaces. The large number of games emerging from independent makers and big game design companies demonstrates that there is room for new kinds of game experiences to be created and to find audiences. We pay attention to games because we are players and designers and also because games tell stories and allow players to engage with systems that help them understand the complexities of contemporary life.

Why Games Are Different

Games have become a central way that we tell stories embedded in larger systems of belief and interaction across cultures, and their recurring conventions, themes, player rituals and actions, and music may function as a means of mythmaking. Theories borrowed from literature, television, and film studies do not fully address the psychological, social, and mythic power of games. The emerging generation of game theorists recognizes the role that digital games play as a distinctive cultural artifact and have begun to theorize about player agency, identity, and rules within a community of play.¹

We do not wish to overstate individual player agency. Neither do we wish to underestimate the debt that digital games owe to the vast contemporary cultural landscape, including science and other art forms. The interactive and iterative nature of digital media is similar to that of analog games, choose-your-own adventure books, and participatory television (such as American Idol).² Contemporary computer games offer a range of interactive experiences, from predetermined choose-your-own-adventure stories like Fable (Lionhead Studios 2004) to dynamic, unpredictable systems that use physics models, multiplayer interaction, and emergence, such as World of Goo (2D Boy 2008) or Minecraft (Mojang 2011).

The distinctive effect that games have also may be due to their immersive character: players actively control and identify with playable characters, and their actions shape situations within the game experience.² Whether or not experiences of agency within games transfer out into real-world contexts, at the very least such agency distinguishes the experience of game playing from films or television viewing. Beyond role playing and perspective taking, digital games offer players a dynamic engagement with content through cycles of effort, attention, and feedback. Unlike traditional forms of other media, which do not respond to players’ journeys or to the readings and interpretations, digital games are particularly compelling environments in which players explore and act based on at least a partial understanding of a system’s relational dynamics. As Janet Murray has observed, games give us “a chance to enact our most basic relationship to the world—our desire to prevail over adversity, to survive our inevitable defeats, to shape our environment, to master complexity, and to make our lives fit together like the pieces of a jigsaw puzzle.”³ Beyond merely telling stories as traditional narratives do, digital games allow for enactment and provide a systems-level rule set for the story’s logic.

What Values? Whose Values?

When we discuss Values at Play, people often ask, “What values? Whose values? And what are values, anyway?” These are entirely reasonable questions given the many meanings of values and value as they are used both colloquially and in academic scholarship. Values also provoke controversy within and across societies, among individuals, and even within a single person. As Isaiah Berlin notes, “Values may easily clash within the breast of a single individual; and it does not follow that, if they do, some must be true and others false.”⁴ Full answers to these general questions lie beyond the scope of this book, but enough must be said about values to convey the basic terms of our theory of Values at Play.

Simply put, values are properties of things and states of affairs that we care about and strive to attain. They are similar to goals, purposes, and ends, but usually they possess a higher degree of gravitas and permanence, and they tend to be more abstract and general. Thus, while you might set a goal to exercise and lose three pounds, it would be odd to cite this as a value. Instead, the relevant value might be good health. As a value, however, good health takes on a general importance—that is, if I cite good health as one of my values, then I care about good health for not only for myself but also about good health for others. Values may take a variety of forms—qualities of the environment (such as species diversity), personal traits (such as honesty), and political states (such as justice and democracy). Values may be specific to individuals or shared by groups, and they may be held by communities, cultures, religions, or nations. We acknowledge these differences by speaking of personal values, cultural values, religious values, human values, and so forth. We may further differentiate among types of values by talking of ethical, political, and aesthetic values and more. Finally, values are often ideals: we promote them even as we accept that we may never achieve them. World peace, tolerance, kindness, and justice are instances of such ideals.
People express their value commitments in a variety of ways. Some reduce values to an economic proposition: how much are people willing to pay to save a species from extinction, promote the health of a population, or ensure territorial security? Although this approach may be useful for practical public policy decisions, we adopt a more pluralistic approach. In addition to expressing their commitments through economic decisions, people also express them through symbolic gestures, artworks, words, comparisons, work, and—as we assert throughout this book—their design for things they build.

Although the range of values is virtually boundless, here we are interested primarily in ethical and political values. Typical examples of ethical values include kindness, honesty, generosity, fidelity, integrity, respect, safety, autonomy, creativity, peace, pleasure, well-being, friendship, collaboration, health, responsibility, happiness, and contentment. All of these contribute to the moral dimension of our lives—how we treat others and how they treat us. Political values include those that define relationships within and between societies, such as justice, equality, security, stability, cooperation, tolerance, privacy, accountability, democracy, voice, property, liberty, liberation, autonomy, equal opportunity, and government transparency. As the scholar Langdon Winner notes, political values are “arrangements of power and authority.”

Narrowing our attention to ethically and politically significant values still leaves plenty of room for controversy over what values and whose values count. Noting differences in values between people and societies, some have asked, “My personal values may be different from yours, and our societal, religious, and cultural values may be different. How can you presume to select particular values and particular versions of those values?”

Such questions emerged in Western philosophical traditions as far back as the ancient Greeks, and to this day they continue to play important roles in debates over the existence of basic human values, moral and cultural relativism, the politics of recognition, and critical theory. Plato considered goodness, justice, and beauty to be objective, universal human values. In contrast, the twentieth-century anthropologist Ruth Benedict argues, on the basis of her ethnographic research, that values in human societies are infinitely elastic and that none rises to the status of universal. Benjamin Franklin’s list of eleven values to guide his life include cleanliness, frugality, industry, moderation, silence, temperance, and sincerity. But why single out these, and should Franklin’s values serve as a guide for others? Social psychologists have conducted research to try to discover which values might be universal across diverse nations and cultures. Milton Rokeach suggests a core of common values, which he divides into two categories—terminal values (such as a comfortable life and freedom) and instrumental values (such as honesty and cooperation). Although doubts persist about the list’s comprehensiveness, there has been general scholarly agreement that the values “cover a broad spectrum.” Shalom Schwartz and Wolfgang Bilsky posit three classes of universal values that are based on three distinct needs—biological, psychological, and interpersonal coordination, and societal needs serving group survival and welfare.

Although these theories of universal human values drawn from biological, individual, and social needs are of compelling interest, a theory of values at Play does not depend on them. Our approach does not require universal values, but it does presume the existence of socially recognized moral and political values—that is, the positive ends that a society strives to enshrine in its institutional, political, and social structures and that it encourages individuals to adopt as a guide. Political philosophers, ethicists, religious and secular leaders, teachers, parents, and peers all engage in the study, deliberation, definition, propagation, and communication of these values, sometimes explicitly in words and decrees and other times through actions and reactions. Although deploying the theory presumes a stance on values, it does not presume any particular stance, instead allowing for divergence of worldviews. One system of values might emphasize freedom, and another might favor responsibility, but both provide a sound platform for the Values at Play model.

Here is the stance that we have adopted throughout the book: as citizens of a liberal, egalitarian democracy, we hold a bias in favor of values such as respect for human rights, the rule of law, individual freedom, justice, and the basic equality of all human beings. We are inspired by foundational political documents, including the U.S. Constitution, the Charter of the United Nations, and the Canadian Charter of Rights and Freedoms. We also depend on literatures in ethics and political philosophy as well as ideals embodied in religious documents. From the high-minded to the vernacular, these sources reveal a resilient core. Values that we encounter in these explorations include justice, equality, freedom, autonomy, security, happiness, privacy, tolerance, cooperation, creativity, generosity, trust, equity, diversity, fidelity, integrity, environmentalism, liberation, self-determination, democracy, and tradition. These commonly encountered socially recognized values are points of departure for Values at Play.

We are aware that there are differences in values across societies and individuals. Gender equity, for example, is explicitly recognized in the United States but not in Saudi Arabia. With even the most commonly encountered
values, differences emerge in the ways that they are interpreted and applied. Plato, for example, favors equality in general but not for slaves or women. A theory of Values at Play is not going to resolve issues that have united and divided people and societies for centuries. There is little choice but to take a stand where a stand is needed. Those who build social institutions and who institute social practices make these determinations all the time: we pass laws, strike treaties, and develop educational systems. We return to our thinkers and writers, and we turn to the people who are served by—or must suffer under—these systems and institutions. These people, in turn, express their values in the ways that they vote, respond to surveys, and make financial and commercial choices.

Values in Technology

Values at Play adds one further dimension to the values landscape. It asserts that digital games—like other technologies and like social practices, systems, and institutions—have values embedded in them. In so saying, we place ourselves within the larger discussion about values in technology. As Langdon Winner argues in his landmark article “Do Artifacts Have Politics?,” the creators of technical systems and devices should consider functional and material properties and also recognize the ethical and political properties of these technologies. The crucial insight of Winner’s article, which has been refined and elaborated many different ways by the author and others,13 is that the values expressed in technical systems are a function of their uses as well as their features and design.14 Privacy is one such value. For example, early versions of the Unix operating system that include the “finger” command to ascertain if a colleague was online might be judged hostile to privacy, and a discussion board that allows anonymous posts might be deemed privacy friendly (more such examples are woven throughout this book). In such ways, we might consider privacy or other values to be embedded in the design of the technology. But reading values into and out of technical systems is not simple as even our two quick examples reveal. “Finger” may seem intrusive to present day users of the Internet but in the early days of Unix, the users of a given system would more than likely be colleagues, even friends or members of a common community and the “finger” command more likely the inquiry of colleague to colleague rather than a problematic intrusion. The expansion to a global environment that many digital systems have attained—both large-scale systems (such as the Internet) and relatively modest sized ones (such as games themselves)—this embedding of values further complicates pressing issues worthy of our attention.

The notion that values are embedded in technology motivates a practical turn in the work on values in design. We can do more than simply demonstrate systematic relationships between technology and values; we can do something about it. If we accept that technology can embody values, the practical turn allows designers and producers to consider ethical and political concerns alongside more typical engineering ideals. System design is typically guided by goals such as reliability, efficiency, resilience, modularity, performance, safety, and cost. We suggest adding items like fairness, equality, and sustainability to the list. Because conscientious designers have the opportunity to integrate values into their everyday practice, they can have a hand in determining which values are expressed.

The idea that values should be considered in the design of technical systems has spurred initiatives such as values-conscious design and values-sensitive design.15 Values at Play offers an alternative approach for guiding technical design for digital games, which are challenging because of their hybridity: they are games, expressive art forms, and technological engines. The first two aspects—game and art form—are generally visible to users as well as critics and theorists. They include storylines, plots, settings, narratives, characters, colors, shapes, landscapes, sound, music, and interface as well as game goals, rules, challenges, representational systems, competitive constructs, and reward systems. These elements have garnered most of the attention in discussions of the social significance of digital games. This is partly because such elements are immediately experienced and therefore obvious but also because highly developed, time-honored theoretical frameworks—borrowed from media, art, sound, cinema, and literary criticism—are able to address them. In other words, there is a rich vocabulary for exploring the plot, character, and rules of digital games.

The same cannot be said for the technological architecture of games. Scholars of values in technology still push against the received view of technology as neutral, and even though this area of study remains active, controversial, and unsettled, it provokes questions and generates approaches that are explored in this book.16 Yet just as narrative and game rules carry values, so do lines of code, game engines, mechanics, and hardware. The Values at Play approach is interested in all three of the hybrid layers—expressive, ludic, and technological. Our aim is to contribute to a critical language for technology that is as rich as those that exist for expressive art.17

Values at and in Play

It is impossible to do justice to the range and depth of inquiry into values in technology, design, and games in the few paragraphs that we have devoted
to these topics in this chapter. We aim primarily to give a sense of the rich heritage that inspires our decidedly pragmatic focus. With concrete cases throughout the book, the text illustrates systemic relationships between values and particular design elements. (Readers interested in plumbing greater depths may find further direction in our bibliographic references.) For example, the best-selling PC game of all time, *The Sims* (Maxis 2000), has been said to inculcate materialist values that define the home as a space that primarily is devoted to consumption. Players are encouraged to earn money and spend it on acquiring goods, especially household goods (such as furniture and televisions) and eventually larger homes.* Saints Row* (Volition, Inc. 2006) is a game series in which crime pays. It portrays the world as a violent place that rewards criminal behavior (such as insurance fraud) and reinforces racial and gender stereotypes. The “Whored” mode in *Saints Row: The Third* (Volition, Inc. 2011) features waves of attacking prostitutes, and “The Penetrator” weapon (a deadly purple dildo baseball bat) is used against them. In a gentler vein, the player in *Okami* (Clover Studio 2006) takes on the role of the animal/goddess Amaterasu, whose job is to make plants and animals happy in the environment. We may say that this game fosters empathy, nurturing, sharing, and care-giving.

Claims such as these, however, deserve close scrutiny if we wish to avoid a similar, simplistic deterministicism that would have bound the “finger” command to a violation of privacy. The tongue-in-cheek tone of *The Sims*, for example, and its presentation of consumerism as monotonous resist facile interpretations and evoke more complicated responses from players. Although our perspective supports the need for this more nuanced interpretation of values in games, we recognize that there are no simple lines that connect characteristics of a game’s elements (such as content, architecture, and actions) with the attainment (or suppression) of certain values and valued states. Just as the connection between “finger” and privacy required an understanding of subtle dynamics introduced by shifting contexts of use, so the features of a game as bearers of values emerge in the act of play, dynamically, depending on the context of play and who is playing. Designers’ intentions matter but are not fully determinative; unintended values may be served in spite of these intentions, and intended values may fall flat.

Inspired by games, we chose the phrase Values at Play as the label for our framework to acknowledge the multidimensional flux of these complexities in the design domain. The term play has many meanings, including “perform a role”; “occupy oneself in amusement, sport, or fantasy”; “play along with and accept the rules in a given situation”; and “allow a space

for movement, as in the free play of gears.” Values at Play shares roots with recent work in ethics in games, focusing on ethical choices and the ways that ethical and unethical actions are structured within games. Values at Play incorporates a perspective on ethical actions, valued ends, and direct and indirect ways that game elements involve values. Recognizing these important shared roots, we have included a short contribution by Karen Schrier, one of the leading contributors to the study of ethics in games.

Yet complexity does not mean anarchy. Admitting that the interdependencies along the pathway from design to values (and back again) are complex and diverse does not warrant nihilism and resignation any more here than in the myriad other circumstances in which thoughtful action is required despite uncertainties. Questioning one’s own worldview is a good start. A conscientious designer might proceed by holding fixed certain variables while manipulating others, learning about who is likely to play (and their worldviews), and exploring the likely context of play. These considerations are all part of the toolkit of a designer who is aiming for a holistic approach to making design choices with values in mind. Although the philosophical rubrics associated with values in technology and values in design are the context for this book, the concrete and the nitty-gritty are our dominant vernacular. We examine the ways that values have been and may be enacted, denied, confronted, and manipulated—the ways that values are “at play” in games and design.

**Introducing the Conscientious Designer**

These are our core premises: (1) there are common (not necessarily universal) values; (2) artifacts may embody ethical and political values; and (3) steps taken in design and development have the power to affect the nature of these values.

Professionals may discover core values while they are working in their respective fields. Donald Schön has related this type of discovery to notions of reflective practice. His work helped us forge thinking about design professionals and brought to light ways that design practitioners might be more reflective or, in our terms, conscientious. His foundational work takes on the challenges of problem setting (asking the right question) over problem solving, noting that many professionals learn about these challenges the hard way by asking the wrong question and trying to solve for the wrong goal. If problems are not well defined initially, then poor results
emerge. This thinking is relevant to game design processes, especially when designers think that they are instilling one set of values but actually may be embedding another.

Our goal is to help designers seek an active role in shaping the social, ethical, and political values that may be embedded in games. When those values inevitably veer off course during the process of iteration, designers need to be confident enough to bring them back on track even when it is difficult to do so.

Conscientious designers consider values when they design and build systems. They often have a passion for learning, a deep curiosity about the world, and a fascination with human behavior. This passion is expressed in well-thought-through design. Our book does not try to persuade skeptics in the design community to accept these premises but instead invites conscientious designers to try the Values at Play heuristic. If you are interested in taking values seriously in design, you are a conscientious designer. To you, we offer Values at Play.

This book is intended as a resource that is grounded in theory but essentially practical. Values at Play is a theory insofar as it constitutes a structured way to understand values in games. As a theoretical framework, it provides a lens through which designers can appreciate values in a game, just as other theoretical approaches guide people to appreciate other dimensions, such as aesthetics, technological efficacy, or narrative. But the purpose of Values at Play is primarily pragmatic. It is a companion for designers who seek to make new and better games by considering values, who accept relationships between design and values, and who ask how we might convert these insights into practices in the world.

Innumerable decisions fall within the scope of our project, because values may be at play at all levels of a design initiative. From overarching architectural principles to decisions at the finest grain, designers and software engineers can influence the shape of an initiative through choices and problem-solving strategies. Although our book reveals philosophical implications of human values that are at play in digital games, its central claims are asserted in terms of concrete examples—many of them—demonstrating connections between abstract ideas about values and games to moment-by-moment decisions in the design process.

Drawing on theory-based principles and practical insights from scholarship and design practice, this book develops a method for integrating values in the conception and design of games that can serve as a guide for games designers and developers. Conscientious designers are ethical (they are truthful, factual, and alert and have the player’s best interests at heart) and also strive to make a difference through their work. The number of conscientious designers is steadily increasing, and as they work, they will find that values appear in a range of games and their constitutive elements. It is essential to identify the issues and address those moment-to-moment decisions about values in game development. The conscientious designer needs backup—prior evidence, support materials, and methods—and we provide such backup in this book.

In the relatively short history of information technologies, stories of its moral and political significance abound in the informal lore and in carefully researched cases. They discuss the Internet’s democratizing potential, the Web’s free and equitable access to knowledge, the diminishing privacy brought about by databases and cookies, and so on. Such stories raise questions about whether these social and political outcomes are accidental or whether they can be integrated into the day-to-day goals and practices of technology design, thereby giving rise to better technologies. Can conscientious designers change society for the better with their work? Our commitment to positive answers to these questions motivates the Values at Play project. Although our ideals are tempered with a good dose of realism, we continue to work toward change by putting social and political values on the design agenda so that it can lead to better games and better technologies.
3 Game Elements: The Language of Values

with Jonathan Belman

Games embody beliefs from a time and place, provide a sample of what is important to a particular group of makers and players, and offer us a way to understand what ideas and meanings are valuable. These beliefs may be investigated as part of the system on which a game operates—through rules, customs, player options, and more. In short, there are many elements in a game, and each affects how games access, represent, and foster particular values.

The many interrelated elements or dimensions of a game—narrative, interface, interactions, mechanics, and more—contribute to a coherent play experience. Any of these elements can have cultural, ethical, and political significance, even when they appear to be value-neutral. Sometimes the values at play in an element are relatively obvious. It would be uncontroversial, for example, to argue that the representation of Tomb Raider’s Lara Croft as a hypersexualized archeologist adventurer is deeply value-laden. By contrast, it is less immediately obvious how a particular game engine encourages violent play over nonviolent play.

This chapter presents a framework of fifteen elements that together constitute a game’s semantic architecture, that is, the way that a game generates meanings. These fifteen elements, by no means exhaustive, are offered with two purposes in mind. First, they can help designers locate specific ways in which values may be conveyed in games. Second, the elements can serve as a checklist of semantic architecture to encourage alertness toward aspects of a design-in-progress that have cultural, ethical, and political resonances, and as an aid throughout the design process. These fifteen elements are:

1. Narrative premise and goals
2. Characters
3. Actions in game
allows for a nuanced reading of values in relation to each individual
element and assumes that values also may emerge from interactions between
two or more elements. The framework provides a structure for analyzing
existing games and designing new ones. After briefly describing each ele-
ment, we present innovative or exciting applications of both in the service
of Values at Play.

1. Narrative Premise and Goals

What is the story? What goals or motivations drive the playable or player
character (that is, the character controlled by the person playing the game,
shortened to PC)? Who or what is the playable character pursuing, and
what happens along the way? How are the events ordered? What will
the playable character have accomplished when the game is “beaten” or
“won”? Are players paying attention to the narrative as they play? The nar-
native element can be more or less integral to the overall play experience.
For example, the narrative premise of Super Mario Bros. (Nintendo 1985)
is Mario’s quest to rescue Princess Toadstool from her kidnapper, Bowser.
However, aside from short, generic, and repetitive noninteractive scenes,
nothing in the game makes direct reference to the princess’s kidnapping or
gives the player a reason to consider it an important part of minute-to-min-
ute gameplay. Players might engross themselves in the game without giving
thought to the nature of the princess’s plight. Games can be engaging when
narrative is cursory or even absent, but narrative can be an obvious site for
values-rich content, motivation, and context.

Illustrative Game: September 2nd

September 2nd (Powerful Robot Games 2003) begins with a cryptic set of
instructions that read, in part, as follows: “You can’t win and you can’t
lose... The rules are deadly simple. You can shoot. Or not. This is a simple
model you can use to explore some aspects of the War on Terror.” The
instructions also provide the means for identifying the game’s two cat-
gories of nonplayable characters: the men who are wearing keffiyeh (the
traditional headdress of Arab men) and carrying guns are terrorists, and
the people who are in robes and skullcaps or headscarves are civilians (fig-
ure 3.1).

The game world is a busy desert marketplace where terrorists are spotted
here and there among civilians. The player controls a targeting reticle that
can be positioned anywhere in the market, and left-clicking fires a missile
at the reticle’s location. Inferring a narrative premise from this set-up is

4. Player choice
5. Rules for interaction with other players and nonplayable characters
6. Rules for interaction with the environment
7. Point of view
8. Hardware
9. Interface
10. Game engine and software
11. Context of play
12. Rewards
13. Strategies
14. Game maps
15. Aesthetics

Although game elements are analytically distinct, they are not experi-
enced individually by players, who are influenced by the context of the
game; these elements tend to be thoroughly intertwined. Just as the word
shooting means something in a conversation about gang violence and another
in a conversation about photography, the shooting mechanic in the anti-
war news game September 2nd (Powerful Robot Games 2003) means some-
thing different from its counterpart in the commercial first-person shooter
call of Duty: Modern Warfare (Activision 2007). In general, elements that
are considered independently may suggest a variety of meanings and val-
ues, but in the context of a game they may guide interpretation toward a
limited range of meanings and values. We have selected the framework of
game elements as a particular way of analyzing games because it useful for
understanding the emergence of values. The framework is informed by our
research with the Values at Play project, our experiences as game designers
and educators, and much prior work in game studies and narrative stud-
ies. Indeed, values at Play belongs to a field-wide conversation about game
6.
Game Elements

2. Characters

Can playable characters be customized or selected? If they can, how is this done, and what options are provided? What are the characters' attributes and characteristics? What are the characteristics and roles of nonplayable characters? In some games, characters are predefined, but in others, the importance of character emerges outside of its purely narrative components. Think of Chrono from Chrono Trigger (Square 1995). Link from the The Legend of Zelda series (Nintendo et al. 1986) (figure 3.2), and Gordon Freeman from Half-Life (Valve 1998). These characters all are examples of a silent protagonist or tabula rasa, and all have garnered much acclaim in the gaming community because they play active roles in game narratives and seem to act as expressive vessels through which the player moves through the game. To the player, such characters define themselves more in terms of their player-controlled actions than in their dialogue or predetermined storylines.

SHODAN (Sentient Hyper-Optimized Data Access Network) is the antagonist in the System Shock (Irrational Games et al. 1999) series and drives the game narratives. She has earned a spot in gaming lore for her sinister demeanor and the way in which plot twists in System Shock 2 are linked to realizations about her character. The Nameless One in Planescape: Torment (Black Isle Studios 1999) provides a good example for a playable character that propels a game, because the narrative is concerned with having the

Figure 3.1
A "deadly simple" narrative posits players as shooters, from September 12th (Powerful Robot Games 2003).

not as straightforward as it usually is in mainstream games. The playable character represents the American side in the war on terror, and someone familiar with the conventions of video games probably would assume that the playable character is supposed to use missiles to eliminate terrorists in the marketplace. However, when the player fires on the terrorists, the explosion is so large and the crowd so thick that both terrorists and civilians are killed. In the aftermath of the attack, people around the explosion begin mourning, and some become terrorists themselves. Firing a missile typically creates more terrorists than it kills.

What will the playable character accomplish when the game is "beaten"? The only sense in which the game can be beaten is if the player realizes the futility of the playable character's one-dimensional approach to fighting terrorism. September 12th inverts the conventional approach to narrative in video games by encouraging the player to recognize that something is flawed in the assumptions underlying the playable character's view of the world and something is tragic and self-defeating in his quest. This might spur players to critique the premises of the real-world war on terror.

Figure 3.2
Link fighting, from The Legend of Zelda: Twilight Princess (Nintendo 1986).
character/player gradually discover who he or she is. Mario the plumber is not nearly as complex as these characters but is a perennial favorite as an everyman turned hero.

It is helpful to examine the kind of relationship that a game intends to establish between players and characters. For example, to what extent will the player feel complicit in the playable character’s actions? Will the player relate to playable characters, be revolted by them, or react with some other emotional response?

**Illustrative Games: Portal and Layoff**

In the *Portal* (Valve 2007) first-person puzzle game series, there are two characters—GLaDOS (Genetic Lifeform and Disk Operating System) and Chell, the silent protagonist player character. The GLaDOS artificially intelligent system is responsible for maintenance and testing within the Aperture Science facility as Chell, a former test subject, tries to escape the center (figure 3.3). At first, GLaDOS is merely an instructional voice that monitors and directs players as they move forward in their “testing procedures.” Yet even early in the game, the instructions that she broadcasts across the facility start to take on sinister aspects. At one point, GLaDOS cautions, “Before we start, however, keep in mind that although fun and learning are the primary goals of all enrichment center activities, serious injuries may occur.” As players move forward, GLaDOS tries to intimidate the player into failure or trick the player into succeeding fewer times. To entice the player character forward, GLaDOS promises parties and a reward of cake for finishing the challenges, while warning the player character of her impending demise: “Cake and grief counseling will be available at the conclusion of the test.” By her own admission, however, GLaDOS is a liar. To add to player stress (and humor in the game), GLaDOS frequently taunts the player: “Please note that we have added a consequence for failure. Any contact with the chamber floor will result in an ‘unsatisfactory’ mark on your official testing record followed by death. Good luck!”

In the first *Portal*, GLaDOS eventually is exposed as a corrupted AI that employed neurotoxins to kill all of the prior scientists in the lab except Chell. At the end of *Portal*, Chell destroys some of GLaDOS’s hardware, including one of her personality core spheres (her “morality core”). As Chell dismembers GLaDOS’s hardware, a new portal is formed, and both Chell and pieces of GLaDOS are seen lying outside the Aperture Science facility. In the game sequel *Portal 2*, GLaDOS is back, accidentally activated by Chell and a positive artificial intelligence named Wheatley. Wheatley ends up being tempted by power and greed and betrays Chell.

*Figure 3.3*

Chell, from *Portal* (Valve 2007).

GLaDOS in *Portal* promises freedom, autonomy, and choice but is critical and cruel to the player character and is intent on her destruction. The player character Chell reacts against these restrictive values in what becomes a clever battle of good versus evil. Chell must rely on creativity and trust in her own abilities to acquire her freedom. When the player character Chell is compared to GLaDOS’s manipulative and malicious behavior, Chell the player character seems honest, clear, genuine, and in the right.

The casual game *Layoff* (Tiltfactor Lab 2009) is designed to elicit empathy in players toward characters in the game and toward the real-world people who are represented by those characters. Unlike *Huish* (Jamie Antonisse and Devon Johnson 2007), which we will discuss in detail in section 3, *Layoff* elicits a different kind of empathy: It is a matching game that resembles others in the genre such as *Bejeweled* (Popcap Games 2001). In *Bejeweled*, players swap adjacent gems on a playing board to create horizontal or vertical sets of three or more identical gems. When sets are created, their component gems disappear from the board and are replaced by new gems falling from the top.

In *Layoff*, players take on the role of “corporate management,” tasked with cutting jobs during a financial crisis (figure 3.4). Each icon in this matching game represents a worker. When the player matches sets of three or more workers, they fall off the bottom end of the board into an “unemployment office.” From management’s perspective, the workers are
interchangeable parts that can be swapped and terminated to save money. But the game is designed to challenge this perspective that a worker is only a cog in a machine. Each worker has a short biography that pops up when his or her icon is selected. For example:

Jaime, 39, is a client relationship manager at a small outsourcing company. This is a new job in Boston, and Jaime likes it very much except for the climate. Jaime works from home on Fridays to ease financial pressure or childcare, but the manager is possibly going to cut all employees down to a 4-day workweek.

In *Layoff*, a bond of empathy is created not only between the player and the playable character, representing management, but rather between the player and nonplayable characters, representing the workers being laid off. (By contrast, in *Hush*, discussed in section 3, players do seem to experience a sample of the same broad class of emotions experienced by the playable character). Even so, in *Layoff*, players probably do not feel exactly what workers actually feel when they lose their jobs. Instead, they might experience indignation at the callousness of the management toward the workers, or sorrow for the people who have lost their jobs in a bad economy.

![Image](image.png)

**Figure 3.4**
Individual characters in *Layoff* fostered empathy during an overwhelming financial crisis (Tidfactor Lab 2009).

This is what psychologists call reactive empathy—an emotional reaction to another person’s situation that does not mirror that person’s own emotional state.

*Layoff* and *Portal* are excellent models of games that create meaningful bonds between players and characters to establish a personal connection with a larger issue or event.

### 3. Actions in Game

What can the player do (or cause playable characters to do) in a game? Most contemporary mainstream games enable a limited set of playable character actions. In games such as *Call of Duty* (Activision 2003), *Angry Birds* (Rovio 2009), and sports games, common actions emerge, including shooting, fighting, running, driving, and sports-related actions (such as batting or jumping). This does not mean that a game where the playable character primarily shoots a gun, for example, will necessarily be clichéd or derivative. *September 12th* is an excellent example of a game in which a conventional action takes on new meanings when placed in a new context. We have been excited by the tremendous expressive possibilities of games that are built around less conventional actions.

#### Illustrative Games: *Three Player Chess, Waking Mars, and Hush*

Traditional chess, in which two players compete for dominance of the board by capturing each other’s pieces, has conventionally been interpreted as an allegory for war. *Three Player Chess* (Catlow 2001) subverts the mechanics (and allegory) of traditional chess by introducing a third player whose goal is to create a state of peace between the other two players (figure 3.5).

Two players in *Three Player Chess* control either the black or white “power pieces” (kings, queens, knights, and rooks). The third player controls all pawns and uses the pawns to run interference between the other two players, preventing them from capturing each other’s pieces. If no pieces are captured for five turns, grass begins to grow on the board, covering the black and white checks. If no pieces are captured for twenty turns, the entire board becomes covered in grass, representing a victory for the pawns and, in the realm of this game, world peace.

The designer said that the game was inspired by the second Iraq war, when the peaceful protests of ordinary people (pawns) presented a counterpoint to the belligerence of power players in the George W. Bush administration. The designer asked a question: under what conditions could nonpower players (pawns) achieve victory over power players? An answer
that will not generate enough biomass. The goal of the game is to discover
the secrets of Mars’s past by bringing the dormant plants to life, but this
will work only if the ecosystem is robust. The notion of balance infuses
the game: some plants grow in basic soils, others in acidic soils; some organisms
are immobile, others are mobile; some organisms are constructive organi-
sms and breed offspring, others are destructive. Patience is required in this
relatively slow-paced game as players solve puzzles about which life forms
are symbiotic with others. Instead of rewarding players for winning or con-
quering, the game rewards players for considering cause and effect and,
over a longer time period than typically is designed into a casual game, it
also credits players’ attention to sustainability.

Hush (Jamie Antonisse and Devon Johnson 2007) uses a timing/matching
mechanic to immerse the player in the role of the playable character,
a Rwandan Tutsi mother hiding with her baby in a hut during the 1994
genocide (figure 3.7). Players play as a mother who sings a lullaby to pacify
her baby as soldiers pass by outside the window. If the lullaby falters, the
baby begins to cry, and the soldiers may discover the hiding place.

Hush’s creators, Jamie Antonisse and Devon Johnson, were conscien-
tious designers who found ways to express values through their game. The
player “sings” the lullaby by typing it at the precise rhythm indicated by
on-screen prompts. Players have reported that as they miss notes in the
lullaby, the baby’s cries grow louder, and the soldiers come nearer, they
Some games, however, provide choices that significantly influence the play experience, and in some cases the choices have a moral valence. For example, the Mass Effect (BioWare 2007) games allow players to approach situations as a compassionate, conciliatory, and altruistic "paragon" or as a ruthless, belligerent, and self-serving "renegade." Choice of play style greatly affects interactions and relationships with nonplayable characters and also determines how the storyline unfolds.

From a values perspective, what does it mean to offer or withhold these kinds of choices? Games like Mass Effect equally incentivize "good" and "evil" choices, and they might be considered morally relativistic. It could be that players experience them as a kind of sandbox for moral play, allowing them to explore ethical issues in a setting where real-world consequences do not apply.

Illustrative Games: Star Wars: Knights of the Old Republic, The McDonald's Videogame, and Spent

The Star Wars: Knights of the Old Republic (KOTOR) (BioWare 2003) role-playing games are similar to the Mass Effect games in that players choose to follow either the "light path" (in which the playable character's behavior is motivated by compassion, mercy, and self-sacrifice) or the "dark path" (in which the playable character is driven by hatred and lust for power) (figure 3.8). Depending on path chosen for one of the three player character classes, the games' stories progress differently, and the playable characters develop different powers.

Figure 3.7
The player actions generating incredible tension and empathy, from Hush (Jamie Antonisse and Devon Johnson 2007).

Figure 3.8
In Star Wars: Knights of the Old Republic (KOTOR), players may choose a dark path or a light path (BioWare 2003).

4. Player Choice

Unlike most other media, games can provide players an opportunity for choice. Many games channel players down a relatively linear path from beginning to end, with determined events that must happen on each level.
The KOTOR games present intriguing moral choices, but players do not necessarily make their decisions using moral criteria. One player might act ruthlessly to acquire dark-side powers because doing so introduces entertaining mechanics. Another player might act virtuously to unlock the light-side powers. So the moral character of the game could depend significantly on how the player decides to engage with it, and players do likely question their identities and responsibilities in gameplay.

The McDonald’s Videogame (Molleindustria 2006) offers a different approach to player choice. This is a business simulation like Railroad Tycoon (MicroProse 1990) or The Movies (Lionhead Studios 2005) in which the player micromanages various aspects of a commercial enterprise. The game description text on the McDonald’s videogame website, written from the point of view of Ronald McDonald, admits that the business has had “glitches” in terms of deforestation, food poisoning, and so on and has negatively affected society and the environment. Unlike most casual games, The McDonald’s Videogame is designed to convey an argument on the nature of capitalism. Starting in the year 2000, players work through successive years to raise revenue. Players need to supervise all areas of the fast-food chain, including agriculture, feedlots, restaurants, and boardrooms (figure 3.9). Because choices are limited, destroying strips of rainforest to produce grazing land for cattle, for example, is inevitable. Restaurant traffic can be controlled by marketing campaigns. Ian Bogost analyzes the play experience:

The McDonald’s Videogame mounts a procedural rhetoric about the necessity of corruption in the global fast food business, and the overwhelming temptation of greed, which leads to more corruption. In order to succeed in the long run, the player must use growth hormones, he must coerce banana republics, and he must mount PR and lobbying campaigns. Furthermore, the temptation to destroy indigenous villages, launch bribery campaigns, recycle animal parts, and cover up health risks is tremendous, although the financial benefit from doing so is only marginal.

The game creates an interesting tension between player choice (players can choose whether to engage in the most injurious business practices) and a general propensity toward running up the score. Players switch between a farm that supplies food to McDonald’s (where deforestation must happen to keep up with growing land needs), a feed lot (where cows are fattened and players attempt to stop disease), a McDonald’s restaurant (where inefficient workers should be fired—“eliminate the weak links”), and corporate headquarters (where the board of directors and the public relations office develops countermeasures against company detractors).

In most games, the choices that players make may be almost exclusively determined by what awards them higher scores (or whatever the game uses as markers of achievement or progress). Similarly, in the context of capitalist venture, player behaviors may be directed almost exclusively toward the goal of higher profits, and in some instances may find exploitation, bribery, and deceit almost irresistibly pragmatic behaviors. By immersing players in the decision-making processes of fast-food executives, the game offers a cogent critique of prevailing political and economic values.

Spent (McKinney 2011) also fosters thought-provoking tensions between player choices, but it does so by limiting possibility to unfavorable options (figure 3.10). The game offers players realistic but difficult decisions that people would face when living on $1,000 per month in or around Durham, North Carolina. Made for the Urban Ministries of Durham, the game offers dilemmas that lead people to seek social or financial help. The goal is to end the month with some funds remaining, but interruptions such as accidents or health issues crop up and threaten to upend the player. Players learn how quickly shifts in jobs, apartments, and medical care can lead to homelessness and poverty.

“You’d never need help, right?” the game asks the player at the start. Players enter the game by clicking “Prove It: Accept the Challenge.” Statistics
open the game to position the player’s point of view: 14 million Americans are unemployed, and you are a single parent. Can you make it through the month? The options are “Find a Job” or “Exit.” From there on, players choose from limited options, such as applying for a job as a restaurant server, warehouse worker, or temporary office worker. Temps have to take an in-game typing test. Restaurant servers have to purchase their uniforms. Most groceries are too costly for the monthly budget.

The game offers real-world feedback from data based on the Durham area. For example, the player can choose to live closer to work, where the rent is much higher, or live farther away, where transportation costs are higher. After players choose an option, the game displays a message acknowledging that “you and 12 million other American households” spend too much on housing.

5. Rules for Interaction with Other Players or Nonplayable Characters

Values are often conspicuously at play in the ways that games afford and regulate interactions with other players or nonplayable characters. Sometimes nonplayable characters offer hints or permit interesting interactions for finding clues or trading. The single-player game series Fable (Microsoft 2004) has deeper-than-average development of nonplayable characters, but there are many good examples of meaningful interactions with nonplayable characters. In multiplayer games, customs and rules that are unique to the gaming community can govern interactions (the context of play is more fully detailed as an element later in this chapter). Some games create welcoming spaces for new players. In contrast, the massively multiplayer online role-playing game (MMORPG) City of Heroes (NCSoft 2004) encourages cooperative relationships between new and experienced players. The game uses a “sidekick system” that provides incentives to both higher- and lower-level characters to play as a team. This relatively straightforward set of rules changes can completely reframe relationships between experts and novices. By tinkering with the rules for interaction with other players or nonplayable characters, designers can put values like cooperation, generosity, and altruism into play or can adjust these rules to affirm more individualistic values like competition and self-sufficiency.

Illustrative Games: Rock, Paper, Scissors Tag and Journey

Celia Pearce, Tracy Fullerton, Janine Froh, and Jacqueline Ford Morie have described an event called New Games Day, where students, faculty, and staff at the University of Southern California revived some of the games created by the experimental New Games Movement of the 1970s. Working with traditional games, the team’s “new” New Games featured large-scale activities that incorporated physicality, trust, and cooperation. Their description of rock, paper, scissors tag provides an excellent example of how changing the rules for interactions between players can reconceptualize the competitive ethos that often is associated with sport and play (figure 3.11):

By far, the group favorite was a game called Rock-Paper-Scissors Tag. In this game, two teams face off across a line. On the count of three, each group shows rock, paper, or scissors, having huddled beforehand to decide on a strategy. The team that shows the losing sign moves and runs to their home base, about fifteen feet behind. The team that shows the winning sign gives chase. Any person tagged by the winning team transfers to that team for the next round of play. The key to the game lies in the fluidity of the teams. Although you may have started on Team 1, soon you will be on Team 2, then back to Team 1, and so on. The game goes on until there is only one team or until everyone is too exhausted to continue.

Many traditional sports use a team-based competitive framework that categorizes other players as either enemy or ally, and that categorization is maintained from the beginning of the game until the end. This team building can create strong bonds among players and animosity toward
opportunities. However, when players switch teams frequently, as in rock, paper, scissors tag, the distinction between allies and adversaries becomes too ephemeral to “stick” in the same way that it does in traditional competitive sports. In the words of Pearce and her colleagues, the alternative approach to competitive play “encourages a global allegiance to the play of the game itself rather than to the success of any particular team.”

*Journey* (thatgamecompany 2012) is a PlayStation 3 game that positions the player as a lone robed figure wearing a scarf and wandering in a vast desert (figure 3.12). Players find themselves traveling on a quest to a distant mountain to discover the history of a once vibrant culture that occupied the land. In each level, the player may encounter one other player who might temporarily connect to their game. The players can see, meet, and help each other, but they can communicate only through musical patterns of singing, and they are paired anonymously. Players can help each other only by showing each other paths or helping change one another’s scarves.

The chance that creates the music transforms found cloth into magical red cloth, which allows the player to float for a time. If players finish a level together, they can stay together for the next. Players can be distinguished by their unique symbols that appear in the air as they sing or are marked on their robes. The design of the game fosters cooperation between players without requiring it and removes competition, because a player can be helpful to the other player but cannot harm the player. player interaction tends to be collaborative and profound. Designer Jenova Chen has noted that some playtesters cry after completing the game. At thatgamecompany’s Web forum for the game, players discuss crying in depth. One player notes, “The one thing that really amazes me though, journey [sic] doesn’t trigger my desire to win or to be better than someone. Something that happens in nearly every other game.”

6. Rules for Interaction with the Environment

What types of interactions does the game afford between playable characters and the nonsentient aspects of the game world (i.e., those aspects of the game world that are not characters)? What resources are available? What types of Interactions are incentivized through the game’s rules and the capacity of the artificial intelligence system? Is the player rewarded for exploring or appreciating, for depleting resources or replenishing them, or for destroying the game world or nurturing it?

**Illustrative Games: StarCraft and Trash Tycoon**

*StarCraft* (1998), a game series created by Blizzard Entertainment after its successful *Warcraft* game (1994), is a real-time strategy game set in the twenty-fifth century, where three species fight for dominance—the insect-like Zerg, the Protoss (a humanoid species with psychic abilities), and
Terrans (humans exiled from Earth). In many strategy games like StarCraft, players continually harvest the game world’s resources for raw materials to build military hardware, buildings, and so on, and they are given no mechanism through which to replenish those resources. It would be a stretch to say that games like StarCraft inculcate anti-environmentalist values, but such games do little to promote the value of sustainability.

The FarmVille-like Facebook game Trash Tycoon (Guerillapps 2011) provides an example of a game that is compatible with sustainability (figure 3.13). The game’s core concept is “upcycling” or converting waste to new materials or products that are of higher quality and better for the environment. Players clean up a trash-strewn city, build facilities like paper recyclers and glass smelters, and sell the products to earn funds to build new facilities and upgrade existing ones. Along the way, they earn badges and rewards for reaching sustainability milestones. The Plastic Master bronze badge, for example, is earned by creating twenty items with recycled plastic.

On an abstract level, the rules of Trash Tycoon are nearly identical to those of many mainstream strategy games. The player harvests resources (in this case, trash) and processes them into products that facilitate progress toward in-game goals. This is not mechanically different from harvesting minerals in StarCraft, for example, to be processed into siege tanks. The narrative of Trash Tycoon reimagines the conventional role sets of strategy games to engender a very different set of values.12 The issue of producing trash in the first place is not addressed, however, which calls into question the effectiveness of reimagining a commonly accepted and successful game model for a social-impact game when the root of the problem remains.

7. Point of View

As in other forms of media, point of view in games shapes how viewers and participants experience the world that is being presented. How do players view the playable character? Do they survey the game world from a first- or third-person perspective? Do players take on the view of a certain character, or are they controlling the situation from a God’s-eye, top-down view? Is it something in between or both? Point of view may partially determine how players understand themselves in relation to other players, non-playable characters, and the game world and may also influence how they perceive their own agency. For example, a game in which playable characters are controlled from a top-down perspective may suggest that players occupy the role of a “god” or “master.” In contrast, a first-person perspective may encourage greater identification with playable characters. Even within one point of view (such as third-person), there are wide variations in interpretation. The vast majority of the Uncharted (Naughty Dog 2007) games, for example, are third person, but the camera is dynamic. Most of the games implement an over-the-shoulder camera (common in games like Resident Evil 4 (Capcom 2005) and Gears of War (Epic Games 2006), but some platforming sections have the camera pull back so that the game effectively become a side-scroller. Other platforming sections in Uncharted have the camera lie in front of the playable character as he continually runs toward it while something chases him from behind, as in Crash Bandicoot (Naughty Dog 1996). Subtle in point of view, such as camera position, make a difference. Even though all three of Uncharted’s camera placements are third person in the broadest sense, they encourage different gameplay, a different relation to the playable character, and a different play experience.

Illustrative Games: Tomb Raider and Mirror’s Edge

The Tomb Raider (Eidos 1996) games have used a conventional third-person perspective in which the camera hovers behind Lara Croft, the series’ iconic playable character. Although the camera often zooms out to accommodate
segments of gameplay that require a wider view, it usually returns to just
behind Lara, offering what many critics have argued is a voyeuristically
satisfying view of her body (figure 3.14).

The critic Mike Ward notes the significance of seeing Lara from the back
during gameplay: the voyeur’s pleasure depends on being able to look with-
out being seen.12 None of this means that the third-person perspective is
necessarily sexualizing or objectifying. But with the context provided by
Lara’s clothing (typically tight shorts and a tank top) and her proportions
(large hips and breasts on an otherwise slender frame), the effect is unam-
biguously sexual.

Compare this to how point of view is used in Mirror’s Edge (EA Digital
Illusions CE 2008), another action-adventure game with a female playable
character. Players see the action from a first-person perspective through the
eyes of its playable character, a courier named Faith who works with anti-
authoritarian rebels in a totalitarian society (figure 3.15). When she runs,
the distance moves quickly forward. When she jumps, the player’s view of
the world rises and then falls. We do not see much of Faith’s body in
 gameplay. Instead, the focus is more on her actions, which are represented
through shifts in her field of vision as she moves. Whereas the Tomb Raider
games present a strong female character who seems at least partly designed

![Figure 3.14]

Camera controls highlighting third-person perspective in games such as Tomb Raider
can offer a voyeur’s pleasure (Eidos 1996).

![Figure 3.15]

Faith, from Mirror’s Edge (EA Digital Illusions CE 2008).

for male pleasure, Mirror’s Edge offers a female action hero who is, semanti-
cally speaking, less paradoxical.

8. Hardware

Game hardware shapes how designers think about games. The hardware—
the core capacity of system memory, the speed of graphics processors, and
the physical device of the mouse, controller, or keyboard—frames the pos-
sibilities of designers’ imaginations.14 With each advance in hardware, new
types of games are possible. This has been true throughout the history of
electronic and digital games. The very early game Tennis for Two (Higinbo-
tham 1958) used an oscilloscope as a visual monitor. In 1998, Nintendo
bundled a “biosensor” with Tetris 64 (Amtex 1998), and in 2010, it offered a
“vitality sensor” that monitors a player’s pulse. In the 2002 game Rez (Sega
2001), designed by Tetsuya Mizuguchi, players fly three-dimensionally
(using a “rail shooter” convention in 3D space) into a seemingly endless
tunnel filled with sound, light, and enemies. Always flying forward, players
fire at enemies, gain points, and create electronic music with the sounds
they are creating. The game was intended to be played with an additional
piece of hardware called “the trance vibrator.” This hardware was designed
to be worn on the body to draw even more senses into the action and create
a synesthetic experience.
Illustrative Game: *Dance Central 2*

*Dance Central 2* (Harmonix 2011) embodies some interesting features that are made possible by the Xbox Kinect hardware, which offers a camera and infrared interface to allow hands-free, accurate control of items on screen. Whereas older dance games used pads to detect foot movements, Kinect hardware allows *Dance Central 2* to respond to a player’s entire body (figure 3.16). The game can track one body or several, monitor bodies in motion in a 3D area, offer simultaneous two-player battles, and provide the ability to monitor and reward dancing to challenging choreography.

The accuracy of the body detection allows players to focus on more creative aspects of dancing, such as style, precision, and timing. The game thus encourages actual dancing rather than dancing “for the game” or making moves solely to get the controller to respond. Additionally, the game’s use of its camera data to provide fun, fast-paced replays of the dancers highlights the individual dancing rather than only the game’s characters. This accuracy shapes the values of the game by allowing players to express creativity and individuality.

9. Interface

*Interface* refers to attributes of the software and hardware that mediate players’ interactions with the game. Interfaces are constructs of hardware (such as in the Kinect) and software, which are the modes through which players interact with the game world. Both physical and on-screen elements shape the player experience. Although these are often assumed to be value-neutral, they may shape the play experience in value-rich ways. For example, a hardware interface that allows physically disabled people to play might be said to affirm the values of inclusiveness and accessibility. A software interface that allows for easy communication between players might affirm the value of cooperation by facilitating collaborative tactical play.

Illustrative Game: *Leela and Giant Joystick*

Often, video games feature fast movements and frenetic decision making. Deepak Chopra’s *Leela* (THQ 2011a) is the opposite type of game. Using an Xbox Kinect (or Nintendo Wii, although the Wii version is not as full-featured), players learn seven meditations and movements that help focus the mind on parts of the body where the seven chakras lie (figure 3.17). The idea that games might offer a spiritual or religious connection is very old, originating in the origins of games six to eight thousand years ago. A digital interface to religion and spirituality, however, seems rather new. In the “Play” section of the *Leela* gaming experience, players play games that target one of their chakras and use subtle movements to stimulate the chakras.

The navel chakra, for example, is supposed to be stimulated as players aim and gather virtual fireballs (the navel chakra's element) to blast floating ore.

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**Figure 3.16**

Kinect hardware enables a new breed of dancing game in *Dance Central 2* (Harmonix 2011).

**Figure 3.17**

The interface of *Leela* involves the body as well as the mind (THQ 2011).
The chakras can be stimulated in sequences, or the player can work on his or her personal mandala. The look of the game—particularly in the “Mandala” section—is psychedelic, with trance-like interactive compositions that feature repeating patterns, manipulable fractals, and shifting colors. In the “Reflect” area of Leela, players use the game as a platform for guided meditation or as an accompaniment to silent meditation. The Kinect actually measures a player’s breathing, for example, and the game displays a representation of the player’s breath to offer feedback. Chopra is interested in healing and the intersection of science, consciousness, and spirituality and has created a successful game that mirrors in a compelling way some internal processes for which other interfaces would be inadequate.

The coauthor of this book, Mary Flanagan, has created an interactive sculpture called [giant Joystick] (2006) that embodies the value of cooperation by modifying the user interface of classic Atari 2600 games like Asteroids and Breakout. The original incarnations of these games are deeply engaging but can become an isolating pursuit: they shift players’ attention toward the action on-screen and away from friends in the physical environment. To change the value of individuality to the value of cooperation and particularly to foster cooperation among strangers, Flanagan changed a specific element of the design—in this case, the scale of the user interface. By making the joystick enormous—it is over 10 feet tall and requires steps
to mount the sculpture—the play experience is transformed (figure 3.18). First, players report transitioning to a childlike state of feeling small again by the sheer scale of the play object: [giant Joystick] brings a feeling of wonder to players. Second, scale fosters a childlike fascination with the work but also determines how people interact in play. Visitors cannot easily play games by themselves with [giant Joystick]. One person (or sometimes more than one) moves the stick, while another presses the fire button by jumping on it. Through its shift in scale, the work highlights the spatial and social role of the interface. [giant Joystick] itself becomes the game and the site for interpersonal communication. With the new interface, classic games become a joyous celebration of collaborative fun. [giant Joystick] redefines technological conventions by recognizing the physicality and arbitrary nature of interfaces themselves. Flanagan’s controller connects real people in real space, a phenomenon that is quickly becoming an emerging domain for digital games as new hardware and interface technologies evolve the body and evolve the nature of digital gameplay.

10. Game Engine and Software

How does a particular software constraint or game engine affect what goes into a game? The affordances of the engine or codebase allow a game to appear and act as it does. Game engines—software frameworks that are used to create games—are often touted for their new features, such as the novelty of the physics engine (rendering, textures, environment, particle systems, lighting, and frame rate), networking ability (multiplayer, chat), and customizability (using tools such as editors). Constraints that are built into the software or the game engine can shape the content and values in a game. In the domain of first-person shooters, the game engines created for Wolfenstein 3D (id Software 1992) and Doom (id Software 1993) set the stage for many conventions that are still in use in 3D gameplay. The engines highly constrained physical interactions, for example: players typically run, jump, duck, and shoot, but they might not reach out with virtual hands to touch something. Players cannot pet a dog, for example, or reach with someone else to carry something. These constraints shape design decisions.

Ragdoll physics, for example, is one example where “what could be done” became a default technique in many 3D games. With ragdoll physics, the animation is computationally generated, allowing the game to avoid “ canned” or predrawn sequences. Ragdoll physics has been used primarily in death scenes, which become more “realistic” because bodies fall in unique ways. Other game conventions also have emerged simply because
of the limitations of the game engine. For example, game characters “pick up” objects mostly by running over or shooting at them, simply because the engine could not handle more complex actions.

Popular game engines make certain types of actions and behaviors, such as collision and particle detection, easier and more spectacular. Physics engines make the calculation of trajectories easy for activities such as throwing, jumping, or shooting. The ease with which such actions are expressed can sway the designer in certain directions and away from actions more in keeping with other values that a designer might be attempting to express, such as family, community, peace, and sharing. Game engines are often made for first-person shooters. They do not perform as well when serving as venues for other types of content, such as the use of text, slow-moving narratives, deep introspective character dialogue, and believable live-action video.

Illustrative Game: Quake
The Quake (id Software 1996) engine strongly influenced game design for a decade. It was the first 3D real-time rendering game engine and the first popular networked first-person shooter (figure 3.19).13 The Quake engine worked well due to the way in which the preprocessor reduced the number of shape “faces” by not processing areas of the game level or map that were not visible to the player’s point of view. In this way, the environment could be drawn quickly on what now would be considered very slow processors. This technology allowed the presentation of 3D graphics on fairly limited machines.

In Quake, the playable character is an unknown protagonist who, in single-player mode, is attacked by monsters, zombies, and other misfortunes during a quest to collect runes and defeat an end boss (the final enemy at the game’s conclusion). Quake contributed to the process in which game norms from existing two-dimensional games were shifted into 3D spaces, such as “collecting” health in the environment and defeating end bosses. In multiplayer mode, players connect through a server and play either together as one cooperative team or against each other in modes such as death matches. Various player actions—such as collecting grenades, shotgun ammo, and nails for the nailgun—were standardized by the 3D game engine techniques and the institutionalization of prior gameplay shortcuts.

11. Context of Play
The cultures that develop around games affect the playing experience. Such cultures can be found in game worlds such as MMORPGs, in online boards and player communities, and in the physical environments in which games are played. Many online multiplayer games provide a relatively hostile environment for new players (“noobs”), who are routinely taunted, exploited, and attacked by more experienced players. In the opposite vein, Lord of the Rings Online (Turbine, Inc. 2007) celebrates exchanges and generosity. Game chat occurs in real time and is almost exclusively via voice rather than text. The game features kinships and other social formations to keep the bonds between players tight. At any time, players can give to other players, and the goods involved are created from activities that end up being quite elaborate. For example, a player can craft cupcakes by finding ingredients and an oven; these can be exchanged for beer or given freely out of generosity. The game re-creates the atmosphere and values of J. R. R. Tolkien’s worlds and characters.

Illustrative Game: Defense of the Ancients 2
Valve’s Defense of the Ancients (2003) is a series of real-time session-based online multiplayer strategy games in which ten players are divided into two
equal teams with the goal of destroying the opposing team’s Ancient Structure in their associated stronghold (Figure 3.20). Team play and communication are the foundations of the game. Like some online games, it is very “noob unfriendly,” meaning that experienced players often treat new players poorly. The hostility of the players who engaged in the first game of the series was well known, and the second game in the series introduced a voice chat feature that furthered hostility. Many players have complained about the unwelcoming, aggressive, and harassing commentary (such behavior directed specifically at female players has been well documented).\textsuperscript{14} Voice chat in most cases makes players’ gender identity more obvious, which leaves players vulnerable to targeted abuse. Harassment is an ongoing issue within and outside of games. Although there are no reliable statistics on in-game harassment, anecdotal evidence suggests that it is a large problem. In-game harassment also reflects a larger cultural problem: a 2009 study shows that half of U.S. adolescent girls experience sexual harassment (it is often glossed over as “bullying”).\textsuperscript{15} Blog posts about Defense of the Ancients (and other games) are filled with hate speech, and the game’s culture is biased against women and players of color. Some people who might otherwise play the game won’t do so because of the context of play.\textsuperscript{16}

Such problems are not limited to Defense of the Ancients. A bullying, unforgiving game culture often challenges new players or those from underrepresented groups to “get over it” or get out of the game. A Battlefield 3 (EA Digital Illusions CE 2011) game launch party in Texas, for example, “disallowed” women from the event to protect them from insults from male players. A statement from organizers is revealing:\textsuperscript{17}

Nothing ruins a good LAN party like uncomfortable guests or lots of tension, both of which can result from mixing immature, misogynistic male gamers with female counterparts. Though we’ve done our best to avoid these situations in years past, we’ve certainly had our share of problems. As a result, we no longer allow women to attend this event.\textsuperscript{18}

That the organizers banned women but welcomed “misogynistic male gamers” says much about the values in this context of play.

12. Reward

What are points awarded for? What are the game goals? If no points are given, how are players rewarded as they advance in the game? What is the end state of the game? How do you win? The game’s reward structure reveals what kinds of accomplishments are valued in the game, and therefore it can be an especially interesting element for values-conscious designers to consider. Aspects of reward systems can include side quests as opposed to mandatory quests, unlockable content, and the requirements for achieving a particular narrative resolution. In Super Mario Bros., for example, the player accumulates a score throughout the game, but many players are motivated by other goals and might regard the score as secondary.

Illustrative Games: Harpooned and SpellTower

Some activist games expose the values that are laden in common game reward systems by providing ironic rewards. In a game touting itself as prosocial, players might take on the role of a polluting company, for example, and higher scores represent damage caused to the environment. In these cases, higher scores are ironically awarded for behaviors that the game actually opposes. One game with an ironic scoring system is Harpooned (Conor O’Kane 2008) (Figure 3.21). The game plays in ways that are almost identical to the vertically scrolling “shoot ‘em up” arcade games of the early 1980s, like Galaga (Namco 1981) and 1942 (Capcom 1984), but the scoring system gives an activist twist to this familiar genre. Players control a Japanese research vessel in Antarctica and are instructed to “perform research on the whales by shooting them with your explosive harpoons.” After killing a whale, a player can maneuver the boat toward the whale’s remains to collect its meat for “later study.” At the end of each level, the meat is offloaded.
to a "research vessel" where players receive a score that is intended as a sarcastic recognition of their performance. For example, a typical end-of-level score summary tells the player, "Our research has produced 320 cans of pet food, 200 whale burgers, 120 cosmetic products, and 1 scientific paper." Once the scoring system is understood, the game's message becomes clear: the mass slaughter of whales for "research" by Japan is a cover for commercial whaling.

SpellTower (Zach Gage 2011) has a different approach to rewards because the game is not necessarily taking on a social issue (figure 3.22). This seemingly simple casual spelling game incorporates a Boggle-style letter mix combined with a Tetris stacking game mechanic to allow players to spell words under constraints. The letters are mixed on the screen, and depending on the mode of the game, time-based or turn-based pressure adds to the difficulty. Points are assigned based on the length of the word, and players compete against their own high score.

Rewards in SpellTower are carefully designed and deceptively simple. The sounds that are created while combining longer and longer words evolve to develop into a magical indicator of mastery, rewarding the player with
rare sounds for increasing word lengths. Along with the sound design, as the individual letters are constructed into words, they glow and pulse in anticipation of word completion. These small feedback elements make the entering of a high-scoring word extremely rewarding; a completed word explodes from the board, and the letters adjust to the new board state. The highest-scored word is recorded for the player, so players can continually try to best their top word. Often the best words need to be created by working backward and diagonally, and thus the game is set up to reward creative thinking. The final reward—seeing one's best word and the points associated with it—motivates the player for the next round.

13. Strategies

What strategies can be usefully applied in the game? What approaches to the challenges presented in the game will help players progress or win? This element is similar to scoring: strategies can straightforwardly convey values by motivating players to use particular play styles, or they can reward particular play styles for the purpose of ironic critique.

Illustrative Game: PeaceMaker

In PeaceMaker (ImpactGames 2007), the player inhabits the role of either the Israeli prime minister or the Palestinian president during a particularly volatile period of the Israeli-Palestinian conflict (figure 3.23). Whichever role the player chooses, the goal is to create conditions in which a two-state solution to the conflict becomes viable. There are a wide variety of actions to choose from—some hawkish, some conciliatory, some unilateral, and some that require cooperation with groups on the other side of the conflict.

The game's values can most clearly be discerned by contrasting the types of strategies that lead to success with those that lead to failure. Generally, a hawkish foreign policy will exacerbate the conflict, and small conciliatory gestures will build trust between the two sides. Small gestures set the stage for more significant peace-building policies that can eventually lead to the end of the conflict. The game affirms the value of diplomacy and a nonmilitaristic foreign policy. The player can accept or reject the model's assumptions but is encouraged to consider their applicability to the real-world conflict.

14. Game Maps

Game maps (also called levels or environments) are the custom scenarios—the stages, settings, and mission details—of a game. In most cases, these are designed in a grid-based or cubic space. Any spatial arrangement in a game can prioritize particular values. Collaboration, for example, cannot easily happen in confined spaces where teams cannot congregate on screen because players often wish to see the interactions of their friends while fighting together. As another example, generosity might require players to be able to approach or at least recognize other players in the game space or to receive a message from the other players. Thus, both the spatial metaphors alluded to in the design of the game map as well as the actual constraints of the map can foster or prohibit certain values.

Illustrative game: Left 4 Dead 2

Left 4 Dead 2 (Valve 2009), the second in a series of zombie games by Valve, is a cooperative first-person shooter set in a postapocalyptic New Orleans (figure 3.24). The story revolves around four people who are immune to a virulent global disease and who must find other survivors and reach safe havens. Those who are infected become zombies and attack the uninfected.
open spaces are dangerous and quickly become filled with attackers who create mob scenes that some critics say mirror depictions of New Orleans in crisis after Hurricane Katrina. The game’s “director”—the technical artificial intelligence that controls game difficulty—changes the layout of the map as players move through the space. In the cemetery, for example, the layout of crypts is rendered dynamically based on how well a player is doing. The patterns are dynamically-generated through game play.\textsuperscript{32}

Chet Faliszek, the writer on the project, described the game spaces as the “Deep South,” featuring swamps and back roads as well as New Orleans.\textsuperscript{23} The space of New Orleans is, to some players and critics, too much for a game to contain after a catastrophe. “Setting the game in a city that was [the scene of dead, bloated bodies floating by so soon afterward was a bad call],” Willie Jefferson of the Houston Chronicle wrote in his “Gamehacks” blog. “New Orleans ... or the Old South can be very, very touchy areas to deal with.”\textsuperscript{18} Faliszek comments on the game’s depiction of New Orleans: “It’s a place we love, it’s dear to our hearts. We would not cheapen it. It’s not a brick-for-brick representation of New Orleans; it’s a fictional version, and I love that city.”\textsuperscript{25} Yet the spaces that are depicted in the game reveal values that are embedded in level design itself.

On the surface, game maps might appear to have little to do with politics and values. The levels in \textit{Left 4 Dead 2} are computationally generated to adjust to player skill. What can be the politics in those mere creations of location? As we know, Faliszek admits to intentionally evoking the post-Hurricane Katrina setting of New Orleans. But because some game maps are rendered to model this time and place, the game invokes issues in U.S. social history. By creating the rules to render the game map, the designers bring along dimensions of troubled race and socioeconomic disparity that followed in the wake of the disaster. Katrina is not a mere backstory: the game brings with it the tension, the accusations, and representations of those who were most affected. The game is rendering the city dynamically and refers to New Orleans post-Katrina, so race and socioeconomic status seem to be algorithmically embedded in the depiction of the city—a claustrophobic game map filled with desperate zombies.\textsuperscript{24}

\textbf{15. Aesthetics}

Although beauty is in the eye of the beholder, the aesthetics of a game express values. All games feature some type of visual look, sonic treatment, or physical movement that links them to the historic concept of aesthetics. Games operate far beyond the functional level: central to any game is
its connection to emotion and feeling. Aesthetics impart strong reasons to like or not like a game. They give players the sense of meaning outside and along with the game actions, narrative, and reward. For many players, for example, the Uncharted (Naughty Dog 2007) series stands out because it is beautiful and “cinematic.” Uncharted 2 (Naughty Dog 2009) earned much praise for the set pieces in which battle took place, the high degree of visual and aural polish, and its Indiana Jones-style plot. These games differentiate themselves from other action-adventure games in their high production values and cohesive look and feel—in other words, for their aesthetics.

All games have some sort of aesthetic, and many games are beautiful, but the aesthetic moves beyond what is good looking or not and ultimately infuses the game with values. Journey, for example, infuses values in several ways. The value of cooperation is integrated through its stunning sound design as the players communicate: the game’s beautiful sonic aesthetic emerges from the value of cooperation. The value of curiosity is rewarded by the gorgeous scenes along the quest to the mountain. A game’s aesthetics are a primary site of player pleasure and also launch values into play.

Illustrative Game: Limbo
The platform game Limbo (Microsoft 2010) sets the player in the role of an unnamed boy whose sister has vanished (figure 3.25). The boy can run, jump, climb, push, and pull. The game has a strong black-and-white art style, which is especially interesting because the character can momentarily become “lost” in the background and foreground of the world, which consists entirely of shadow shapes. The audio environment is minimal and haunting. Dangerous creatures such as giant spiders emerge from the shadows in a surprising, beautiful, and (for many) horrifying way. The beautiful monochromatic game world has reminded critics of film noir or German expressionist films. The beauty of the game works in contrast to the dark theme and the style of play that is encouraged. Gruesome animation (dismemberment, beheading) materializes effortlessly and surprisingly from this seemingly simple and otherwise aesthetically stunning world, disrupting feelings of beauty and sympathy with horror. The values of beauty and cruelty emerge together through the play of Limbo.

Conclusion
In this chapter, we have examined fifteen categories of game elements—an ontological breakdown of what “makes up” a game. But a couple of warnings are in order. First, meaning emerges not from individual elements but from the relationships among elements. This point has been an implicit theme in preceding sections. Recall how point of view and character representation in the Tomb Raider games interrelate to cast Lara Croft as an object of voyeuristic pleasure or how Three Player Chess introduces supplementary actions and rules to subvert the values of ordinary chess. We see these relationships among elements playing a role that is similar to the syntax of a language, which, along with other systems, enables us to understand how words combine to convey meaning through sentences. Similarly, if we understand the syntax of games, we know how elements combine to convey meaning through play. Second, these elements in any game could plausibly take on a variety of different and even opposing meanings depending on who plays. Values-conscious design and analysis must therefore give full weight to contextual factors, including the variability in players’ values, beliefs, and backgrounds.

Groundwork for Values at Play
In these first three chapters, we lay the groundwork for Values at Play. In chapter 1, we establish a theory of values in digital games. In chapter 2, we survey some of the many ways that values can crop up, intentionally or
unintentionally, in games. Here in chapter 3, we describe fifteen elements, the raw materials from which the world of a game is built. In the next section of the book, chapters 4 through 7, we take a practical turn. Guided by our theory of values and with the fifteen game elements as our building blocks, we describe the three key components of the Values at Play heuristic—discovery, implementation, and verification—to offer guidance to conscientious designers as they create new games.

II The Values at Play Heuristic
Failed Games:
Lessons Learned from Promising but Problematic Game Prototypes
in Designing for Diversity

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ABSTRACT
Iterative game design approaches have proven effective in creating persuasive games, but these approaches inevitably lead to as many abandoned designs as ones that are pursued to completion. This paper serves as a reflective and instructive post mortem for the unpublished non-digital game prototypes developed for our team’s “Transforming STEM for Women and Girls: Reworking Stereotypes & Bias” (BIAS) research project. We outline three abandoned designs and explain why they were ultimately not pursued, focusing on the challenges of balancing enjoyability, feasibility of production, and impact. We discuss design strategies, including: masking games’ persuasive intentions, prioritizing prototypes with their efficacy-to-cost ratio in mind, and designing for fun first. This discussion offers insights into the design of both non-digital and digital “games for impact” that allow designers and researchers alike to learn from these promising but problematic prototypes.

Keywords
Iterative design, game design, persuasive games, gender stereotypes, STEM

INTRODUCTION
The iterative design method allows game designers to create, test, and evaluate multiple problem-solving approaches quickly and efficiently (Fullerton et al. 2004). Such a method is particularly vital when attempting to tackle new and difficult problems with games, for which no best practices or little foundational research exists. Iterative design calls for designers to create many rough prototypes as quickly as possible (stressing quantity over quality), and then to pursue those prototypes that are deemed to hold the most promise.

The most promising of prototypes necessarily receive the most attention, but we can also learn a great deal from the less promising, abandoned designs, the ‘unsung sacrificed heroes’ of the iterative design process. Designers and researchers alike often avoid closely studying or analyzing their own failures, and the study of failure is an under-utilized aspect of reflective practice than can contribute substantially to the growth and maturity of the field of game design.
Starting in 2011, in our lab’s “Transforming STEM for Women and Girls: Reworking Stereotypes & Bias” research project (hereafter referred to as the “BIAS project”), we aimed to design and study game-based interventions to reduce biases and encourage broader participation for women in science, technology, engineering, and math (STEM) domains. Because our prior work has revealed that games themselves are powerful sites for enculturation (Flanagan 2009), and that values are often embedded into games through a variety of game elements (Flanagan and Nissenbaum 2015), we approached our work with biases and stereotypes thoughtfully and carefully, with a priority on evidence-based design. Our team developed, tested, researched, and produced a suite of games, both digital and non-digital, that would be accessible and implementable in a variety of school, after-school, and home settings. The target audience for these games was to be primarily middle school and high school students in the United States (ages 11-15). In order to maximize the impact of these interventions, the games were playtested with, and created for, diverse audiences. Our team included players from differing socio-economic strata, races, ages, and ethnicities, in order to help ensure that our designs would address issues of self-efficacy and interest in STEM for students across a broad range of underrepresented social categories.

RATIONALE

Much research has pointed to the specific ways in which girls (and underrepresented populations in general) might further succeed in STEM areas in the US if particular social and cultural aspects were to improve (Hill et al. 2010). Some of these barriers might be changed through well-designed, collaborative game activities that can engage and energize players around these issues. For example, games that address psychological obstacles to identification with STEM pursuits may be especially effective for pre- and early-adolescent players. Pajares (1996; 2005) and others (e.g., Cvencek et al. 2011) have documented the decline in self-confidence in STEM areas that begins to emerge for girls in middle school and continues to amplify in high school and beyond. Girls consistently report less self-efficacy in STEM than do boys, despite the fact that actual gender differences in STEM performance are by most accounts insufficient to explain the lopsided participation of males and females in STEM courses and careers (Hyde et al. 2008).

With a massive review of twenty years of research regarding the lack of women in STEM (Hill et al. 2010) as a starting point, our exploratory work aimed to offer testable proof-of-concept activities centered on several distinct practical approaches and interventions for increasing representation in STEM. Among other strategies, we focused on designing game-based interventions to counteract implicit bias and stereotype threat—two particularly powerful psychological barriers that may benefit from small changes that can end up making large differences in girls’ experiences. All of the games created in the course of the BIAS project were translations or variations of strategies that prior psychological research has shown to be effective for combating the effects of stereotype threat, implicit bias, and other key psychological barriers to underrepresented students in STEM.

Also known as ‘hidden bias’ or ‘unconscious bias’, implicit bias stems from the mind’s natural (and automatic) means of constructing mental schemas, or representational templates, for understanding broad categories, including social identity groups (Greenwald and Banaji 1995; Greenwald and Farnham 2000; Kang 1995). The schemas we use to categorize the world are generally unconscious, but are good predictors of individuals’ perception and behaviors (particularly less deliberative, more spontaneous
In the case of the underrepresentation of girls and women in science, the implicit bias that girls’ peers, families, and teachers (as well as girls themselves) hold may limit girls’ self-efficacy, interest, and achievements in STEM. Implicit bias is essential to unpack because, often, one thinks of ‘discrimination’ as an act perpetrated knowingly by prejudiced individuals acting to cause someone harm. Implicit bias shifts this discourse to focus more on environmental or socio-cultural causes of bias that are less volitional and more unconscious and pervasive, but, at the same time, may be reduced through the use of conscious strategies intended to reverse the ‘metal habit’ of bias (Devine 1989).

*Stereotype threat* refers to the anxiety or concern that arises in situations in which a person has the potential to confirm a negative stereotype about his or her identity group (Steele and Aronson 1995). Steele and Aronson showed that even subtle reminders of culturally-shared stereotypes that predict lower aptitude or poorer performance from certain groups can disrupt the performance of an individual who identifies with that group. Across experiments, research has shown that members of groups subject to disparaging, negative stereotypes in a given domain will experience performance-debilitating anxiety unless bolstered in some way. For example, stereotype threat is known to emerge if a test is introduced to a member of a stereotype-targeted group as being diagnostic of a person’s innate ability (Bell et al. 2003; Steele and Aronson 1995). Researchers have found that women who were told that a math exam had “shown gender differences in the past” scored lower than other women with equivalent math backgrounds (Johns et al. 2005). There are many such studies supporting the evidence that stereotype threat has real-world impact (Hill et al. 2010). Certain types of “strengths-focused’’ activities have been found to help ‘inoculate’ learners against the effect. For example, research indicates that subtly shifting female students’ focus onto their strengths, rather than potential weaknesses, can work against the effects of stereotype threat in STEM (Johns et al. 2005).

With this vast body of psychological research as a foundation and starting point, our team iteratively crafted over twenty game prototypes that attempted to counteract stereotypes and biases, using strategies including promoting growth mindset (i.e., the perception that abilities are not fixed, but rather amenable to change through experience and practice: Aronson et al. 2002), teaching about stereotype threat (Johns et al. 2005), utilizing techniques from embodied cognition (i.e., using bodily or visceral experiences to trigger emotional or cognitive changes: Wilson 2002), and improving spatial reasoning abilities (Sorby and Baartmans 2000).

Seven prototypes in the BIAS project reached states at which they were studied experimentally. To date, three of these games have been produced and distributed, with one additional game currently in production; two success cases are described at the end of this paper. The games that reached the production stage were deemed to meet the ‘dual bottom line’ of enjoyability and impact. The games had to be good games first, and, additionally, meet the challenge of producing quantifiable results as evidence attesting to their positive impact on players. Prototypes that failed to meet these either of these criteria were abandoned; this was the outcome for each of the abandoned prototypes described in this paper. Failures recognized early on in the iterative design process, however, often informed and contributed to the success of other prototypes.

**CASE STUDIES**

The abandoned prototypes to be presented were each judged to be problematic for different reasons. Through playtesting, for example, the board game *Doubtlanders* was

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found to be lacking in several respects: the game’s pacing was too slow, it did not include enough opportunities for meaningful choice, and was it not balanced enough to support its intended impact in overcoming stereotype threat. During development, the party game Teaser Totter was revealed to be impractical to develop, and, after controlled research, the board game (and possible digital game) Skyline was not able to be shown to be effective for producing its intended impact. Each of these failed designs provided our team with a host of new insights and helped guide the design of subsequent games that successfully balanced the criteria of being fun, practical to produce, and impactful.

**Doubtlanders**

The cooperative board game prototype Doubtlanders was developed in order to illustrate the effects of stereotype threat and to model a growth mindset in STEM. Research has shown that, in the case of stereotype threat, simply informing participants about the existence and debilitating impact of stereotype threat can mitigate its effects on self-belief and performance (Hill et al. 2010).

During gameplay, players take on the role of the fantastical citizens of the fictional ‘Barony of Doubtland’ and work together to combat the dictatorial rule of their evil ruler, ‘Baron Nefarious’. Players take turns moving their characters around a nonlinear board (see Figure 1), defeating challenges and improving their characters’ skills. The tension in the game arises from Baron Nefarious himself: in between the players’ turns, the Baron moves about the board and places difficult-to-defeat ‘Dastardly Scheme’ cards. These cards require the players to strategize and accumulate skills in order to bolster the character’s sense of self-efficacy and remove the schemes, or risk losing the game.

The crux of Doubtlanders’ impact lies in its modeling of stereotype threat. Throughout the game, Baron Nefarious threatens the characters using stereotypes about them depicted on ‘Doubt’ cards; these temporarily reduce the characters’ skills from their full potential and make it more difficult for characters to overcome the Baron’s schemes. Players must spend time overcoming these Doubt cards in order to restore their skills.

Many games intended to promote diversity take the very literal approach of assigning the player (or non player characters) real-world minority group status, and then seek to confront existing cultural biases against those groups (e.g., the representation of an African-American graduate student in Fair Play: Carnes et al. 2013). Doubtlanders allows players to assume the roles of members of a fictional species, with real-world stereotypes randomly ascribed to them: for example, the Toadstool Folk are thought of as cowardly, the Banshees are thought of as evil, and so forth. The use of fiction to address real-life social biases is a tactic that has been used in other popular media, such as such as the depiction of racism against aliens in the film District 9 (2009), and against elves in the cross-platform Dragon Age video game series (2009, 2014), to cite two recent examples. Researchers and game designers, however, have not fully adopted this strategy of fictionalizing biases to address a real-world problem, particularly in the domain of pervasive games or “games for change.” Nonetheless, given that in related psychological research we have found that fiction is powerful and transformative means of shifting individuals’ beliefs, behaviors, and identities (Kaufman and Libby 2012), we believed the use of fiction and light metaphor would be an effective and promising means of modeling the tricky dynamics of stereotype threat. Furthermore, we hypothesized that using fictional depictions of bias would increase the game’s potential to reach a wider array of target demographics by not confining its appeal to a single real-life stereotyped group.
At the same time, while *Doubtlanders* wholly fictionalized the concrete details of bias depicted in the game (i.e., the groups involved and the stereotypes attributed to them), the game only slightly fictionalized the *processes* of experiencing and overcoming stereotype threat. Tellingly, during playtesting, it became apparent that players found these mechanics painfully clear in their intention: to illustrate the anxiety and self-doubt triggered by stereotype threat and teach methods to overcome the impact of stereotype threat on performance. The depiction of stereotype threat was quite literal.

The problem of literally representing the process of stereotype threat was inevitable. *Doubtlanders* needed to be explicit in its purpose, or else risk the possibility of players not being able to transfer and apply concepts they learned in the game to real-world examples or experiences of stereotype threat. The game relied on players grappling with their character’s self-doubt and anxiety on nearly each turn. Ultimately, the direct nature of the modeling of this serious topic led to *Doubtlanders* being perceived by most players as dour and heavy in tone, instead of whimsical and fun. The prototype was eventually abandoned due to the challenges posed by the problematic prototype: simply put, the game was on-topic but not enjoyable. Addressing stereotype threat directly was a key challenge to keeping the game’s tone light and fun.

When examined with the dual bottom line criteria of enjoyment and impact in mind, however, the *Doubtlanders* prototype did not meet our needs. *Doubtlanders* had potential to be effective at modeling stereotype threat, but did so at the expense of the second bottom-line criterion of enjoyability. Directly modeling issues such as stereotype threat and the means for overcoming it proved too overt. The game even used the word “stereotype,” which, in a related game framing study we conducted, reduced players’
interest and blunted the impact of one of the successful prototypes discussed later in this paper (Kaufman and Flanagan 2015C; Kaufman, Flanagan, and Seidman 2015). Such overttness can ruin a game whose aim is to engage controversial or sensitive issues. A game that players do not wish to play or complete should not be made.

As our team continued development on games in our BIAS research, we were careful to learn from this attempt at literally addressing biases. For other games, we decided to address biases indirectly, a decision that led to Buffalo: The Name Dropping Game (described later in this paper) and, more broadly, to a design approach that further research has confirmed can increase a game’s impact. When dealing with thorny issues such as biases and stereotypes, obfuscating a game’s intentions while still having it facilitate effective attitude and behavior change, is not only possible – it is more effective than making the game’s intentions overt (Kaufman and Flanagan 2015B, 2015C; Kaufman, Flanagan, and Seidman 2015). 

**Teaser Totter**

The party game prototype *Teaser Totter* was developed to have two related effects: first, to lead players to confront their own implicit biases, and, second, to model the hindering effects of those biases. In the game, two teams of players pose riddles to one another, with a representative player from the “guessing” team designated to give answers in front of the entire group. Riddle Cards, consisting of five clues and an answer, are to be drawn by one team who pose the riddle to the other team.

The Riddle Card text is intentionally composed in order to defy common, everyday gender stereotypes (see Figure 2). Thus, in order to provide a correct answer, players must ideally “check” (i.e., override) any stereotypical assumptions inherent in the guesses that come to mind most quickly, such as the notion that women are not likely to be construction workers. In addition to challenging traditional gender roles, the riddles were made more difficult by allowing the opposing team posing the riddle to read the clues in any order they wished.

To illustrate the effects of implicit bias on perceivers, *Teaser Totter* attempted to use the body to physically model the mental “contortion” that implicit bias entails: that is, the ways that implicit bias skew one’s judgments and perceptions, often in an unrecognized and unconscious fashion. In order to simulate this experience for players, *Teaser Totter* provides a physical manifestation of this contortion: every time a player fails to correctly guess a riddle’s answer after a given clue, she must balance a physical object on her body (see Figure 3). If at any point one of the balanced objects falls, that player’s team loses their chance to answer the riddle (and, thus, to gain points for that round).
Playtests of *Teaser Totter* revealed that the game was a spectacle both to watch and play, as players contorted their bodies to hold strange objects, and the riddles were challenging brain teasers to solve (even without balancing objects on one’s body). The employment of embodiment (in particular, the use of embodied elements as metaphors for mental processes) has been underutilized in games for impact in general, and specifically in games dealing with biases and stereotypes. *Teaser Totter* was a promising prototype.
because, unlike \textit{Doubtlanders}, initial playtests made it clear that the game was fun, and its mechanics had the potential to be effective at combating stereotype threat.

Despite its potential for success, during development it quickly became clear that \textit{Teaser Totter} would be challenging to produce affordably. The game’s design relied a great deal on content (riddle) generation, while the game’s core strengths lay in its embodied elements. The nature of \textit{Teaser Totter}’s gameplay dictated that each riddle in the game could only be used once, necessitating a very large number of riddles, which, our team discovered, were non-trivial to write. The daunting task of writing hundreds of equally-challenging riddles that could cleverly address bias in nonobvious ways was the practical consideration that led to \textit{Teaser Totter}’s abandonment.

It is always tempting when creating games for change to design heavily content-driven games, relying on designer-written anecdotes, situations, trivia questions, or (as in this case) riddles to change players’ attitudes and behaviors. When not crafted carefully, content-driven games run the risk of having low replayability (which is especially problematic in tabletop games), while requiring high design investment. Successful content-driven tabletop games tend to fall into two categories. “Combinational” games such as \textit{Cards Against Humanity} make use of a fairly limited collection of cards with lengthy content, but this limited collection of content is lent replayability by the combining of the content in many ways (perhaps most notably in \textit{Cards Against Humanity}’s fill-in-multiple-blanks mechanic). “Massive Content” games such as \textit{Taboo} and \textit{Pictionary} rely on a substantial collection of content, of which each piece can only be used once (or once in a while), but take relatively little thought, time, or effort to develop.

<table>
<thead>
<tr>
<th>Difficult to write content</th>
<th>Quick to write content</th>
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<tbody>
<tr>
<td><strong>One-time-use content</strong></td>
<td>Example: \textit{Teaser Totter}, Prognosis: Inefficient</td>
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<tr>
<td><strong>Reusable content</strong></td>
<td>“Combinational” Games, Examples: \textit{Cards Against Humanity}, \textit{Awkward Moment}, Prognosis: Efficient</td>
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\textbf{Table 1:} Content Types and Efficiency of Generation in Content-Driven Games

More broadly, it is crucial to remember that iterative game design for social impact encourages prioritization of prototypes not only by their fun and likely effects, but also (as in all disciplines) by practical production concerns. This is not to say that designers should not endeavor to realize technically challenging prototypes, but instead to let efficiency of impact play a role in the prioritization of which prototypes to bring to fruition. Ultimately, \textit{Teaser Totter} was deemed to be too inefficient and expensive to produce, and our team questioned its efficacy-to-cost ratio.

\textbf{Skyline}

The cooperative spatial puzzle game prototype \textit{Skyline} was developed to improve ten to fourteen year-olds’ spatial reasoning and three-dimensional mental rotation abilities. Greater spatial reasoning skills has been shown to correlate with increased retention in
college engineering courses (Sorby and Baartmans 2000). This finding poses a particular barrier to women, who have been shown to enter college with lower spatial reasoning ability than their male peers (Linn and Petersen 1985; Voyer et al. 1995). This difference, which most scholars believe can be attributed to less frequent use of spatial toys among women during childhood rather than an inherent biologically-determined difference in aptitude between genders, can fortunately be overcome with a relatively small amount of training (Sorby and Baartmans 2000). Skyline was developed to help provide this practice and to enhance players’ spatial skills.

Skyline challenges four players to construct a city from blocks on a square board placed between them. Each player is tasked with constructing a particular pattern on one of the sides of the board, and the players win when each side matches its player’s pattern. As there are never enough blocks for each player to build her pattern independently of the others, Skyline was designed to force its players to cooperate and to envision their allies’ patterns to succeed in the game: players must choose blocks which, when oriented correctly, help construct multiple players’ patterns (see Figure 4).

![Skyline game being played](image)

**Figure 4:** Two players play Skyline. Each player has two cards and controls two sides of the city.

Skyline’s strengths as a game lay in its engaging cooperative and communicative gameplay, the ability to easily and quickly create new puzzles for the game, and its indirect approach to combating gender bias in STEM fields (none of Skyline’s players guessed the game’s true purpose of increasing their retention in science or engineering courses). Skyline was a particularly promising prototype due to its broad and diverse appeal. It was not a tabletop strategy game designed for the stereotypical gamer but, rather, an accessible social game that would transcend traditional player boundaries.

Our design process very consciously puts empirical research (and demonstrated evidence of players’ experiences and the game’s impact) at the very beginning, middle, and end of every project. At the start of a project, research guides and informs the initial game concept brainstorms. Along the way, pilot studies point to whether the team’s ideas are having impact. At the end of a project, research verifies and optimizes the games’ efficacy, and allows us to draw general lessons from the games to inform future
designs. Simultaneously, our games are iteratively designed with player enjoyment as the primary concern. This parallel method ensures that a game that has been developed to a production stage is going to be both fun and effective.

Unfortunately, controlled studies conducted on prototypes of Skyline showed no significant increase in middle school students’ spatial reasoning performance over baseline scores exhibited by a no-game control condition after a single play session. Skyline serves as a testament to iterative design and the ‘fun-first’ design methodology in game design for impact. It works well as a game, but does not (at the time of this paper) produce the results we aim for. Further work will test whether the reliance on just one play session (versus repeated play experience) or some aspect of the game’s design can best account for the game’s lack of demonstrated efficacy. Designing for player enjoyment alongside empirically-verified effectiveness promises that, even should the worst happen and the game proves ineffectual at changing attitudes or instilling new skills, the process will result in at least an enjoyable game. This is by far preferable to inverting the process and being left with an effective but unenjoyable intervention that users simply will not engage with of their own volition.

SUCCESS CASES
We have reviewed three failed games. At this point it is relevant to describe the most successful games produced as part of our BIAS work as counterpoints for the abandoned designs described earlier. The games we will now review in fact produced great success in our ‘dual bottom line’ of enjoyability and impact; ‘enjoyability’ being measured both by extensive playtesting throughout every stage of our design process as well as subsequent purchase and distribution figures, and ‘impact’ measured through controlled research studies obtaining quantifiable results attesting to the games’ efficacy.

Awkward Moment
Falling within the card-based party game genre alongside the popular Apples to Apples and Cards Against Humanity, Awkward Moment (2012) is a party card game in which players (typically aged 10-14) are challenged to react to awkward middle-school social situations. Some of these “awkward moments” are “on-topic” and include gender bias scenarios related to STEM fields (e.g., “The math team is 100% boys”), but other moments are “off-topic” and present neutral embarrassing moments unrelated to gender bias in STEM (e.g., “You sit on ketchup at lunch.”). To play, players select one “Moment” card from the deck to present the social situation, to which the players must respond from their hand of ‘Reaction’ cards. Reactions range from silly to serious. A deck of ‘Decider’ cards list the criteria (such as “Most Serious”) that one player uses to select the winning Reaction each round.

Via a series of controlled experimental studies, we tested the impact of Awkward Moment on players’ likelihood of associating women and science, levels of assertiveness in responding to imagined occurrences of bias, and perspective-taking abilities, using a variety of measures. Results have shown that the game exerts a statistically significant positive effect on all of these outcomes for both youth and adult players immediately following gameplay. Importantly, these outcomes only emerge for versions of the game utilizing the “intermixing” method of balancing bias-related Moments with lighter, more whimsical Moments (Kaufman and Flanagan 2015A, 2015C). In this way, the game successfully balances the dual criteria of enjoyability and effectiveness by utilizing a less overt approach than that used by Doubtlanders to engage players with the serious issues of biases and stereotypes. At the same time, as discussed earlier, the fact that Awkward
Moment is “combinational” – the content for the Moment, Reaction, and Decider cards (while being difficult to write) is reusable by virtue of new pairings with each reshuffling of the decks – made it a relatively efficient game to produce compared to Teaser Totter.

Buffalo: The Name Dropping Game

A second party card game that we developed, called Buffalo: The Name Dropping Game (2012), is a free-form trivia game designed for players ages 14 and above. Buffalo is played with two card decks (one with cards listing individual adjectives and one listing nouns), and players must race to shout out the name of a real person or fictional character who is described by the pairing of adjective and noun shown when one card from each deck is revealed. For example, if the revealed cards read “British” and “Wizard,” the first player to come up with a response such as “Harry Potter” or “Merlin” wins the round and claims the cards.

The key goal of Buffalo is to expose players to a plethora of cross-cutting categories (through the pairing of a wide array of adjectives with numerous social categories, such as race, gender, nationality, religion, profession, and ideological orientation) as a means of reducing prejudice. A series of controlled studies involving Buffalo revealed that the game significantly lowered adult players’ prejudices and increased their concern about being biased, as measured by the Universal Orientation Scale, a measure of universal non-prejudice assessing individuals’ likelihood of focusing on interpersonal similarities rather than differences, and the Internal and External Motivation to Control Prejudice scales (Kaufman and Flanagan 2015C). At the same time, as both our playtest interviews and controlled research revealed, in contrast to Doubtlanders very few players realized the underlying intention of the game or its connection to prejudice (instead connecting the game more to knowledge of pop culture or historical trivia). The fact that Buffalo had measurable impact and provided a pleasurable experience for most players meant that the game satisfied our dual bottom line criteria of fun and efficacy. Buffalo achieved a gold standard of efficacy-to-cost by, unlike Teaser Totter, featuring reusable content (stemming from the game’s 200+ noun and adjective cards in combination) that was extremely efficient for the design team to produce.

CONCLUSION

Designers can learn much from their successes, and perhaps even more from their failures. Our team finds that contrasting successes and failures provides deeper insight. Comparing the elements that led to the success of Buffalo and Awkward Moment with the elements that contributed to the abandonment of Doubtlanders, Teaser Totter, and Skyline, yielded generalizable lessons relevant to any designer creating games for impact.

Just as with any game, when creating games for impact, designers must focus on the player experience first but, at the same time, negotiate the additional responsibility of verifying the game’s intended impact on its players. As our work has shown, persuasive games can be both more fun and more persuasive (especially when dealing with controversial issues) when their messages are less obvious, or even masked, in gameplay. Furthermore, when possible, content-driven games should strive to be designed with reusable and/or combinatorial content; otherwise they risk being extremely challenging for small teams to produce well and to capture audiences for repeated play experiences. The case studies and reflections offered here provide designers and researchers of games for impact with three concrete standards (and the means to assess them) to forecast the ultimate success of their prototypes.
ACKNOWLEDGMENTS
This research was supported by the U.S. National Science Foundation, HRD-1137483 
“(EAGER) Transforming STEM For Women and Girls: Reworking Stereotypes & Bias.”
Special thanks to the entire Tiltfactor team and our community for their thinking, 
playtesting, and practical insights in developing these failed (and successful!) games.

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CHAPTER SEVEN

The Benefits of Alternate Realities

Whenever I walk through the front door of my apartment, I enter an alternate reality. It looks and works just like regular reality, with one major exception: when I want to clean the bathroom, I have to be really sneaky about it.

If my husband, Kiyash, thinks I’m going to scrub the tub on Saturday morning, he’ll wake up early, tiptoe out of the bedroom and silently beat me to it. But I’ve lived in this alternate reality long enough to have developed a highly effective counterstrategy: I clean the bathroom at odd hours in the middle of the week, when he’s least expecting it. The more random the hour, the more likely I am to complete the chore before he does. And if this strategy ever starts to fail? Well, let’s just say that I am not above hiding the toilet brush.

Why exactly are we competing with each other to do the dirty work? We’re playing a free online game called Chore Wars. And it just so happens that ridding our real-world kingdom of toilet stains is worth more experience points, or XP, than any other chore in the Land of the 41st-Floor Ninjas, which is what we’ve dubbed our apartment in the game. (We live on the forty-first floor, and my husband has a thing for ninjutsu.)
Chore Wars

Chore Wars is an alternate reality game (ARG), a game you play in your real life (and not a virtual environment) in order to enjoy it more. Chore Wars is essentially a simplified version of *World of Warcraft*, with one notable exception: all of the online quests correspond with real-world cleaning tasks, and instead of playing with strangers or faraway friends online, you play the game with your roommates, family, or officemates. Kevan Davis, a British experimental game developer who created Chore Wars in 2007, describes it as a “chore management system.” It’s meant to help you track how much housework people are doing—and to inspire everyone to do more housework, more cheerfully, than they would otherwise.

To play Chore Wars, you first have to recruit a “party of adventurers” from your real-life household or office. That means getting your roommates, family members, or coworkers to sign up online, where together you’ll name your kingdom and create avatars to represent everyone in the game.

Anyone who creates an avatar is eligible to undertake any of the custom “adventures” that you create in the game’s database—in my household, these include emptying the dishwasher and brewing the first pot of coffee. And because it’s a role-playing game, you’re encouraged to write up the chores with a fantastical spin. In the Land of the 41st-Floor Ninjas, for example, brushing out our Shetland sheepdog is “Saving the dog-damsel in distress from clumps and shedding,” and doing the laundry is “Conjuring clean clothes.”

Whenever you complete one of these chores, you log in to the game to report your success. Every chore grants you a customized amount of experience points, virtual gold, treasure, avatar power-ups, or points that increase your virtual skills and abilities: plus ten dexterity points for dusting without knocking anything off the shelves, for example, or plus five stamina points for taking out all three kinds of recycling. And because you get to craft the adventures from scratch yourself, you can customize the in-game rewards to make the least popular chores more attractive—hence, the battle in my apartment to clean the bathroom first. It’s worth a whopping one hundred XP.
The Benefits of Alternate Realities

The more chores you finish, the more experience points and virtual gold you earn, and the faster you level up your online avatar’s powers. But Chore Wars isn’t just about tracking your avatar development; it’s also about earning real rewards. The game’s instructions encourage households to invent creative ways to redeem the virtual gold in real life. You could exchange the gold for allowances if you’re playing with your kids, or for rounds of drinks for roommates, or coffee runs for workmates, for example. My husband and I share a single car, so we use our gold pieces to bid on what music to play in the car whenever we’re driving somewhere together.

But even more satisfying than all of my avatar powers, accumulated gold, and music privileges is the fact that after nine months of playing Chore Wars together, my husband’s avatar has earned more overall experience points than I have. And avatar stats don’t lie: for nearly a year now, Kiyash has definitely put in more effort cleaning the apartment than I have.

Clearly, this is a game that you win even if you lose. Kiyash has the satisfaction of being the best ninja on the forty-first floor, and I have the pleasure of doing fewer chores than my husband—at least until my competitive spirit kicks back in. Not to mention, it’s more enjoyable to be partners in crime when it comes to housework, instead of nagging each other about chores. And, of course, as an added bonus, our place is cleaner than it ever has been before. Chore Wars has transformed something we both normally hate doing into something that feels creative and fun. The game has changed our reality of having to do housework, and for the better.

We’re not alone. Chore Wars is one of the best reviewed and most beloved, if little known, secrets on the Internet.

A mom in Texas describes a typical Chore Wars experience: “We have three children, ages nine, eight, and seven. I sat down with the kids, showed them their characters and the adventures, and they literally jumped up and ran off to complete their chosen tasks. I’ve never seen my eight-year-old son make his bed! And I almost fainted when my husband cleaned out the toaster oven.”

The experience apparently works as well for twentysomethings as it does for kids. As another player reports: “I live in a house in London with one other girl and six guys. A lot of the time I’m the only one tidying up, which was
driving me slowly insane. I set up an account for us last night, and set some ‘adventures,’ and when I got up this morning everyone in the house was cleaning. I honestly could not believe what I was seeing. All we had to do is make it a competition! Now the guys are obsessed with beating each other!”

How, exactly, does Chore Wars do it?

We typically think of chores as things we have to do. Either someone is nagging us to do them or we do them out of absolute necessity. That’s why they’re called chores: by definition, unpleasant tasks. The brilliant master-stroke of Chore Wars is that it convinces us that we want to do these tasks.

More important, however, is the introduction of meaningful choice into the housework equation. When you set up your party, your first task is to create a large pool of adventures to choose from. No player is assigned a particular adventure. Instead, everyone gets to pick their own. There are no necessary chores. You are volunteering for every adventure you take. And this sense of voluntary participation in housework is strengthened by the fact that you’re encouraged to apply strategy as you choose your own housework adventures. Should you go for lots of chores that are fast and easy to complete, and try to rack up as many XP as possible that way? Or should you go for the harder, bigger chores, blocking other players from getting all that gold?

Of course, there are no good unnecessary obstacles without arbitrary restrictions. And for advanced Chore Wars players, that’s where the real fun comes in. You can make it harder to earn XP and gold by adding new rules to any adventure. For example, you can set target time limits: double XP if you can put away your laundry in under five minutes. Or you can add a stealth requirement: you must empty the trash without anyone seeing you. Or you can simply tack on absurd restrictions: this chore must be done while singing, loudly, for example, or while walking backward.

It sounds ridiculous—why would making a chore harder make it more fun? But like any good game, the more interesting the restrictions, the more we enjoy playing. The Chore Wars management system makes it easy for players to dream up and try out new ways of doing the most ordinary things. Chores are, again by definition, routine—but they don’t have to be. Doing them in a game format makes it possible to experience fiero doing something as mun-
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dane as cleaning up a mess, simply by making it more challenging, or by requiring us to be more creative about how we do it.

In real life, if you do your chores, there are visible results—a sparkling kitchen, or an organized garage. That’s one kind of feedback, and it can certainly be satisfying. But Chore Wars smartly augments this small, everyday satisfaction with a more intense kind of feedback: avatar improvements. As online role-playing gamers everywhere know, leveling up is one of the most satisfying kinds of feedback ever designed. Watching your avatar profile get more powerful and skillful with each chore makes the work feel personally satisfying in a way that a cleaner room just doesn’t. You are not just doing all this work for someone else. You are developing your own strengths as you play.

Best of all, you are getting better and better all the time. Even as the laundry gets dirty again or the dust starts to sneak back in, your avatar is still getting stronger, smarter, swifter. In this way, Chore Wars brilliantly reverses the most demoralizing aspects of regular housework. The results of a chore well done may start to fade almost immediately, but no one can take away the XP you have earned.

Individual success is always more rewarding when it happens in a multiplayer context, and this is part of Chore Wars’ successful design as well. The game connects all of my individual activities to a larger social experience: I’m never just doing “my” chores; I’m playing with and competing against others. I can see how I measure up to others and compare avatar strengths to learn more about what makes me unique. Meanwhile, as I’m working, I’m thinking about the positive social feedback I’ll get in the comments on my adventure, whether it’s friendly taunts from a rival or OMGs of amazement for getting such a herculean task done.

Chore Wars isn’t the kind of game you’d want to play forever; like all good games, their destiny is to become boring eventually, the better you get at them. But even if household interest in the game dies down after a few weeks or months, a major feat has been accomplished: players have had a rather memorable, positive experience of doing chores together. And that should change the way they think about and approach chores for some time.

So that’s how Chore Wars achieves the seemingly impossible. It turns
routine housework into a collective adventure, by adding unnecessary obstacles and implementing more motivating feedback systems. And it’s the perfect example of our next reality fix:

WIREFRAMING FIX #7: WHOLEHEARTED PARTICIPATION

Compared with games, reality is hard to get into. Games motivate us to participate more fully in whatever we’re doing.

To participate wholeheartedly in something means to be self-motivated and self-directed, intensely interested and genuinely enthusiastic.

If we’re forced to do something, or if we do it halfheartedly, we’re not really participating.

If we don’t care how it all turns out, we’re not really participating.

If we’re passively waiting it out, we’re not really participating.

And the less we fully participate in our everyday lives, the fewer opportunities we have to be happy. It’s that plain and simple. The emotional and social rewards we really crave require active, enthusiastic, self-motivated participation. And helping players participate more fully in the moment, instead of trying to escape it or just get through it, is the signature hallmark of alternate reality projects—the focus of this and the following three chapters of this book.

If “alternate reality” is an unfamiliar term for you, then you’re not alone. Alternate reality development is still a highly experimental field. The term “alternate reality game” has been in use as a technical industry term since 2002, but there are still plenty of gamers and game designers who know little about it, let alone people outside of the gaming world.

As game developers are increasingly starting to push the limits of how
much a game can affect our real lives, the concept of alternate reality is be-
coming more and more central to discussions about the future of games. It’s
helping to promote the idea that game technologies can be used to organize
real-world activity. Most importantly, it’s provoking innovative ideas about
how to blend together what we love most about games and what we want most
from our real lives.

On a recent Saturday morning, I found myself on Twitter, trading possible
definitions for “alternate reality game” back and forth with about fifty other
alternate reality gamers and developers. We were trying to work out a short
definition that would really capture the spirit of ARG design, if not necessarily
describe all the possible technological and formal components.

Collectively, we cobbled together a description of ARGs that seems to cap-
ture their spirit more effectively than any other definition I’ve seen: alternate
realities are the antiescapist game.

ARGs are designed to make it easier to generate the four intrinsic rewards
we crave—more satisfying work, better hope of success, stronger social connec-
tivity, and more meaning—whenever we can’t or don’t want to be in a virtual
environment. They’re not meant to diminish the real rewards we get from play-
ing traditional computer and video games. But they do make a strong argument
that these rewards should be easier to get in real life.

In other words, ARGs are games you play to get more out of your real life,
as opposed to games you play to escape it. ARG developers want us to par-
ticipate as fully in our everyday lives as we do in our game lives.

Apart from this common mission, great alternate reality games can differ
tremendously from one to another, in terms of style, scale, scope, and budget.
Some ARGs, like Chore Wars, have relatively humble ambitions. They pick
one very specific area of our personal lives and try to improve it. Others have
quite audacious goals, involving entire communities or society at large: for
example, to reinvent public education as we know it, to help players dis-
cover their true purpose in life, or even to improve our experience of death
and dying.

Of course, not all ARGs are designed explicitly to improve our lives. His-
torically, in fact, most ARGs, like most computer and videogames, have been
designed simply to be fun and emotionally satisfying. But my research shows that because ARGs are played in real-world contexts, instead of in virtual spaces, they almost always have at least the side effect of improving our real lives.\(^3\) And so while others might distinguish between “serious” ARGs and “entertainment” ARGs, I prefer to look at all ARGs as having the potential to improve our quality of life. Indeed, a significantly higher percent of newer ARGs (created since 2007, compared with early ARGs created 2001–2006) are designed with explicit quality of life or world-changing goals. You’ll read about these “positive impact” ARGs in the chapters ahead.

Some ARGs are invented and playtested on a shoestring budget, whether by artists, researchers, indie game developers, or nonprofit organizations. They’re often developed for relatively small groups: a few hundred or a few thousand players. Others are backed by multimillion-dollar investments, receive funding from major foundations, or are sponsored by Fortune 500 companies. These bigger games can attract tens of thousands, hundreds of thousands, or even, in a few extremely successful cases, millions of players.\(^4\)

Still, for the most part, alternate reality games today are small-scale probes of the future. They’re a showcase for new possibilities. No single ARG is changing the world yet. But taken together, they’re proving one at a time the myriad and important ways we could make our real lives better by playing more games.

So let’s look at a few groundbreaking alternate reality projects. As we do, you’ll notice that there are two key qualities that every good ARG shares.

First and foremost, like any good game, an ARG must always be optional. You can bet that if you required someone to play Chore Wars, it would lose a large part of its appeal and effectiveness. An alternate reality game has to remain a true “alternate” for it to work.

It’s not enough, however, just to make something optional. Once the activity is under way, a good ARG, like any good game, also needs compelling goals, interesting obstacles, and well-designed feedback systems. These three elements encourage fuller participation by tapping into our natural desires to master challenges, to be creative, to push the limits of our abilities. And that’s where optimal experience design comes in. Without a doubt, some alternate
realities are more fun and engaging than others, just as some traditional games are better than others. The best ARGs are the ones that, like the best traditional computer and video games, help us create more satisfying work for ourselves, cultivate better hopes of success, strengthen our social bonds and activate our social networks, and give us the chance to contribute to something bigger than ourselves.

One ARG that achieves all of these goals is Quest to Learn—a bold new design for public schools that shows us how education can be transformed to engage students as wholeheartedly as their favorite video games.

**Quest to Learn—And Why Our Schools Should Work More Like a Game**

Today’s “born-digital” kids—the first generation to grow up with the Internet, born 1990 and later—crave gameplay in a way that older generations don’t.

Most of them have had easy access to sophisticated games and virtual worlds their entire lives, and so they take high-intensity engagement and active participation for granted. They know what extreme, positive activation feels like, and when they’re not feeling it, they’re bored and frustrated. They have good reason to feel that way: it’s a lot harder to function in low-motivation, low-feedback, and low-challenge environments when you’ve grown up playing sophisticated games. And that’s why today’s born-digital kids are suffering more in traditional classrooms than any previous generation. School today for the most part is just one long series of necessary obstacles that produce negative stress. The work is mandatory and standardized, and failure goes on your permanent record. As a result, there’s a growing disconnect between virtual environments and the classroom.

Marc Prensky, author of *Teaching Digital Natives*, describes the current educational crisis:

“Engage me or enrage me,” today’s students demand. And believe me, they’re enraged. All the students we teach have something in
their lives that’s really engaging—something that they do and that
they are good at, something that has an engaging, creative compo-

ten to it. . . . Video games are the epitome of this kind of total
creative engagement. By comparison, school is so boring that kids,
used to this other life, can’t stand it. And unlike previous genera-
tions of students, who grew up without games, they know what real
engagement feels like. They know exactly what they’re missing.6

To try to close this gap, educators have spent the past decade bringing more
and more games into our schools. Educational games are a huge and growing
industry, and they’re being developed to help teach pretty much any topic or
skill you could imagine, from history to math to science to foreign languages.
When these games work—when they marry good game design with strong
educational content—they provide a welcome relief to students who other-
wise feel underengaged in their daily school lives. But even then, these edu-
cational games are at best a temporary solution. The engagement gap is
getting too wide for a handful of educational games to make a significant and
lasting difference over the course of a student’s thirteen-year public education.

What would make the difference? Increasingly, some education innovators,
including Prensky, are calling for a more dramatic kind of game-based reform.
Their ideal school doesn’t use games to teach students. Their ideal school is
a game, from start to finish: every course, every activity, every assignment,
every moment of instruction and assessment would be designed by borrowing
key mechanics and participation strategies from the most engaging multi-
player games. And it’s not just an idea—the game-reform movement is well
under way. And there’s already one new public school entirely dedicated to
offering an alternate reality to students who want to game their way through
to graduation.

Quest to Learn is a public charter school in New York City for students in
grades six through twelve. It’s the first game-based school in the world—but
its founders hope it will serve as a model for schools worldwide.

Quest opened its doors in the fall of 2009 after two years of curriculum
design and strategic planning, directed by a joint team of educators and profes-
sional game developers, and made possible by funding from the MacArthur Foundation and the Bill and Melinda Gates Foundation. It’s run by principal Aaron B. Schwartz, a graduate of Yale University and a ten-year veteran teacher and administrator in the New York City Department of Education. Meanwhile, the development of the school’s curriculum and schedule has been led by Katie Salen, a ten-year veteran of the game industry and a leading researcher of how kids learn by playing games.

In many ways, the college-preparatory curriculum is like any other school’s—the students learn math, science, geography, English, history, foreign languages, computers, and arts in different blocks throughout the day. But it’s how they learn that’s different: students are engaged in gameful activities from the moment they wake up in the morning to the moment they finish up their final homework assignment at night. The schedule of a sixth-grader named Rai can help us better understand a day in the life of a Quest student.

7:15 a.m. Rai is “questing” before she even gets to school. She’s working on a secret mission, a math assignment that yesterday she discovered hidden in one of the books in the school library. She exchanges text messages with her friends Joe and Celia as soon as she gets up in order to make plans to meet at school early. Their goal: break the mathematical code before any of the other students discover it.

This isn’t a mandatory assignment—it’s a secret assignment, an opt-in learning quest. Not only do they not have to complete it, they actually have to earn the right to complete it, by discovering its secret location.

Having a secret mission means you’re not learning and practicing fractions because you have to do it. You’re working toward a self-chosen goal, and an exciting one at that: decoding a secret message before anyone else. Obviously not all schoolwork can be special, secret missions. But when every book could contain a secret code, every room a clue, every handout a puzzle, who wouldn’t show up to school more likely to fully participate, in the hopes of being the first to find the secret challenges?

9:00 a.m. In English class, Rai isn’t trying to earn a good grade today. Instead, she’s trying to level up. She’s working her way through a storytelling unit, and she already has five points. That makes her just seven points shy of
a “master” storyteller status. She’s hoping to add another point to her total today by completing a creative writing mission. She might not be the first student in her class to become a storytelling master, but she doesn’t have to worry about missing her opportunity. As long as she’s willing to tackle more quests, she can work her way up to the top level and earn her equivalent of an A grade.

Leveling up is a much more egalitarian model of success than a traditional letter grading system based on the bell curve. Everyone can level up, as long as they keep working hard. Leveling up can replace or complement traditional letter grades that students have just one shot at earning. And if you fail a quest, there’s no permanent damage done to your report card. You just have to try more quests to earn enough points to get the score you want. This system of “grading” replaces negative stress with positive stress, helping students focus more on learning and less on performing.

11:45 a.m. Rai logs on to a school computer to update her profile in the “expertise exchange,” where all the students advertise their learning superpowers. She’s going to declare herself a master at mapmaking. She didn’t even realize mapmaking could count as an area of expertise. She does it for fun, outside of school, making maps of her favorite 3D virtual worlds to help other players navigate them better. Her geography teacher, Mr. Smiley, saw one of her maps and told her that eighth-graders were just about to start a group quest to locate “hidden histories” of Africa: they would look for clues about the past in everyday objects like trade beads, tapestries, and pots. They would need a good digital mapmaker to help them plot the stories about the objects according to where they were found, and to design a map that would be fun for other students to explore.

The expertise exchange works just like video game social network profiles that advertise what games you’re good at and like to play, as well as the online matchmaking systems that help players find new teammates. These systems are designed to encourage and facilitate collaboration. By identifying your strengths and interests publicly, you increase the chances that you’ll be called on to do work that you’re good at. In the classroom, this means students are
more likely to find ways to contribute successfully to team projects. And the chance to do something you’re good at as part of a larger project helps students build real esteem among their peers—not empty self-esteem based on nothing other than wanting to feel good about yourself, but actual respect and high regard based on contributions you’ve made.

2:15 p.m. On Fridays, the school always has a guest speaker, or “secret ally.” Today, the secret ally is a musician named Jason, who uses computer programs to make music. After giving a live demonstration with his laptop, he announces that he’ll be back in a few weeks to help the students as a coach on their upcoming “boss level.” For the boss level, students will form teams and compose their own music. Every team will have a different part to play—and rumor has it that several mathematical specialists will be needed to work on the computer code. Rai really wants to qualify for one of those spots, so she plans to spend extra time over the next two weeks working harder on her math assignments.

As the Quest website explains, boss levels are “two-week ‘intensive’ [units] where students apply knowledge and skills to date to propose solutions to complex problems.” “Boss level” is a term taken directly from video games. In a boss level, you face a boss monster (or some equivalent thereof)—a monster so intimidating it requires you to draw on everything you’ve learned and mastered in the game so far. It’s the equivalent of a midterm or final exam. Boss levels are notoriously hard but immensely satisfying to beat. Quest schedules boss levels at various points in the school year, in order to fire students up about putting their lessons into action. Students get to tackle an epic challenge—and there’s no shame in failing. It’s a boss level, and so, just like any good game, it’s meant to whet your appetite to try harder and practice more.

Like collaborative quests, the boss levels are tackled in teams, and each student must qualify to play a particular role—“mathematical specialist,” for example. Just as in a big World of Warcraft raid, each participant is expected to play to his or her strengths. This is one of Quest’s key strategies for giving students better hopes of success. Beyond the basic core curriculum, students spend most of their time getting better at subjects and activities—ones they
have a natural talent for or already know how to do well. This strategy means every student is set up to truly excel at something, and to focus attention on the areas in which he or she is most likely to one day become extraordinary.

6:00 p.m. Rai is at home, interacting with a virtual character named Betty. Rai’s goal is to teach Betty how to divide mixed numbers. Betty is what Quest calls a “teachable agent”: “an assessment tool where kids teach a digital character how to solve a particular problem.” In other words, Betty is a software program designed to know less than Rai. And it’s Rai’s job to “teach” the program, by demonstrating solutions and working patiently with Betty until she gets it.

At Quest, these teachable agents replace quizzes, easing the anxiety associated with having to perform under pressure. With a teachable agent, you’re not being tested to see if you’ve really learned something. Instead, you’re mentoring someone because you really have learned something, and this is your chance to show it. There’s a powerful element of naches—vicarious pride—involved here: the more a student learns, the more he or she can pass it on. This is a core dynamic of how learning works in good video games, and at Quest it’s perfectly translated into a scalable assessment system.

Secret missions, boss levels, expertise exchanges, special agents, points, and levels instead of letter grades—there’s no doubt that Quest to Learn is a different kind of learning environment, about as radically different a mission as any charter school has set out in recent memory. It’s an unprecedented infusion of gamefulness into the public school system. And the result is a learning environment where students get to share secret knowledge, turn their intellectual strengths into superpowers, tackle epic challenges, and fail without fear.

Quest to Learn started with a sixth-grade class in the fall of 2009, and it plans to add a new sixth-grade class each year as the previous year graduates upward. The first senior class will graduate from Quest to Learn in 2016, and potentially from college by 2020. I’m willing to bet that that graduating class will be full of creative problem solvers, strong collaborators, and innovative thinkers ready to wholeheartedly tackle formidable challenges in the real world.
SuperBetter—Or How to Turn Recovery into a Multiplayer Experience

Either I’m going to kill myself or I’m going to turn this into a game. After the four most miserable weeks of my life, those seemed like the only two options I had left.

It was the summer of 2009, and I was about halfway through writing this book when I got a concussion. It was a stupid, fluke accident. I had been standing up, and I slammed my head straight into a cabinet door I didn’t realize was still open. I was dizzy, saw stars, and felt sick to my stomach. When my husband asked me who the president was, I drew a blank.

Some concussions get better in a few hours, or a few days. Others turn into a much longer postconcussion syndrome. That’s what happened to me. I got a headache and a case of vertigo that didn’t go away. Any time I turned my head, it felt like I was doing somersaults. And I was in a constant mental fog. I kept forgetting things—people’s names, or where I’d put things. If I tried to read or write, after a few minutes my vision blurred out completely. I couldn’t think clearly enough to keep up my end of interesting conversations. Even just being around other people, or out in public spaces, seemed to make it worse. At the time, I scribbled these notes: “Everything is hard. The iron fist pushes against my thoughts. My whole brain feels vacuum pressurized. If I can’t think, who am I?”

After five days of these symptoms and after a round of neurological tests that all proved normal, my doctor told me I would be fine—but it would probably take an entire month before I really felt like myself again. In the meantime, no reading, no writing, no working, and no running, unless I was completely symptom-free. I had to avoid anything that made my head hurt or made the fog worse. (Sadly, I quickly discovered that computer and video games were out of the question; it was way too much mental stimulation.)

This was difficult news to hear. A month seemed like an impossibly long time not to work and to feel this bad. But at least it gave me a target to shoot
for. I set the date on my calendar: August 15, I would be better. I believed it. I *had* to believe it.

That month came and went, and I’d barely improved at all.

That’s when I found out that if you don’t recover in a month, the next likely window of recovery is three months.

And if you miss that target, the next target is a year.

Two more months living with a vacuum-pressurized brain? Possibly an *entire year*? I felt more hopeless than I could have ever imagined. Rationally, I knew things could be worse—I wasn’t dying, after all. But I felt like a shadow of my real self, and I wanted so desperately to resume my normal life.

My doctor had told me that it was normal to feel anxious or depressed after a concussion. But she also said that anxiety and depression exacerbate concussion symptoms and make it much harder for the brain to heal itself. The more depressed or anxious you get, the more concussed you feel and the longer recovery takes. Of course, the worse the symptoms are and the longer they last, the more likely you are to be anxious or depressed. In other words, it’s a vicious cycle. And the only way to get better faster is to break the cycle.

I knew I was trapped in that cycle. The only thing I could think of that could possibly make me optimistic enough to break it was a game.

It was a strange idea, but I literally had nothing else to do (except watch television and go on very slow walks). I’d never made a health care game before. But it seemed like the perfect opportunity to try out my alternate reality theories in a new context. I might not be able to read or write very much, but hopefully I could still be creative.

I knew right away it needed to be a multiplayer game. I’d been having a lot of trouble explaining to my closest friends and family how truly anxious I was and how depressed I felt, how hard the recovery process was. I also felt awkward, and embarrassed, asking for help. I needed a way to help myself tell my closest friends and family, “I am having the hardest time of my life, and I really need you to help me.” But I also didn’t want to be a burden. I wanted to *invite* people to help me.

As with any alternate reality project, I needed to research the reality of the
situation before I could reinvent it. So, for a few days, I spent the limited amount of time I was able to focus—about an hour a day at that point—learning about postconcussion syndrome online. From various medical journals and reports, I pieced together what experts agree are the three most important strategies for getting better and coping more effectively—not only from concussions, but any injury or chronic illness.

First: stay optimistic, set goals, and focus on any positive progress you make. Second: get support from friends and family. And third: learn to read your symptoms like a temperature gauge. How you feel tells you when to do more, do less, or take breaks, so you can gradually work your way up to more demanding activity.

Of course, it immediately occurred to me that these three strategies sound exactly like what you do when you’re playing a good multiplayer game. You have clear goals; you track your progress; you tackle increasingly difficult challenges, but only when you’re ready for them; and you connect with people you like. The only thing missing from these recovery strategies, really, was the meaning—the exciting story, the heroic purpose, the sense of being part of something bigger.

So that’s where SuperBetter comes in.

SuperBetter is a superhero-themed game that turns getting better into multiplayer adventure. It’s designed to help anyone recovering from an injury or coping with a chronic condition get better sooner—with more fun, and with less pain and misery, along the way.

The game starts with five missions. You’re encouraged to do at least one mission a day, so that you’ve successfully completed them all in less than a week. Of course, you can move through them even faster if you feel up to it. Here are excerpts from the instructions for each mission, along with an explanation of how I designed it and how I played it.

Mission #1: Create your SuperBetter secret identity. You’re the hero of this adventure. And you can be anyone you want, from any story you love. So pick your favorite story—anything from James
Bond to *Gossip Girl*, *Twilight* to *Harry Potter*, *Batman* to *Buffy the Vampire Slayer*. You’re about to borrow their superpowers and play the leading role yourself.

I chose *Buffy the Vampire Slayer* as my story line. That made me Jane the Concussion Slayer, and that made my symptoms the vampires, demons, and other forces of darkness I was destined by fate to battle against. The point of this mission is to start seeing yourself as powerful, not powerless. And it underscores the fact that you *are* heroic for choosing to persevere in the face of your injury or illness.

Mission #2: Recruit your allies. Every superhero has an inner circle of friends who help save the day. Pick the people you want to count on most, and invite them to play this game with you. Ask each one to play a specific part: Batman needs a Robin and an Alfred, while James Bond needs an M, a Q, and a Moneypenny. If you’re Bella, you’ll want at least an Edward, a Jacob, and an Alice. Give each ally a specific mission, related to his or her character. Use your imagination—and feel free to ask for anything you need! When you’re saving the world, you can’t be shy about asking for help. Be sure to ask at least one ally to give you daily or weekly achievements—these are surprise accomplishments they bestow upon you based on your latest superheroic activities.

As Jane the Concussion Slayer, I recruited my twin sister as my “Watcher” (*Buffy’s* mentor in the TV series). Her mission was to call me every single day and ask for a report on my concussion-slaying activities. She should also give me advice and suggest challenges for me to try. Before playing *SuperBetter*, I hadn’t known how to explain to her that I really needed daily contact, and not just to hear from her on the weekends.

I recruited my husband as my “Willow” (*Buffy’s* smarty-pants best friend who’s also a computer geek). His mission was to do all of the score- and record-keeping for me, read me interesting articles, and in general help me with
anything I wanted to do on the computer without getting a headache. Finally, I recruited my friends Natalie and Rommel, and their miniature dachshund, Maurice, as my “Xander” (he’s the comic-relief character). Their mission was to come over once a week and just generally cheer me up.

Why recruit allies? Social psychologists have long observed that one of the hardest things about a chronic injury or illness is asking our friends and family for support. But reaching out and really asking for what we need makes a huge difference. It prevents social isolation, and it gives people who want to help, but don’t know how, something specific and actionable to do.

And why have achievements? Every fiero moment helps increase optimism and a sense of mastery, which has been proven to speed recovery from everything from knee injuries to cancer. But achievements feel more meaningful when someone else gives them to you—that’s why it’s important to have a friend or family member bestow them upon you. Kiyash gave me my achievements based on the titles of episodes of *Buffy the Vampire Slayer*. (For example, I unlocked the “Out of Mind, Out of Sight” achievement for ignoring my e-mail for an entire day, and “The Harvest” achievement for eating vegetables for dinner instead of cookies and ice cream, which was one of my favorite postconcussion ways to drown my sorrows. At the time, both of those felt like epic struggles.)

Mission #3: Find the bad guys. To win this battle, you need to know what you’re up against. Pay attention all day to anything that makes you feel worse, and put it on your bad-guys list. Some days, you’ll be able to battle the bad guys longer—some days not so long. But every time you do battle, you’ll want to make a great escape. That means getting away from the bad guy before he knocks you flat. You can always add more bad guys to your list as you discover them—and if you vanquish one forever, you can take it off and claim the permanent victory.

My list of bad guys at the start of the game focused on activities I kept trying to sneak in even though I knew they made me feel worse: reading and re-
sponding to e-mail, running or doing any kind of vigorous exercise, playing Peggle, drinking coffee.

The better you can identify triggers of your symptoms, the more pain and suffering you’ll avoid. And making a great escape turns a potential moment of failure—*This is harder than it should be*, or *I can’t do what I want to do*—into a moment of triumph: *I succeeded in recognizing a trigger and vanquished it before it did too much damage*. One of the highlights in my recovery was when I enlisted the entire crew at the Peet’s Coffee down the block to help me modulate the amount of caffeine in my morning iced coffee, which I was really reluctant to give up. It was their idea to start me off with 90 percent decaf with just a splash of caffeine so that I could work my way up to half and half, and eventually full caffeine when my brain was finally ready to be stimulated again.

Mission #4: Identify your power-ups. Good thing you’ve got superpowers. Maybe they’re not your typical superpowers—but you definitely have fun things you can do for yourself at a moment’s notice to feel better. Make a list, and be ready to call on them whenever the bad guys are getting the better of you. In fact, try to collect as many power-ups as you can every day!

For my concussion recovery, I focused on things I could do with my senses that weren’t affected by my head injury. Touch was fine, so I could sit and cuddle with my Shetland sheepdog. Hearing was fine, so I could sit by the window and listen to a podcast. And the biggest superpower I discovered had to do with my sense of smell: I really started to enjoy smelling different perfumes. I would go to a perfume counter, spray samples of a dozen perfumes on cards, then take them home and smell them throughout the rest of the evening, to see how they changed and to learn the different notes. It was one of the most engaging activities I could do without hurting my brain at all. And eventually, once my vertigo was improved, I was able to add to my power-up list long walks up San Francisco hills with my husband.

The power-ups are meant to help you feel capable of having a good day,
no matter what. Having specific positive actions to take increases the odds of doing something that will break the cycle of feeling negative stress or depression.

Mission #5: Create your superhero to-do list. Not every mission is possible, but it doesn’t hurt to dream big. Make a list of goals for yourself, ranging from things you’re 100 percent positive you can do right now to things you might not have been able to do even in your wildest dreams before you got sick or hurt. Everything on your list should be something that would make you feel awesome and show off your strengths. Every day, try to make progress toward crossing one of these superhero to-dos off your list. Be sure to get your allies’ help and advice.

This final idea was inspired by a question I’d found on the website of a New Zealand occupational therapist. “If I can’t take your pain away, what else would you like to improve in your life?” It’s one of the abiding features of a good game: the outcome is uncertain. You play in order to discover how well you can do—not because you’re guaranteed to win. SuperBetter has to acknowledge the possibility of failure to achieve complete recovery. But it can also make it less scary to fail—because there is an abundance of other goals to pursue and other rewarding activities to undertake along the way. That’s why it seemed essential to make part of the game a project to discover as many positive activities that it was still possible to do. It increased my real hopes of enjoying life more, no matter what else happened with the recovery or treatment.

One of my easiest superhero to-dos was baking cookies for people who live in my neighborhood. I liked it so much, I did it three times. A more challenging to-do was finding an opportunity to wear my favorite pair of purple leather stiletto boots, which meant getting up the energy to go out and see people. (I crossed this one off my list by going to see a movie with a big group of friends. I was a bit overdressed, but I felt great anyway.) The biggest superhero to-do on my list was, of course, to finish this book.
Once you have completed the five big missions, your challenge is to stay in constant contact with your allies, collect power-ups by battling the bad guys and making great escapes, and tackle items on your superhero to-do list. You might want to “lock in” your gameplay by keeping a game journal, posting daily videos on YouTube, or using Twitter to announce your achievements.

Near the end of every day, hold a secret meeting with one of your allies. Add up your great escapes, your power-ups, and your superhero points.

Talk to your other allies as often as possible, and tell them what you’ve been doing to get superbetter. Ask them for ideas about new things to add to your to-do list.

Be sure you have at least one ally who is giving you daily achievements. Share these achievements with your friends online, using Twitter or Facebook status updates, to keep them posted on your progress.

So that’s how you play SuperBetter. But does it actually improve the reality of getting better?

The first few days I was playing, I was in a better mood than I had been at any time since I hit my head. I felt like I was finally doing something to get better, not just lying around and waiting for my brain to hurry up and heal itself.

My symptoms didn’t improve instantly—but I was so much more motivated to get something positive out of my day, no matter what. Every day, no matter how bad I felt otherwise, I would score at least one great escape, grab at least one power-up, rack up some points, and unlock an achievement. Doing these things didn’t require being cured; it just required making an effort to participate more fully in my own recovery process.

There’s not a whole lot you can prove with a scientific sample of one. I can say only that, for me, the fog of misery lifted first, and then, soon after, the fog of symptoms started to lift as well. Within two weeks of playing Jane the Concussion Slayer, my symptoms were improved by roughly 80 percent, according to the log Kiyash helped me keep of my pain and concentration problems on a ten-point scale, and I was up to working as many as four hours a day. Within a month, I felt almost completely recovered.
I can’t say for sure if I got better any faster than I would have without playing the game—although I suspect it helped a great deal. What I can say for sure is that I suffered a great deal less during the recovery as a direct result of the game. I was miserable one day, and the next day I wasn’t; and I was never that miserable again as long as I was playing the game. When my allies joined the game, I finally felt like they really understood what I was going through, and I never felt quite so lost in the fog again.

After declaring my victory over the concussion in a Twitter post, I received dozens of requests to post all the rules and missions, so that other people could game their own injuries and illnesses—for everything from chronic back pain and social anxiety to lung disorders, migraines, the side effects of quitting smoking, newly diagnosed diabetes, chemotherapy, and even mononucleosis.

I published the rule set on my blog, and I gave it the more general name SuperBetter (after all, most people probably don’t dream of being like Buffy the Vampire Slayer). I suggested that people use the hashtag “#SuperBetter” for their own videos, blog posts, and Twitter updates, in case they wanted to find each other online. (A hashtag is a way to easily add context to your online content, and to find other people talking about the same topic.) And that was it. I didn’t build a Web application, or develop an automated scoring system, or even set up a social network for playing the game. A game doesn’t have to be a computer program. It can simply be like chess or hide-and-seek: a set of rules that one player can pass on to another.

An alternate reality game can be as simple as a good idea, a fresh way of looking at a problem. SuperBetter, of course, isn’t meant to replace conventional medical advice or treatment. It’s meant to augment good advice, and to help patients take a more active role in their own recovery.

When you’re sick or in pain, getting better is all you want. But the longer it takes, the harder it gets. And when the tough reality we have to face is that getting better won’t be easy, a good game can better prepare us to deal with that reality. In an alternate reality linked to our favorite superhero mythology, we’re more likely to stay optimistic, because we’ll set more reasonable goals...
and keep better track of our progress. We’ll feel successful even when we’re struggling, because our friends and family will define fiero moments for us every day. We’ll build a stronger social support system, because it’s easier to ask someone to play a game than it is to ask for help. And we’ll hopefully find real meaning and develop real character in our epic efforts to overcome what may be the toughest challenge we’ve ever had to face. And that’s how we get superbetter, thanks to a good game.

THE THREE GAMES discussed in this chapter represent three of the main approaches to developing an alternate reality and solving a quality-of-life problem.

Chore Wars is an example of a life-management ARG—a software program or service that helps you manage your real life like a game.

Quest to Learn is an example of an organizational ARG. It uses game design as a guiding philosophy for creating new institutions and inventing new organizational practices.

And SuperBetter is a concept ARG. It uses social media and networking tools to virally spread new game ideas, missions, and rule sets, which players can repurpose and adapt for their own lives as they see fit.

These three methods aren’t the only ways to create an alternate reality. In later chapters in this book, you’ll also read about live event ARGs, which gather players at physical locations for a game that takes only an hour or a day to play, and narrative ARGs, which use multimedia storytelling—video, text, photographs, audio, and even graphic novels—to weave real-world game missions into a compelling fiction that plays out over weeks, months, or even years.

Of course, by the time you read this book, dozens—probably hundreds—of new alternate reality games will no doubt be widely playable. This movement
is just getting started. When we imagine how the ARG movement might unfold, we can—as always—look for guidance from the past.

In the early 1970s, just before the computer and video game revolution, another game revolution took place, with significantly less fanfare but a rather important and lasting legacy. It was called the New Games movement, and its goal was to reinvent sports to be more cooperative, more social, and more inclusive.

The New Games philosophy was simple, composed of two parts. First, no one should ever have to warm the bench because they’re not good enough to play. And second, competitive gameplay shouldn’t be about winning. It should be about playing harder and longer than the other team, in order to have more fun.

The founders of the movement, a group of San Francisco–based counterculturists, invented dozens of new sports, all sillier and more spectacular than traditional athletic activities. The most well known were the “earth ball” games (played with a ball six feet in diameter, so that it takes multiple people to move the ball together) and parachute games (in which twenty to fifty people stand around the rim of a piece of parachute material and flap and billow it together, working to create various shapes and ripples). They held large New Games festivals in the Bay Area and eventually trained tens of thousands of schools and parks and recreation departments across the country, so that they could include New Games in their physical education and public recreation programs.

Many of today’s leading game developers grew up playing New Games at school and local parks—and it’s not hard to see the influence of New Games on multiplayer and massively multiplayer game designers today. From the cooperative missions in MMOs to the 256-player combat environments on consoles, video gameplay today often looks a lot like a New Game, set in a virtual world. In fact, New Games theory has come up at every single Game Developers Conference I’ve attended over the last decade—which is how I know that many game designers have managed to acquire for themselves a copy of the long out-of-print and little-known New Games Book, published in 1976.
The New Games Book includes instructions for how to play the new sports and, more importantly, essays explaining the philosophy of the movement. Many of my friends in the industry have acknowledged they’ve flipped through its pages for game-design inspiration.

I’ve nearly worn the print off the page of my favorite essay in the book. It’s called “Creating the Play Community,” by Bernie DeKoven, then the codirector of the New Games Foundation and today a leading play theorist. In the essay, DeKoven calls for a community of players to volunteer to be of service to the movement. He asks: Who will be willing to try these new games and help assess whether they are, in fact, better than the old games? If they are better, the community should teach others how to play. If they’re not better, the players should suggest ways to improve them, or start inventing their own new games to test. He explains:

Because the games are new, we get a sense that we’re experimenting. No one guarantees anything. If a game doesn’t work, we try to fix it, to see if we can make it work. After all, it’s a new game. It’s not official yet. In fact, we’re the officials, all of us, every one of us who has come to play. We make the judgments. We each take the responsibility for discovering what we can enjoy together.10

This is the kind of community that is currently coming together around alternate reality games. As we develop alternate realities, we need to be both open-minded and critical about what actually raises our quality of life, what helps us participate more fully in our real lives, and what simply serves as yet another distraction. There will be many, many different alternate realities proposed in the coming years, and it’s not up to just the game developers to shape this movement. The players, more than anyone else, will get to decide if a new alternate reality is indeed a good game.

The “how” of alternate reality game design boils down to the game-design principles that best generate the four rewards we crave most. Traditional computer and video game developers are leading the way, constantly innovating new ways to reap these rewards; ARG developers are already borrowing and
refining these design strategies and development tools as their go-to solutions for how to make the world work more like a game.

But as we playtest different possibilities to decide what makes a good alternate reality, three additional sets of criteria are certain to emerge.

First: *When* and *where* do we need an alternate reality? Which situations and spaces call for it—and when are we better off leaving reality alone?

Second: *Who* should we include in our alternate reality games? Besides our close friends and family, who else would we benefit from inviting to play with us?

And third: *What* activities should we be adopting as the core mechanics of our alternate reality games? Game design is a structure—goals, restrictions, feedback—but within that structure, we can ask players to do almost anything. What habits should we be encouraging? What actions should we be multiplying?

These three different sets of criteria are the subjects of the next three chapters, which in turn cover three key kinds of alternate reality projects: alternate realities designed to make difficult activities more rewarding, alternate realities designed to build up new real-world communities, and alternate realities designed to help us adopt the daily habits of the world’s happiest people in our real, everyday lives.
We are living in a geological era that scientists dub the “anthropocene epoch,” from the Greek *anthropo*-, for “human,” and *-cene*, for “new” or “recent.” It’s the age of human impact on the earth.

Our impact is measurable in myriad ways: increasing levels of carbon dioxide in the atmosphere, deforestation and continental erosion, a rising sea level. We may not have set out to remake the planet in any of these ways—but we have nonetheless. And now we must learn better ways of remaking it, this time with intention, discipline, and purpose.

As Steward Brand, author of *Whole Earth Discipline*, puts it, “Humanity is now stuck with a planet stewardship role. . . . We are as gods and have to get good at it.”

Brand is perhaps best known as the founder of the *Whole Earth Catalog*, a countercultural catalog of “tools and ideas to shape the environment” published from 1968 to 1972. (When he launched that catalog, he wrote, “We are as gods and might as well get good at it.”) In 1996 he cofounded the Long Now Foundation, a San Francisco–based foundation dedicated to long-term thinking and responsibility—for the earth, and for the survival of the human species—over the next ten thousand years and beyond. If we want to stay on
this planet for anywhere near that long, Brand says, we have to become better at strategically affecting our ecosystem. “We are forced to learn planet craft—in both senses of the word. Craft as skill and craft as cunning.” We not only have to master the ability to change how our ecosystem works, we also have to figure out the right ways to change it. And that won’t be easy.

“The forces in play in the Earth system are astronomically massive and unimaginably complex,” Brand writes. “We’re facing multidecade, multigeneration problems and solutions. Accomplishing what is needed will take diligence and patience—a sustained bearing down, over human lifetimes, to bridge the long lag times and lead times in climate, biological, and social dynamics.”

Fortunately for all of us, gamers actually have a head start on this mission. Gamers have been mastering the art of planet craft for years. There’s actually a genre of computer games known as “god games”—world- and population-management simulations that give a single player the ability to shape the course of events on earth in dramatic ways, over lifetimes or longer.

As we’ve seen, Will Wright’s The Sims gives players godlike powers over the daily lives of individual people. Sid Meier’s Civilization challenges players to guide a civilization (such as the Aztecs, the Romans, the Americans, the Zulus) from the start of the Bronze Age, six thousand years ago, through the Space Age, or AD 2100. And Peter Molyneux’s Black & White invites players to govern the entire biome of a remote island, inspiring either joyful worship or terrified obedience in the island’s tribal population by performing a combination of benevolent and evil divine ecological interventions.

What all of these god games have in common is that they encourage players to practice the three skills that are critical for real planet craft: taking a long view, ecosystems thinking, and pilot experimentation.

**Taking a long view** means working at scales far larger than we would ordinarily encounter in our day-to-day lives. Players of god games have to consider their moment-by-moment actions in the context of a very long future: an entire simulated human life, a single civilization’s rise and fall, or even the entire course of human history.

**Ecosystems thinking** is a way of looking at the world as a complex web of interconnected, interdependent parts. A good ecosystems thinker will study
and learn how to anticipate the ways in which changes to one part of an ecosystem will impact other parts—often in surprising and far-reaching ways.

Pilot experimentation is the process of designing and running many small tests of different strategies and solutions in order to discover the best course of action to take. When you’ve successfully tested a strategy, you can scale up your efforts to make a bigger impact. Since god gamers want to maximize their success, they don’t just come up with one plan and stick to it. Instead, they carefully feel their way around the system, poking and prodding until they find the strategies that seem to reliably maximize success.

Taken together, these three ways of thinking and acting are exactly the kinds of effort Brand recommends in Whole Earth Discipline. Instead of seizing the day, he says, “Seize the century.”

He advises, “Participation has to be subtle and tentative, and then cumulating in the right direction. If we make the right moves at the right time, all may yet be well.”

Of course, we can’t actually use existing commercial computer games as test environments to solve the real problems we face. They radically simplify the forces at play in the complex ecosystems we live in. But as we try to develop systems for engaging massively many people in world-changing efforts, we can take an important cue from the most successful god games. Specifically, we can learn from their ability to change the way players think about the world, and their own powers within it.

Take, for example, the most epic god game yet designed—the universe simulation Spore, developed by Will Wright and produced by Maxis Software. Of all the god games to date, Spore is the most explicitly linked to the notion of planet craft—and the most intentionally focused on getting players to think of themselves as capable of changing the real world.

In Spore, players control the development of a unique species through five stages of evolution: from single-cell origins (stage one) into social, land-dwelling creatures (stage two), who form tribes (stage three), build technologically sophisticated civilizations (stage four), and ultimately venture off into
intergalactic space exploration (stage five). Each stage zooms out to give the player control over a more complex system. Players advance from manipulating cellular DNA to increasing their creature’s intelligent behaviors; from organizing a division of labor in their tribe to growing a global economy; from advancing national interests through trade, military action, or spiritual outreach to colonizing other planets and transforming them into inhabitable ecosystems. They can spend as much time as they want in any stage, piloting different strategies for improving their species and transforming the environment.

The game is fun and rewarding to play, but it’s meant to accomplish more than just relieving boredom or making us happy. As Wright has said on numerous occasions, the game is meant to spark a sense of creative capability among players, and to inspire them to adopt the kind of long-term, planetary outlook that can save the real world.

Consider this exchange, which occurred shortly after the 2008 release of Spore, when the popular science magazine Seed hosted a public salon between Wright and Jill Tarter, a noted astrobiologist. The topic of the salon: how games like Spore are preparing young people to take a more active role in reimagining the real world.

TARTER: I keep thinking about the generation that’s getting exposed to all this wonderful, rich opportunity of game playing as education, and that they expect to be able to manipulate the real world the way they do the game world. How do we bridge that? How do we turn them into socially functioning members of humanity on one planet? [. . .]

I’m eager to understand how learning to be good at a game makes you good at life, makes you good at changing the world, and gives you skills that are going to allow you to reinvent your environment.

WRIGHT: Well . . . if there’s one aspect of humanity that I want to augment, it’s the imagination, which is probably our most powerful cognitive tool. I think of games as being an amplifier for
the imagination of the players, in the same way that a car amplifies our legs or a house amplifies our skin. […]

The human imagination is this amazing thing. We’re able to build models of the world around us, test out hypothetical scenarios, and, in some sense, simulate the world. I think this ability is probably one of the most important characteristics of humanity.⁷

Why does Wright believe that augmenting our natural capacity for imagination is so important at this precise moment in human history? It’s a matter of survival, pure and simple.

The name *Spore* is itself an important clue: the definition of a spore, in biology, is “a reproductive structure that is adapted for dispersal and surviving for extended periods of time in unfavorable conditions.”⁸ It’s a perfect metaphor for the present circumstances of the human race.

We have collectively entered into what is all but certain to be a time of increasingly unfavorable planetary conditions, largely of our own making—an unstable climate, extreme weather, and an increasingly depleted environment. We need to adapt for survival. We need to imagine planetary-scale solutions and disperse them as far and wide as possible.

We need to become like spores ourselves.

And there’s an explicit call to action to do so, for players who complete all five stages of the game successfully. *Spore* has what game developers call a “primary win condition”: a supergoal that represents the ultimate achievement in the game. The primary win condition in *Spore* is to develop your single-cell creature into such a successful intergalactic space-faring civilization that it eventually reaches one galactic destination in particular: a supermassive black hole at the center of the galaxy.

Players who reach the black hole receive a “staff of life,” which allows them to transform any planet in the *Spore* galaxy into a vibrant, diverse ecosystem: teeming with plants and creatures of all kinds, with breathable atmosphere, sustainable food webs, and plentiful water supply. (No wonder players also refer to it as the “Genesis device.”)
The staff of life is a shortcut to making an otherwise uninhabitable planet inhabitable. Along with the staff of life, players receive a special message and mission:

You have traveled very far and overcome many obstacles. Your creative efforts have not gone unnoticed. Your heroic efforts have proven you deserving, worthy of advancement to the next level of your existence. You are now to be given the power. Yes, that’s right, THE POWER. The power to create and spread life, intelligence and understanding throughout the cosmos. Use this power wisely. There is a wonderful opportunity to start on one particular planet: Look for the third rock from Sol.

Sol is Latin for “sun,” and so the Spore community has translated this final message from the game as a playful imperative to remake our own Earth—which is, of course, the third rock from our sun.

In the end, a win in Spore is a push back to the real world. Players are told, “Your gameplay has prepared you to become a real creator and protector of life on Earth.” Not by making them an expert in geoengineering, atmospheric science, or ecological planning, certainly, but rather by creating the seed of planetary creativity and activism. As Wright said at the Seed salon:

All of the really tough problems we’re facing now are planetary problems. There’s real value in being pushed toward global awareness and looking long-term. That’s one of the things that I find very useful about games. . . . I think these are the timelines we need to be looking at — the one-hundred- or two-hundred-year horizons. Because most of the really bad stuff that’s happening right now is the result of very short-term thinking.

We can break free of the cognitive chains of short-term isolated thinking, with games that direct our collective attention to the future and challenge us to take a global perspective.
GOD GAMES LIKE *Spore* have gotten us successfully started on this journey. Now a different genre of games can get us where we need to go: massively multiplayer forecasting games, or *forecasting games* for short.

Forecasting games combine collective intelligence with planetary-scale simulation. They ask players to reimagine and reinvent the way we feed ourselves, the way we transport ourselves, the way we get water, the way we design cities, the way we manufacture everything, the way we power our lives. They’re designed to create diverse communities capable of investigating the long-term challenges we face, propose imaginative solutions, and coordinate our efforts to start putting our best ideas into action at the planetary scale.

It’s a process I call **massively multiplayer foresight**. And future-forecasting games are the perfect tool for helping as many people participate in the process as possible.

Which brings us to our final fix for reality:

**FIX #14: MASSIVELY MULTIPLAYER FORESIGHT**

Reality is stuck in the present. Games help us imagine and invent the future together.

How exactly does massively multiplayer foresight work? The best way to understand the process is to start with the project that inspired the forecasting game genre.

**World Without Oil: Play It Before You Live It**

*You know it’s bad for you.*

*You’ll cut back someday.*

*On April 30, join a World Without Oil—and play it before you live it.*

—Announcement for the game
In April 2007, the world ran out of oil. It didn’t run completely out of oil—it simply ran out of *enough* oil. The daily demand for oil worldwide began to outpace our daily production capacity. Shortages broke out, reserves were tapped, and yet the gap between global supply and demand grew wider.

The United States was among the hardest countries hit. During the darkest days of the crisis, as many as 22 percent of Americans were unable to get access to gas, while one in ten U.S. companies buckled under the strain of higher fuel costs and diminished operating capacity.

Two main strategies emerged to deal with the oil crisis. We could collectively reduce our daily demand for petroleum in order to create equilibrium with the available supply. Or we could compete even more aggressively for the available oil—with our own individual neighbors, with other companies, with other states, and with other countries.

Of course, this didn’t really happen—at least not for most of us. But for two thousand online gamers, this peak-oil scenario was the basis for a life-changing six-week experiment: a collaborative simulation designed to find out what *would* happen if demand for oil did eventually outstrip our supply, and what we could collectively do about it.

The project was called World Without Oil (WWO), and it was the first massively scaled effort to engage ordinary individuals in creating an immersive forecast of the future.

## HOW TO PLAY WORLD WITHOUT OIL

At heart World Without Oil is very simple. It’s a “What if?” game. What if an oil crisis started today—what would happen? How would the lives of ordinary people change?

What would you do to survive the crisis? How would you help others?

Let’s play “What if?” and find out.
Create your own story of life during the oil crisis—and share it with us by e-mail or by phone call, by photos or by blog post, by videos or podcasts.

Then join our citizen “nerve center” at worldwithoutoil.org to track events and share solutions. Every day, we’ll update you with news about the crisis, and highlight our favorite stories from across the country and around the world.

No expert knows better than you do how an oil shock could impact your family, your job, your town, your life. So tell us what you know.

Because the best way to change the future is to play with it first.

Funded by the Corporation for Public Broadcasting and presented by the Independent Television Service (ITVS), World Without Oil was first conceived by Ken Eklund, an independent writer and interactive developer based in San Jose, California. He pitched the idea in response to an ITVS announcement of funds up to $100,000 being made available for innovative educational online games. I was invited by ITVS to serve on the evaluating committee for online game proposals.

“No one today has a clear picture of oil availability or what will happen when demand inevitably outstrips supply,” Eklund wrote in his proposal. “That will largely depend on how well ordinary people respond to the crisis. Until now, no one has ever thought to ask them what they might do. WWO will evoke the wisdom of crowds in advance, as players work together to gain grassroots insights into the forces that will rule at street level in a crisis—and figure out the best ways to prepare, cooperate, and collectively create solutions if and when a real peak-oil shortage happens.”

It was designed as a massively multiplayer thought experiment: players would spend six weeks imagining how such a crisis might play out in their local communities, their industries, and their own lives. They would make
highly personal forecasts using online social media. And they would rely on an “alternate reality dashboard” to get daily updates on the scenario, in the form of fictional news stories, video reports, and economic indicators from the peak-oil crisis in order to flesh out their personal forecasts in more detail.

Players would also be strongly encouraged to take the simulation a step further, and spend some time each day living their real lives as if the simulated oil shortage were true. How hard would it be to get to work, or to prepare dinner, or to see friends and family if the fictional simulation were real? Players were challenged to test their own ability to adapt, rapidly and dramatically, to a potential oil crisis. Instead of just imagining a peak-oil scenario, they could start making changes and testing adaptive solutions for real.

Each day in real time would represent a week in the simulation. This would enable players to consider longer-term impacts and strategies. The game itself would last for thirty-two days, so the scenario could play out over thirty-two weeks.

WWO would give players firsthand insight into a plausible future, helping them prepare for, or even prevent, its worst outcomes. The game would also create a collective record of how a real peak-oil scenario might play out—a kind of survival guide for the future, a record of tremendous value for educators, policy makers, and organizations of all kinds.

I happily accepted Eklund’s invitation to join the project team as the game’s “participation architect”—a fancy way of saying my job was to help make sure every single player found a way to contribute meaningfully to the collaborative effort.

Of course, to start, we had to attract a community of players. I set our target at one thousand players, a number based on my experience with online communities and collective intelligence. One thousand participants seems to me to be a critical threshold to allow for an online game to get interesting—to ensure enough diversity among players, to have enough participants to tackle missions on an epic scale, and to produce enough chaotic interaction to generate complex and surprising results.

For six weeks before we launched, we spread the word online and at public
events. We asked our friends and colleagues to blog about it. I announced the
game in my keynote for the Serious Games Summit, an annual two-day meet-
ing in San Francisco for people working on games designed to teach, train,
and solve real problems. ITVS reached out to educators and media creators
across the country. There wasn’t any other marketing plan or promotional
budget for the game. It was simply an open, public invitation to simulate the
future, and the game was free to play.

So who showed up to play? They numbered just over nineteen hundred
(nearly doubling our initial goal), evenly divided between men and women,
and representing all fifty United States and a dozen countries abroad. Most
players were in their twenties or thirties, but there were notable clusters of
every age group, from teenagers to seniors. And our most active players brought
together an astonishingly diverse range of personal concerns and real-life ex-
pertise to the game. For example:

• Peakprophet, a self-described “hobby farmer” in Tennessee, who
forecast the collapse of the fresh-food supply chain—and then
took it upon himself to train other players how to grow their own
food and increase their food self-sufficiency.

• Lead_tag, a soldier stationed in Iraq, who blogged every single day
of the game, creating a series of thirty-two reflections on the chal-
lenges of fighting a war during an oil crisis.

• Anda, a college student pursuing a bachelor of fine arts in graphic
design at the San Francisco Art Institute, who created a series of
eleven Japanese manga-style Web comics about how she and her
friends would help each other during the oil crisis, and how it
might affect their ability to find work after graduation.

• OrganizedChaos, a dispatcher at a General Motors plant in De-
troit, who contributed fifty-five blog posts, videos, and podcasts, and
found herself forecasting that pretty soon—peak oil or not—she
would no longer have a job. As a result, at the end of the game she
decided to go back to school in real life to prepare for a new career
in a postoil economy.
Once we’d assembled our forecasting community, it was crucial for us that a significant portion of our players stay engaged with the game for its entire six-week duration. That’s because when it comes to future forecasting, our first ideas are often the most obvious and generalized, and therefore the least useful. It takes a while, even for an experienced forecaster, to drill down to the most interesting specifics and spin off unexpected possibilities. So we adopted several strategies to keep players engaged and actively investigating different aspects of the scenario.

First, each game day we added a new piece of information to the mix: rolling brownouts from oil-dependent power companies; airlines canceling flights and dramatically raising the cost of tickets; empty shelves and food shortages due to inability of deliveries to be made to local stores. In return, players told us about difficulties dealing with unreliable power at home; business travelers getting stranded in other countries when airports unexpectedly shut down; public transportation overcrowding in towns and cities with previously underutilized systems; a disruptive uptick in work-from-home days; the rise of bicycle thefts and a new bicycle black market; impromptu homeschooling as a result of gas shortages in suburban and rural areas; and neighborhood potluck meals to deal with the food shortage.

Another important tool for continuing participation was our alternate reality dashboard, which included a map depicting thirty-eight different regions, such as the Boston metro area, the Cincinnati–Columbus metro area, the Great Lakes, the High Plains, and the Atlantic South, each with its own set of “power meters” reflecting the local rise and fall in quality of life, economic strength, and social stability. The power meters fluctuated in direct response to player activity. The more positive forecasts they made, the more cooperative strategies they developed, and the more actively they reduced their own collective daily oil consumption, the more favorable the regional metrics. However, if players chose to imagine a darker turn of events, or if they chose to focus on how increased competition might play out, or if they reported significant difficulties or hardships in adapting to a lower-consumption lifestyle, the metrics would reflect increased chaos, rising misery, or even economic collapse. The meters created a clear feedback loop between players’ stories and the scenario updates.
Of course, the sizable online audience that assembled for World Without Oil was also a huge incentive for players to tell the best stories possible. For every active forecaster, we had an additional twenty-five people watching the game and writing about it. This amplification of their ideas helped make the players’ efforts feel more meaningful.

In the end, the game produced more than a hundred thousand online media artifacts—including a core set of more than two thousand future-forecasting documents from the players and tens of thousands more blog posts and articles reflecting on the game and its findings. One reviewer called it a “huge growing, twisting network of news, strategy, activism, and personal expression.”

At first, the majority of players focused their efforts on imagining how local, regional, and international competition for oil resources would play out in this new environment of increased scarcity. They exercised a dark imagination, anticipating the worst possible outcomes and the most serious threats. They documented gas theft, riots, food shortages, widespread looting, job loss, school closures, and even military actions worldwide. At a more personal level, they told stories of personal stress, anxiety, and families in crisis.

But over the course of thirty-two weeks, the balance shifted. About halfway through the game, having exhausted their dark imagination, players began focusing on potential solutions. They started imagining best-case-scenario outcomes: new ways of cooperating to consume less, a focus on local community and neighborhood infrastructure, less time spent commuting, the geographic reassembly of extended family, and more time spent in pursuit of a new American dream—happiness built around notions of sustainability, simplicity, and stronger social connectivity.

The game started with near-apocalyptic undertones; it ended with explicit, if cautious, optimism. The best-case-scenario outcomes were posed not as probabilities—and certainly not as inevitabilities—but rather as plausible possibilities worth working toward.

There was no explicit prompt to start with dark imagination and only later veer toward optimism. But it is, in fact, a very sound forecasting strategy.
Researchers have pointed to a particularly American failure to believe that the worst can really happen, because we’re systematically trained by our culture to focus on the positive. It’s a failure that makes us more susceptible to catastrophic events, like Hurricane Katrina or the 2008 housing market collapse, for example. In Never Saw It Coming, sociologist Karen Cerulo argues that our collective inability to focus on negative futures is our culture’s biggest blind spot. As one reviewer of Cerulo’s book summed it up: “We are individually, institutionally, and societally hell-bent on wishful thinking.” We are very good at positive thinking, but we tend to avoid articulating worst-case scenarios, which unfortunately makes us more vulnerable to them and less resilient if they occur.

World Without Oil gave players a space for nonwishful thinking; that’s what created a sense of urgency to find solutions. That mind-set also lent a sense of gravitas and realism to even the most hopeful stories players told later in the game—stories we later compiled into a guide, “A to Z: A World Beyond Oil.” It contains some of the most interesting community solutions players devised and can give you a taste of how massively multifaceted the final collaborative forecast was. Here are a few of my favorite topics from the document:

- Architecture Without Oil—notes from attendees of a national architecture convention on how to design and build homes for a world without oil
- Fellowship Without Oil—a collection of sermons and prayers from pastors, ministers, and other spiritual leaders offering guidance for how to act compassionately during the oil crisis
- Neighborhood Without Oil—guidelines for how to build stronger personal relationships with our geographically closest neighbors, the people most likely to be of assistance to us during an oil crisis
- Your Mama Without Oil—reflections from mothers of young children on how to parent in a world without oil
- Zoom Zoom Without Oil—conversations among automotive rac-
ing fans about the future of NASCAR and potential partnerships with alternative vehicle races, including electric vehicle races and human-powered vehicle races

“The forecasts are of astonishing quality,” one reviewer said of WWO afterward. “The players got to the heart of a complex subject.” I think “heart” is a key word here, because players were telling stories about the futures they cared about most—the future of their industry, their religion, or their own town and their children.

After the game, creative director Ken Eklund reflected on what it had accomplished. “WWO didn’t only raise awareness about oil dependence. It roused our democratic imagination. It made the issues real, and this in turn led to real engagement and real change in people’s lives. Via the game, players made themselves better citizens.” This is clearly evident in what players reported afterward. One player reported:

I really mean it when I say WWO changed my life. I really have been using my cloth bags at the stores, walking more/driving less, turning off lights, and, yes, recycling. My friends, family and co-workers have all noticed the difference. In all seriousness, this entire thing has made me a different person.15

While another wrote:

This experience has been just incredible for me. I’ve learned so much and started to think about even small things in my daily life in new ways. . . . Your stories and suggestions give me hope, that good ideas are emerging, that people are reaching out to help each other through these times, that necessary skills and knowledge are being saved and treasured for times when we will need them desperately. You show me that many really great people are out there . . . [and] you’ll lead the way through.16
Today, the entire simulation has been preserved in a sort of online time machine at Worldwithoutoil.org, where you can experience the game from day one all the way through day thirty-two. Each day of gameplay is captured in time so you can see exactly how the collaboration unfolded; there are also guidelines for playing the game yourself today—on your own, with your family, with colleagues, with a classroom, or with your neighbors. In fact, the simulation has been repeated many times at a smaller scale to help individuals and communities prepare themselves, and invent their own solutions, for living in a world beyond oil.

**Perhaps you’re wondering**—as many people have asked me since—why did the players participate?

Why would anyone want to play a serious game like World Without Oil instead of a fantasy game, an escapist game, a completely feel-good game?

I asked myself the same question—before WWO launched, while it was being played and afterward, even when we had proof that players were enjoying themselves and audiences found it compelling to watch the project unfold.

Here’s what I’ve come to believe about a game like WWO. By turning a real problem into a voluntary obstacle, we activated more genuine interest, curiosity, motivation, effort, and optimism than we would have otherwise. We can change our real-life behaviors in the context of a fictional game precisely because there isn’t any negative pressure surrounding the decision to change. We are motivated purely by positive stress and by our own desire to engage with a game in more satisfying, successful, social, and meaningful ways.

I also firmly believe that many gamers want to do something that matters in the real world as much as their efforts matter in the game world. One player summed this up best:

Looking back at World Without Oil, I think it is the most amazing, best multiplayer game I have experienced. Usually gaming takes time away from accomplishing useful things in real life, but WWO
taught me a lot, lowered my electric bill, and got me focused on doing things that matter to me.¹⁷

Gamers are ready and willing to take on challenges outside of strictly virtual environments. Meanwhile, people who don’t ordinarily play games are happy to do so when it can help make a difference in the real world.

The numbers are still small. Two thousand players doesn’t begin to compare with Spore’s active community of more than a million. But unlike Spore, which represents roughly two decades of some of the smartest computer programmers, some of the most creative game designers, and some of the most brilliant artists in the world working together to advance the genre of planetary simulation and god games (SimEarth was released in 1990), we are essentially still in the Pong days of future-forecasting games. (With the operating budget of Pong to boot.)

We are Pong, competing with Spore. It’s not much of a matchup yet.

But as the field attracts more of the world’s best programmers, storytellers, designers, and artists, as more people are exposed to these games and learn how to play them, and as we invest millions, rather than thousands, of dollars in developing these future worlds, we will grow our future world-building skills just as we’ve grown our virtual world-building skills over the past thirty years. With enough attention and investment, we will start to create immersive future environments as engaging as our favorite virtual worlds.

WORLD WITHOUT OIL changed the lives of many of our players—but it was also a life-changing experience for me.

It was the proof-of-concept game that convinced me we really can save the real world with the right kind of game. It’s the project that inspired me to define my biggest hope for the future: that a game developer would soon be worthy of a Nobel Prize.

I’ve since taken to advertising that goal everywhere I go, in the hopes of inspiring other game developers to join me in my mission. Of course, both inside and outside the game industry, when I suggest the idea, I’m often met
with skepticism. How could a game possibly accomplish enough real-world good to warrant such a prize?

Even on the heels of a project as promising as World Without Oil, it’s true that winning a Nobel Prize is a fairly bold ambition. But consider this: Albert Einstein, who won his own Nobel Prize in physics in 1921, once famously said, “Games are the most elevated form of investigation.” This quotation appears in multiple biographies of Einstein and circulates widely in various collections of famous sayings, but, interestingly, its origins remain elusive. No one seems to have recorded the context of Einstein’s statement—when or where he said it, or what he meant by it. Why would an esteemed physicist call games, and not science, the most elevated form of investigation? It’s an unsolved mystery—one I’ve spent much of my free time puzzling over.

Although of course I can’t say for sure I’ve solved the mystery, I do have a theory. And it comes directly from working on World Without Oil.

Einstein, we know from many biographers, was a gamer—albeit a sometimes reluctant one. He had a lifelong love-hate relationship with the game of chess. He played it enthusiastically as a child, although he gave it up for much of his adult life, even once insisting to the New York Times, “I do not play any games. There is no time for it. When I get through work I don’t want anything which requires the working of the mind.” Yet many friends and colleagues recall playing countless games of chess with Einstein, particularly later in his life.

Historians have suggested that Einstein avoided chess during the height of his scientific career precisely because he loved it so much and found it so distracting. “Chess holds its master in its own bonds,” he once said, “shackling the mind and brain.” In other words, when he started thinking about chess, he found himself unable to stop. Why? Most likely because, as so many chess masters have noted, the game is an incredibly compelling problem that becomes more compelling the longer you think about it.

The central problem of chess is perfectly constructed, clear, and constrained: how do you manipulate a set of sixteen resources of different abilities in order to capture your opponent’s most valuable asset, while simultaneously protecting your own? But it can be approached with endlessly many different
strategies, each strategic effort changing the future possibilities in the problem space. As one famous chess saying goes, “Chess is infinite.”

There are 400 different positions after each player makes one move apiece. There are 72,084 positions after two moves apiece. There are 9-plus million positions after three moves apiece. There are 288-plus billion different possible positions after four moves apiece. There are more potential games than the number of electrons in our universe.20

The possibility space of chess is so massive and complex, one individual has no hope of understanding or exploring it fully—even if one spends a lifetime, as many chess players do, investigating it.

Fortunately, while chess is a two-player game, it is also a massively multiplayer project. The global community of chess players has collaborated for centuries to explore and document its problem space as thoroughly and imaginatively as possible. Indeed, for as long as modern players have played chess, they have recorded their games, shared strategies, formalized successful approaches, and published them for others’ benefit. Even after centuries of collective play, the chess community continues to seek a better understanding of the problem, to invent more surprising and successful approaches, and to hold the massively many possibilities of the game in their head as they drive the sum human understanding of the game forward, one move at a time.

To play chess as a more than casual player is to become a part of this problem-solving network. It means joining a massively collaborative effort to become intimately familiar with an otherwise unfathomably complex possibility space. And that’s what I believe Einstein meant when he described games as an elevated form of investigation. When enough people play a game, it becomes a massively collaborative study of a problem, an extreme-scale test of potential action in a specific possibility space.

I believe that’s the direction we’re heading with forecasting games. These games help us identify a real-world problem and study it from massively mul-
multiple points of view. They present the problem in a compelling way, and they help us compile a record of massively multiple strategies for addressing it. They give us a safe space to play out the possible consequences of each and every possible move we could make. And they help us anticipate the massively multiple moves that others could conceivably take.

That’s actually what we tried to do with World Without Oil. We defined a problem: an oil shortage, with no available means of increasing supply. There was a clear goal: to resolve the imbalance between supply and demand. The possible strategies were infinite. We asked players to craft their own strategies, based on their own unique points of view: a combination of location, age, life experience, and personal values. We asked them to test, on a local scale, different actions, and to report their findings. Taken together, all the players’ stories and solutions represent massively multiple perspectives on the same problem. It was a truly elevated investigation.

And in a world of changing climate, geopolitical tensions, and economic instabilities, there are plenty more problems to be tackled with our collective imagination.

If we can develop the same kind of intelligence about the real problems we face as players do about their favorite games, then we will be able to practice better planet craft. We’ll elevate our collective understanding of the challenges we face. And we’ll build a global community of individuals ready to play a role in discerning the right moves to make in the future.

At the end of World Without Oil, I was struck by how optimistic players were. Despite having spent nearly a month imagining incredibly dark forecasts, our players wound up feeling better—not worse—about the future and their ability to impact it. They experienced a sense of improved capability, greater resilience, and realistic hope.

In other words, they became what futurist Jamais Cascio calls “superempowered hopeful individuals,” or SEHIs.21

A SEHI (pronounced SEH-see) is someone who feels not just optimistic about the future, but also personally capable of changing the world for the better. According to Cascio, SEHIs get their confidence from network
technologies that amplify and aggregate individual ability to impact the common good.

Cascio coined the term “SEHI” in contrast to another term, “super-empowered angry men,” which New York Times columnist Thomas Friedman used in his writing about terrorism in a globally networked age. Osama bin Laden, Friedman wrote, seeks to create super-empowered angry men who feel capable of leaving their mark on the world, in terrible ways. In response, Cascio explains:

The core of the “super-empowered angry individual” (SEAI) argument is that some technologies may enable individuals or small groups to carry out attacks, on infrastructure or people, at a scale that would have required the resources of an army in decades past. . . . But angry people aren’t the only ones who could be empowered by these technologies. As a parallel, the core of the “super-empowered hopeful individual” (SEHI) argument is that these technologies may also enable individuals or small groups to carry out socially beneficial actions at a scale that would have required the resources of a large NGO or business in decades past.

SEHIs don’t wait around for the world to save itself. They invent and spread their own humanitarian missions. More importantly, they are “able to do so with smaller numbers, greater speed, and a far larger impact” than a slow-moving, risk-averse organization. Of course, in an ideal world, SEHIs would be able to band together and scale up their efforts—to avoid making redundant efforts, to learn from each other’s mistakes, to amplify each other’s abilities to make a difference. Disorganized SEHIs would have a hard time making significant strides. But organized SEHIs—well, they could change everything.

So a year after the World Without Oil experiment, Cascio and I teamed up at the Institute for the Future to find as many of those millions of SEHIs as possible—to give them a platform for organizing, and a new game to play.

It was called Superstruct, and its promise was simple: Play the game, invent the future.
Superstruct: Inventing the Future of Organization

Every year, the Institute for the Future produces a Ten-Year Forecast. It’s a look ahead at the next decade, to identify new economic forces, social practices, and changing environmental realities that will impact the way leading businesses, governments, and nonprofit organizations work, and to define the new challenges they’ll face. As we like to say at IFTF, “Ten years is a good, useful horizon—distant enough to expect real changes, close enough to feel within our grasp.”

Each Ten-Year Forecast (TYF) has a defining theme, a driving question. In 2008, the TYF program director Kathi Vian decided that the driving question for the next year’s forecast would be: What is the future of scale for human organization?

Clearly, we were embarking on a decade of extreme-scale challenges: economic collapse, pandemics, climate change, the continuing risk of global terrorism, and disruptions to our global food supply chain, to name just a few. We knew that existing organizations would have to reinvent themselves in order to simply survive, let alone make a difference.

“We know that the old ways of organizing the human race aren’t enough anymore. They’re not adapted to the highly connected world we’re living in. They’re not fast enough, or collaborative enough, or agile enough,” Vian wrote during our early brainstorming meetings. “We need to design better ways for the world to work together in the future. We need networked organizations that can solve problems better, move faster, be more responsive, and overcome the old ways of doing and thinking that paralyze us.”

So we wanted to find out: How might businesses, governments, and nonprofit organizations team up to make each other more resilient during crisis? How could existing organizations work together to tackle these planetary-scale problems? How should these entities engage the super-empowered individuals who want to be a part of changing the world—and who will go it alone, for better or for worse, if they don’t feel engaged?

Our hunch was that surviving the next decade would require entirely new
ways of cooperating, coordinating, and creating together. So we wanted to find a new strategic language for talking about revolutionary ways of working together at extreme scales—language that could completely shift our thinking about how to adapt for the coming decade.

We looked at a lot of potential language, but as soon as we hit on the term “superstruct,” we knew we’d found it.

**superstruct** /səˈprrstrəkt/

verb trans. [L. superstructus, p.p. of superstruere, to build upon; super-, over + -struere, to build. See super-, and structure.]

To build over or upon another structure; to erect upon a foundation.  

“Superstruct” is a term that shows up most often in the fields of engineering and architecture. To superstruct a building is to extend it, to make it more resilient.

Superstructing isn’t about just making something bigger. It’s about working with an existing foundation and taking it in new directions, to reach beyond present limits. It means creating flexible connections to other structures, to mutually reinforce each other. And superstructing means growing in strategic and inventive ways so that you can create new and more powerful structures that would have been previously unimaginable.

So superstruct really seemed to capture the process of extension and reinvention that we wanted to explore in our Ten-Year Forecast. But what would be the best way to investigate a process that didn’t quite exist yet?

My graduate studies background is in a social science called “performance studies,” in which one of the core research methodologies is to actually do, or perform, the thing that you’re studying. So we decided to build a superstructure.

We decided to superstruct our own Ten-Year Forecasting project by opening it up to the public. We would conduct our primary TYF research as a live, online six-week collaborative experiment—completely open to anyone who wanted to join us.
We called this experiment, naturally, Superstruct, and we framed it as a massively multiplayer forecasting game. We wanted the world to help us forecast the future of organizing at extreme, or epic, scales in order to survive real global threats and solve real planetary-scale problems. And we committed to using whatever collective forecast our players came up with as the foundation for our annual research report and conference the following spring.

The core creative team for the project was made up of program director Kathi Vian, scenario director Jamais Cascio, and myself, the game director. We spent six months working with a team of a dozen additional IFTF researchers and designers to develop the 2019 scenario, research the game topics, create the immersive content, design the gameplay, and build the website.

The game launched on September 22, 2008, with a press release from a fictional organization called the Global Extinction Awareness System. The press release was dated September 22, 2019.

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For immediate release:
September 22, 2019

Humans have 23 years to go
Global Extinction Awareness System starts the countdown for Homo sapiens.

Based on the results of a yearlong supercomputer simulation, the Global Extinction Awareness System (GEAS) has reset the “survival horizon” for Homo sapiens—the human race—from “indefinite” to 23 years.

“The survival horizon identifies the point in time after which a threatened population is expected to experience a catastrophic collapse,” GEAS president Audrey Chen said. “It is the point from which a species is unlikely to recover. By identifying a survival horizon of 2042, GEAS has given human civilization a definite deadline for making substantive changes to planet and practices.”
According to Chen, the latest GEAS simulation harnessed over 70 petabytes of environmental, economic, and demographic data, and was cross-validated by ten different probabilistic models.

The GEAS models revealed a potentially terminal combination of five so-called “superthreats,” which represent a collision of environmental, economic, and social risks.

“Each superthreat on its own poses a serious challenge to the world’s adaptive capacity,” said GEAS research director Hernandez Garcia. “Acting together, the five superthreats may irreversibly overwhelm our species’ ability to survive.”

GEAS notified the United Nations prior to making a public announcement. The spokesperson for United Nations Secretary-General Vaira Vike-Freiberga released the following statement: “We are grateful for GEAS’ work, and we treat their latest forecast with seriousness and profound gravity.”

GEAS urges concerned citizens, families, corporations, institutions, and governments to talk to each other and begin making plans to deal with the superthreats.

We chose an intentionally provocative starting point for the scenario for several reasons. First, we wanted players to propose awe-inspiring solutions. So we had to pose a scenario that would inspire a sense of awe and wonder—an epic “What if?” What would you do if you woke up one morning to discover that the world’s most trusted supercomputer had calculated the entire human species was as endangered as tigers, polar bears, and pandas are today?

Second, we wanted to learn something new, so we had to push our players to imagine previously unthinkable ideas. We aimed to create a forecasting context so far from their ordinary day-to-day concerns that they would feel free to practice extreme creativity and be comfortable pitching “outlier,” or unexpected, ideas.
And third, we wanted to give our players a clear goal, a way to measure their success in the game. The GEAS survival horizon gave us the perfect way to do both. We would challenge our players to work together to extend the survival horizon from the year 2042 as far as we could possibly take it. Each year they added to the horizon would represent a significant milestone in the game. (Advances in the survival horizon would be based on an algorithm factoring in the number of active players, how many game missions they completed, and how many achievements they unlocked.)

To ground the game in some specific forecasting topics, we identified five key areas in which players could make a significant impact on our survival horizon. These were the five superthreats, extreme-scale challenges that posed the greatest threat to humanity’s survival. But they weren’t just threats—they were also opportunities, key areas for coordinated effort and innovation, among organizations and SEHIs alike.

If you wanted to make a difference in our game world of 2019, you had to pick one of these superthreats and start tackling it with the biggest, most surprising ideas you could come up with. These were the five superthreats:

- **Quarantine** covers the global response to declining health and pandemic disease, including the current respiratory distress syndrome (ReDS) crisis. The challenge: How can we protect and improve our global health, especially in the face of pandemics?
- **Ravenous** focuses on the imminent collapse of the global food system, leading to food safety lapses and shortages worldwide. The challenge: How can we feed ourselves in more sustainable and secure ways?
- **Power Struggle** follows the tremendous political and economic upheaval, as well as quality-of-life disruptions, we may suffer as we attempt to move from oil-based societies to solar, wind, and biofuel societies. The challenge: How can we reinvent the way we create and consume energy?
- **Outlaw Planet** tracks the efforts to hack, grief, terrorize, or other-
wise exploit the communications, sensor, and data networks we increasingly rely on to run our lives. The challenge: How can we be more secure in a globally networked society?

- *Generation Exile* looks at the difficulties of organizing society and government in the face of one particular challenge: the disappearance of secure habitats for three hundred million refugees and migrants, who have been forced to leave their homes and in many cases their homelands due to climate change, economic disruption, and war. The challenge: How can we govern ourselves and take better care of each other across traditional geopolitical borders?

To help players quickly grasp the details of this complex scenario, for each of these superthreats we created a short video trailer and a series of news headlines describing unfolding events. We also released an online report, set in the year 2019, outlining some of the dilemmas each of these superthreats might provoke, and how they might interact with and magnify each other. In the report, we emphasized a sense of optimism about humanity’s ability to overcome the superthreats.

The human species has a long history of overcoming tremendous obstacles, often coming out stronger than before. Indeed, some anthropologists argue that human intelligence emerged as the consequence of the last major ice age, a period of enormous environmental stress demanding flexibility, foresight, and creativity on the part of the small numbers of early *Homo sapiens*. Historically, those who have prophesied doom for human civilization have been proven wrong, time and again, by the capacity of our species to both adapt to and transform our conditions.

GEAS does not argue or believe that this future is unavoidable. This is perhaps the most important element of our forecast. This is not fate. If we act now—and act with intelligence, flexibility,
foresight, and creativity—we can avoid the final threat. We may even come out of this period far stronger than we were before.

Both the report and the trailers ended with the same call to action: Join us to invent the future of the human species. We announced that volunteers were gathering on an online social network site called Superstruct. And we issued a public invitation—on blogs, on Facebook, on e-mail, on Twitter—to join the network. Our core message: Everyone has a part to play in reinventing the way the world works. And in the end, we attracted 8,647 super-empowered hopeful individuals to contribute their best ideas for the future to our super-structuring experiment.

But before they tackled the superthreats, our players had an important first mission: invent their future selves.

Like any present-day social network, our 2019 social network asked you to fill out a personal profile. But our profile was different: it focused on survivability. What are the specific skills, resources, and communities you can bring to bear on these superthreats? What are you uniquely qualified to contribute to reinventing the world? We encouraged players to have fun imagining their future selves, but we also told them to keep it real. This was essential. Don’t invent a fictional character, we told them. This is about real play, not role play. We want to know who you really think you might be in 2019. Feel free to dream big, but make sure it’s grounded in reality.

Here’s the profile. How would you answer these questions? Remember: It’s not who you are today. It’s who you might be in the future.

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**YOUR WORLD IN 2019**

Where do you live?

Who do you live with?

What do you do? Where do you work?

What matters to you most?
How did you get to be this person? Was there a particular turning point for you in the past ten years?

YOUR UNIQUE STRENGTHS
What do you know more about than most people? Tell us about your skills and abilities.
Who do you know? Tell us about the communities and groups you belong to, and what kinds of people are in your social and professional networks.

This first mission helped immerse players in the future. It required them to vividly imagine the year 2019, and how their work and lives might be different by then. It also helped them identify specific personal resources they could bring to bear on the superthreats. At heart, Superstruct was about figuring out new roles for individuals, organizations, and communities to play in much bigger, longer-term efforts to make life on this planet better. To accomplish this goal, we had to help our players make direct connections between their current skills, resources, and abilities and the demands of the future.

If you were to ask an ordinary person if they could personally fix the economy, stop a pandemic, or prevent famine, they probably wouldn’t even know where to begin. So we gave the players a specific place to start: in their own communities, groups, and social networks, using whatever they knew best as a foundation for suggesting solutions.

Finally, this mission gave us some concrete data about our players. We asked players to tell us, confidentially, a little bit about who they were in 2008, to help us put their forecasts and ideas into context. This 2008 data didn’t appear on their public profile; it was only to help during the research process, so we could cross-reference their future ideas by real-life age, location, and occupation. We wanted to find out more about how SEHIs think of themselves and what kinds of projects they are most likely to tackle.

So who superstructs? Here’s what we found out.
Out of just under nine thousand forecasters who joined the effort, the vast majority were between the ages of twenty and forty, with the rest spread out like a bell curve. Our youngest player was ten (he was particularly interested in the future of food, especially “lab-grown meat,” which is in fact an emerging food technology). Our oldest player was ninety (she was interested in the future of education).

We had players from forty-nine out of fifty U.S. states and more than one hundred countries worldwide. We had a startlingly diverse group of professionals, including chief engineers, chief technical officers, chief creative officers; longshoremen, hotel concierges, and museum curators; astrophysicists, atmospheric scientists, mathematicians; nurses, plumbers, and photographers. There were also numerous college and graduate students, senior executives, members of the armed forces, and public servants.

What expertise did these diverse participants bring to the game? Players identified expertise in areas as wide as labor activism, transportation and logistics, and robotics; specialty coffee, the comic book industry, the steel industry; immigration, forestry, and fashion; tourism, health care, and journalism; chemical engineering, caregiving, and e-commerce; consulting, defense, and human resources; forensics, human rights, and nanotechnology.

These were among the skills and resources we asked players to bring to bear on the five superthreats. And we asked them to tackle the superthreats in a very specific way: by inventing superstructures.

HOW TO INVENT A SUPERSTRUCTURE

This is a game of survival, and we need you to survive.

We’re facing superthreats, and we need to adapt.

The existing structures of human civilization just aren’t enough. We need a new set of superstructures to rise above, to take humans to the next stage.

You can help. Superstruct now. It’s your legacy to the human race.
Q: WHAT'S A SUPERSTRUCTURE?
A: A superstructure is a highly collaborative network that’s built on top of existing groups and organizations.

THERE ARE FOUR TRAITS THAT DEFINE A SUPERSTRUCTURE:
1. A superstructure brings together two or more different communities that don’t already work together.
2. A superstructure is designed to help solve a big, complex problem that no single existing organization can solve alone.
3. A superstructure harnesses the unique resources, skills, and activities of each of its subgroups. Everyone contributes something different, and together they create a solution.
4. A superstructure is fundamentally new. It should sound like an idea that no one’s tried before.

Q: WHAT KINDS OF GROUPS CAN COME TOGETHER TO FORM SUPERSTRUCTURES?
A: Any kind of group at all. For profit and not-for-profit, professional and amateur, local and global, religious and secular, online and offline, fun and serious, big and small.

ANY EXISTING COMMUNITY CAN BE ADDED TO A SUPERSTRUCTURE! HERE ARE SOME EXAMPLES:
- Companies
- Families
- People who live in the same building or neighborhood
- Industry and trade organizations
- Nonprofits and NGOs
- Annual conferences or festivals
- Churches
• Local or national governments
• Online communities
• Social network groups
• Fan groups
• Clubs
• Teams

Q: HOW DO I CREATE A NEW SUPERSTRUCTURE?
A: Start by picking a community that you already belong to. What could your community uniquely contribute to solving one or more of the superthreats? And who else do you want to work with to make it happen?

When you’re ready to share your idea, create a new wiki article. Use the wiki fields (name, motto, mission, who we need, how we work, and what we can accomplish) to describe your new superstructure.

Q: I’VE MADE A SUPERSTRUCTURE. WHAT NEXT?
A: When you have a basic description of your superstructure in place, invite other SEHIs and your own friends, colleagues, neighbors, and networks to join.

If you’ve made your superstructure public, keep an eye on your wiki to welcome new members and to see how the superstructure evolves. If you’ve made your superstructure private, be sure to check back often to approve new members so they can help you build your superstructure.

Together, your Superstruct members can keep editing the wiki until it describes exactly the way you think your superstructure should work.

DON’T STOP NOW!

Once you’ve created your first superstructure, there’s lots more to do. You can create superstructures for other superthreats. Or you can design spin-off superstructures from your
original superstructure. You can invent competing superstructures, or bigger superstructures to swallow up superstructures that are already existing.

Keep superstructuring, and surprise us with your big ideas!

The most important rule for inventing a superstructure was that it should be unlike any existing organization. It should be a fundamentally new combination of people, skills, and scales of work. But it also had to be a plausible approach to a problem—a way to give people who don’t ordinarily work on challenges like hunger, pandemic, climate change, economic collapse, or network security a way to make a difference.

Inventing a superstructure was the core element of gameplay; it was how players earned survivability points (up to one hundred), which tallied into a total survivability score. The more thoughtful, clearly explained, creative, and surprising the superstructure, the more points a player earned. A player could also earn points by joining and contributing ideas to other players’ superstructures.

What, exactly, is a survivability score? We described it to players as follows:

Your Survivability Score is a number between 0 and 100 that appears in your Survival Profile. When you first join, you have a score of 0. Any score higher than 0 means you personally are becoming more and more important to the survival of the species. If you achieve a score of 100, you personally are absolutely central to the future of the human race.

In other words, our scoring system wasn’t meant to be competitive, but simply to represent your personal progress.

Let’s take a look at some brief descriptions of some of the particularly high-scoring superstructures, and the SEHIs who created them.
WE HAVE THE POWER—ENERGY-HARVESTING CLOTHES

You don’t need to buy power from an energy company. You can make your own power. What you wear every day can help you collect and save energy, which you can use to power your laptop, your cell phone, your MP3 player, or to provide heat.

Think: Jackets with solar panels that collect energy and can be used to provide electric heat when you wear the jacket at night. Headbands with solar-paneled flowers that collect the energy you need to power your iPod. Fringed skirts that harness wind energy and store it in a tiny battery that you can detach and use to power anything at all. A belt with a sound wave collector that turns environmental noise into an energy source.

We’re creating and collecting designs for all kinds of wearable energy sources. We’ll make working prototypes of these designs and present them in a We Have the Power fashion show. We need your help sharing and improving these designs so that as many people as possible can harvest their own energy.

The We Have the Power superstructure was founded by SEHI Solspire, or, in real life, Pauline Sameshima, an assistant professor in the department of teaching and learning at Washington State University. She led her design class in creating a series of real, working prototypes and impromptu campus fashion shows for clothes that incorporated the kinds of wearable energy technologies described above. Their SEHI mission: to use rapid prototyping and design innovation to tackle the Power Struggle superthreat, and help invent the future of energy.

SEEDS ATMS—WITHDRAW YOUR FOOD FOR FREE

Food shouldn’t cost anything. Seeds also shouldn’t cost anything. That’s why this superstructure has been created: to build a
Seeds ATM network, so anyone who needs seeds can easily go to an ATM and get free seeds.

What we want to accomplish: spread the GYO (grow your own) food concept, as well as set the foundations of a bigger free-food network.

We envision a network of secure Seeds ATMs installed at bank locations worldwide. However, as a working prototype, we propose a really simple hack: gumball machines. We will fill them with seeds and set them to not need money, or to simply require a penny. We will install them outside grocery stores and farmers’ markets.

This superstructure was invented by SEHI Jorge Guberte, a twenty-five-year-old digital artist in São Paulo, Brazil. With no direct connection to the food industry or agriculture, he proposed a completely unexpected, extreme-scale solution to the Ravenous superthreat. His SEHI mission: to make access to food a basic civic right, and help invent the future of how we feed ourselves.

THE DEMOCRATIC CENTRAL AFRICAN REPUBLIC (DCAR)—THE REFUGEE STATE

DCAR, the Democratic Central African Republic, is a “weakly statelike entity,” or WSLE, a 16 million person quasi-state entity in east central Africa in a contested region where the neighboring countries have largely lost the will to continue fighting but will not allow each other to declare victory.

Humanitarian efforts in this disordered area therefore had to provide many basic functions of the state, such as identity services, issuing what amounted to passports, issuing a basic electronic currency, and generally trying to keep life going until somebody asserted governance over the area.

Eventually, after four or five years of interim governance using electronic democracy software and biometric cell phones, DCAR
has begun to have semiofficial, quasi-state status. Like Taiwan, it
cannot safely assert full sovereignty, but the shells of the previous
governments of the region have technically passed their legitimacy
to the refugee councils of DCAR, and as long as nobody raises an
army, nobody seems to mind self-organizing refugees trying to
manage their lives until the governments settle their territorial
disputes.

Anybody can support DCAR. You just have to remember how
important it is that refugees get political rights to manage their
own lives, just as we do. Being a refugee is hard enough without
being oppressed too!

If you want to get more involved, display the DCAR flag where-
ever you can to let people know that DCAR still matters.

The DCAR superstructure was founded by SEHI Hexayurt, or Vinay
Gupta, a noted world expert on disaster relief. He is also the inventor of the
Hexayurt, an inexpensive, lightweight shelter designed to provide sustainable
housing for refugees. He wanted to address the Generation Exile superthreat
in the context of the ongoing African refugee crisis. His SEHI mission: to help
invent the future of peace and government.

**NONE OF THESE** ideas will reinvent the way the world works on its own. But
alongside the more than five hundred other superstructures that players cre-
ated, they effectively prove a new reality: that problem solving at extreme
scales can involve ordinary people; that all scales of human organization can
combine and recombine in startling ways; that continuous reinvention is not
only possible, it’s an evolutionary imperative for the next decade.

**WE RAN SUPERSTRUCT** as a live forecasting experiment for six weeks. So what
were the final results?

After the game, our players inventoried and organized their efforts into a
catalog of solutions called the Whole Superstructure Catalog (a play on Stew-
art Brand’s Whole Earth Catalog), which you can view online, at Superstruct.
wikia.com.

In addition to their catalog of 550 superstructures, our players created more
than a thousand vivid first-person accounts of the superthreats, told in videos
and photos, blogs and Twitter updates, Facebook messages and podcasts. This
world lives online as a resource for other forecasters, policy makers, educators,
and interested individuals to explore and analyze.

We set up traditional discussion forums to provide players with a sounding
board for strategies they wanted to apply in their superstructures. The players
held court across more than five hundred different forum topics, such as “Net-
working the offline world: How do we reach out to people who aren’t online?”;
“What can we do with bicycles: Beyond exercise, how can we use bicycles to
help solve some big problems?”; and “Art for art’s sake: What is the role of arts
in 2019? What role can art play during times of epic crisis?” There’s enough
reading material on these forums to comprise dozens of future-forecasting
reports—and it’s all saved online for public browsing.

In terms of gameplay, we had nineteen players achieve a survivability score
of 100—the equivalent of winning the staff of life in Spore, or creating a level
80 character in World of Warcraft. We invited these nineteen players to be-
come our “SEHI 19,” and we extended invitations to them to continue col-
laborating with the Institute for the Future. All of the players, but in particular
the SEHI 19, became a kind of superstructure for IFTF itself.

Finally, our Ten-Year Forecast team spent six months analyzing the results
of the forecasting game. We prepared the year’s TYF research report, “Super-
structuring the Next Decade,” developing the themes explored in our scenario
and analyzing the most promising superstructuring methods demonstrated by
our players. We’ve since made these materials—including a set of “Super-
struct strategy cards,” a visual map of the Superstruct ecosystem, and three
alternate scenarios for the next fifty years of planet craft—available to the
public on the Institute for the Future’s website.27

Oh, and just in case you’re wondering—how much good did our players
collectively do, according to the game’s Global Extinction Awareness System?
By the end of the six-week game, the players had pushed the survival horizon for the human species to the year 2086—or one year more for every thousand survivability points they collectively earned. That’s forty-four more years they earned us on this planet—enough time for two more generations of potential super-empowered hopeful individuals to be born and to start working on these problems with us.

The entire experience is perhaps best summed up by a Twitter post from one of our players. It epitomizes exactly what IFTF hoped to accomplish with the game.

“This is my favorite vision of the future, ever,” he wrote. “Because it’s the first one I feel personally capable of making a difference in.”

Superstruct was designed to wake gamers up to the possibility of making the future together—a critical first step to increasing our collective engagement with global superthreats. But to produce real change in the world, it’s not enough to spread a feeling of super-empowerment and hope. We also have to build up actual world-changing capacity among gamers. We have to help them cultivate the specific future-making skills and abilities, and acquire the practical knowledge they need, in order to increase their chances of making a real and sustained difference.

Super-empowered hope and collaborative creativity must be combined with practical learning and real capacity development. And it can’t just happen in the parts of the world where computer and video game technology is already pervasive. World-changing games must be custom designed specifically for the most impoverished regions of the world, where future-making skills are most urgently needed—for example, developing areas in much of Africa.

These are the two key insights that led me to my most recent game, EVOKE.

**EVOKE: A Crash Course in Changing the World**

EVOKE is designed to empower young people all over the world, especially in Africa, to start actively tackling the world’s most urgent problems—poverty,
hunger, sustainable energy, clean-water access, natural disaster preparation, human rights.

Dubbed as a “crash course in changing the world” and produced for the World Bank Institute, the learning arm of the World Bank, EVOKE is a social network game designed to help players launch their own world-changing venture in just ten weeks. It’s playable on computers, but it’s optimized for mobile phones—the most ubiquitous social technology in Africa.

The world of EVOKE is set ten years in the future. The story, told in the form of a graphic novel, follows the adventures of a secret superhero network based in Africa. The network is made up of “stealth social innovators,” a concept we invented for the game.

Excerpt from episode eight of EVOKE.
(Jacob Glaser, World Bank Institute, 2010)

Social innovation, of course, is a real concept—and an increasingly important method of tackling poverty worldwide. It means applying entrepreneurial ways of thinking and working to solve social problems that are ordinarily tackled by governments or by relief and aid agencies. The key principle of social innovation is that anyone, anywhere, can start their own project or business venture to try to solve a social problem. Also referred to as “social entrepreneurship,” it emphasizes taking risks, understanding the local context, and looking for breakthrough innovations, rather than applying standard, cookie-cutter solutions.

So what is stealth social innovation? In the world of EVOKE, social innovators tackle social problems with superheroic secrecy and spectacle—public
and yet mysterious, like Batman or Spider-Man—in order to capture global imagination so that the solutions have a real chance to catch on and spread virally. EVOKE superheroes are particularly known for applying an innovation method referred to by real development experts today as “African ingenuity.”

Erik Hersman, a technologist and editor for the blog AfriGadget, is a leading proponent of African ingenuity. Hersman, who grew up in Sudan and now lives in Kenya, describes it as follows:

A Malawian boy creates a windmill from old bicycle parts and sheet metal. A Kenyan man fabricates welding machines from scrap metal, wood and copper wire. An Ethiopian entrepreneur makes coffee machines from old mortar shells. A Malawian scientist invents a new micro–power plant that uses sugar and yeast. A South African youth makes a working paraglider from plastic bags, rope and bailing wire. Though you might not hear those stories in the international press, these are just a few of the incredible tales of African ingenuity happening every day in thousands of villages, godowns, industrial areas, roadside shops and homes throughout the continent. Africans are bending the little they have to their will, using creativity to overcome life’s challenges.28

Many experts on Africa, including Hersman, believe that the people who tackle the hardest problems in the developing world today will be the ones most capable of solving any crisis, anywhere in the world, in the future. Indeed, problem solvers in Africa today may leapfrog past the rest of the world, coming up with cheaper, more efficient, and more sustainable solutions, simply because they have no other choice. The obstacles they face are so enormous, and the resources they have so limited, that their solutions must be more creative, more resourceful, and more resilient than traditional solutions developed by the rest of the world.

EVOKE is designed to help players become a part of the emerging culture of African ingenuity—to build up their social innovation skills today so they have a real chance to become the world’s superheroes in the future.
So how does the gameplay work? Over the course of a ten-week “season,” players are challenged to complete a series of ten missions and ten quests. Each week’s challenges are focused around a new “urgent evoke.”

An *evoke*, in this game world, is an *urgent call to innovation*, an electronic SOS message sent from a city in crisis to the secret problem-solving network in Africa. In the first two episodes of the game, for example, the EVOKE network is called upon to help prevent a famine in Tokyo and to rebuild following a collapse of the energy infrastructure in Rio de Janeiro.

After reading the urgent evoke online, players are challenged to respond in the real world—and get real, firsthand experience tackling an urgent crisis on a small and local scale. Consider the first two EVOKE missions.

**URGENT EVOKE: Food Security**

More than a billion people go hungry every day. This week, YOU have the power to change at least one of those lives. Your objective: Increase the food security of at least one person in your community. Remember: Food security isn’t about providing temporary help or a single meal. It’s about long-term solutions to hunger and food shortages. Here are some ideas to get you started:

- Help someone start a home garden.
- Volunteer at a local community garden.
- Invent a way to make it easier for people in your community to share the food they have with others.
- Create a resource for local farmers.

**URGENT EVOKE: Power Shift**

Today, less than 10 percent of global electricity is produced by sustainable energy sources. This week, discover YOUR power to help change that number. Your objective: Design a new way to power something you use every day. Take a look around you. Something YOU use or do every day could be powered differently—with solar power, wind power, or kinetic power, for example. Maybe it’s
your mobile phone. Maybe it’s the light you use to read at night. Your solution should be cheaper or more sustainable than your current power source.

To help them brainstorm creative solutions to these challenging tasks, we provide players with secret “investigation files” that document social innovations already happening in Africa and other parts of the world—projects that can spark their own African ingenuity and inspire their own efforts.

In order to receive credit for their missions, players must share a blog post, video, or photo essay documenting the effort they made and what they learned. Other players review the mission evidence to verify it and to award EVOKE powers: plus-one spark, for example, or plus-one knowledge sharing, or plus-one local insight. Through the course of the game, by completing all ten missions, players build up a personal portfolio of world-changing efforts (their collection of blog posts, videos, and photos), as well as a profile of their unique future-making attributes (an interactive display of all the EVOKE powers they’ve earned).

Meanwhile, players are also challenged to complete a series of ten online quests. These personal quests are designed to help players discover their own unique “origin story.” The game instructions explain, “In comic books, the origin story reveals how a character became a superhero—where their powers came from, who inspired them, and what events set them on a path to change the world. Before YOU can change the world, you need to figure out your superhero origins.” Over time the players’ quest log becomes a kind of world-changing calling card, describing, for example, their secret identity. The quest log would include answers to questions like “What are three things you know more about, or do better, than most of your friends and family?” and “What three personality traits or abilities make you stand out from the crowd?” The quest log also represents their heroic call to action when they answer questions like “If you had the power to convince today one person—or a hundred people, or a million people—to do one thing, who would it be, and what would you call on him or her to do?” By completing these introspective quests, players aren’t just learning about their own strengths or charting their own future.
They’re also developing the foundations for a multimedia business plan that they can use to attract collaborators, mentors, and investors.

Robert Hawkins, a senior education specialist at the World Bank Institute, first came up with the idea for a social innovation game. “The demand is so great for a game like this,” Hawkins told me when he first invited me to join the project as its creative director. “We keep hearing from African universities that they need better tools to engage students in real-world problems and to develop their capacities for creativity, innovation, and entrepreneurial action. This game needs to be a response to that desire, to serve as an engine for job creation now and in the future.” In fact, the game was promoted to university students across English-speaking Africa as “Free job training—for the job of inventing the future.”

Not only are EVOKE players learning real-world skills, they’re also earning real-world honors and rewards. Players who successfully complete ten online missions in ten weeks receive a special résumé-worthy distinction: official certification as a World Bank Institute Social Innovator. Top players also earn postgame mentorships with experienced social innovators, and scholarships are awarded so they can share their vision for the future at the annual EVOKE Summit in Washington, D.C.

In the first trial of the game, run in the spring of 2010, we enrolled more than 19,000 young people from over 150 countries, including more than 2,500 students from sub-Saharan Africa—making it the largest collaborative online problem-solving community in Africa to date.

Collectively, in just ten weeks, this founding group of players completed more than 35,000 future-making missions together, documented on the EVOKE network. More importantly, as their final challenge, they proposed more than a hundred new social ventures—creative enterprises they planned to undertake in the real world, with the support of seed funding and ongoing mentorships from the World Bank Institute. These EVOKE-inspired ventures include:

- Evokation Station, a pilot program created and managed by high school students in Cape Town, South Africa, and designed to give
people the skills and knowledge to grow their own food for their families and as a source of income. The program is currently being tested in one of the poorest communities in Cape Town, Monwabisi Park, an informal settlement, or squatter camp, of more than twenty thousand displaced people who have been living for twelve years without running water, sanitation, proper houses, roads, or access to health care and employment.

- Solar Boats, a project by and for young women in Jordan, with the goal of converting more than 120 glass boats in the Gulf of Aqaba to solar-powered ones, in order to save on fuel, decrease pollution of the Red Sea coral and sea life, and lead to cleaner beaches and lower-cost boating.

- Spark Library, a venture developed by a U.S. graduate student in architecture, to design and pilot a new kind of crowdsourced library across sub-Saharan Africa. In order to check out a book from a Spark Library, you must first contribute a piece of local or personal knowledge, in order to help build up a database of indigenous or traditional knowledge about the environment, cultural practices, and natural resources.

As I write this chapter, plans to develop future seasons of EVOKE are already under way, based on its early success. New seasons of the game will focus attention and engagement on a single issue, such as energy, food security, or women’s rights. Meanwhile, the first season of the game—EVOKE’s core curriculum—will be translated into Arabic for the Middle East, Spanish for Latin America, Mandarin for China, and more, in order to reach even more students. And in order to support EVOKE play in regions of Africa without reliable Internet access, episodes from the first season of EVOKE are being compiled into a single graphic novel, with all of the missions and quests adapted into workbook-style exercises. SMS-based interactivity—as most young people in the developing world do have access to mobile phones—will
ensure that these “pen and paper” players are still connected to the global EVOKE network.

The goal of all of these adaptations? To ensure, over time, that every young person on this planet receives an education in urgent problem solving and planet crafting—and has free and open access to a global network of potential world-changing collaborators, investors, and mentors.

**SO HOW MIGHT** future-making games like World Without Oil, Superstruct, and EVOKE evolve in a best-case-scenario future?

At the end of Superstruct, all of the IFTF game masters had an opportunity to select and honor their favorite superstructure during an online streaming Superstruct Honors broadcast. I chose a superstructure called The Long Game, proposed by player Ubik2019, one of Superstruct’s most active players. The Long Game represents, to me, what future-making games must aspire to become by the end of the twenty-first century: an *epic collaboratory* for our most awe-inspiring global development efforts.

In real life, Ubik2019 is Gene Becker, formerly the worldwide director of product development for extreme performance and mobility at Hewlett-Packard, and now the founder and managing director of Lightning Laboratories, an emerging-technology consulting company that works with a range of Global 2000 companies and preinvestment start-ups. Becker brought to Superstruct a particularly keen sensibility about how to develop initiatives on a global scale, and how to leverage new network technologies for innovation. Here is Becker’s best idea for a new superstructure:

**THE LONG GAME**

Fostering a long-term mind-set by playing a game that lasts a thousand years.

*Who we need:* SEHIs who believe that a long-term mind-set and a playful approach to life can help us to become a better people, make better choices about our actions and their consequences,
potentially avoid the kind of supercrises we are facing here in 2019, and give every person on the planet the opportunity to create a meaningful legacy to the human race.

What we can accomplish: If you put just one dollar into an investment today that has an average real return of 3 percent per year after inflation and taxes, in a thousand years it would be worth $7 trillion. Now think about what your descendents thirty generations in the future might be able to do with such capital—and think about how you might communicate your wishes to them about how they would spend it.

Now consider how we might invest our nonfinancial capital—intellectual, natural, social, familial, genetic—in such a way that it compounded its value over time. Such a rich gift we could endow for the future of humanity . . .

A thousand-year game, combining financial and nonfinancial investment of our most important resources—how exactly would such a game work?

During the Superstruct experiment, we brainstormed different ideas, focusing largely on structure rather than theme, story, or content. For example, we imagined the entire world setting aside one day each year to play the game, as a kind of global holiday. Of course, like all good games, participation would be optional. But the supergoal of the game would be, by the end of one thousand years, to engage virtually 100 percent of the human population in playing.

Enthusiastic players could spend as much time as they wanted throughout the year preparing for the global game day. Casual players could simply show up to a game site (online or in the real world) and take part for a few minutes, a few hours, or even all twenty-four hours in the year’s game day.

That entire global game day would represent one “move” in the game. And perhaps, we imagined, The Long Game would be played in rounds of fifty moves each. So if you played The Long Game your entire life, you would hope to be able to experience a complete round at least once, if not twice.
Every tenth move would represent a bigger and more significant occasion, to provide a kind of momentous leveling-up occasion each decade. Each twenty-fifth and each fiftieth move, the halfway mark and the end of each round, would be an even more momentous occasion—each time the culmination of a quarter century of gamers’ efforts.

What specifically would making a move in the game entail? We envisioned a combination of events. Social rituals and circle games to build common ground. Crowdsourced challenges and collective feats—in the style of a traditional barn raising—to focus the world’s energy and attention on a single problem and a single transformation. And forecasting exercises to create shared momentum for the future, and to collectively decide the challenges and themes of the next year’s set of games.

No one would ever live to see both the start and the end of the game, of course—not even close. But the game would be a throughline for humanity, a tangible connection between our actions today and the world our descendants inherit tomorrow. It would create a sense of awe and wonder, inspiring us to imagine how this massively scaled adventure we are a part of could play out, and to make as meaningful an impact in the game as possible, so we can make a difference in our lifetime that lasts for many lifetimes more.

It’s not that hard to imagine people spending their entire lives playing a single game. Many World of Warcraft gamers have now been playing their favorite game for nearly an entire decade already; so has the Halo community. Countless among us spend a lifetime mastering a game like chess, poker, or golf.

And we already have a historical precedent for societies successfully keeping a game tradition alive for an entire millennium—the ancient Greeks ran their Olympiad every four years without interruption for roughly one thousand years.

The Long Game doesn’t exist yet. But it just might be what the world needs now.

Aspiring to engage every single human being on the planet in a single game isn’t an arbitrary goal. To accomplish that goal would mean transforming the planet and global society in key ways.
It would require every single village in the world to have some level of access to the Internet, via personal computers or mobile phones, so that truly everyone could contribute to the game. Universal Internet access is in its own right a significant and worthy goal. Today, roughly one in four people on the planet has reliable, daily Internet access. When every family in the remote villages of Africa, or in what today are the slums of India, or throughout Nicaragua—when they and everyone else in the world has access to The Long Game, that will mean greater access to education, culture, and economic opportunity as well.

Furthermore, for every person on the planet to play the same game, there would need to be free communications across all geopolitical borders. What would it take before every citizen of North Korea, for example, could play The Long Game?

The Long Game, if we have the will to design it, and if we create the means for universal participation, could be the good game that humanity plays to collectively take us to the next level, achieving a new scale of cooperation, coordination, and cocreation. As Kathi Vian urged in her introduction to the Superstruct Ten-Year Forecast:

> Zoom out. Look at the coming decade from the perspective of millennia of change. Focus on the progress of the universe from the breakthrough structures of the atom to the living cell, the biota, the community of nations, the global economy. This is how the future will be new, by continuing the incredible experiment of reorganization for greater complexity, by creating the next astonishing structural forms in this long evolutionary path.

It seems clear to me that games are the most likely candidate to serve as the next great breakthrough structure for life on earth.

There’s no guarantee, of course, that evolution will continue along any given path, other than the path of improved survivability in a given environment. But all of the historic evidence seems to suggest that collaboration improves human survivability, and will continue to do so, as long as we can innovate new ways of working together.
First humans invented language. Then farming, and cities; trade and democratic forms of government and the Internet—all ways of supporting human life and collaboration at bigger and more complex scales.

We have been playing good games for nearly as long as we have been human. It is now time to play them on extreme scales.

Together, we can tackle what may be the most worthwhile, most epic obstacle of all: a whole-planetary mission, to use games to raise global quality of life, to prepare ourselves for the future, and to sustain our earth for the next millennium and beyond.
Serious Play at Hand: Is Gaming Serious Research in the Humanities?

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Abstract
Games are used to teach the humanities not for research. We are not even comfortable studying games seriously, let alone proposing that games could be a form of research. It is only recently that computer games have become the subject of serious humanities inquiry. [Note 1] At the same time there is a tradition that proposes that what we do in the humanities is a form of play, even if it is serious play. In theorists like Huizinga, Bakhtin, and Gadamer play is presented as a component of humanities practice. The playful dimension of the dialogue of the humanities is that which distinguishes our (hermeneutical) methods from those in the social and natural sciences. If we want to resist becoming a (human) science we need to reassert the playfulness of representation and interpretation. That means acknowledging the place of games and game theory in our practice.

In this component of the panel Geoffrey Rockwell will make the case for building games and playing them as a way of modeling and then reflecting on our activities that is in the spirit of the humanities. Geoffrey Rockwell was invited to sit in on the design of the Game and will provide a concluding presentation that reflects on the witnessed process of developing Ivanhoe as itself a recognizable form of research that combines the play of the symposium with the implementation demands of digital practice.

Introduction

Do Adelheid and the Bishop play a real game of chess?—Of course. They are not merely pretending—which would also be possible as part of a play.—But, for example, the game has no beginning!—Of course it has; otherwise it would not be a game of chess.—(Wittgenstein, Philosophical Investigations, section 365)

In section 365 of the Philosophical Investigations, Wittgenstein presents
a short exchange between voices (of which the second seems to stand for Wittgenstein) about a game of chess that is finished at the beginning of the second act of Goethe’s Götz von Berlichingen mit der eisernen Hand. (Gottfried of the Iron Hand) This exchange raises questions about the beginning of a game that may or may not really be a game. When I asked the Ivanhoe team what they thought of this passage Worthy Martin made the interesting observation that this dramatic game had potentially an infinite number of beginnings – an observation Wittgenstein probably would have appreciated.

Like you I came to the Ivanhoe game after it had started and have spent the months since I was invited to sit in wondering how it got started, and more importantly what were its principii, or research principles. Like Worthy I have concluded that, in a collaborative project like Ivanhoe, there are many principled-beginnings and charting them is a way to answer the question about the seriousness of gaming research and Ivanhoe. It is in the nature of messy research that you pause at some point, like now, and looking back, try to justify a research trajectory by imagining beginnings or principles, which is what I am going to do today.

What is a game?

The obvious place to start philosophically is to try to define games and then ask what sort of game Ivanhoe is, and how it may be research. The exchange quoted at the start of this paper is at the end of the Investigations where Wittgenstein introduced “language-games” as a tool for understanding and critiquing formal descriptions of language and thought. In fact, he turns to “games” as a paradigm for one of the central expressions of the Investigations – namely “family resemblance”. In sections 66 and 67 he presents another exchange, one which leads to family resemblance:

Section 66.
Consider for example the proceedings that we call “games”. I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all?--Don’t say: “There must be something common, or they would not be called ’games’”--but look and see whether there is anything common to all. For if you look at them you will not see something that is common to all, but similarities, relationships, and a whole series
of them at that. To repeat: don’t think, but look!—Look for example at board-games, with their multifarious relationships. Now pass to card-games: here you find many correspondences with the first group, but many common features drop out, and others appear. When we pass next to ball-games, much that is common is retained, but much is lost. Are they all ‘amusing’? Compare chess with noughts and crosses. Or is there always winning and losing, or competition between players? Think of patience. In ball games there is winning and losing; but when a child throws his ball at the wall and catches it again, this feature has disappeared. Look at the parts played by skill and luck; and at the difference between skill in chess and skill in tennis. Think now of games like ring-a-ring-a-roses; here is the element of amusement, but how many other characteristic features have disappeared! And we can go through the many, many other groups of games in the same way; can see how similarities crop up and disappear.

And the result of this examination is: we see a complicated network of similarities overlapping and criss-crossing: sometimes overall similarities, sometimes similarities of detail.

67.
I can think of no better expression to characterize these similarities than ”family resemblances“; for the various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way. And I shall say: ‘games’ form a family. (Wittgenstein, *Philosophical Investigations*, sections 66-67) < I need to cut this down for reading or paraphrase it.>

There are a number of points to be made about Wittgenstein’s challenge from which to survey the principles of Ivanhoe.

1. First, he resists the temptation to start with definitions and calls us instead to look at actual games. He calls us, his philosophical interlocutors, with a doubled optical challenge by asking us to “look” and “see”.
This looking is opposed to thinking – in other words we should start with the observation of games, not with the Cartesian isolation of thinking about them. The looking is also sequential – we are asked to start with a class of games – board games and then to move through other classes, card games, ball games, and on to chess, patience and tossing a ball and finally to ring-a-ring-a-roses. What he describes is a heuristic for philosophical investigation that he believes results in “a complicated network of similarities and overlapping and criss-crossing” an image that should be suggestive to us in the age of the Web.

Such a sequential investigation, while not the sole pursuit of the Ivanhoe team, has been one of its research practices – a way it begins. Again and again we looked out and asked about games and toys, especially those that seemed similar in functionality to Ivanhoe. And that perhaps is one beginning for Ivanhoe and what Bethany has called “game criticism”. It starts with a looking – and in particular a looking at a class of artifacts that have not been seriously considered in academic circles until recently – namely games. As such Ivanhoe is one of many ways we in the Humanities are starting to expand beyond literary, historical, and philosophical texts to treat the texts of popular culture like games.

2. Second, Wittgenstein elsewhere provides a different example of looking. While in section 66 he calls us to look at the games that are played, starting in section 6 and 7 he introduces the first of a series of hypothetical games that he calls “language-games” for the purpose of understanding language, the “actions into which it is woven” and then critiquing theories of language. In effect he turns theories with their definitions into dramatic games or imagined simulations of what language use would be like if limited to those actions defined as legal in a theory in order to show how no theory is capable of defining the “language-game”. These fictional games have no beginning nor end, they are not played, just imagined, but they are none the less games and as such Wittgenstein would say, of course they have a beginning.

Ivanhoe as a project, in this spirit imagines games, though it is interested not in games that imagine theories about language so much as implementing intuitions about interpretation and discourse. While we talk about the Ivanhoe game, in practice there is as yet no single game, (except perhaps the game of games) but a number of prototypes designed to test intuitions about the play of criticism and writing. Just as Wittgenstein through the *Investigations* tries out different language-games, the project of developing a game has forced the team to repeatedly try to articulate
what it is that we are modeling and to imagine models that would reflect these intuitions about criticism. While Ivanhoe has as a preliminary goal the development of at least a first generation of implemented game, Ivanhoe as a project continually cycles around questions about how to model in rules different beliefs about what criticism should and could be in the context of learning and collaborative research.

There is a danger, however, to pushing the similarities between the trajectory of the *Investigations* and that of the Ivanhoe team. One thing that has always constrained the Ivanhoe project is the challenge of actually implementing a game that others could play. Wittgenstein’s language-games were thought experiments that to my knowledge never left the page while Ivanhoe has set itself the challenge of trying to imagine something that could not only be implemented but which people would play, have fun playing and reflect back on after playing. And here we see another beginning in the form of a constraint – the constraint of implementation (within a modest budget) and the associated constraint of playability. This has taken Ivanhoe into the realm of software design and game design, something Bethany in particular has researched, though most of us hold the strong opinions of wanna-be game-players without the leisure to play. This constraint has, in turn, opened possibilities for game-design as playful research. Ivanhoe has undertaken a more active form of looking where we examine criticism through modeling.

In this way Ivanhoe could become not one game, but a framework for the implementation and playing of a class of text based games of defor-mance. A framework or toy with which we can play games of learning and collaboration. A framework that would provide another starting point for games of criticism.

3. Returning to Wittgenstein - after calling us to look Wittgenstein goes on to use games as a paradigmatic example of a network that while it cannot be defined can be discussed as a “family” of instances which share resemblances. These resemblances are features that are shared by two or more members of the family and form the links that build the semantic web of games. In the attempt to define games we are tempted to pick up and follow these linking features, hoping to find one which can serve as a defining or essential feature. The failure to find a satisfactory essential feature, is for Wittgenstein another beginning, the beginning of a cure for essentialist thinking. Therapy for the habit of definition that leads to a more domestic view of the phenomenon.

And here is another beginning for Ivanhoe – the search for family
resemblances, an investigation of the linking features that connect games to other forms of rhetoric and entertainment. For Ivanhoe this investigation has, as noted above, been constrained by the promise of implementation – in the Ivanhoe project as we search for features that connect games and other forms we start to recover a philosophy of play. These features can be found in Huizinga, Gadamer and other philosophers who have dealt with sport and play. They are worth recapitulating if only to show the pragmatic research in game design.

1. **Playful Purpose.** Most games have no purpose other than their play and for that reason games are played voluntarily for their own sake. The point of playing a game is not some extrinsic end, but the absorbing interest of the play. This is what makes games fun and not purposeful activity.

   Funding agencies, however, discourage such “pure” research and development, for which reason Ivanhoe has had to articulate educational goals for the game – extrinsic goals that are at odds with the playful purpose of games. One might ask whether Ivanhoe is a game or a toy. A toy, like a ball, can be voluntarily used as a prop for a game, like soccer, but can also be used for extrinsic purposes, like filling a closet or learning about gravity.

   Tests of Ivanhoe have and will be run where the game is played in an educational context where students have no choice but to play (if they want a decent grade.) The hope is that they will become absorbed as if it is a game, but the truth is that Ivanhoe in these cases is being used as a toy – a toy that while it can be used for a game is in an educational context being used for other purposes with the hope that the players will leave absorbed to the point of forgetting.

2. **Isolation from the Real.** Games are played in isolation from the life of real work. Certain games formally isolate a pocket of activities, time, and place from the real world of serious pursuits and incidentally also from other games. This isolation is what frees games from instrumental purposes. As such a game resembles a simulation that tries to model a phenomenon by isolating the essential features of that phenomenon and playing them out in a way that does not affect the phenomenon. The difference is that a simulation is not meant to be fun, but tries to model as efficiently as possible the phenomenon. A game builds on the pretence of the real, mimicking it in ways, but ultimately sacrifices verisimilitude to play. When we play games of imitation like Doctors and Nurses we use the real as a guide from which to play, but constantly negotiate the relation-
ship between fun and faithful simulation. In so far as Ivanhoe is a game, and therefore should be fun, there is at issue the degree to which it should model or play with interpretation.

3. Goals and Rules. Certain games are defined by limitations in the form of goals, especially competitive games. Goals include goals for the players like winning conditions, but also include playful goals that may not be formally described in the rules (of the sort “remember you just want to have fun” or “be a good sport”). The challenge of implementation is to take project goals and to formalize them into goals that can be articulated as winning conditions and therefore be programmed in. The process of rearticulating hermeneutical goals into programmable features in turn defines the playful goals that may not be programmed but can be discussed. The challenge of mirroring goals in code is part of the speculation.

Like goals, certain games are defined by their rules. In fact, most goals can be articulated as rules and vice versa. Rules are particularly important to computer implementation as they are the feature of games that can most easily be implemented in algorithms. As Bethany has pointed out in an unpublished paper “Ludic Algorithms” the rules that constrain a game also provide the isolated space for playful and creative freedom. The trick, however, is what rules and how to implement rules that encourage appropriate game play – in other words encourage appropriate activity.

Pragmatically, if we return to beginnings, a crucial start to theorizing implementation was made by Worthy Martin with the proposal that the game be thought of as a series of game-states with programmed rules that constrain the transition between states. Thus you can think of game design as a process of first specifying the parameters of the game-states (what does the computer know about a state) which define the characteristics of the isolated world in play, and then specifying the rules that govern how a move (made by a human or the computer) can transform a game-state (which could include specifications as to termination state or goals).

4. Props. A fifth feature of many classes of games like card games and board games is that they use specific props like boards, pieces and dice. It is possible in some cases to define the props in terms of rules (the game of chess is played on a board of 8 by 8 black and which alternating squares…), but in most games the props are too complex and rich to conveniently describe in rules and in practice they are usually developed independently. (My colleague Andrew Mactavish has pointed out that the success of some computer games like Half-Life is the provision for users
to create their own props – to use the game engine to make new games.) For this reason I treat props as a distinct feature. There are genres of props like cards that link families of games to each other. In the Ivanhoe game there is one privileged prop – the source text which starts the game and from which the game gets its name “Ivanhoe” – though few may ever play it with “Ivanhoe” as the source.

5. Repetition and Rapture. Repetition is the final feature that shows up in the literature to gather those games of rapture or physical exhilaration that don’t have rules, like rolling down a hill or leap-frog. Even games with goals and rules often have repetitive patterns called turns and guidelines formalized into rules that specify what is repeated in order to define the play.

Gaming as Hermeneutical Play

To approach this from another angle, I close by stepping back from this list of features and returning to the way in which the project is itself characterized by game design that is in play. Johanna Drucker has placed the Ivanhoe project on the Web among the projects of the Spec lab or Speculative Computing Laboratory. The project is not an investigation, but a speculation which tries to mirror that which we try to understand in order to look at it. While we pretend the goal is to mirror interpretation I doubt any of us believe we will succeed the way engineers in AI hope to succeed at simulating intelligence, but, like all humanities computing projects, in the failure to model we believe we can learn by looking. We learn not by thinking in isolation but by building and looking and rebuilding and looking again – the iteration makes of speculation a game of sorts (repetition being one of the features of certain games of rapture) a game which is interpretation and about interpretation – a variant on the hermeneutic circle – a variation which we hope is not, as the joke goes, hermetically sealed, but which leaks news.

This places Ivanhoe in a tradition of thought after the announced fall of metaphysics – a tradition that does not aim to engineer human science from the ground up, but to constantly rebuild from what is at hand – bricolage. As Derrida puts it in “Structure, Sign, and Play”

There are thus two interpretations of interpretation … The one seeks to decipher, dreams of deciphering a truth or an
origin which escapes play and the order of the sign, and lives the necessity of interpretation as an exile. The other, which is no longer turned toward the origin, affirms play and tries to pass beyond man and humanism … (p. 292)

In this case, as Computing Humanists, we are assembling and disassembling the toys of computing that are at hand. This is a serious play that iterates over a tradition of thinkers like Gadamer, Wittgenstein and Derrida – an iteration that they may not have imagined, let alone approved of, though both Derrida and Wittgenstein seem to strain against the rhetorical forms of philosophy as they speculate.

Gaming, in the broader sense that includes game criticism and game speculation, but is not necessarily game theory (which is still in the engineering tradition of economic efficiency) is research in the humanities in that it is a return to play as one of our subjects and methods, play with the defining technology of this age, the computer as a toy at hand. We can adapt some of the characteristics of play mentioned above and compare them in a chart to similar features in research.

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<td>Playful Purpose</td>
<td>Pure Research (as self determined activity)</td>
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Conclusion

This is not a discussion of research simply tailored to include the practices of the Ivanhoe project, as tempting as such a sophistical approach would be. Rather, in the repeated beginnings of Ivanhoe, this panel, and this paper, a familiar pattern emerges that has a family resemblance to research. A pattern of starting to search over and over when you know not what the end will be. That is research at play.

But is it serious? Is there a danger that such gaming is what we should do as children – a beginning we are supposed to have left behind when we got down to real work. Listen to what Callicles pointedly says to Socrates in one of Plato’s dialogues on rhetoric, the Gorgias,

It is a good thing to engage in philosophy in so far as it is an aid to education, and it is no disgrace for a youth to study it; but when a man who is now growing older still studies philosophy, Socrates, the situation becomes ridiculous. I feel towards philosophers very much as I do towards those who talk baby-talk and play the child. … when one hears a grown man lisping, or sees him playing the child, it looks absurd, unmanly, and worthy of a good beating. (484c-485c)

Of course, we all know what happened to Socrates!
Notes

1 Espen Aarseth in his editorial “Computer Game Studies, Year 1”, which introduces the newly launched journal Game Studies, writes that “2001 can be seen as the Year One of Computer Game Studies as an emerging, viable, international, academic field.” <http://www.gamestudies.org/0101/editorial.html>.

2 See the section “Play as the clue to ontological explanation” in Truth and Method, page 101 and following.

References


Wittgenstein, *Philosophical Investigations*. I am using a e-text version from the Electronic Text Centre at the University of Virginia.

"IVANHOE: Education in a New Key"

December 2004

IVANHOE: Education in a New Key

Jerome McGann (in collaboration with Johanna Drucker and Bethany Nowviskie)

Introduction.

1. IVANHOE (http://www.ivanhoegame.org/) is a research and pedagogical project for humanities scholars and students working in a digital age like our own, where books are only one among many cultural sources and objects of critical reflection. It is designed within the framework of the traditional goals of humanities education: to promote rigorous as well as imaginative thinking; to develop habits of thoroughness and flexibility when we investigate our cultural inheritance and try to exploit its sources and resources; and to expose and promote the collaborative dynamics of all humane studies, which by their nature both feed upon and resupply our cultural legacy.

2. IVANHOE emerged in the spring of 2000 from a conversation between Jerome McGann and Johanna Drucker on the subject of literary-critical method, and their shared dissatisfaction with the limitations of received interpretive procedures. They were interested in exploring forms of critical inquiry that moved closer to the provocative freedom of original works of poetry and literature.

3. McGann suggested that Walter Scott's famous romance fiction Ivanhoe contained within itself many alternative narrative possibilities, and he added that this kind of thing was characteristic of imaginative works in general. Scott's book epitomizes this situation in the many continuations it spawned throughout the nineteenth-century—versions in different genres as well as other kinds of responses, textual, pictorial, musical. For example, when many Victorian readers complained about Scott's decision to marry Ivanhoe to Rowena and not Rebecca, they were clearly responding to one of the book's underdeveloped possibilities. In our own day readers often react to other unresolved tensions in the book—for example, to the complex ways it handles, and mishandles, the subject of anti-Semitism. "Everyone knows that an anti-Semitic strain runs through the novel," he said. "The question is: 'What are you prepared to DO about it?'" Victorian's rewrote and reimagined the book. Why are we so hesitant about doing the same thing?

4. The concept of criticism as "a doing," as action and intervention, is a founding principle of IVANHOE. Traditional interpretation is itself best understood as a set of reflective activities and hence as something that lays itself open to active responses from others. It is not so much that "all interpretation is misinterpretation", as Harold Bloom observed some 25 years ago, as that all interpretation pursues transformations of meaning within a dynamic space of inherited and ongoing acts of interpretation. Interpretation is a dialogical exchange and, ultimately, a continuous set of collaborative activities.

5. This critical vantage point necessarily resists the traditional assumption about the self-identity of a particular text or cultural work. Various factors and agencies so impinge on the textual condition that the field of textuality, including all the objects we locate in that field, are in a perpetually dynamic state of formation and transformation. This view of textuality implies that any textual object—what in IVANHOE we call "the source text"—has to be encountered within a dynamical "discourse field" (i.e., the extended network of documents, materials, discussions, and evidence within which the work is continually being constituted).

6. When we began playing IVANHOE these initial premises were a somewhat loosely held set of intuitions. The actual gameplay transformed them into clear and governing ideas. Not surprisingly, it also drove us to rethink the whole process of interpretive method and theory. As a result, we began to see that IVANHOE could be designed and developed as an environment for the study and encouragement of critical practices that would make self-awareness pivotal to the whole enterprise. IVANHOE is what Coleridge might have called "an aid to reflection": a machinery for making explicit the assumptions about critical practice, textual interpretation, and reading that remain unacknowledged, or irregularly explored, in conventional approaches to literary studies.

7. In IVANHOE, the idea is that interpretation should no longer be imagined as proceeding from a subject grappling with a transparent object. By contrast, IVANHOE discourages players from assuming that there is something to be called, say, "The Poem Itself". Perhaps even more crucially, it routes the acts of an interpreting agent back into the material being studied. Players and their moves are continually returned to the ongoing process of collaborative investigation for further critical reflection, both by the agent herself and by the others players. All players thus move in that Burnsonian space where each is repeatedly drawn "to see ourselves as others see us". Based on economies of expenditure, deficit, and gain, with winning conditions and costs, IVANHOE's underlying game model urges the player—the thinker—to a continuing process of measuring and assessing his or her moves in relation to everyone else's. IVANHOE has been dominated from the start by a ludic spirit. This attitude is reflected in the name of the project, IVANHOE, which references a cultural work now rarely taken "seriously," though it was once reigned as perhaps the most popular and seriously influential work of fiction in nineteenth-century Europe and America. We took that avoidance as a sign of a poverty of criticism, which goes broke by following a Gold Standard of value. IVANHOE would encourage, instead, as much circulation and exchange as possible.

8. From the initial provocation, IVANHOE quickly spun itself into life. Playing with Scott's novel generated new practical design features, the most important of which was the idea that the game would have to be played "in" a role, or en masque, under an explicitly assumed conceit of identity. Players would make their moves only through that role. This device would introduce into IVANHOE another vehicle—in addition to the dialogic form and performative procedures—for encouraging critical self-reflection. We also began to see that a robust environment would only be built if we tested our ideas in as many kinds of gameplay as possible. (Top)

The Development Schedule

9. IVANHOE was initially conceived as a general purpose tool for enhancing a person's range and acuity of critical reflection on some given set of cultural material. The first test iterations of its use focused on particular, paper-based literary works Scott's Ivanhoe, Wuthering Heights, Frankenstein, several stories
by Murakami, "The Fall of the House of Usher," The Turn of the Screw, and Blake's The Four Zoas. These sessions were run to test IVANHOE's performative methodology and its logical structure, and to clarify the requirements needed for building IVANHOE as a digital environment.

10. Played in what was essentially an electronically enhanced paper-space, these iterations were most successful in the ways they exposed the critical and interpretative power of performance-based acts of textual invention. They supplied us with useful information about how to construct an initial IVANHOE design for studying traditional text-based materials. The test runs also suggested two other useful ways in which to explore the tool's design possibilities: first, to deploy IVANHOE as both a pedagogical and a scholarly research tool; second, to launch its functions in a born-digital database of materials. IVANHOE's interpretational capacities were conceived to have wide range and flexibility across every sort of informational material in the humanities and the social sciences.

11. In the past year (2003-2004) the online playspace has been in development and we have run test sessions with Poe's "The Fall of the House of Usher", Hawthorne's "Rappaccini's Daughter", D. G. Rossetti's "The Orchard Pit", Swinburne's "A Criminal Case", and Jerome K. Jerome's Three Men in a Boat. These sessions were run to clarify the technical and interface issues and lead us to implementation. The 1.0 IVANHOE was released on 1 December 2004. (Top)

"What Does a Session of IVANHOE Look Like?"

12. A group of people, two at a minimum, agree to collaborate in thinking about how to reimagine a particular work, say Ivanhoe. The agreement is that each person will try to reshape the given work so that it is understood or seen in a new way. The reshaping process in IVANHOE is immediate, practical, and progressive. That is to say, the interpreters intervene in the textual field and alter the document(s) by adding, reordering, or deleting text. Interpreters are engaged in a play, or they are set of interpretive moves that are performed on the features of the textual field that were invisible in its original documentary state. Interpreters will also look for ways that their interventions might use or fold in with the interpretive moves of others working in the collaborative session of IVANHOE. An IVANHOE session typically extends for a set period of time—we have found that a week seems a useful timeframe for pedagogical purposes. To this point we have played IVANHOE by focusing on single literary works. Nonetheless, a session of IVANHOE might focus on a set of works that define an interesting cultural phenomenon—the Salem Witch Trials, for example—and in that case the pedagogical event might well run on for a much longer period.

13. Some analogies may be helpful for understanding what it means to play IVANHOE. Interpreting agents in IVANHOE approach their work much as performers or conductors approach a piece of music, or as a director approaches a play. Performance fashions an interpretation of the original work, and the result is what Gertrude Stein, in a slightly different sense, called "Composition as Explanation." Performative interpretations of all kinds—translation, for example—have much in common with IVANHOE. Book artists and illustrators work along similar interpretive lines, and we have many cases where authors themselves illustrate or design the embeddings of their own textual works, thereby glossing them with intervening sets of interpretive signs. Some notable figures integrate text and visualization into a composite or double work—in England one thinks immediately of Blake, Dante Gabriel Rossetti, Edward Lear, Lewis Carroll. Or consider how "The Matter of Arthur" or "The Matter of Troy" are conceived and elaborated. A set of legends centering in the Trojan war and in King Arthur multiplies as versions and variants that expose fresh ranges of meaning resting latent in the materials. The interpretive transformations that unfold in a session of IVANHOE seek to exploit a logic of interpretation of that kind.

14. IVANHOE is not like a "creative writing workshop," however. Its textual transformations get executed in a frame of reference focused on the significance of the changes in relation to the original textual field and the changes that one's collaborating agents make to that field. The presence of the initial state of the text(s) is always preserved because the point of IVANHOE is to study that field of relations as it provokes or licenses its readers to reimagine its implications and textual possibilities. Interpreters are expected to keep a journal in which their interpretive moves are justified and explained in relation to the originary work and/or the moves made by the other agents.

IVANHOE and Pedagogy

15. In recent years the scene of humanities instruction grows less like the classroom of the 1930s, when the remarkably successful teaching protocols of the New Criticism were invented. New Critical pedagogy centered in a single textual object—"The Rime of the Ancient Mariner," The Symposium, Pride and Prejudice—that would be brought into the classroom for close reading and discussion. That model for a classroom procedure was so effective that it still dominates the way the Humanities classroom is conducted in high schools, colleges, and universities. Indeed, its procedures remain in certain ways foundational to any kind of effective education. But our classrooms now are populated by students for whom the book is only one kind of communication tool. Like ourselves, they live every day in a complex communication network of paper as well as electronic texts, and of texts as well as all sorts of other media, much of it mixed. Because we all bring that world with us into the classroom as (so to speak) the cultural air we breathe, New Critical models of instruction now regularly specialize and restrict both the materials and the arena of that general education the Humanities educador has always so carefully cherished. Because the Humanities have never been about specialization but about the training and education of broadly informed citizens, we are being called to imagine new instructional methods and procedures. IVANHOE is being developed to help answer that call.

16. Research in the field of education has made a convincing case for the use of games in promoting goal-centered learning. IVANHOE makes use of selective principles of role-playing scenarios—such as requiring players to choose a real or fictional identity and create their interpretation or analysis from that point of view. Likewise, role-playing is an established practice in the constructivist classroom. IVANHOE makes use of some of these features of entertainment and game models to motivate reading, interpretation, and study of documents that are traditionally associated with the Humanities. Most fundamentally, IVANHOE seeks to promote self-conscious critical thinking.

17. IVANHOE works by encouraging players to work with a designated textual work and its sources, variations, versions, and other materials relevant to the history and production of the text. At a basic level, this will encourage such activity as the comparison of an illustrated version of a classic work to a text-only edition, or a facsimile manuscript to a printed edition. Students will be introduced to the concepts of bibliographical studies and to theoretical issues in textual interpretation without having to first engage with a technical vocabulary. IVANHOE allows them to enact the principles of comparison and critical analysis that are essential to the Humanities and social sciences where informed qualitative judgments are crucial. Collaborative, peer-exchange models of engagement will encourage cooperative development of analytical skills in reading and comprehension and appreciation of individual points of view in writing. IVANHOE promotes curricular dependence on creative, synthetic practices and engagement with primary materials that have traditionally been inaccessible in classrooms.

18. In a post-secondary context, players will be encouraged to develop library and research skills through the integration of traditional text-based materials and on-line resources for playing the game. A great degree of self-conscious awareness, and a higher level of bibliographical skill will be required. Crucial skills in assessing the validity and credibility of sources and self-conscious awareness of the point of view from which a player makes a critical judgment will be encouraged by the structure of the game. Players will be rewarded to the degree that their critical interpretations have been made explicit within an interactive community of other players through the creation of well-documented commentary on their individual contributions, and critical assessment of other players' work. (Top)

Conclusion

19. In summary then, IVANHOE can be used in a variety of ways as a competitive, game-like environment, as a collaborative study and research situation, or as a context in which players strive to achieve their own individual goals. In a classroom setting, IVANHOE could encourage students to improve bibliographical and research skills in one round and critical-reading skills in the next. Individual students could decide which of several interpretive skills they wish to improve in a round of play, or they could consult with a teacher to set these goals. For more mature players, various collaborative situations might be imagined to promote specific types of critical reflection and scholarly research. IVANHOE can be played in a game mode with points, scoring, and competitive...
interactions. It can also be used for non-competitive collaborative work within a community of scholars or in classroom activities.

20. It is important to note that although developed from models taken from literary studies, IVANHOE is not subject specific, and can be readily adapted to the questions that are a regular concern throughout the Humanities and social sciences. Rather than operating as a delivery mode of pre-packaged content, it is a tool that can be configured anew by instructors and scholars according to the goals that suit their research or pedagogical circumstances. It is an effective web environment for any field of cultural investigation that is primarily document and text-based, and in which access to electronic archives, collaborative work, and critical interpretation are central concerns. (Top)

Parent Section:
Pedagogies

Parent Resource:
Innovations

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Tags:
- IVANHOE game

Person:
- Walter Scott

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to work in the first place, instead making loose and technically inaccurate appeals to computer hardware as exotic metaphors rather than as material systems. Continuing the argument above, he compares hypertext to computer chipsets: "individual texts are placed in no particular order, like the Web page designed by [artist collective] antirom for HotWired. Expanding this comparison further, we can note that Random Access Memory, the concept behind the group’s name, also implies a lack of hierarchy: Any RAM location can be accessed as quickly as any other." Manovich compares the HotWired website to RAM not because computer memory facilitates the authorship of websites, but because the website was designed by a group that uses a pun on a computer chip term in their name—a different chip from RAM, as it happens, Read Only Memory, or ROM.

Manovich admits that a new rhetoric of hypermedia is “probably possible,” but clearly he has no intention of pursuing one. Gurak and Warnick are not cynical about rhetoric and communication, but they focus on digital communities of practice, treating the computer primarily as a black-box network appliance, not as an executor of processes. In short, digital rhetoric tends to focus on the presentation of traditional materials—especially text and images—without accounting for the computational underpinnings of that presentation.

Rhetorician Elizabeth Losh neatly summarizes this inconsistency among digital rhetoricians. “In the standard model of digital rhetoric,” she argues, “literary theory is applied to technological phenomena without considering how technological theories could conversely elucidate new media texts.” While I admit that there are useful interrogations of digital media that focus on reception over the technological structure (Losh’s own work on the way digital artifacts take part in the public sphere is such a one), my contention here is that approaches to digital rhetoric must address the role of procedurality, the unique representational property of the computer.

**Procedural Rhetoric**

With these lessons in mind, I would now like to put the concepts of procedurality and rhetoric back together. As I proposed at the start of this chapter, procedural rhetoric is the practice of using processes persuasively, just as verbal rhetoric is the practice of using oratory persuasively and visual rhetoric is the practice of using images persuasively. Procedural rhetoric is a general name
for the practice of authoring arguments through processes. Following the classical model, procedural rhetoric entails persuasion—to change opinion or action. Following the contemporary model, procedural rhetoric entails expression—to convey ideas effectively. Procedural rhetoric is a subdomain of procedural authorship; its arguments are made not through the construction of words or images, but through the authorship of rules of behavior, the construction of dynamic models. In computation, those rules are authored in code, through the practice of programming.

My rationale for suggesting a new rhetorical domain is the same one that motivates visual rhetoricians. Just as photography, motion graphics, moving images, and illustrations have become pervasive in contemporary society, so have computer hardware, software, and videogames. Just as visual rhetoricians argue that verbal and written rhetorics inadequately account for the unique properties of visual expression, so I argue that verbal, written, and visual rhetorics inadequately account for the unique properties of procedural expression. A theory of procedural rhetoric is needed to make commensurate judgments about the software systems we encounter every day and to allow a more sophisticated procedural authorship with both persuasion and expression as its goal.

Procedural rhetorics afford a new and promising way to make claims about how things work. Consider a particularly sophisticated example of a procedural rhetoric at work in a game. *The McDonald's Videogame* is a critique of McDonald’s business practices by Italian social critic collective Molleindustria. The game is an example of a genre I call the anti-advergame, a game created to censure or disparage a company rather than support it. The player controls four separate aspects of the McDonald’s production environment, each of which he has to manage simultaneously: the third-world pasture where cattle are raised as cheaply as possible; the slaughterhouse where cattle are fattened for slaughter; the restaurant where burgers are sold; and the corporate offices where lobbying, public relations, and marketing are managed. In each sector, the player must make difficult business choices, but more importantly he must make difficult moral choices. In the pasture, the player must create enough cattle-grazing land and soy crops to produce the meat required to run the business. But only a limited number of fields are available; to acquire more land, the player must bribe the local governor for rights to convert his people’s crops into corporate ones. More extreme tactics are also available: the player can bulldoze rainforest or dismantle indigenous settlements to clear space for
grazing (see figure 1.1). These tactics correspond with the questionable business practices the developers want to critique. To enforce the corrupt nature of these tactics, public interest groups can censure or sue the player for violations. For example, bulldozing indigenous rainforest settlements yields complaints from antiglobalization groups. Overusing fields reduces their effectiveness as soil or pasture; creating dead earth also angers environmentalists. However, those groups can be managed through PR and lobbying in the corporate sector. Corrupting a climatologist may dig into profits, but it ensures fewer complaints in the future. Regular subornation of this kind is required to maintain allegiance. Likewise, in the slaughterhouse players can use growth hormones to fatten cows faster, and they can choose whether to kill diseased cows or let them go through the slaughter process. Removing cattle from the production process reduces material product, thereby reducing supply and thereby again reducing profit. Growth hormones offend health critics, but they also allow the rapid production necessary to meet demand in the restaurant sector. Feeding cattle animal by-products cheapens the fattening process, but is more likely to cause disease. Allowing diseased meat to be made into burgers may spawn complaints and fines from health officers, but those groups too can be bribed through lobbying. The restaurant sector
demands similar trade-offs, including balancing a need to fire incorrigible 
employees with local politicians’ complaints about labor practices. 

*The McDonald’s Videogame* mounts a procedural rhetoric about the necessity 
of corruption in the global fast food business, and the overwhelming tempta-
tion of greed, which leads to more corruption. In order to succeed in the long-
term, the player must use growth hormones, he must coerce banana republics, 
and he must mount PR and lobbying campaigns. Furthermore, the tempta-
tion to destroy indigenous villages, launch bribery campaigns, recycle animal 
parts, and cover up health risks is tremendous, although the financial benefit 
from doing so is only marginal. As Patrick Dugan explains, the game imposes 
“constraints simulating necessary evils on one hand, and on the other hand 
. . . business practices that are self-defeating and, really just stupid.”75 The 
game makes a procedural argument about the inherent problems in the fast 
food industry, particularly the necessity of overstepping environmental and 
health-related boundaries. 

Verbal rhetoric certainly supports this type of claim; one can explain the 
persuasive function of processes with language: consider my earlier explana-
tion of the rhetoric of retail store return policies, or Eric Schlosser’s popular 
book and film *Fast Food Nation*, which addresses many of the issues repre-
sented in *The McDonald’s Videogame*.76 But these written media do not express 
their arguments procedurally; instead, they describe the processes at work in 
such systems with speech, writing, or images. Likewise, it is possible to char-
acterize processes with visual images. Consider a public service campaign 
called *G!rlpower Retouch*, commissioned by the Swedish Ministry of Health 
and Social Affairs. The goal of the campaign was to reduce the fixation on 
physical appearance caused partly by unrealistic body images in magazines 
and media. Forsman & Bodenfors, the agency hired to execute the campaign, 
created a click-through demo that explains how photo retouchers make sig-
nificant changes to the bodies of their already striking models, hoping to 
render them even more perfect.77 The demonstration depicts an attractive, 
young blonde on the cover of a fictional magazine. The user is then given the 
opportunity to undo all the photo retouches and individually reapply them. 
A textual explanation of the technique is also provided. 

*G!rlpower Retouch* unpacks a process, the process of retouching photos for 
maximum beauty. It uses sequences of images combined with written text to 
explain each step. The artifact makes claims about images, so it makes rea-
sonable use of images as propositions in the argument. *Retouch* even deploys
the Aristotelian tactic of example, using a single model image to depict feature modifications common to all model images—eyes, teeth, lips, nose, jawline, hair, breasts, and so forth. The piece makes claims about the process of retouching, which is itself facilitated by the procedural affordances of image-editing software like Adobe Photoshop. However, Retouch does not deploy a procedural rhetoric, since it does not use representational processes to explain the actual processes used in photo retouching. That said, one could imagine a procedural version of the same argument. Simply replicating a photo editor would supply the needed procedurality, but not the required rhetoric. The steps needed to accomplish the individual effects are complex and require professional-level command of the tools. Instead, a procedural implementation might abstract a set of editing tools particular to model editing, for example a “thinning” tool for waists, arms, and hips. Shadow and highlighting tools could be added for cheeks, hair, and breast augmentation. Instead of clicking through a sequence of images that explain the retouching process, the user would be in charge of implementing it himself. A procedural implementation would accentuate and extend the use of paradigmatic evidence in the existing version of Retouch. In its current implementation, the piece depicts only one model. Her archetypical appearance makes her an effective example, and her three-quarter perspective pose allows the authors to address both face and body modifications. But a procedural version of the same argument would facilitate a variety of different images, full-body, head-and-shoulders, different body types, and so forth. Such a system might also allow the user to load his own photos, or photos from the Internet; these would serve as the data on which the retouching processes could run. Such a capacity would extend the rhetorical power of example.

Another, similar online consumer-awareness tool makes strides in the direction of procedural rhetoric while resting comfortably in the domain of visual rhetoric. PBS Kids maintains a website for young viewers, hosting show pages, games, and other interactive features. Among the features is “Don’t Buy It,” a minisite that seeks to educate kids about the tricks advertisers use to turn kids into consumers. The site features simple quizzes to help kids understand media manipulation (coincidentally, among them is a much simpler version of G!rlpower Retouch for food advertising).

One of these features is Freaky Flakes, an interactive program that allows the user to design a cereal box. Unlike Retouch, Freaky Flakes asks the user to
construct a box from the ground up, starting with its color. Textual information explains the benefits of each color, for example, “Orange stimulates the appetite and is one of the most popular cereal box colors.” Next the user selects a character, again reading textual descriptions, for example, “The superhero is a great choice because little kids prefer fantasy characters to pictures of real people.” Next the user enters a cereal name; the program advises him to “pick a name that is an attention grabber.” Then the user selects one of four banners to add to the box to add marketing appeal, such as “Outrageous Crunch!” which “makes your cereal seem fun and exciting to eat.” Finally, the user selects a prize to place inside, following advice about gender identification such as “Tattoos appeal to boys and girls.” The user can view the completed box (see figure 1.2) or make a new one.

The argument *Freaky Flakes* mounts is more procedural than *Retouch*, but only incrementally so. The user recombines elements to configure a cereal box, but he chooses from a very small selection of individual configurations. *Freaky Flakes* is designed for younger users than *Retouch*, but the children who watch PBS Kids also likely play videogames much more complex than this simple program. Most importantly, *Freaky Flakes* fails to integrate the process of designing a cereal box with the supermarket where children might actually encounter it. The persuasion in *Retouch* reaches its apogee when the user sees the already attractive girl in the fake magazine ad turned into a spectacularly beautiful one. This gesture is a kind of visual enthymeme, in which the

![Figure 1.2](image.png)  
*Figure 1.2* PBS’s *Freaky Flakes* offers a simple representation of practices of children’s advertising. Courtesy of KCTS Television. © 2004 KCTS Television. All rights reserved.
authors rely on the user’s instinctual and culturally mediated idea of beauty to produce actual arousal, jealousy, or self-doubt. *Freaky Flakes* offers no similar conclusion. The user creates a cereal box, but every box yields the same result (even combining the superhero and the princess ring yields the congratulatory message, “Your box looks great!”). A more effective procedural argument would enforce a set of rules akin to the tactics advertisers use to manipulate kids, while providing a much larger possibility space for box authorship. Within this space, the user would have the opportunity both to succeed and to fail in his attempt to manipulate the simulated children buying the cereal. Through multiple designs, the user might home in on the logic that drives the advertisers, resulting in increased sales of his virtual cereal. This gesture represents a procedural enthymeme—the player literally fills in the missing portion of the syllogism by interacting with the application, but that action is constrained by the rules. That is to say, a set of procedural constraints would determine which combinations of design strategies influence kids more and less successfully.

Let’s revisit verbal and visual rhetorics’ stumbling blocks in light of these two examples of potential procedural rhetorics. Charles Hill pointed out that images offer greater “vividness” than verbal narration or written description. Vivid information, he argued, “seems to be more persuasive than non-vivid information.” J. Anthony Blair countered that vivid images may increase presence, but they do not necessarily mount arguments. Even if images successfully cause viewers to take certain actions, those viewers are more likely manipulated than they are persuaded. Visual arguments, argues Blair, “lack [the] dialectical aspect [of] the process of interaction between the arguer and the interlocutors, who raise questions or objections.” Procedural rhetoric must address two issues that arise from these discussions: first, what is the relationship between procedural representation and vividness? Second, what is the relationship between procedural representation and dialectic?

To address the first question, I reproduce a table from Hill’s essay, which he names “A comprehensive continuum of vividness.”

<table>
<thead>
<tr>
<th>Most Vivid Information</th>
<th>actual experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>moving images with sound</td>
</tr>
<tr>
<td></td>
<td>static photograph</td>
</tr>
<tr>
<td></td>
<td>realistic painting</td>
</tr>
<tr>
<td></td>
<td>line drawing</td>
</tr>
</tbody>
</table>

Chapter 1
Immediately one can see that procedural representation is absent from this continuum. Simulation does not even make the list. Further yet, Hill accounts for no computational media whatsoever. I would be less inclined to quibble with the exclusion had Hill not called the continuum “comprehensive,” indicating his intention to cover representational forms and their relationship to vividness fully. Procedural representation is representation, and thus certainly not identical with actual experience. However, procedural representation can muster moving images and sound, and software and videogames are capable of generating moving images in accordance with complex rules that simulate real or imagined physical and cultural processes. Furthermore, procedural representations are often (but not always—see below) interactive; they rely on user interaction as a mediator, something static and moving images cannot claim to do. These capacities would suggest that procedurality is more vivid than moving images with sound, and thus earns the second spot on the continuum, directly under actual experience. However, other factors might affect the relative vividness of procedural representations. For example, a simulation that accepts numerical input and generates numerical output might seem more akin to an abstract, impersonal analysis or even a set of statistics, falling to the bottom of Hill’s continuum. Recalling Crawford’s notion of process intensity, I would submit that procedural representations with high process intensity and with meaningful symbolic representations in their processes—specimens like interactive fiction, software, and especially videogames—certainly earn a spot above moving images on the continuum. Given this caveat, procedural representation seems equally prone to the increased persuasive properties Hill attributes to vividness.

What about procedural representations’ relationship to dialectic? Hill argues that images are comprehended “wholistically and instantaneously,” whereas verbal texts are apprehended “relatively slowly over time” as a result of their “analytic nature.” Interestingly, Hill characterizes the latter as “made up of discrete meaningful units,” a property somewhat similar to my characterization of procedurality as the configuration of logical rules as unit operations. Blair’s objection to visual arguments centers around images’ reduced ability to advance propositions, a requirement of rhetorical argument. The
visual argument Blair names most effective is the famous 1964 Lyndon Johnson television spot known as the “Daisy Ad.” Here is an account of the ad as accurately described by Wikipedia (www.wikipedia.org):

The commercial begins with a small girl picking the petals of a daisy while counting slowly. An ominous-sounding male voice is then heard counting down as the girl turns toward the camera, which zooms in until her pupil fills the screen, blacking it out. Then the countdown reaches zero and the blackness is replaced by the flash and mushroom cloud from a nuclear test. A voiceover from Johnson follows: “These are the stakes! To make a world in which all of God’s children can live, or to go into the dark. We must either love each other, or we must die.” Another voiceover then says, “Vote for President Johnson on November 3. The stakes are too high for you to stay home.”

Blair argues that this visual image does make an argument “in the sense of adducing a few reasons in a forceful way.” In particular, the ad invokes a visual enthymeme that completes a syllogism:

Increasing nuclear proliferation will likely lead to the destruction of humanity.
Goldwater supports nuclear proliferation (omitted).
Therefore, electing Goldwater may lead to the destruction of humanity.

Nevertheless, argues Blair, the ad “does not embody dialectic completely. In particular, it “does not permit the complexity of such dialectical moves as the raising of objections in order to refute or otherwise answer them.”

How does such an example compare with procedural representation? For one part, procedural rhetorics do mount propositions: each unit operation in a procedural representation is a claim about how part of the system it represents does, should, or could function. The McDonald’s Videogame makes claims about the business practices required to run a successful global fast-food empire. My hypothetical revision of Freaky Flakes makes claims about the techniques advertisers use to design cereal boxes, as well as claims about children’s culturally and psychologically influenced responses to specific box configurations. These propositions are every bit as logical as verbal arguments—in fact, internal consistency is often assured in computational arguments, since microprocessors and not human agents are in charge of their consistent execution.
What about raising objections? One might argue that many computational systems do not allow the user to raise procedural objections—that is, the player of a videogame is usually not allowed to change the rules of play. Many critics have objected to this tendency, calling for games that allow players to alter core simulation dynamics to allow alternative perspectives. Most famously, Sherry Turkle has criticized Sim City for its failure to include alternative taxation-to-social services dynamics, a debate I have discussed in detail elsewhere. Applying this objection to our current examples, one might point out that users of Freaky Flakes cannot make alterations to the designers’ conception of advertising manipulation.

I have two responses to this objection. For one part, the type of user alteration Turkle and others call for is not the same as the dialectical objections Blair requires of arguments. One raises objections to propositions in the hopes of advancing conflicting or revisionist claims. Conversely, one allows user alteration in order to construct an artifact that accounts for multiple perspectives on a particular subject. One usually makes rhetorical claims precisely to exclude opposing positions on a subject, not to allow for the equal validity of all possible positions. For example, in the case of Freaky Flakes, one might object that the underlying model for advertising influence presumes the media ecology of consumer capitalism. This is a reasonable objection; but such a wholesale revision might imply a different simulation entirely, one that would be outside the expressive domain of the artifact. However, procedural representations often do allow the user to mount procedural objections through configurations of the system itself. In my hypothetical procedural revision of Freaky Flakes, the player might attempt to find inconsistencies in the creator’s model by designing boxes that both produce socially responsible messages and appeal to children.

For another part, all artifacts subject to dissemination need not facilitate direct argument with the rhetorical author; in fact, even verbal arguments usually do not facilitate the open discourse of the Athenian assembly. Instead, they invite other, subsequent forms of discourse, in which interlocutors can engage, consider, and respond in turn, either via the same medium or a different one. Dialectics, in other words, function in a broader media ecology than Blair and Turkle allow. This objection applies equally to all rhetorical forms—verbal, written, visual, procedural, or otherwise.

Just as an objection in a debate would take place during the negation or rebuttal of the opponent rather than in the construction of the proponent, so
an objection in a procedural artifact may take place in a responding claim of a verbal, written, visual, or procedural form. Such objections are not disallowed by the Daisy ad or by *Freaky Flakes*; they merely require the interlocutor to construct a new claim in another context—for example a responding TV spot or software program.

Consider an example of a procedural representation that addresses both of these concerns. *The Grocery Game* is a website that gives subscribers access to a special grocery list, sorted by grocery store and U.S. location. The game’s premise is this: supermarkets structure their pricing to maximize consumer spending on a short-term basis; they count on families buying enough groceries for about a week’s time and then returning for more the following week. Buying in this fashion inevitably costs more, as consumers don’t take advantage of the cost leverage afforded by bulk purchases of staples. *The Grocery Game* addresses this issue by automating the research necessary to produce lists of common products that maximize weekly coupon and in-store specials for a given week, while encouraging larger purchases of basics to last many weeks. Despite its name, “The List” is really a procedural system designed to maximize savings through strategic use of coupons and stockpiling. The game’s method is clarified on the website:

The Grocery Game is a fun, easy way to save hundreds of dollars on groceries each month. TERI’S LIST [the founder’s name is Teri] reveals the “rock bottom” prices on hundreds of products each week and matches them up with manufacturers’ coupons for the best possible savings at your local supermarket. The Grocery Game has exclusive databases that track manufacturers’ coupons along with weekly sales and specials, both advertised and UN-advertised. With TERI’S LIST, the days of time consuming work required for effective couponing are over. The Grocery Game does all the hard work and research, presented in a quick reference format on the internet each week, as TERI’S LIST. Members log in, spend a few minutes with a pair of scissors, and they’re off to win The Grocery Game!

The game has a goal (save as much money as possible) and a set of simple rules (stockpiling and couponing) that constitute its procedural rhetoric. A subsequent procedural system trolls grocery stock and advertising lists to produce a savings-maximized shopping plan tuned to a particular locality, based on the two tactics just mentioned.
The Grocery Game makes two major claims. For one part, it claims that the grocery business relies on weekly shopping for higher profits. Playing for a month and checking one’s grocery budget against a previous month easily confirms this claim. For another part, the game claims that grocery shopping is fundamentally an exercise in spending as little money as possible. One might raise several objections to this claim: gastronomy is an experience central to human culture and should not be blindly replaced with frugality; buying the cheapest products for a given week sidesteps considerations like business ethics and the sustainability of growers and manufacturers; the cheapest products are sometimes, and perhaps often, at odds with ideal nutritional goals; a lowest-common-denominator grocery list assumes that all families are the same, while in fact every family has specific tastes and health considerations (such as food allergies); stockpiling requires storage space, which supports an undesirable obsession with material property. The Grocery Game has a hard time responding to these objections, although it is possible to pick and choose among the items the search algorithm generates.

While the game does not provide the user with direct access to the search algorithms that generate its lists, so that a user could wage these objections in code, it does provide a flourishing community of conversation. The message boards have entire threads devoted to savings for a particular week. This variation on the high-score list replaces hierarchical performance with discourse—an opportunity to share how well you did according to your own particular goals. It’s not just about winning; it’s also about telling people what you did and how you did it. Cash savings are winnings in a literal sense. To a lesser extent, so is fooling the grocery industry by refusing to play by their profit-maximizing rules. But the real winnings seem to come from what people do with what they save. Here’s an example from the boards:

i [sic, throughout] have been a lister for 1 year now. grocery shopping has changed 100% for me. i dreaded every single minute of being in a market. now, i find it to be fun. i average 100.00 a week in savings and spending 150.00. Today, i was able to purchase the dvd “Holes” for my children. It is because of the great savings weekly that i am able to purchase things like that “big ticket” item with ease.

The community discourse at the game’s message boards are not always related to objections to its underlying procedural rhetoric, but the availability of this
forum facilitates active reconfiguration of the game’s rules and goals, a topic to which I will return in chapter 11.

Interactivity

Procedural representations do not necessarily support user interaction. Many computational simulation methods make claims about processes in the material world, but limit user participation significantly. Take a simple computational model like the Monte Carlo method, a statistical sampling technique used to approximate the results of complex quantitative problems. The classic example of the Monte Carlo method in practice is the so-called Buffon’s needle problem. George-Louis Leclerc, Comte de Buffon, posed the following question: If a needle of a particular length is dropped at random onto a horizontal surface ruled with parallel lines drawn at a greater than the length of the needle, what is the probability that the needle will cross one of the lines?96 In a computational model of the Monte Carlo algorithm, the user might configure the length of the needle and the distance of the lines, then run the operation. Similarly, in a physical simulation, such as a demonstration of rigid body collision or mechanical dynamics, a human operator might configure the size and mass of objects or the relative force of gravity, elasticity, and other properties before observing the result.

A more complex and expressive example of a procedural system with limited user interaction can be found in Chris Crawford’s 1990 game about global ecology, *Balance of the Planet*.97 In the game, the player sets global environmental policies. The game challenges players to balance global ecological and economic forces through taxation and expenditure. However, each of the player’s policies sets a complex set of interrelated relationships in motion. For example, forest clearing changes the carbon dioxide levels, which affect global warming. The player enacts policy by adjusting sliders to change underlying policies (see figure 1.3), executing the results, and again revising the policies.

The Monte Carlo simulation, physical simulations, and *Balance of the Planet* all accept simple user input and configuration, perhaps the most basic type of input to a computer program other than merely executing and automatically returning results based on hard-coded parameters. *Interactivity* is an entrenched notion in studies of digital media. Janet Murray rightly calls the term “vague” despite its “pervasive use.”98 Murray argues that the simple manipulation of
Figure 1.3 Chris Crawford’s 1990 title *Balance of the Planet* offers a sophisticated model of interrelated environmental issues.
a computational system, the “mere ability to move a joystick or click on a mouse” is not sufficient cause for “agency”—genuine embodied participation in an electronic environment. Rather, such environments must be meaningfully responsive to user input. This state of affairs constitutes one of Murray’s four properties of the computer, its participatory nature. “Procedural environments,” she argues, “are appealing to us not just because they exhibit rule-generated behavior, but because we can induce the behavior.... the primary representational property of the computer is the codified rendering of responsive behaviors. This is what is most often meant when we say that computers are interactive. We mean they create an environment that is both procedural and participatory.”

As Balance of the Planet suggests, procedural rhetorics do not necessarily demand sophisticated interactivity. But we might ask if procedural rhetorics benefit from sophisticated interactivity. Following Murray, sophistication in this context does not refer to more or more frequent interaction, the kind that more buttons or faster hand-eye responses would entail. Rather, sophisticated interactivity means greater responsiveness, tighter symbolic coupling between user actions and procedural representations. Balance of the Planet offers a terrifically sophisticated procedural model of global ecology, but its coupling of user action to the game’s causal model is weak, reducing both empathetic and dialectical engagement.

Another way to understand the role of interactivity in procedural rhetoric is through the concept of play. The weak coupling between model and experience in Balance of the Planet does not arise from a poverty of procedural representation. Rather, it arises from the awkward way that representation is exposed to the player. Play is a complex concept with a long and arduous intellectual history in numerous fields. Rather than understand play as child’s activity, or as the means to consume games, or even as the shifting centers of meaning in poststructuralist thought, I suggest adopting Katie Salen and Eric Zimmerman’s useful, abstract definition of the term: “play is the free space of movement within a more rigid structure.” Understood in this sense, play refers to the possibility space created by processes themselves. Salen and Zimmerman use the example of the play in a mechanism like a steering column, in which the meshing gears creates “play” in the wheel, before the turning gesture causes the gears to couple. In a procedural representation like a videogame, the possibility space refers to the myriad configurations the player might construct to see the ways the processes inscribed in the system work.
This is really what we do when we play videogames: we explore the possibility space its rules afford by manipulating the game’s controls.

While *Balance of the Planet* sports a very large possibility space, the game’s controls and feedback system make it difficult for players to keep track of the decisions they have already made and to see the aggregate effects of those decisions. The game is *hard to play*; that is, it is difficult to understand the processes at work inside and the nature of the possibility space those processes create.

In the context of procedural rhetoric, it is useful to consider interactivity in relation to the Aristotelian enthymeme. The enthymeme, we will remember, is the technique in which a proposition in a syllogism is omitted; the listener (in the case of oratory) is expected to fill in the missing proposition and complete the claim. Sophisticated interactivity can produce an effective procedural enthymeme, resulting in more sophisticated procedural rhetoric. Sometimes we think of interactivity as producing user empowerment: the more interactive the system, the more the user can do, and the better the experience. For example, many players and critics have celebrated *Grand Theft Auto III (GTAIII)*\(^\text{102}\) as a game that allows the player to “go anywhere, do anything.”\(^\text{103}\) This sentiment is flawed for several reasons. First, the game does not actually allow the player to “do anything”; rather, in the words of one reviewer, *GTAIII* let you do anything you wish, within the parameters of the game.”\(^\text{104}\) The “parameters of the game” are made up of the processes it supports and excludes. For example, entering and exiting vehicles is afforded in *GTAIII*, but conversing with passersby is not (see chapter 3 for more on this subject). This is not a limitation of the game, but rather the very way it becomes procedurally expressive. Second, the interactivity afforded by the game’s coupling of player manipulations and gameplay effects is much narrower than the expressive space the game and the player subsequently create. The player performs a great deal of mental synthesis, filling the gap between subjectivity and game processes.

Previously, I have argued that the ontological position of a videogame (or simulation, or procedural system) resides in the gap between rule-based representation and player subjectivity; I called this space the “simulation gap.”\(^\text{105}\) Another way to think about the simulation gap is in relation to rhetoric. A procedural model like a videogame could be seen as a system of nested enthymemes, individual procedural claims that the player literally completes through interaction. If *Balance of the Planet* increased player interaction by
adding more sliders to move, it would not necessarily become more expressive or more persuasive. On Hill’s vividness continuum, *Balance of the Planet* might land closer to the realm of abstract analysis, despite its rich procedural policy model. However, if it increased the coupling between the computer’s procedural rhetoric and the exposition of that rhetoric, its persuasive value would likely increase as well. Ironically, Chris Crawford himself has offered a definition of interactivity that addresses this very problem: “I choose to define it [interactivity] in terms of a conversation: a cyclic process in which two actors alternately listen, think, and speak. The quality of the interaction depends on the quality of each of the subtasks (listening, thinking, and speaking).”

In the case of *Balance of the Planet*, the player does a lot of meaningful listening and thinking, but not much meaningful speaking. The computer does a lot of meaningful thinking, but not much meaningful listening or speaking. Maximizing all three does not necessarily optimize expression—*GTAIII* does limited computational listening and thinking, for example—but understanding the relationship between the three can offer clues into the rhetorical structure of a procedural argument.

**Videogames**

I have chosen to explain and exemplify the function of procedural rhetoric in a subcategory of procedural expression, namely, videogames. There are several reasons I privilege this medium over other procedural media, and over other computational media in particular.

For one part, videogames are among the most procedural of computational artifacts. All software runs code, but videogames tend to run more code, and also to do more with code. Recalling Crawford’s term, videogames tend to offer more process intensity than other computational media. Videogames tend to demand a significant share of a computer’s central processing unit (CPU) resources while running; they are more procedural than other computational artifacts. As I write this paragraph, my computer is running twelve major applications, including the active one, resource hog *Microsoft Word*, and some seventy total processes to run the machine’s underlying systems—window management, networking, graphics, audio, and so forth. Despite this immodest quantity of activity, my CPU remains 75–85 percent idle. The quantity of processes and the amount of random access memory (RAM) they consume does not necessarily correlate with their process intensity. Modern
videogames often require another processor devoted to processing graphics instructions, a graphics processing unit (GPU). Videogames regularly drive computer hardware upgrades; physics processing units are slowly emerging as another tool to extend the power of the CPU. Process-intensive programs like videogames are not guaranteed to mount more interesting or sophisticated procedural rhetorics, but they are predisposed to do so.

For another part, videogames are generally a more expressive subgenre of computational media than other types, for example, productivity software.\textsuperscript{107} By expressive, I mean that videogames service representational goals akin to literature, art, and film, as opposed to instrumental goals akin to utilities and tools. All software structures experience, including productivity software, and much has been written about the ways word processors, spreadsheets, and web applications influence our conception of the world (to cite just one example, Friedrich Kittler has written about the ways WordPerfect, coupled to the MS-DOS operating system, structures writing practice).\textsuperscript{108} But videogames are uniquely, consciously, and principally crafted as expressions. As such, they represent excellent candidates for rhetorical speech—persuasion and expression are inexorably linked.

For yet another part, videogames are often interactive in the particular way I described above; they require user action to complete their procedural representations. As such, they provide particularly promising opportunities for the procedural translation of rhetorical devices like enthymeme. Interactivity guarantees neither meaningful expression nor meaningful persuasion, but it sets the stage for both. Sid Meier, designer of \textit{Civilization}, has argued that gameplay is “a series of interesting choices.”\textsuperscript{109} Interesting choices do not necessarily entail \textit{all} possible choices in a given situation; rather, choices are selectively included and excluded in a procedural representation to produce a desired expressive end. For example, \textit{The McDonald’s Videogame} includes control of cattle slaughtering but abstracts control of restaurant line-workers for a rhetorical end: to force the player to make decisions with social and political implications.

Greater interactivity is often considered especially engaging, or “immersive.” The interactivity of (good) videogames might locate those games higher on the “vividness spectrum” discussed earlier, producing more vivid experience thanks to the player’s active involvement. But I want to suggest that vividness comes not from immersion, but from abstraction. The values common to virtual reality and computer graphics assume that the closer we
get to real experience, the better. This sentiment corresponds directly to the vividness spectrum, with the best interactivity coming closest to real experience. But meaning in videogames is constructed not through a re-creation of the world, but through selectively modeling appropriate elements of that world. Procedural representation models only some subset of a source system, in order to draw attention to that portion as the subject of the representation. Interactivity follows suit: the total number and credibility of user actions is not necessarily important; rather, the relevance of the interaction in the context of the representational goals of the system is paramount. Videogames offer a particularly good context for this selective interactivity.

Finally, I will admit that I have a particular fondness for videogames. I am a videogame critic and a videogame designer, and I am devoted to the process of connecting videogames with the history of human expression. In my previous book, *Unit Operations*, I argued for a comparative understanding of procedural expression, using the concept of unit operations to define the elements of procedural representation common across media. In this book, I argue for a similar understanding with respect to rhetoric. As I have already suggested, rhetoric in its contemporary sense refers to both persuasion and expression, and so a study of procedural rhetoric shares much in common with a study of procedural expression. Despite my preference for videogames, I should stress that I intend the reader to see **procedural rhetoric** as a domain much broader than that of videogames, encompassing any medium—computational or not—that accomplishes its inscription via processes. I hope my choice of videogames as examples of procedural rhetoric inspires both an increased appreciation of that medium and inspiration to study procedural rhetorics in other media.

**Persuasive Games**

I give the name *persuasive games* to videogames that mount procedural rhetorics effectively. Before addressing persuasive games in this sense, it is worth diffusing some of the other ways videogames and persuasion have intersected, so as to distinguish my approach from others’.

Starting with Bushnell’s *Computer Space*, arcade games have shared much in common with pinball and slot machines. They accepted coins as payment, and one of their main design goals entailed persuading players to insert (more) coins. In the arcade industry, this is called “coin drop.” Andrew
Rollings and Ernest Adams have discussed the effect of coin drop on the design of such games: “Arcade operators care little for richness, depth, and the aesthetic qualities of a game as long as it makes a lot of money for them. This requires some fine balancing. If a game is too hard, people will abandon it in disgust, but if it is too easy, they will be able to play for a long time without putting any more money in.” Procedural rhetoric might be deployed in such games, but more often persuasion is accomplished through more basic appeals to addiction and reinforcement. Shuen-shing Lee explains such persuasion via Geoffrey R. Loftus and Elizabeth F. Loftus’s 1983 study *Mind at Play*:

*[Mind at Play]* sorts out two types of psychological configurations embedded in game design that aim to get players addicted to gaming. The first type, “partial reinforcement,” is that utilized by slot machines which spit out coins intermittently to reward a gambler. The experience of being occasionally rewarded often drives the gambler to continue inserting coins, in hopes of another win or even a jackpot. Arcade game designers have cloned the same reinforcement strategy in their games. Surprises such as score doubling, weapon upgrading, expedient level advancing may pop up randomly during the gaming process to heighten the player’s intrigue, stimulating continued playing.

Partial reinforcement is certainly a type of persuasion, but the persuasion is entirely self-referential: its goal is to cause the player to continue playing, and in so doing to increase coin drop. Despite its relationship to gambling and other addictive activities, partial reinforcement is an interesting and worthwhile area of inquiry that can help game designers understand how to produce experiences that players feel compelled to continue or complete. However, this kind of persuasion is not my concern here. Instead, I am interested in videogames that make arguments about the way systems work in the material world. These games strive to alter or affect player opinion outside of the game, not merely to cause him to continue playing. In fact, many of the examples I will discuss strive to do just the opposite from arcade games: move the player from the game world into the material world.

As arcade games suggest, there are reasons to leverage videogames for goals orthogonal to those of procedural expression. The increasing popularity of and media attention paid to videogames means that merely producing and distributing a videogame may have its own persuasive effect. When Gonzalo
Frasca and I co-designed *The Howard Dean for Iowa Game* in 2003, it became the first official videogame of a U.S. presidential candidate. While the game did deploy procedural rhetorics (see chapters 4 and 11 for more), the very existence of an official Howard Dean game served its own rhetorical purpose, further aligning the candidate with technology culture. In another, similar example, Elizabeth Losh has reflected on the government’s creation of *Tactical Iraqi*, a learning game designed to teach U.S. soldiers Arabic language and customs in order to help them accomplish military missions in the Middle East. Losh, who studied the game as a field researcher and has written lucidly about her moral and rhetorical conflicts in doing so, later mused about its true rhetorical function in an online discussion forum:

In the wake of all the publicity that *Tactical Iraqi* has received in the last few months, I find myself with an even more serious reservation about the game, which crystallized after reading Max Boot’s article, “Navigating the ‘human terrain,’” in which Boot, a senior fellow at the Council on Foreign Relations, enthuses about visiting “the Expeditionary Warfare School, where captains study Arabic by playing a sophisticated computer game complete with animated characters.” It was then that I realized that the purpose of the game might be rhetorical not pedagogical. Despite what the researchers thought they were doing, perhaps it was primarily intended to SHOW the teaching of Arabic to policy makers and the general public not actually TEACH Arabic more effectively. Traditional classroom teaching doesn’t make for a good media spectacle, but a video game might.

*Tactical Iraqi* cannot be accused of sporting low process intensity. As an engineering effort, it deploys sophisticated procedural models of language understanding, simulated gestures, and cross-cultural communication. But, Losh suggests, as an expressive artifact, the project might serve an agenda different from its primary one, namely drawing attention to a videogame training system to distract critics from America’s military occupation of Iraq. Again, such a gesture is undeniably rhetorical, but its rhetoric is accomplished through media speech, not through processes. I will return to the substitution of procedural rhetoric for audience correlation in the context of advertising in chapter 5.

Videogames created with a more genuine interest in expression and persuasion may still underplay procedurality in favor of visual images. The commercial game industry dazzles buyers with high-fidelity images of
increasingly greater verisimilitude, but these images do not necessarily couple with advances in procedural representation. In 2004, the American Legacy Foundation commissioned *Crazy World*, a game in service of their ongoing antismoking campaign, best known for its rhetorically powerful “the truth”-themed television ads. Built around a satirical carnival world that coincided with the foundation’s advertising campaign at the time, the game sports very high production values, visuals, and sound—the very factors that contribute to vividness, according to Charles Hill. But the procedural rhetoric in the game is weak. In a press release, one of the creators describes a mechanic in the game:

The game, which is aimed at a wide audience, ages 18–50, was created to show both smokers and non-smokers the dangers of cigarettes using humor and irony. Players score points by avoiding moving green puffs of radioactive smoke. If they get caught in the smoke, they mutate into an alien-like form. “The idea is to attract people to entertain themselves and keep the message within context—to play for fun,” [Templar Studios president Peter] Mack said.

A game like *Crazy World* may speak through visual rhetoric alone, or at least principally. The use of highly polished visual and sound design builds an expectation of authority. Images hypnotize many consumers, and even the largest videogame companies often repackage the same games with improved (or simply different) graphics. Considerable attention and investment has gone into improving the visual fidelity of commercial games, including the move to high definition and higher polygon models on the now-current Xbox 360 and PlayStation 3 consoles. Visual fidelity implies authority. Likewise, simplistic or unrefined graphics are often taken as an indication of gameplay quality. Just as a poor or “generic” package design can turn consumers away from a quality product, so the skin of a procedural rhetoric might influence player enticement. The 2004 Republican National Committee game *Tax Invaders*, which barely succeeds in replicating the rudimentary graphics of the classic arcade game *Space Invaders*, is an example of the latter (for more on this game, see chapter 3).118

The tenuous coupling between visual appearance and procedural rhetoric also hinders videogames that seek to make persuasive statements about issues in the material world, but fail to adopt effective procedural representations for those issues. One common pitfall is borrowing a procedural form from an
existing game or game genre and skinning it with new graphics. Such a one is *Congo Jones and the Raiders of the Lost Bark*, a game about deforestation sponsored by the nonprofit Rainforest Foundation. The game borrows its gameplay from 2D platform games of the *Super Mario Bros.* variety. The player controls a monkey who must find and defeat the president of the World Bank. The player must jump from platform to platform to avoid flying chainsaws, while attempting to reach and defeat the bank president.

*Congo Jones* adopts no procedural representation—and therefore no procedural rhetoric—of its own. Instead, it borrows the notion of progress through abstract obstacles as an object lesson for deforestation’s struggle against the World Bank (who had supported logging in the Congolese rainforests). The game makes no claims about possible reasons to oppose the World Bank, nor how to do so, although it does succeed in positing the World Bank as an archetypal opponent, the “boss monster” of the game. The game might or might not be effective in building “awareness” about the issue, but it certainly does not mount a procedural argument about the topic. Or more precisely, it does not mount its own procedural rhetoric; it adopts processes of obstacle avoidance and goal pursuit from platform games and reinscribes them onto deforestation.

*Congo Jones* borrows gameplay and applies a graphical skin—a visual rhetoric—atop it. Another common technique is to borrow gameplay and apply a textual skin—a verbal rhetoric—atop it. An example of such a game is *P.o.N.G.*, created by the Global Arcade art collective. The game’s website explains that the game features “a few different variations of the classic Pong, each with just a little different play on the language of globalization.” The result is a direct copy of *Pong* in which the ball is replaced by words that might arise in discussions of globalization (*neoliberalism*, $$, etc.). The player must bat these back and forth with the paddle, as one might “exchange words” in a conversation on the topic. While the Global Arcade’s mission statement announces their commitment “to make information about globalization interesting, engaging and interactive,” *P.o.N.G.* serves as little more than a sight gag, perhaps not even articulating expression adequate to warrant the moniker of digital art.

The notion of adopting *Pong*’s back-and-forth procedural mechanic or *Super Mario Bros.*’ platform mechanic as rhetorics for discourse might have promise, but *P.o.N.G.* and *Congo Jones* do not make meaningful use of those processes in their arguments. *Tax Invaders*, which I mentioned
above and discuss in detail in chapter 3, is an example of a game that borrows a videogame form and successfully mounts its own procedural rhetoric atop it.

A more successful procedural rhetoric can be found in the 1982 title *Tax Avoiders*, an unusual game for the Atari Video Computer System (popularly known as the Atari VCS or Atari 2600).\textsuperscript{123} Conceived by Darrell Wagner, a “Licensed Tax Consultant and former IRS Revenue Agent,” the goal of the game is to become a millionaire by amassing income and avoiding red tape and audits.\textsuperscript{124} The player controls a human character, John Q, who must collect income (represented by dollar-sign icons) and avoid red tape (represented by an abstract tape icon). After each fiscal quarter the player has the opportunity to shelter income in investments, which are represented as sprites on screen, or to store income in a portfolio, represented as a briefcase sprite (see figure 1.4). A second sprite oscillates between an IRS agent, a CPA, and an investment advisor. The player always loses an audit, and 50 percent of his income is lost to taxes. A CPA charges a small fee but always makes new

\textbf{Figure 1.4} Although the Atari VCS title *Tax Invaders* may look simplistic, it constructs a sophisticated procedural rhetoric about tax strategy.
tax-sheltered investments available. The investment advisor can maximize returns on sheltered investments. At the end of this interstitial phase, the player's remaining income is taxed and he returns to work.  

*Tax Avoiders* mounts an interesting and relatively complex procedural rhetoric about tax avoidance strategies. The fact that these techniques are mapped onto movement, a graphical logic, is perhaps not ideal, but it is also not detrimental to the argument. The player must run around to collect income, literally *avoiding* red tape. Likewise, he must avoid the IRS agent while racing to *catch* investment opportunities before their window of opportunity closes. These metaphors of locomotion correspond quite well to the abstract processes of work, investment, and taxation.

Finally, I would like to make a distinction between persuasive games, procedural rhetoric, and the rhetoric of play. In contemporary game studies, considerable attention has been paid to the relationship between games and play—and this is a worthwhile pursuit. However, my interest here is not in the function of play, nor in videogames as a subdomain of play activities. Rather, my interest is in the function of procedural representation as it is used for persuasion, and in videogames as a subdomain of procedural media. In particular, I should draw a distinction between procedural rhetoric and what Brian Sutton-Smith has called "rhetorics of play," or ways "play is placed in context within broader value systems." While we both use the term *rhetoric*, we use it in different contexts, although not in entirely different ways. Sutton-Smith discusses the rhetorical modes of play itself: the ways theorists present play as a human cultural activity. As Katie Salen and Eric Zimmerman explain, Sutton-Smith's rhetorics of play "identify how games and play embody ideological values and how specific forms and uses of play perpetuate and justify these values." Sutton-Smith's project is a general one, focused on the cultural role of play, not the culturally embodied practice of playing specific games. He identifies seven rhetorics of play, including play as progress, fate, power, identity, the imaginary, the self, and frivolity, each of which orchestrates play in different ways and for different ends under the same ostensibly name (hence the ambiguity). Sutton-Smith musters these rhetorics to attempt to explain the reasons people play, and the cultural function of that play. His approach is broad and macroscopic, investigating play itself as a cultural activity that serves multiple purposes, purposes which often complicate one another.
I am discussing the rhetorical function of procedural expression in the tradition of representation rather than the tradition of play. This said, Sutton-Smith’s rhetorics may prove useful in contextualizing procedural rhetorics among the values of play. This is not an effort I will attempt here, but which Salen and Zimmerman attempt in their text on game design, *Rules of Play*. The two suggest *The Landlord’s Game* (the conceptual precursor to the popular board game *Monopoly*) as an embodiment of Sutton-Smith’s rhetorics of power and progress. Unlike *Monopoly*, *The Landlord’s Game* opposes land monopoly, instead advocating the single tax proposed by economist Henry George. As Salen and Zimmerman explain:

Despite the strong similarity between *The Landlord’s Game* and *Monopoly*, there are distinct (and wonderfully incongruous) differences in the rhetorics each evokes. While the play rhetorics of progress and power apply to both games, *The Landlord’s Game* was distinctly anti-capitalist in its conception. The game’s conflict was not premised on property acquisition and the accumulation of monopolies, but instead on an unraveling of the prevailing land system. Because properties in the game could only be rented, there was no opportunity for domination by a greedy land baron or developer.¹³⁰

Without realizing it, Salen and Zimmerman helpfully clarify the difference between Sutton-Smith’s *rhetorics of play*—the global, cultural roles for exploring themes like ownership and property—and the *procedural rhetoric of a game*—the local argument *The Landlord’s Game* makes about taxation and property ownership. Salen and Zimmerman do not actually apply Sutton-Smith’s rhetorics of play, a gesture that shows how macroscopic the latter’s approach really is. On the one hand, they admit that progress and power “apply” abstractly to both *The Landlord’s Game* and *Monopoly*. On the other hand, their analysis relies not on these higher-level categories, but on the specific function of the rules of each game, for example rental as collective equity versus ownership as individual leverage. When Salen and Zimmerman say that there are “distinct . . . differences in the rhetorics each evokes,” they refer not to Sutton-Smith’s cultural rhetorics, but to the procedural rhetorics of the two specific games, *The Landlord’s Game* and *Monopoly*. In fact, Salen and Zimmerman’s analysis of the procedural rhetorics of these games is quite mature, revealing the way the rules of the games make fundamentally different
arguments about land ownership, despite having apparently similar boards and gameplay dynamics.

The difference between rhetorics of play and procedural rhetoric should now be clear. Sutton-Smith’s rhetorics of play characterize broad cultural contexts, while procedural rhetorics express specific patterns of cultural value. Despite their invocation of Sutton-Smith as a figure at the intersection of rhetoric and games, Salen and Zimmerman are actually invoking the more ordinary notion of rhetoric as persuasive and expressive discourse. Although they claim to “take the word ‘rhetoric’ from Brian Sutton-Smith’s remarkable treatise *The Ambiguity of Play,*” really they take the word from its more general classical and modern roots, applying it to the analysis of games. There may be value in applying Sutton-Smith’s rhetorics of play to specific procedural rhetorics, perhaps for comparative anthropological purposes. But as Salen and Zimmerman unwittingly demonstrate, the more useful intersection between rhetoric and play is one that unpacks the particular rules of a particular game in a particular context, not the more general intersection between modes of play in general. This distinction mirrors the one that separates representational discourse from sociological discourse. Clearly cultural context influences the creation of and interaction with games. But the games we create can also support, interrogate, or oppose those cultural contexts.

**Persuasive Games versus Serious Games**

Topics like taxation, deforestation, and globalization are not the usual subject matter of videogames; furthermore, the games about these topics discussed above are very arcane, so much so that I doubt many readers would have chanced upon all three before. Procedural rhetoric is not limited to such anomalous specimens; in the following pages I discuss numerous commercial games that have enjoyed great market success. But one often uses persuasion in the context of domains like economics, business, and politics. As it happens, an entire subdomain of videogame development has erupted around such topics, known as *serious games.* What, if anything, differentiates persuasive games from serious games?

Interrogating the relationship between seriousness and play is nothing new. Dutch anthropologist Johan Huizinga struggled with the ambiguous link between seriousness and play in his classic study *Homo ludens.* On the one hand, Huizinga notes that play “is the direct opposite of seriousness.” But on
further investigation, he argues that “the contrast between play and seriousness proves to be neither conclusive nor fixed.” Huizinga notes that one can “play seriously,” that is, with great devotion and resolve, but seriousness does not seem to include the possibility of play, making the latter of a “higher order” than seriousness. Despite this status, play helps constitute social and cultural functions of great gravity, according to Huizinga, including religion, politics, and warfare. Huizinga remains conflicted to the end on the interrelation between play and seriousness. As such, it is not surprising that scholars, business people, and developers thought they had fallen upon something new in “reuniting” seriousness and play.

An early example of the new collusion of seriousness and gameplay comes in Clark C. Abt’s 1970 book *Serious Games*, which addresses the use of analog games (board games, role-play, etc.) in education, science, government, and industry. In his first chapter, titled “The Reunion of Action and Thought,” Abt offers a definition of serious games: “We are concerned with serious games in the sense that these games have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement.” Abt quickly admits that this does not mean that serious games “are not, or should not be entertaining,” but the message is clear: serious games are created under the direct influence and guidance of external institutional goals.

When the Woodrow Wilson International Center for Scholars unearthed the moniker “serious games” as the name for their new videogame initiative, they did so without direct reference to Abt’s proposal thirty years earlier. Rather, the name arose fairly spontaneously. Wilson Center Director of Foresight & Governance David Rejeski and consultant Ben Sawyer were trying to title a white paper Sawyer had written for the center. The two had a subtitle—”Improving Public Policy through Game-Based Learning and Simulation”—but they wanted a snappy title to entice readers. Rejeski had been reading Michael Schrage’s 1999 book *Serious Play: How the World’s Best Companies Simulate to Innovate*, a call for businesses to foster play as an agent for innovation. Schrage cites Abt in his book, and Rejeski, perhaps influenced by conscious or unconscious memory of that reference, suggested “Serious Games” as a title. Since then, Woodrow has founded and funded the Serious Games Initiative, an ad hoc networking and knowledge-sharing group with a thriving membership. Its primary activities include collecting resources, facilitating contacts between government/industry and developers, and
running meetings and conferences on its core topics, including the Serious Games Summit, a large biannual conference (on whose advisory board I happen to serve). Interestingly, the Initiative’s goals read very similarly to Abt’s 1970 definition: “the goal of the initiative is to help usher in a new series of policy education, exploration, and management tools utilizing state of the art computer game designs, technologies, and development skills.”

Mirroring Abt’s goals with nondigital games, the Initiative seeks to couple videogames to the needs of modern institutions. Their mission statement asks, “How can we quickly expand the application of computer-based games to a much wider range of key challenges facing our government and other public or private organizations?” Abt’s “carefully thought out educational purpose” and the Serious Games Initiative’s focus on “government and other public or private organizations” both suggest that serious games are crafted in the service of officials, especially officials of governments or corporations. The language used to advertise the Serious Games Summit confirms this sentiment; under a header reading “Gaming for your Industry” follows a list of institutional interests: education, government, health, military, corporate, first responders, science.

If the notion of “seriousness” is what distinguishes this group’s efforts from other types of videogaming, it is worth briefly interrogating the term and its relationship to their endeavor. Serious is a word with many meanings, and it should no longer be sufficient merely to oppose it to entertainment, the major mover-and-shaker in the videogame marketplace.

Serious can mean solemn, implying emotionlessness and sobriety. One might think of the drill sergeant, the librarian, or perhaps even the IRS agent as an agent of this type of seriousness: she shot me a serious look and I reconsidered my itemizations.

Serious can mean weighty, implying consequence and demanding consideration. One might think of authority figures like teachers, parents, or religious leaders using this meaning of the term when addressing the particularly foolish (not serious) plans of pupils, offspring, or followers: Don’t tell me to calm down, son! Marriage is a serious commitment.

Serious can mean grave, implying severity and foreboding. One might think of officials making statements about unthinkable acts of war, disease, or suffering: Two of the five miners remain hospitalized in serious condition.

Serious can mean highbrow, implying intellectualism and profundity. One might think of academics, artists, curators, and more generally snobs
insistent on segregating weighty matters from light ones: *James is a serious artist, he doesn't make that pop-culture drivel.*

All of these ways of understanding serious have something in common: they rely on a point of reference that affirms the seriousness of a subject in relation to some nonserious alternative. Solemnity responds to behavior outside a known, desired code of conduct; weightiness responds to behavior thought to lead to crucial and perhaps irreversible decision; gravity suggests an opposite and always undesirable condition; and snobbery isolates worthwhile pursuits from insignificant ones. Furthermore, these meanings suggest that seriousness is often deployed in the service of institutions: governments, corporations, healthcare systems, religious beliefs, cultural communities, and so forth. Seriousness implies actions that support the goals and progress of these institutions.

Such a conception of seriousness is coincident with Abt’s use of the term in relation to board games and the Serious Games Initiative’s use of the term in relation to videogames. Serious games are videogames created to support the existing and established interests of political, corporate, and social institutions. To apply this principle to the industry domains of the Serious Games Summit proves a simple task. Educational games translate existing pedagogical goals into videogame form; government games translate existing political goals in videogame form; health games provide doctors and medical institutions with videogame-based tools to accomplish their existing needs; military games help armies and soldiers address existing global conflicts with new, cheaper, and more scalable simulations; corporate games provide executives with videogame-based tools to accomplish their existing business goals; first responder games offer simulated views of already known methods of response to natural disaster or terrorist incident; and science games provide appealing videogame-based tools to clarify known principles and practices.

Such goals do not represent the full potential of persuasive games. If persuasive games are videogames that mount meaningful procedural rhetorics, and if procedural rhetorics facilitate dialectical interrogation of process-based claims about how real-world processes do, could, or should work, then persuasive games can also make claims that speak past or against the fixed worldviews of institutions like governments or corporations. This objection—which bears some resemblance to Socrates’ opposition to sophist and technical rhetoric in the fifth century BCE—suggests that persuasive
games might also interrogate those institutions *themselves*, recommending cor-
rectives and alternatives.

If we wanted to retain the term *serious games*—a questionable goal—then
two other meanings stand out as potential ways of understanding the phrase. First, *serious* can imply care and attention to detail, especially as such care leads to reflection: *I will give your ideas serious thought*. This meaning is related to
weightiness, but carries the sense of open discourse, of the possibility of finding
new structures of thought not immediately given by a current worldview. Second, and more esoteric, *serious* can imply substance, a window onto the
underlying structure of a thing. This use may be limited to informal discourse;
a sentiment like *dude, that is a serious cheesecake* implies that the specimen pre-
sented offers a fundamental insight into the nature, even the apotheosis of the
thing in general. “Serious games” in this sense—a sense commensurate with
what I intend persuasive games to mean—would deal with the exposition of
the fundamental structure of existing situations intended to invoke support,
doubt, or debate about their validity or desirability, or universality. These are
not games in the service of governments, corporations, educational institu-
tions, and their kindred but games that challenge such institutions, creating
opportunities to question, change, or eliminate them.

The notion of the serious as the underlying structure of a system is par-
ticularly compatible with the concept of procedurality. Procedural represen-
tation depicts how something does, could, or should work: the way we
understand a social or material practice to function. I connect this idea to
contemporary philosopher Alain Badiou’s notion of the *situation*, a “structured
presentation” of a *multiplicity*, a particular ontological arrangement. Badiou
applies transfinite set theory to philosophy, understanding being to mean being a member of. The gesture of including a concept in a situation is akin to the
set-theoretical notion of belonging, which Badiou names the *count-as-one*. I have previously correlated the count-as-one with the unit operation, the
gesture of conceiving of a particular process as an encapsulated concept. Badiou
further understands situations to have a *state*, the logic by which the
elements in a situation are counted as one—or the reasons why the structure
is organized in the way it is. It is the state that is commensurate with “seri-
ousness” as the nature of a thing, the reasons that make it what it is. Badiou
further articulates a concept called the *event*, which offers a chance to disrupt
the state of a situation and reinvent it, wholly anew, under a different organ-
izing logic, a topic I will return to in chapter 11.
FirstPerson
New Media as
Story, Performance, and Game

Edited by Noah Wardrip-Fruin and Pat Harrigan
Designed by Michael Crumpton

The MIT Press
Cambridge, Massachusetts
London, England
Videogames of the Oppressed: Critical Thinking, Education, Tolerance, and Other Trivial Issues

Gonzalo Frasca

Is it possible to design videogames that deal with social and political issues? Could videogames be used as a tool for encouraging critical thinking? Do videogames offer an alternative way of understanding reality? Although videogames are now about three decades old, these questions remain unanswered. It seems that even if the medium has reached incredible popularity, it is still far away from becoming a mature communication form that could deal with such things as human relationships, or political and social issues. Or maybe it can never become such thing. After all, as many may say, these are simply games and games have been considered trivial entertainment for ages. Nevertheless, I claim that videogames could indeed deal with human relationships and social issues, while encouraging critical thinking. In this essay, I explore the possibilities of non-Aristotelian game design, mainly based on the work of drama theorist Augusto Boal.

Simulation and Representation

The design of consciousness-raising videogames is not as simple as replacing Nintendo’s Mario and Luigi with Sacco and Vanzetti. According to Brenda Laurel’s now-classic Computers as Theater (1991), computer software and videogames can be understood through the same rules that Aristotle described in his Poetics. The “interactive drama/storytelling/narrative” paradigm has been the leading design guide in most current videogame design, supported both by such theorists as Laurel and Janet Murray (Murray 1997) and by the videogame industry. It seems that the current tendency is to explain the computer (and videogames) as an extension of a previously existing medium: Laurel did it with drama, Murray with storytelling and, more recently, Lev Manovich (Manovich 2001) based his approach on film studies. The main advantage of these perspectives is that they depict the similitude between so-called “new” and “old” media.

It would be extremely naive to think that videogames are a brand new cultural manifestation that does not draw upon any previous tradition. However, even if it sounds obvious, videogames are, before anything else, experimentation which are less available to audiences of traditional narrative forms. This seems to me to be mostly right, and I too have been intrigued and excited by the opportunities that users of digital media have to appropriate, reshape, and subvert centrally-produced content, particularly with the advent of the web and greater mobilization of user communities.

At the same time, I feel it is important to consider not only the differences between videogames and narrative forms but also the connections and overlaps. I am not necessarily pointing to the use of narrative form and theory in game design, but rather how our engagements with popular culture embed us in a hybrid media ecology as print, movies, games, and television increasingly reference one another. Looking at the media mix around children’s content in Japan,
Videogames of the Oppressed
Gonzalo Frasca

games. Sadly, good formal research on games is scarce. It seems that it is easier to use already popular theories rather than exploring the field from a fresh perspective. If we want to understand videogames, we first need to understand games. We need a ludology (Frasca, 1999), a formal discipline that focuses on games, both traditional and electronic.

If videogames are not narratives, what are they? I am not denying that games and narrative do share many elements, but as Espen Aarseth argues (Aarseth 1997), it is necessary to study games through a cybernetic approach. Unlike narrative, which is constituted by a fixed series of actions and descriptions, videogames need the active participation of the user not just for interpretational matters, but also for accessing its content. Narrative is based on semiotic representation, while videogames also rely on simulation; understood as the modeling of a dynamic system through another system. A narrative film about a dog gives us information about the dog itself (description) and the sequence of events that this particular dog endured (action). A virtual pet, such as a Tamagotchi, is not about description or action, but rather about how it conducts itself in relationship with the player and the environment (behavior). In temporal terms, narrative is about what already happened while simulation is about what could happen.

Because of its static essence, narrative has been used by our culture to make statements. We explain, understand and deal with reality through narrative. Our religious and moral values have been historically shaped in this way through different sacred books (Bible, Koran, Popol Vuh). Although the interpretation of sacred texts has always been open, the written words and the stories themselves have mainly remained fixed. On the other hand, simulation is dynamic and its essence is change: it produces different outcomes. This makes simulations not such a good choice for sacred moral codes since you may not want to have your holy scripts alternately read, “Thou shall not kill,” and “Thou shall kill.” This also explains why videogames are not a good realm for historic events or characters or for making moral statements. A videogame about Anne Frank would be perceived as immoral, since the fact that she could survive or die depending on the player’s performance would trivialize the value of human life. We all know that Anne Frank died and the reasons for her death; her story serves to convey a particular set of values.

The potential of simulation is not as a conveyor of values, but as a way to explore the mechanics of dynamic systems. SimCity”, Will Wright’s urban simulator, is not about Paris or Rome, but about potential cities. Of course, it is possible to learn a lot

the hybridization between different media types is one of the most interesting sites of action. The narrative strengths of television, movies, and comic books furnish compelling characters, backstory, and setting for the more interactively intense and personalized formats of card games, videogames, and digital pets.

Thus, more than the distinction between narrative and simulation, I find myself galvanized by Frasca’s distinguishing between different stances of engagement: critical versus immersed, actor versus spectator, or producer versus consumer. I am just back from Comiket, the largest convention in Japan, which is devoted to buying and selling comics and computer games created by fans. Content ranges from genre mixing, to pornographic renderings of mainstream characters, to exploring alternative narratives and character qualities. This material would not be taken up by mainstream publishers, and often embeds a critical stance toward mainstream media. “Biohazard Pikachu” is mostly about humor, pleasure, and play, but is also a critical commentary on Nintend’s production of sanitized cuteness. This kind of appropriation and remaking seems to be at the heart of what Frasca envisions for the videogame community, and is something that cross-cuts media genres, as studies of fan communities have amply demonstrated (Penley 1991; Jenkins 1992; Tulloch and Jenkins 1995).

The productions of fan culture are just one piece of the dead serious economic and social negotiations around popular culture, and the ongoing political struggles between producers and consumers. For example, adult action entertainment is in a politically
about a big city such as Paris — or any other — through SimCity, but that kind of knowledge is
different from what we can read in a Hemingway or
Balzac book. It would be possible to create a model of
Paris in SimCity and use it for experimentation: "What
would happen if I removed the Seine River? What if I
built narrow streets rather than large avenues?" Novels
usually take a concrete set of characters, in a particular
setting, enduring a particular set of events. Simulations
also have particularities and referents, but their main
characteristic is that they allow tweaking and changing
the original model. Certainly, a reader can extrapolate
the characteristics of the characters and settings of a
novel to model its ideological rules. Although this is an
exception in narrative reserved for sophisticated
readers, it is a requirement in simulations. Simulation is
an ideal medium for exposing rules rather than
particular events.

Resurfacings from Immersion
Laurels approach to software design and part of
Murray’s — particularly her concept of immersion as
one of the three key providers of pleasure in interactive
environments — are heavily influenced by Aristotelian
poetics. The fact is that, while Aristotel’s ideas are
definitively popular in our culture, other approaches
exist. One of the biggest problems of Aristotelian
antagonistic relationship with educational children’s
media, both at the institutional level (capitalist/private
versus nonprofit/public), and at the level of explicit
representational content. This antagonism is a force in
everyday negotiations about play versus homework,
what software makes it into the schools, or whether a
game should be marketed as an entertainment, kids, or
educational title. In other words, videogames function
as political actors in a wide range of settings that
extend beyond moments of game play.

At the end of his paper, Frasca ruminates on the
difficulties of getting people to engage deeply with the
videogaming medium in the form of programming.
Clearly this is a key barrier to the types of social
engagements that Frasca envisions. Again Comiket
strikes a hopeful note. The content at Comiket spans
gender categories and a broad range of genres such as
Action, Romance, and Fantasy, and the technical
sophistication of the productions is often on par with
professional comic production. My hope, my belief
even, is that if people identify with the content, have a
compelling investment, and a degree of organization,
they will overcome substantial technical obstacles.

As Frasca reminds us, it is not just the design of
games that creates new social possibilities, but the ways
in which this content gets mobilized by players. Frasca’s
proposals are perhaps most radical as a call for
changing the social and economic conditions in which
games get produced and played, even more than as a
call for different sorts of game content. His example of
critical engagement with The Sims importantly relies on
an open-source model. In addition to considering how
criticism would try to use simulation as a means of consciousness-raising. (71)

These alternative simulations imagined by Turkle are not yet available on the computer. Interestingly, they are available somewhere else. For more than three decades, Brazilian playwright and drama theorist Augusto Boal has developed the "Theater of the Oppressed," an original form of theater that combines theater and simulation in order to produce social and political simulations. He built his techniques based on the Marxist theater tradition developed by Bertolt Brecht, as well as on Paulo Freire’s Pedagogy of the Oppressed (1970).

Bertolt Brecht’s drama challenged Aristotle’s ideas; as mentioned previously, he argued that Aristotelian theater keeps the audience immersed without giving them a chance to take a step back and critically think about what is happening on the stage. Brecht created several techniques in order to alienate what is familiar in the play, constantly reminding the spectators that they were experiencing a representation and stimulating them to think about what they were watching. Brecht’s techniques, however, were not exclusively targeted at the audience. He also encouraged performers to be completely aware of their actions. Instead of being “inside the skin” of the character, he encouraged having a critical distance that would let them understand their role.

Brazilian dramatist Augusto Boal (1971) took Brecht’s ideas even further by creating a set of techniques, known as the “Theater of the Oppressed” (TO), that tear down the stage’s “fourth wall.” Boal’s main goal is to foster critical thinking and break the actor/spectator dichotomy by creating the “spect-actor,” a new category that integrates both by giving them active participation in the play. The repertoire of techniques of TO is extremely large and includes, among others, the “invisible theater” — where actors work “undercover” in public spaces — and the “Forum Theater.”

Forums are created around a short play (five to ten minutes long), usually scripted on-site, and based on the suggestions of the participants. The scene always enacts an oppressive situation, where the protagonist has to deal with powerful characters that do not let her achieve her goals. For example, the play could be about a housewife whose husband forbids her to go out with her friends. The scene is enacted without showing a solution to the problem. After one representation, anybody in the audience can take over the role of the protagonist and suggest, through her acting, a solution that she thinks would break the oppression. Since the problems are complex, the solutions are generally

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From Eric Zimmerman’s Online Response

If, as I believe, existing digital games are riddled with ideological baggage, why not use one of the many open-game creation systems commercially available? Zillions of Games <http://www.zillions-of-games.com> is a software package that lets users design the art and create the rulesets of turn-based multiplayer games. Adventure Game Engine <http://www.twilightsoftware.com> lets players script complex multimedia adventure games. Game Maker <http://www.cs.uu.nl/people/markov/gmaker/> is a free software package that lets players create action games. Similar nondigital game exercises exist as well, such as STARPOWER, a classroom exercise that explores power, economics, and society though the
incomplete. This is why the process is repeated several times, always offering a new perspective on the subject. In Boal's (1992) own words: "It is more important to achieve a good debate than a good solution." It is central to stress that Boal uses theater as a tool, not as a goal per se. In other words, the ultimate objective of Forum Theater plays is not to produce beautiful or enjoyable performances, but rather to promote critical discussions among the participants. Unlike traditional theater that offers just one complete, closed sequence of actions, Forum Theater sessions show multiple perspectives on a particular problem. They do not show "what happened" but rather "what could happen." It is a theater that stresses the possibility of change, at both social and personal levels.

For these reasons, TO is a perfect model for creating non-Aristotelian, nonimmersive videogames. Earlier in this essay, I criticized other authors that explain games through narrative and theater, and here I am proposing a drama model for videogames! However, while Boal certainly uses theater techniques, his work is closer to games and simulation than to theater. As performance theorist Philip Auslander argues, Boal had to give up performance altogether in order to bridge the gap between performers and spectators (Auslander, 1999). Forum Theater is nothing but a game, with specific rules, that uses theater to simulate certain events and programmed breakdown of social game rules (Ellington, Addinal, Percival, 1982). […]

In his second proposal, Frasca seems to exhibit a fundamental misunderstanding of the way that games function. Near the beginning of presenting his Sims-based "videogame of the oppressed," he laments the many "constraints" of The Sims. Actually, constraints are the raw material out of which games are made. This misstep leads to other problems.

http://www.electronicbookreview.com/thread/firstperson/zimmernash1

The Search for a Social and Political Logo
Certainly, the idea of using simulation and videogames for educational purposes is far from new and was already extensively explored by constructionism. The idea was developed by Seymour Papert through Mindstorms (1985) and Logo, and it was continued by such authors as Yasmin Kafai (Kafai 1995), whose students learned mathematics through videogame design. The main problem with constructionism is that it was not designed for dealing with social and humanities education. This can be easily explained by many factors, including Papert's own background as a mathematician and the election of the computer as their main tool. Certainly, Kafai's students had to research Greek mythology to create their videogames, but this was mainly a side effect, because their focus was on mathematics. In fact constructionism's main success stories are in the field of science education, and it does not seem to be the ideal environment for critically discussing human and social matters.

Paulo Freire's pedagogy was developed about the same time as constructionism. In fact, they share many behaviors. Without a single line of computer code, Boal created a Third World, non-Aristotelian version of the Holodeck. And the best thing about it is that it actually works.

Frasca Responds
Mods and hacks certainly could help to develop "videogames of the oppressed" but the top-down approach is also needed. We will not see critical videogames until major games are developed by biased authors that understand that fun is not the only thing that could be conveyed through this medium.
characteristics. However, Freire had different goals
(mainly adult literacy and the development of critical
attitudes towards reality in order to attain social
change) and settings (the Brazilian Nordeste, one of the
poorest places of the world). Unlike constructionism,
his pedagogy offers great tools for critical discussion
and social awareness — but it is not as well suited for
science education.

What I am proposing here is to use Boalian
techniques to develop a complementary approach to
constructionism that would allow the use of
videogames as tools for education and sociopolitical
awareness. To create a simile with Logo, I argue that we
need an engaged, political Logo. We need an
environment that engages children in questioning the
ideological assumptions of videogames. We need a
political microworld where it would matter if the turtle
turns left or right. In the next sections, I introduce two
elements on how Boalian techniques could be brought
to the computer. Please note that both systems are
hypothetical and serve only as an illustration of the
potential of non-Aristotelian videogames.

Forum Videogames
The following technique is a computer-based equivalent
of Boal’s Forum Theater that uses videogame rather
than drama. Instead of performing on a stage,
participants would discuss real-life situations by
creating videogames and then modifying them in order
to reflect their personal points of view.

Forum Videogames could work as a feature available
inside a bigger “Videogames of the Oppressed” online
community. It would be targeted to a homogenous
small group — for example, a class of high school
teenagers — coordinated by a moderator. Any
participant — who will be referred as the “protagonist”
— would be able to start a forum. The protagonist
would be able to design one or a series of videogames
where she would try to simulate a problematic
situation that she is trying to deal with. The process of
videogame design would be done by modifying
preexistent templates based on classic videogames
(Space Invaders, Street Fighter, Pac-Man, etc).

Once the game is ready, the protagonist would post it
online, allowing the rest of the group to play with it.
Players would be able to post their written comments
and even submit a modified version of the game that
reflects their personal position towards the
protagonist’s problem. The modified version could be a
variant of the protagonist’s original game, or a brand
new game based on a different template. The process
would repeat many times, just as it happens in Forum
Theater, triggering new designs and discussions.

For example, let’s imagine that the protagonist’s
problem is that he is being bullied at school and he
doesn’t know how to deal with this. In order to
simulate his problem, he could use a Pac-Man template
and modify the original game. He would replace the
Pac-Man with a cartoon version of himself and replace
the ghosts with images of his harassers. In addition to
this, he could also take away the score feature and the
pills, leaving nothing but a labyrinth where he is being
constantly chased. Once that game is posted online, the
other members of the group could respond by creating
variants. One of them could be to modify the structure
of the labyrinth to create a small space where the
protagonist could live isolated, safe from the bullies. But
other players could say that this means giving up his
freedom and, therefore, that it is not a good solution.
Then, another player could suggest using violence, by
introducing weapons on the environment. Another
may suggest introducing more players (several Pac-
Mans) who would stick together and defend
themselves as a group of virtual vigilantes. Of course,
somebody may argue that it is technically impossible to
be all the time surrounded by your friends: the bullies
will find you alone sooner or later.

Again, the goal of these games is not to find
appropriate solutions, but rather serve to trigger
discussions — which could take place in person or
through online chat. It would not matter if the games
could not simulate the situation with realistic accuracy.
Instead, these games would work as metonyms that
could guide discussions and serve to explore alternative
ways of dealing with real life issues.
Simulating Characters in The Sims

The Sims represents a breakthrough in videogame design. For the first time, a best-selling game is not about trolls and wizards. This simulation is about regular people — known as Sims — in everyday situations in an American, suburban environment.

In my opinion, The Sims's biggest achievement was that it fully opened the Pandora's box of simulating human life. Although structurally The Sims is similar to other resource management simulations, the fact that it portrays people, and not aliens, results in players asking questions about the game's ideology. Is it okay to let a Sim starve to death? Is it possible to have same-sex Sims relationships? What about threesomes? Will I spoil my Sim child if I buy her too many toys? All these questions would have probably never been asked if the game had been about monsters or aliens. The fact that the best-selling game of the year 2000 was about people is a clear sign that videogames are on their way towards maturity.

For ages, our civilization has been learning to deal with the issues of representation, including concerns about its accuracy and its limits. Videogames like The Sims are introducing to the masses a different form of representation — simulation — which has always been present in our culture through games, but that now can dare to start modeling more complex systems, such as human life. Even if The Sims is a very limited model of human relationships, it is a harbinger of videogames as a mature communicational and artistic form.

The Sims's constraints are many. For example, Sims cannot communicate in a verbal language and their personal relationships are not described with depth. In addition, the consumerist ideology that drives the simulation is nothing short of disturbing: the amount of friends that you have literally depends on the number of goods that you own and the size of your house. Nevertheless, simulation is an extremely complex task and, despite its shortcomings, The Sims succeeds at delivering an enjoyable game involving human characters.

The game allows players to create their own skins and designs and then share them online. However, the designers did not create an open environment where players could modify the rules of the simulation by coding new behaviors and objects. This is understandable from a marketing perspective: software companies want both to retain authorial control over their productions and to prevent players from creating controversial materials.

What follows is a description of how a hypothetical, open-source, modified version of The Sims could serve as an environment for players to distance themselves from the representation and engage in critical discussions. My intention is to show that Boal's ideas could also be used in mainstream videogame design. Although my previous example was better suited for small groups, educational or therapeutic environments, this one could appeal to a larger community of players.

In traditional videogames, the player "is" the character. In The Sims the player can control the character in a less direct way. However, The Sims's characters are generally flat, because most of their differences are based either on their moods, or on visual traits that do not affect their behavior. This would be solved if players had more control over character creation by deciding their behavioral rules instead of just selecting their clothes. In order to encourage critical debate, the modified version of The Sims that I propose would allow players to modify the internal rules of the characters. The basic gameplay would be similar to the current game but, in addition to downloadable objects and skins, it would also be possible to get user-designed characters with different personalities and particular sets of actions. These characters would be created with a special tool that would require programming. Players would be able to rate the different characters and even create their own versions, based on behavioral details that they think need improvement in order to attain a higher level of realism. Both behaviors and comments would be available online in a "Character Exchange" site.
A Sample Scenario

The following is a sample scenario of a particular session, based on the rules that I am proposing:

Agnes has been playing with the simulation for many days. She knows its basic dynamics and enjoys it. Nevertheless, she feels that it would be better if family relationships were more realistic. So, she goes to the “Character Exchange” web site and browses through different characters. She finds one that looks interesting. It is called “Dave’s Alcoholic Mother version 0.9,” and it has the following description:

This mother spends a lot of time working, and she is very tired when she gets back home. Still, every night she has to fix dinner and do some housecleaning. She can get very annoyed by children and pets and may become violent. In order to escape from her reality, she drinks a lot of bourbon.

Agnes considers giving it a try and downloads it into one of the houses with which she has been playing. Agnes’s virtual household is composed of a couple, three children, and a cat. After the download, her original mother character is replaced by “Dave’s Alcoholic Mother version 0.9.” Agnes finds the character quite interesting. After playing with it for a while, she realizes that when the mother reaches a certain degree of fatigue, she starts drinking. The more she drinks, the less she will care about her family. She remains calm unless her husband insists on coddling or giving her a back rub.

Although Agnes thinks that the character is pretty well-depicted, there are details that she does not agree with. For example, the character always gets her drinks from the little bar in the living room. Agnes knows from personal experience that, in general, alcoholics hide their bottles around the house and try not to drink in public. So, she goes back to the “Character Exchange” and writes a public critique of Dave’s creation. After doing this, she tries alternative alcoholic-mother behaviors. If the available characters do not satisfy her, she can modify one of the available versions and introduce a new behavior that makes the mother hide her alcohol bottles. She can then post this new character online and make it available to other players.

Some weeks later, Agnes gets a little tired of playing with her character and wants to give her some more personality. So, she decides that it would be great if she could add some extra behavioral code to it. Agnes downloads a character described as “Peter’s Radical Greenpeace Activist version 9.1.” After some editing and modifications, Agnes introduces this behavior to her alcoholic-mother character. The new character would still be an alcoholic, but she would take more care of plants, recycle everything and would never kick her cat while drunk.

The Problems of Simulation Building

As I previously said, the biggest obstacle for building Boalian videogames lies in the fact that programming simulated behaviors is an extremely difficult and time-consuming task. Even with a design tool that involved templates or some kind of visual object-oriented programming, it is likely that the average player would consider the task overwhelming. Still, as Amy Bruckman’s (1998) work on MOOSE Crossing — an object-oriented, multi-user dungeon where participants can modify the environment by creating new objects — suggests, players can become really involved with programming simulated features and will exchange tips and help with others who are less skilled programmers.

Although it is possible that certain players could deal with the programming of new behaviors, it is likely that most participants would only be able to download behaviors made by others. I think that even if most players would not be able to code their own features, they could at least tinker with preexisting behaviors. The fact that a single behavior such as alcoholism could be available in so many different versions from players from different social and cultural backgrounds would encourage players to think about issues such as social construction of reality — but also about defending their points of view and listening to alternative opinions.

Of course, the lack of programming proficiency is not the only problem that Boalian videogame designers
would face. However, the popularity of simulators such as The Sims or SimCity may serve as a tool for transforming the perception of videogames from interactive narratives into simulated models. As the public becomes more familiar with manipulating and modifying simulations, the concept of designing their own may become more appealing.

Conclusion: Videogames of Tolerance

The two examples that I just gave should be considered more as illustrations of the paths that could be taken in order to design Boalian videogames than as blueprints for actual systems. The main goal of these examples is to show that videogames could be used as tools for better understanding reality and raising critical awareness among players. Current Aristotelian videogame design paradigms such as immersion should not be taken for granted, since questioning the values and mechanics of videogames could also be a source of engagement for players.

The main problem with these examples is that they require players to be very good programmers, a prerequisite that might be impossible to attain. Nevertheless, there may be some possible solutions to this problem. Further details on these techniques can be found in "Videogames of the Oppressed," a thesis (Frasca 2001) developed at the Georgia Institute of Technology and on which this article is based (available at <www.ludology.org>.

When I describe these ideas to fellow researchers or game designers, they usually ask me if I really believe that social and personal change is possible through videogames. My answer is always a straight "no." Neither art nor games can change reality, but I do believe that they can encourage people to question it and to envision possible changes.

Unlike narrative, simulations are a kaleidoscopic form of representation that can provide us with multiple and alternative points of view. By accepting this paradigm, players can realize that there are many possible ways to deal with their personal and social reality. Hopefully, this might lead to the development of a tolerant attitude that accepts multiplicity as the rule and not the exception.

Note

1. I am often criticized for using the term "simulation" in a very broad sense, particularly by colleagues with a computer science background. Traditionally, simulations model real systems and connotate an intention of scientific understanding. When I use the term it is in order to describe a different form of representation and, as in modern semiotics, I do not see the need for a real referent. Just as the word "unicorn" lacks a real referent, I say that Mario Brothers simulates an imaginary dynamic system (the Mario world).

References: Literature


Videogames of the Oppressed
Gonzalo Frasca


References: Games

The Sims. Will Wright; Electronic Arts. 2000.

we publish the darkness
INTRODUCTION
MERRITT KOPAS

1. ME

I’ve been trying to think of a way to phrase this that won’t sound over the
top, but I can’t. So here it is:
Twine changed my life.
I know, I know. But hear me out.
When I first encountered Twine I was a graduate student in my early
twenties. I went into grad school right out of college, which I went into
right out of high school. It wasn’t totally bad. I liked getting to read so
many books, and getting to talk with clever people. But a couple of years
in, I was beginning to realize that something wasn’t right. Without sitting
down and planning on it, I’d been an academic for my entire adult life. I felt
trapped, like I’d gotten on a train and drifted off, and now it was speeding
along the tracks of my life so fast that I’d never have a chance to disembark.
Listen: I had been dissociating for so much of my life that academia
was easy for me, because it let me distance myself from the subjects of my
writing. It let me interpose layers of interpretative analysis between my-
self and my experience. And those layers functioned as protective barriers,
keeping me safe from any unfiltered contact with reality. I wrote paper after
paper about queerness and bodies, but I wasn’t writing about myself, not
really—at least, that’s what I told myself. I couldn’t write about me, because
to do that would mean tearing up boarded-off places in memory and really
acknowledging what my life had been like up to that point.
merritt kopas

And then I discovered Twine.

The first time I ever played a Twine game I was confronted with this text:

If there’s one thing Encyclopedia Fuckme knows - and this is a hypothetical statement, of course, because she’s actually got a lot crammed in her big fat brain - it’s how to get off!
But in addition to her brain, our hero also has a very greedy pussy - one that sometimes leads her into trouble! Such is “the case” today. But if she does what she does best, she just may solve . . .

THE CASE OF THE VANISHING ENTREE.

Fuck.

This was 2012, and I hadn’t ever seen writing like that in a videogame. I’d grown up with games, but I’d never felt the presence of their authors. Games were, to me, cultural products similar to big-budget films: Obviously there were people involved in their design, but they never came through as individuals. And although by 2012, I was dimly aware of the existence of independent artists who made their presence as individual human beings felt through games, my experience had led me to believe that even those creators were mostly men, telling stories that were maybe interesting but not directly relevant to my life.

And then, this: Anna Anthropy’s Encyclopedia Fuckme, a game about a clever lesbian with a submissive streak trying to avoid becoming her seductive cannibal date’s dinner.

Maybe it’s tipping my hand too much to say this game spoke to me, but it did. It was everything I had been led to believe videogames weren’t, couldn’t be: funny, hot, relevant to my life. And there were more. There were people writing in ways that resonated with me, about things I didn’t even know I needed to see written about. I started devouring Twine works wherever I could find them, building up a renewed appreciation for interactive fiction and digital games.

It was a while before I worked up the courage to write my own story in Twine. I was self-conscious, unconfident in my abilities. It was a struggle trying to write something outside of an academic, analytical mode for the first time in years—looking back, even my personal blog posts at the time were intellectualizing. But I fought through it and ended up writing a piece for a partner I was with at the time, a game called Brace, meant for two people to play together and about struggle and perseverance against a hostile world. It wouldn’t be the last time I used Twine to write a game as a gift for somebody I cared about: Months later, I wrote a game for distant friends on New Year’s Eve (Queer Pirate Plane) and a short piece mixing personal narrative and sex education for a lover (Positive Space).

It was like a floodgate broke. For the next year, Twine was the main outlet through which I processed my emotions, working through personal
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and political struggles by making something out of them. I made works about family, love, sex, bodies: things I’d never been able to examine directly before. I made a game about difficult talks with my mother; I made a game about childhood abuse; I made a game about consensual sadomasochism.

Hell, I made a game about muffing, an underground sex act popularized through a zine, and it got coverage on mainstream videogame sites.

What was it that made Twine special for me? I think that something in the form of it, its presentation of nodes and links, felt less intimidating than the blank page and blinking cursor of a word processor. Somehow it felt more inviting. It didn’t demand, as that blank page seemed to, that I tell a linear story, one that was neat and made sense and contained some kind of resolution. Of course, there’s nothing about traditional text that demands any of these things either. But I’d been writing in an analytic mode for so long that I couldn’t look at a blank page without my mind struggling to put things in order before I got a single word down. When I opened up Twine, I felt free to just start writing fragments, each in their own passage. The connections could come later.

Most importantly, I was able to share these works with other people like me. Twine brought me into a network of people who made games outside of the mainstream. On Twitter, we made connections, shared techniques, built friendships and informal collaborations.

Late 2012 and early 2013 was an extraordinarily exciting period for me: I started, for the first time, to feel like I was a part of something. The “queer games scene” covered by videogame outlets might not have been as cohesive as some accounts supposed, but for a little under a year, it definitely felt real. We were telling new stories in new ways, stories that were not just unheard of as subjects for videogames—which they certainly were—but rare in any medium. We were writing about messy lives on the economic and social margins of society, about the complexities of embodiment and community, about our grotesque cyberpunk dreams and gay pulp fantasies.

Things fell apart, as they often do in tightly knit, passionate communities of artistic people with few resources—especially when those people are all also friends, lovers, or something in between. But that period was intensely generative, launching a number of authors into visibility and recognition and solidifying the reputations of others. When the burst of activity around Twine during this time ended, it didn’t just fizzle out—it left marks on literary and independent videogames communities.

Twine games ended up on college syllabi, technical resources piled up for those wanting to play with variations on the form, and even the relatively small amount of journalistic and critical attention paid to some prominent Twine works raised the profile of the tool to a new level. When Richard Hofmeier—winner of the 2013 Independent Game Festival’s grand prize award for his game Cart Life—defaced his own booth and replaced his game’s demo with Twine author Porpentine’s well-received game Howling Dogs, it became impossible to ignore the importance of Twine to indepen-
dent games.

Of course, we shouldn’t overstate that importance. A very small number of authors gained visibility during this period, and almost all of them still struggle with material insecurity. Independent videogames is a notoriously competitive field, one in which a very few people do extremely well while everyone else just tries to get by. Twine authors, being on the margins of an already marginal field, struggle to do even that. The mainstream videogame industry prides itself on being on the cutting edge of technology, for better or for worse. And as Twine work generally doesn’t involve high-definition graphics or immersive three-dimensional worlds, Twine authors continue to find themselves defined out of videogames and denied coverage or critical attention in favor of more graphically appealing or lucrative works, while mainstream videogames are just beginning to develop richer narrative techniques and are receiving heaps of praise and money for it.

This is what an artistic revolution looks like: some people get a little famous, nobody gets rich, and years later, people who have more resources than you steal your ideas and use them to get richer and more famous than they already were.

But the thing about artistic revolutions is that people keep working long after the mainstream has moved on to its next fascination. It’s 2015, years out from the “Twine revolution,” and people continue to produce powerful, unique works with the tool.

And ultimately, Twine’s importance goes beyond the work produced by the most visible, recognized creators. Twine showed me that people who weren’t interested in becoming “game developers” or “game designers” themselves could use games to tell important, personal stories.

Once I started using the tool, it wasn’t long before I started running Twine workshops at schools, conferences, and community spaces. Most memorably, I co-ran a Twine workshop with Anna Anthropy at the Allied Media Conference in Detroit in 2013. The participants included an elderly local man and a mother with her toddler daughter, each of them excited to use the medium to tell their stories in a new way. As Ian Bogost describes in his book How to Do Things with Videogames, we’re approaching a reality in which people like our workshop participants can use videogames in the same way as they might use a digital camera. We’re not quite there yet, but it’s exciting to see the form enlarging and expanding, shifting away from a specialized media produced by and for a narrow audience and toward a range of new shapes and contexts.

It’s been a huge privilege to be a part of that. In 2012, I was a depressed, impoverished academic. Writing this, in early 2015, I’m still not exactly well-off, and I wouldn’t say I’m the most mentally or emotionally well person around, but I have work I’m proud of and networks of friends and colleagues I’ve met through making it. I’ve ended up in a place I couldn’t imagine I might when I sat down and played that first Twine game a little over two years ago.
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But this book isn’t about me, not really.

2. TWINE

Okay. So what is Twine? For most people, the easiest parallel is to Choose Your Own Adventure books. You know, those books that were popular in the 80s and 90s that presented you with some kind of fantastical narrative along with a list of choices. Like, you’re confronted with a weird potion: If you’d like to drink it, turn to page 60; if that sounds like a terrible decision, turn to page 251. These branching narratives were a neat mutation of the textual form of the book, though they mostly remained marginal in literature and were generally marketed only to young readers.

Twine is kind of like that, in that it’s a tool you can use to create branching narratives. More broadly, it’s a tool for creating hypertexts, collections of passages joined by links. A typical Twine story looks like a textual webpage, and the player generally advances through it by clicking textual hyperlinks. This is one of the great attractions of Twine: playing a Twine game draws on familiar skills. Unlike contemporary videogames, which require the player to navigate bewildering fictional three-dimensional spaces and complicated control schemes, anyone who can navigate a webpage can play a Twine game.

Because of that use of familiar skills, the games produced with Twine are at root far more accessible than most contemporary videogames (though I’ll have more to say on this later). As a tool, Twine is more accessible than most game design environments too. Interestingly, this accessibility is partly because Twine’s development environment isn’t strictly textual. Whereas traditional game design requires the designer to be able to write and understand lines of purely textual code and to visualize the in-game results, Twine’s development environment presents the prospective designer with only two core elements: passages and links. To create a passage, it’s only necessary to write it, and then any text within the passage can be turned into a link. These passages can be dragged and shifted around the screen, with links between passages represented by arrows, creating a kind of flowchart. Thus it’s easy to track branching paths as you build by following the trail of arrows through the narrative. You don’t really need to understand the logic of code to make something in Twine, but at the same time, Twine’s logical flowchart environment makes it easy to pick up the basic principles that make up more complex structures of code.

Finally, since its creation by Chris Klimas in 2009, Twine has been free for anyone to use and modify, whereas many other game development tools require potential designers to purchase licenses running in the hundreds of
dollars.

Twine started as a desktop application. In 2014, Chris Klimas and Leon Arnott released Twine 2 as both a desktop and web application. Crucially, though, Twine 2 continues the original’s ideals of accessibility and user control. All user work is still saved locally on user computers, so there’s no dependence on centralized servers or services. In the context of this period in which tool creators such as Adobe and Google are shifting to subscription-based models with the purpose of getting users invested in their “ecosystems” and thus fostering dependent relations between tool users and developers, Klimas and Arnott’s commitment to user control is more important than ever.

Twine’s financial and technical accessibility are major reasons for its broad adoption, especially among economically marginalized, nontraditional game designers—i.e., people who are not white men with college-level programming training. As a result, Twine has been the site of an incredible artistic flourishing at the intersections of digital games and fiction: a rebirth of hypertext. People who might never otherwise make a videogame make them with Twine. Some of these people have taken the skills they develop in using Twine and branch out to other forms and media; others have delved deeper into Twine itself and done things with it that nobody expected; and still others use it to make games that tell stories without the intention of becoming a professional artist or designer, just as one might write a poem or take a photo without needing or wanting extensive training in either of those skills. Authors can use Twine to create choose your own adventure stories, or interactive poetry, or nonlinear essays, or anything composed of sections of text and connections between them. Theoretically, authors could also use a word processor or pen and paper to create those texts. But there’s a key difference between traditional writing tools and Twine: Twine simplifies the process of creating digital texts rather than analog ones, and it includes tools that allow Twine authors to conceal the rules and structure of their works from the reader. For example: In a choose-your-own-adventure book, the reader can page through to find the various endings or skip ahead to other segments, and the reader often has to keep track of states relevant to the game (how many weird potions she’s carrying, for instance.) Twine keeps track of these states as the author directs, and it doesn’t necessarily tell the reader it’s doing so. Thus Twine games are often opaque, only revealing their full shapes to the player over the course of the narrative and sometimes not entirely at all.

Actually, this is one of the interesting things about digital games versus analog games as a whole. Think about a board game or a physical sport: You and the other players (or referees) are responsible for keeping the rules. But in the case of a digital game, the author dictates the rules through code, and the computer then enforces those rules while you’re playing. You don’t have to imagine or keep track of how far Pac-Man moves per second or what happens when a line of Tetris pieces forms; the game constantly tracks
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des things for you and tells you what happens as a result of your actions. And the game can track them without you even knowing it’s happening, so there’s the potential for surprise.¹

Thus Twine readers/players can experience a narrative in a way that would be difficult or impossible to reproduce on paper. Twine games can track how long we’ve lingered on particular decisions, remember the decisions we’ve made, and shift the later narrative accordingly without our necessarily being able to perceive a direct connection between our actions and the results. Take a game like Gaming Pixie’s Eden, which mixes random events, player decisions, and tests of reaction time to create a feeling of urgency and risk, or Tom McHenry’s Horse Master, which openly tracks a number of statistics for the player while also secretly managing others that affect the course of the narrative in the background.

But the possibilities go beyond digital ruleskeeping, allowing Twine works to go beyond a simple emulation of paper-based texts. In Michael Brough’s scarfmemory, for example, hyperlinks function as parentheticals, unfolding diversions and side notes in the narrator’s internal monologue, adding to, revising, and complicating his recollections as the narrative progresses, turning the experience of reading the game into one that spirals inward rather than moves forward.

In Bryan Reid’s for political lovers, a little utopia sketch, clicking on links cycles the text through a series of possibilities—occupations, places, dreams—that reflect the hopeful tone of the work. Clicking the verbs in certain sentences cycles them through a dreamy set of options: translating, training dogs, becoming an astronaut, growing vegetables, building houses, and on and on.

Finally, in Christine Love’s Even Cowgirls Bleed, the cursor itself becomes the crosshair of the player character’s touchy gun. The player has to carefully navigate the cursor around the screen—learning the first time that she mouses over a link that her gun will go off at the object or person the link names, whether she wants it to or not. This transforms the usually relaxed, almost thoughtless activity of pointing and clicking a mouse into a deliberate, careful physical interaction with the text of the story.

To put it simply: Authors are doing things with Twine that aren’t possible with traditional text. And at the same time, they’re using interactive media to tell stories that mainstream videogames couldn’t dream of telling. Thus far, this double innovation has made Twine hard to classify, which has left it without a home or much support from either literary or videogame communities. This book is an effort to change that.

¹ For more discussion of this “digital ruleskeeper” concept, see Anna Anthropy’s Rise of the Videogame Zinesters (Seven Stories Press, 2012).
3. This Book

Twine is unique because it is at once a medium, form, and community. People use it to do wildly different things, and individual creators may never come in contact with one another. Yet we can still trace connections between their work.

This is a book about that work, as well as the communities, networks, and individual authors that have developed around Twine. It’s about putting them into conversation with one another and with more established literary communities, because the works that they’re creating are exciting, experimental, and worthy of sustained consideration. By finding stories we can tell about those works and those people, we can provide that consideration.

For example: Many of the figures who have risen to prominence in Twine circles are trans women. That trans women are recognized as the leaders of an artistic scene is a fact worth appreciating in its own right. But these authors’ recognition should also be considered in the context of the emergence of new transgender literatures in the early 2010s, as represented by books like Imogen Binnie’s *Nevada* and Casey Plett’s *A Safe Girl to Love*. These texts are the result of trans people wresting their stories back from non-trans publishers and audiences, telling stories about themselves for other trans people. The work being done by trans women authors in Twine needs to be seen as a part of this movement, and is just one example of how critical work is emerging in Twine communities in parallel with broader literary developments.

What other kinds of stories can we tell about Twine?

There’s the story of Twine as the focal point for the “personal games” movement of 2012-2013, catalyzed by Anna Anthropy’s critical text *Rise of the Videogame Zinesters*. This story’s been told before in different ways, positioning Twine as a truly accessible tool, the focal point for the growth of a community and the rise of a number of nontraditional authors in games. But there are elements of the story that people have left out, including the rapid pushback by traditional gamers and Twine’s relegation to marginalized status both because of the intrinsic accessibility traditional gamers saw it as representing and because of its cultural association with nontraditional authors.

We could tell the story of the mostly invisible labor that’s gone into the design and modification of the tool, the support work that’s enabled the creation of all the works that appear in this book. That story hasn’t really been told yet, but it’s an important one. We tend to privilege people who create flashy, visible products over those who do the work that enables that production. Support work is invisibilized, feminized labor, and there’s a rich story to be told about the work that’s gone into making Twine into what it is today. (Leon Arnott is our fairy godmother.)
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Finally, we could tell the story of Twine as the rebirth of hypertext after its decline in the 90s, as well as the repopularization of interactive fiction after its relegation to mostly niche status. Interactive fiction has always had rich, dedicated communities, but parser-based interactive fiction shrunk in popularity in the 1980s, after it became cheap and easy to generate digital graphics. Twine represents a broader resurgence of interest in interactive fiction, and it’s indirectly led to the development of other tools for producing this kind of work.

We could have told any of these singular stories about Twine—as phenomenon, as platform, as medium. But in putting this book together, it didn’t feel right to pick any one of them. Instead, we wanted to tell a number of stories by showcasing the actual works people have created with the tool—and the reactions actual people have had to those works.

Here’s the thing, though: Twine’s been used by a lot of people to make a lot of work. Go to Twinery.org and scroll through the lists of games: There are hundreds, maybe thousands. Some of these are by prolific writers whose names are well known, whereas others are made by people who gave the tool a shot and might never touch it again. The collective output of Twine users represents a bewildering spread of stories, kinds of authors, and approaches.

By necessity, then, any collection of Twine works is going to be partial. So how did I select the works that appear here?

Most of all, I wanted a wide range of authors, content, and forms. The works in this book include interactive poetry, traditional choose-your-own-adventure games, therapeutic experiences, personal essays, and elaborate jokes. And their authors are similarly varied: Most don’t fit into the traditional game designer profile of a straight, white man (though there are some of those, too).

Finally, the subjects of these games cover topics that mainstream games have still, in 2015, hardly touched. Partly, this speaks to the freedom afforded individual artists who aren’t working to create a multi-million dollar product in the context of the massive entertainment industry of contemporary videogames. But partly, I think it also speaks to the ways that the medium of interactive fiction is suited to exploring themes that graphical games—for all their high-definition visuals and incredible technology—still have trouble with.

For instance, digital games have a hard time with sexuality. Maybe it’s hard for designers to translate physical intimacy into a medium that’s historically been mainly concerned with competition, or maybe it’s an issue with the technical challenge of graphically depicting living bodies in a way that doesn’t look comical or grotesque. Regardless, narrative text-based games are uniquely positioned to explore sex in a way that many large-scale graphical games can’t. Games like Benji Bright’s *Fuck That Guy*, Olivia Vitolo’s *Negotiation*, Cara Ellison’s *Sacrilege*, Soha Kareem’s *reProgram*, and Gaming Pixie’s *Eden* get into themes of consent, sexual identity, and cruis-
merritt kopas

ing, whereas mainstream videogames have only recently gotten past the inclusion of monogamous same-sex partnerships.

More generally, a lot of the work in this book challenges digital games’ traditional elision of the body and emotions. Whereas in most mainstream games, protagonists have unfailing, untiring machine bodies and exhibit little to no emotional expression, the characters and roles in the games in this book have physical and psychic weight. Twine has occasionally been mocked for the number of games about physical or mental ailments that it’s been used to produce. But these works exist in the context of a medium that historically hasn’t made any space for explorations of weakness, hurt, or struggle. And far from being simple excursions in empathy tourism, many Twine games use interactivity to explore complex issues around embodiment and affect in wildly divergent ways.

Consider Depression Quest and Anhedonia, two games about the experience of depression. The former presents the player with a very systemic interface, one familiar to anyone with experience playing any kind of simulation game, in order to show the slow grind of mental illness, the way it keeps so many options just out of reach. Anhedonia, on the other hand, has links that behave in erratic and unpredictable ways, keeping the reader off balance. These two works use their interactive elements to tell very different stories about similar experiences of physical and mental distress.

Conversely, some works in Twine embrace the videogame logic of the power fantasy in order to subvert it. In Eva Problems’s SABBAT, players invoke dark magic to transform themselves into badass demons. This might be the beginning of any typical videogame, except that from there the player goes on to have abortive sex with a witch, smoke magically enhanced weed, and instigate the overthrow of patriarchal capitalism. It’s definitely a power fantasy, but an extremely unusual one, a fantasy of escape for those with antagonistic relationships toward their bodies—those who can feel something strange moving within them, waiting to be called into the world by just the right ritual. (To me it’s totally a trans narrative too, but in a way that isn’t necessarily obvious to non-trans audiences.)

Similarly, Aevee Bee’s Removed uses imagery associated with conventional roleplaying games—hit points, turn-based combat, and so on—to tell a story about forms of power found in unusual places. In Sloane’s Electro Primitive Girl, the trappings of the giant robot genre of manga become a vehicle to talk about femininity and strength. And in Winter Lake’s Rat Chaos, the feeling of control and heroism produced by so many games is both harnessed and undermined in order to invoke a feeling of illusory power that ultimately must give way to uncertainty and the messiness of reality.

Finally, a number of Twine games aren’t about dark magic or struggling with catastrophic psychological maladies or hooking up with the sexual partner of your dreams. They’re about mundane experiences of daily life, the kinds of issues that have been widely considered “too boring” to be portrayed in mainstream games.
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In Michael Brough’s *scarfpaper*, the quiet English designer best known for his mechanically complex puzzle games expresses his grief over the loss of a treasured, self-knitted scarf. Even working in text, Brough’s attention to the mechanics of play comes through to convey an everyday, personal experience of loss.

Similarly, Mary Hamilton’s *Detritus* confronts us with the challenge of leaving and thus, leaving behind. Over a successive series of moves, the player has to decide what to keep and what to abandon. What objects do we invest with meaning? How do we pare down our lives again and again?

Finally, Jeremy Penner’s *There Ought to Be a Word* explores the experience of dating during a separation from one’s partner. As a piece about the complicated snarl of feelings that arise when a long-term relationship ends—even on the best of terms—it’s a resonant, generous work about being a father that stands in stark contrast to mainstream games’ recent clumsy, patriarchy-steeeped attempts to put fathers in protagonist roles.

To be fair, mainstream videogames are more and more often attempting to deal with challenges other than violent ones, pains that aren’t physical, goals that aren’t acquisitive. But those projects are necessarily beholden to shareholders, making them subject to conservative convention and to the industry’s ongoing desire to cater to young white men in the most reductive, shameful ways possible.

To see what’s really exciting in videogames, we have to look to the fringes. From personal experiences of mental illness, to contracting with dark powers, to cruising at gay bars, to the adventures of space banditas in the far future and the experience of being a pregnant mermaid, the games in this book should be refreshing to anyone interested in the potential of interactive narrative but tired of games about grim antiheroes and Tolkien-obsessed fantasy settings.

I feel like it’s important to note that I don’t see this book as a “best of” Twine thus far, or as perfectly “representative” of the work being created with the tool. It felt simultaneously thrilling and overwhelming to build a list of games and then cull it down to a few dozen, and I tried my best to strike a balance between prolific writers and relative unknowns, between works that had touched me personally and those that had made an obvious impact on broader communities. And I tried to avoid too much of a temporal bias by including both older and more recent pieces. Unfortunately, of course, authors rudely continue to write while anthologies are being printed, and so nothing more recent than the fall of 2014 made it in.

Thus, instead of an exemplary or representative sample, I see this book as a dip into a river at a particular moment in time, gathering up some of the strange and unfamiliar things drifting past in hopes of inspiring others.
merritt kopas

to do the same. If this book inspires further critical consideration of Twine, including more anthologies with their own editors who have their own editorial preferences, then I’ll be overjoyed.

Choosing which works to include was hard enough. But then there’s another question: how do you anthologize interactive fiction? Collecting the works on their own felt unsatisfying, and trying to literally reproduce them as physical choose-your-own-adventure books, while potentially an interesting commentary on the difference between those forms, seemed like a pointless exercise. So what could a book format add?

Jeanne Thornton suggested that we print playthroughs of each work, drawing on the tradition of annotated literature to produce a book that would be comprised of a series of conversations between games and players. Initially, we thought about printing this commentary in the margins, as annotations. But late in the process, we decided on printing single-column, with commentary following each passage. This format means that the book reads less as a linear collection of hypertext works with some added notes and more as a true series of dialogues between the works and their selected readers.

In choosing those readers for the book, I tried to pick people who I thought might have interesting things to say about a particular piece, who might have a personal connection to it, or who I thought might be fruitfully challenged by it. There’s significant overlap between the list of authors who contributed games and those who contributed playthroughs, and that’s by design. Twine communities are critically as well as creatively vibrant, with many authors generating insightful critique and analysis of each other’s work, and although Twine works are certainly worthy of consideration by more traditional literary critics, we didn’t want to set up a dynamic by which all the works in this book were up for judgment.

Still, in some cases I wanted to bring in readers who aren’t involved in Twine communities themselves, but who I thought might have interesting perspectives. What would it be like to play through Eva Problem’s SABBAT—a work that approaches themes of trans experience in a totally unexpected way—with Imogen Binnie, an traditional literary fiction author who writes trans stories like Nevada? What might Leigh Alexander, one of the most insightful games critics writing today, have to say about Christine Love’s Even Cowgirls Bleed?

Admittedly, this was kind of an experiment—I wasn’t entirely sure what to expect when I assigned readers their works. But what I got back astonished me. The playthroughs recorded in this book not only give Twine games the critical attention they deserve, but share broader insights about interactive fiction, digital games, and storytelling.
Introduction

For example, in his reading of *Fuck that Guy*, Benji Bright’s game about gay casual sex, Riley MacLeod draws out connections between gay men’s tech-enabled hookups and the iterative, repeatable nature of interactive fiction. Just as interactive fiction allures with the promise of taking another path to see what might have been, apps like Scruff and Grindr continually present the promise of someone new — another chance, another possibility.

Other readers chose to dive deep into the inner workings of their subjects. As Naomi Clark plays Tom McHenry’s *Horse Master*, she admits: “I have played this game to its bones, I have read the code.” In doing so, she shows us the technical workings of the piece, providing a deeper understanding of the game than most players might typically glean. Non-technical readers might wonder at the value of this kind of exercise, but given the ways in which all videogames are capable of hiding their rules from the player, this kind of deep reading of the code is as valuable as a technical analysis of the prose that makes up the game as the player experiences it, just as understanding the mechanics of syntax and rhythm gives us new ways to examine poetry.

And other readers still chart out the personal and artistic relationships between themselves and creators. Far from being signs of “corrupt” or insular design circles, as some conspiracy theorists would have it, these relations are critical to the development of any artistic community. In her reading of Aevee Bee’s *Removed*, for example, Lydia Neon intertwines conversations about the messiness of memory and authorial intent with notes on her own relationship to the author. At one point, she actually texts Aevee, asking if one of the characters in the work is meant to be her. These kinds of relationships don’t jeopardize some fabled notion of “critical distance”—they’re evidence of generative links between authors that make up the broader communities this book is about.

To me, the conversational format of these “readings” suggests the feeling of sitting next to the player and listening to them talk about the work they’re engaging with as they move through it. Some of these reflections are deeply personal, while others focus on the technical qualities of the work. (And given the diversity of approaches, some readings will inevitably appeal more to some readers than others.) In each case, though, the conversation between game and player feels greater than the sum of its parts.

4. THE FUTURE

I’m beyond thrilled that this book has come together; I think it’s well past due. But I don’t want *Videogames for Humans* to be seen as the capstone
of the “Twine revolution,” a kind of historical record of some interesting work done in the early 2010s. Because really, in so many ways, this is still a beginning.

First, I hope this book kicks off more communication and crossover between fringe game design and literary communities. Above, I gave the example of the need for conversation between the parallel work being done by trans authors in Twine and in traditional fiction, but I think there’s a more general need here too. Twine is marginalized within games circles for not fitting into the dominant shape of videogames—which means that Twine needs to build bridges to other creative communities. And literary and artistic circles, too, could benefit from taking a closer look at Twine and the exciting artists and authors who are finding their voice with it.

Second, I want to challenge the notion that the current state of Twine represents some kind of final achievement of diversity in digital games. Yes, it’s fantastic that through Twine, we have more and more games by nontraditional game designers. But it would be a mistake to think that the relative success of Twine means that problems of power have been solved. For one, the status of queers, women, people of color, and people with disabilities in games is still tenuous. Few of these authors are accorded the respect, attention, or monetary success of their white male counterparts, even within alternative games communities, and publicly working in digital games is still an intensely precarious position for women, people of color, queers, and people with disabilities.

And while we should rightly celebrate the achievements of women and queers in this hostile space, I want to be real about the fact that we’ve been not nearly as proactive as we should about attending to issues of white supremacy. The people whose work the community holds up may be women—and often poor, gay, trans women, at that—but those female authors are still overwhelmingly white. There are people of color doing work in Twine, but they’re systematically kept out of the spotlight. I’ve made an attempt to resist that dynamic in this collection, but it would be naive to believe that this book existed outside of the context of systemic racism.

To put it bluntly, this ongoing exclusion is bullshit, and if we’re serious about building radical alternatives to mainstream videogames, to building more inclusive spaces, then we absolutely have to pay more attention to the ways that white supremacy manifests even in our supposedly more progressive communities. We need to constantly remind ourselves and others that so long as the women who are successful and visible as authors or designers are mostly white, we’re not doing well enough.

Finally, I see this book as a step towards more human forms of digital play. I mean, I did call it “Videogames for Humans.” Twine isn’t the only or

2 Of course, naming a book Videogames for Humans carries with it some dangers. Namely, that we mistake the progress we’ve made toward democratizing games with the arrival of a perfect, ideally “human” state of affairs. That’s obviously not the case.
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best route there, but it is an especially inviting one.

So what do more human forms of digital play look like?

They look like a move away from "the industry," from modes of production that rely on exploited labor and that perpetuate the technological fetishism of cutting edge, "hyperrealistic" graphics and "immersive" worlds in which we are meant to lose ourselves.

They look like games by and about more kinds of people, games not just about marginalized experiences, but created by and for people who historically haven’t seen themselves in games and who have been denied access to them as a creative medium.

They look like games with a wider range of purposes, games that aren’t about collecting or shooting or managing or accomplishing, but that are about communicating, interacting, resting, healing, and growing.

They look like experiences that use the unique features of videogames to connect people, rather than to isolate us from one another.

They look like games that are short, small, and generous with the player’s time, that don’t want to consume the player, but that invite them into playful engagement.

And they look like games that are positive escapes rather than negative ones, experiences that help us to imagine better worlds rather than simply providing temporary reprieve from the one we live in.

This book is one step toward all of that. Other steps are happening all the time, and I hope this anthology sparks many more anthologies in its wake.

This is a book about Twine. But let’s not let it be the book, yeah?

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In ways, Twine (and all text-based media) carries with it some exclusions that other forms of digital games don’t. You don’t really need to be able to read English to play *Super Mario Brothers* or *Pac-Man*, but every one of the works in this book was originally produced in that language. (Some thankless volunteers like David T. Marchand have translated some of the more popular Twine works into other languages, but most remain English-only.) This emphasis on text can also inadvertently exclude people with disorders like dyslexia. An added complication is that while a reader can check the page count of a book or the length of a poem as a gauge on how long the experience will be, many Twine games don’t provide any sort of time estimate, or even rely on this unfolding quality, the ability to conceal the full contours of the work. This is definitely one of the interesting features of the form, but it can also cause problems for readers who would like to have some sense of what it is that they’re getting into.

Thus in calling this book *Videogames for Humans*, my goal wasn’t to imply that we’re there, that we’re good.
Handbook of Computer Game Studies

edited by Joost Raessens and Jeffrey Goldstein

The MIT Press Cambridge, Massachusetts London, England
Although computer and video games are most often thought of as pure entertainment, it is important to understand that they are enormously powerful learning tools as well. Realizing this will not only help us to design better games, but will allow us—using computer games as a medium that can express many different messages—to create effective new learning opportunities and tools for those raised on a heavy computer and video game diet from an early age.

In this chapter I shall explore the **learning dimensions** of computer games. In doing so I shall refer to the phenomenon I am talking about here—putting games and learning together—as *digital game-based learning*.1

My aims here are to help clarify the rich and complex relationship between computer games and learning, and to highlight computer and video games’ enormous potential for helping people to learn more effectively in the future. In so doing, I will address the following:

1. Why might we want or need to consciously design and use games as vehicles for learning “serious” (i.e., nongame) content and subject matter?
2. What learning already happens when a person plays a computer or video game designed purely for entertainment—whether consciously or partially or totally unbeknownst to the player?
3. *How do we design learning games that create rigorous learning of given academic or training material and, at the same time, appeal to players?*
4. *Where are we today in the process of creating digital game-based learning? What has been done so far and how successful has it been? How can we do better? What will the future hold?*

**Why Use Games for Learning?**

*Play is our brain’s favorite way of learning things.*

—Diane Ackerman

Anyone who makes a distinction between education and entertainment doesn’t know the first thing about either one.

—Attributed to Marshall McLuhan

Why might we want or need to consciously design and use computer and video games for learning “real-world” (i.e., nongame) content and subject matter? There are two key reasons:

- Our learners have changed radically.
- These learners need to be motivated in new ways.

All digital game-based learning is based on these two key premises. Let us examine them in more detail.

The first premise that today’s learners have changed *in some fundamentally important ways*. Growing up with digital technology, of which computer and video games are a major part, has dramatically—and, importantly, discontinuously—changed the way people raised in this time think and process information. These changes have been so enormous that today’s younger people have, in their intellectual style and preferences, *very different minds* from their parents and, in fact, *all preceding generations*.

The second premise is that *computer games can provide a new way to motivate today’s students to learn*. One of the growing problems facing *all formal learning*, whether classroom, online, distance, or “e-,” is *keeping students motivated*—motivated enough to stick with the learning process to the end of a class, lesson, session, course, semester, or degree. Motivation is important because learning requires putting out effort. However, the things that were effective in motivating learners in past do not motivate the learners of today. We need something new.

Fortunately, we now have a generation that when growing up deeply experienced, for the first time in history, a radically new form of play—computer and video games. As this new form of entertainment has radically
shaped their preferences and abilities, it has absorbed their time and effort to an extent never before seen. The typical student has now played thousands of hours of video games before graduating from college. The engagement power of electronic games for this generation (and those to come) may be, if used correctly, the biggest learning motivator we have ever seen.

**How Learners Have Changed**

It is interesting to me that so few have observed that our students are no longer the people our educational system was designed to teach. Today's students have not just changed incrementally from those of the past, nor simply changed their slang, clothes, body adornments, or styles, as has happened between generations previously. A really big discontinuity has taken place. One might even call it a “singularity”—an event that changes things so fundamentally that there is absolutely no going back. This so-called “singularity” is the arrival and rapid dissemination of digital technology in the last decades of the twentieth century.

Today’s students—kindergarteners through college—represent the first generation to grow up with this new technology. They have spent their entire lives surrounded by and using computers, video games, digital music players, video cameras, cell phones, and all the other toys and tools of the digital age. Today’s average college graduate has spent fewer than five thousand hours of their lives reading, but more than ten thousand hours playing video games and another ten on their cell phones (not to mention twenty thousand hours watching TV). Computer games, email, the Internet, cell phones, and instant messaging are integral parts of their lives.

It is now clear that as a result of this ubiquitous digital environment and the sheer volume of their interaction with it, today’s students think and process information fundamentally differently from their predecessors. These differences go far further and deeper than most educators suspect or realize. “Different kinds of experiences lead to different brain structures,” says Dr. Bruce D. Berry of Baylor College of Medicine. It is very likely that our students’ brains have physically changed—and are different from those of their parents—as a result of how they grew up. But whether or not this is literally true, we can say with certainty that their thinking patterns have changed. I will get to how they have changed shortly.

What should we call these “new” students of today? Some refer to them as the N-(for Net)-gen or D-(for digital)-gen. But the most useful designation I have found for them is Digital Natives. Our students today are all “native speakers” of the digital language of computers, video games, and the Internet.

So what does that make the rest of us? Those of us who were not born into the digital world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology are, and always will be compared to them, Digital Immigrants.

The importance of the distinction is this: As Digital Immigrants learn—like all immigrants, some better than others—to adapt to their environment, they always retain, to some degree, their “accent,” that is, their foot in the past. The “Digital Immigrant accent” can be seen in such things as turning to the Internet for information second rather than first, or in reading the manual for a program rather than assuming that the program itself will teach us to use it. Today’s older folk were socialized differently from their kids, and are now in the process of learning a new language. And a language learned later in life, scientists tell us, goes into a different part of the brain.

There are hundreds of examples of the Digital Immigrant accent. They include printing out your email (or having your secretary print it out for you—an even “thicker” accent); needing to print out a document written on the computer in order to edit it (rather than just editing on the screen); and bringing people physically into your office to see an interesting website (rather than just sending them the URL). I’m sure you can think of one or two examples of your own without much effort. My own favorite example is the “Did you get my email?” phone call. Those of us who are Digital Immigrants can, and should, laugh at ourselves and our accent.

But this is not a joke. It’s deadly serious, because the single biggest problem facing education today is that our Digital Immigrant instructors, who speak an outdated language (that of the predigital age), are struggling to teach a population that speaks an entirely new language.

This is obvious to the Digital Natives. School often feels pretty much as if we’ve brought in a population of heavily accented, unintelligible foreigners to lecture them. Ever since Pong arrived in 1974, our kids have been adjusting or programming their brains to the speed, interactivity, and other factors in computer and video games, much as their parents the boomers reprogrammed their brains to accommodate TV. But when they get to school they have to “power down.”

The “mind alterations” or “cognitive changes” caused by the new digital technologies and media have led to a variety of new needs and preferences on the
part of the younger generation, particularly—although by no means exclusively—in the area of learning. In fact, says one observer, “Linear thought processes that dominate educational systems now can actually retard learning for brains developed through game and Web-surfing processes on the computer.” (Moore, 1997)

Ten Ways Digital Natives Are Different
Exactly how are the Digital Native learners different as a result of the technology and games they grew up with? Here are ten examples.

Twitch Speed versus Conventional Speed
“Twitch speed” is the rate that a game player’s thumbs move up and down on the controller. Because of games and other experiences (such as MTV), the Digital Natives have had far more experience at processing information quickly than their predecessors, and are therefore better at it. Of course, humans have always been capable of operating at faster than “normal” speeds—think of airplane pilots, race-car drivers, and speed-reading guru Evelyn Wood—but this ability has now moved into a generation at large, and at an early age. A big problem Digital Natives face is that, after MTV and video games, they essentially hit a brick wall—short of piloting a jet, little in real life moves that fast. Traditional school feels to them like a depressant. We see the Digital Natives’ need for speed manifesting itself in a number of ways, including a demand for a faster pace of development, less “time-in-grade,” and shorter lead times to success. We need to create learning experiences that maintain the pace and exploit the Digital Natives’ facility with twitch speed while adding content that is important and useful. Digital game-based learning is one of the ways we can do this.

Parallel Processing versus Linear Processing
Digital Natives grew up doing their homework while watching TV and doing almost everything while wearing a Walkman. Most of these people feel much more comfortable than their predecessors doing more than one thing at a time. At least some of this comes from games—Patricia Greenfield of UCLA (1984) cites parallel processing as a “cognitive requirement of skillful video game playing.” It turns out our attention does not necessarily have to be limited to only one thing at a time, because the mind can actually process many tracks at once (or in very quick succession) and often has quite a bit of “idle time” from its primary task that can be used to handle other things. “There is no question that people can learn to do quite a bit of parallel processing in certain job situations, such as a lot of military jobs,” says Susan Chipman. Today it is common to see young computer artists creating complex graphics while listening to music and chatting with coworkers, young business people having multiple conversations on the phone while reading their computer screens and email, and securities traders managing multiple screens of information simultaneously. On today’s cable TV news, the anchor person takes up only a small corner of the screen, the remainder being filled with sports statistics, weather information, stock quotes, and headlines, all presented simultaneously.

We need to be thinking of additional ways to enhance parallel processing for the Digital Natives to take advantage of this now more highly enhanced human capability. We can feed Digital Natives much more information at once than has been done in the past. As in their games, having all the information at their fingertips—numbers, video, links, simultaneous conversations, with the ability to move seamlessly between them—is the Digital Native’s nirvana.

Random Access versus Linear Thinking
Digital Natives were the first to experience hypertext and “clicking around” in their games and on the web. As a result, “they develop hypertext minds,” says William Winn. “They leap around. It’s as though their cognitive structures were parallel, not sequential.” Another reports that the Digital Native takes in and outputs information differently—typically from multiple sources and occurring in a less sequential manner. This new random access information structure has increased the Digital Natives’ awareness of and ability to make connections, has freed them from the constraint of a single path of thought. Although some fear that unbridled hyperlinking may make it more difficult for these people to follow a linear argument and to do some types of deep or logical thinking, what has been lost in linearity may have been made up for by a greater ability to perceive, and think in, structure and patterns. “Our electronically configured world,” wrote Marshall McLuhan “has led us to move from the habit of data classification to the mode of pattern recognition. We can no longer build serially, block-by-block, step-by-step, because instant communication insures that all factors of the environment and of experience coexist in a state of active interplay” (1967, p. 9).

Graphics First versus Text First
In previous generations, graphics were generally illustrations, accompanying the text and providing some
kind of elucidation. For today’s Digital Natives, the relationship is almost completely reversed: the role of text is to elucidate something that was first experienced as an image. Since childhood, these people have been continuously exposed to television, and computer and video games that put high-quality, highly expressive graphics in front of them with little or no accompanying text. The result has been to acutely sharpen their visual sensitivity. They find it much more natural than their predecessors to begin with visuals, and to mix text and graphics in a richly meaningful way.

Video games figure importantly in Greenfield’s explanation of a worldwide rise of what she terms “visual intelligence” (1984). It is linked to the other changes as well, because, in her words, “pictorial images, in general, tend to elicit parallel processing.”

This shift toward graphic primacy in the younger generation raises some thorny issues with regard to textual literacy and depth of information. Our challenge is to design ways to use this shift to enhance comprehension, while still maintaining the same or even greater richness of information in the new visual context.

**Connected versus Stand-Alone**

The Digital Natives have been raised with, and become accustomed to, the worldwide connectedness of email, broadcast messages, bulletin boards, usegroups, chat, multiplayer games, and instant messaging. The games generations’ connectedness is both synchronous and asynchronous—any time, anywhere, at almost no cost. For Digital Natives, there are people who can be contacted, spoken to and played with—somewhere in the world—24/7/365.

The connectedness of the Digital Natives has made them much less constrained by their physical location and more willing to work in the so-called “virtual teams” that are becoming more useful in a variety of education settings and businesses. Some claim that this leads to depersonalization, as people meet, chat, play, and even work on the web without ever seeing each other or knowing the other person’s name or gender. But people who do this often find it enormously liberating and fun to be freed of all the effects of “lookism” and other prejudices. Moreover, as a result of their connected experience, Digital Natives tend to think differently about how to get information and solve problems. When a Digital Native wants to know something, he or she typically searches the web and possibly posts his question to a bulletin board, contacting thousands of people, rather than relying on only one or two “authorities.”

**Active versus Passive**

A striking cross-generational difference can be observed when people are given new software to learn. Older folks almost invariably want to read the manual first, afraid they won’t understand how the software works or that they’ll break something. Digital Natives rarely even think of reading a manual. They just play with the software, hitting every key if necessary, until they figure it out. If they can’t, they assume the problem is with the software, not with them—software is supposed to teach you how to use it. This attitude is almost certainly a direct result of growing up with electronic games where each level and monster had to be figured out by trial and error, and each trial click could lead to a hidden surprise. The games were designed to teach you as you go, as Greenfield was one of the first to point out. We now see much less tolerance among the Digital Natives for passive situations such as lectures, classrooms, and meetings. Nike’s slogan “Just do it” (which began in 1988) hits this generational change squarely on the head (Greenfield, 1984).

**Payoff versus Patience**

One of the biggest lessons the games generation learned from playing all those hours of video games is that if you put in the hours and master the game, you will be rewarded—with the next level, with a win, with a place on the high scorers’ list. What you do determines what you get, and what you get is worth the effort you put in. Computers excel at giving feedback, and the payoff for any action is typically extremely clear. A key outcome of this is a huge intolerance on the part of Digital Natives for things that don’t pay off at the level expected. Digital Natives make payoff versus patience decisions every minute. “Why should I bother?” they constantly ask. The challenge is to understand just how important these payoff versus patience trade-offs are, and to find ways to offer Digital Natives meaningful rewards now, rather than advice about how things “will pay off in the long run.”

**Fantasy versus Reality**

Another striking aspect of the games generation is the degree to which fantasy elements, both from the past (medieval, Dungeons & Dragons imagery), and the future (Star Wars, Star Trek, and other science fiction imagery) pervade their lives. This phenomenon has certainly been encouraged by games and technology. Although young people have always indulged in fantasy play, the computer has by its nature made this easier and more realistic, in many ways bringing it to life. Network
Technology allows people not only to create their new fantasy identities, but also to express them to others and join in fantasy communities and games such as EverQuest. Rather than admonish Digital Natives to “grow up and get real” and abandon their rich fantasy worlds, we need to search for new ways to combine fantasy and reality to everyone’s benefit.

Play versus Work

Although often derided in the press as intellectual slackers, in reality the Digital Natives are very much an intellectual problem-solving-oriented generation. Many types of complex logic, challenging puzzles, spatial relationships, and other demanding “thinking” tasks are built into the computer and video games they so enjoy. They spend more on such electronic games than on going to the movies; and unlike for many Digital Immigrants, getting a complex PC to run can be a fun way to spend their time. Some have argued that play and games are good preparation for work. For today’s Digital Natives play is work to a large extent, and work is increasingly seen in terms of games and game play. The fact that the “real life” games are very serious does not make the player’s approach any different than the way he or she approaches game software. Achievement, winning, and beating competitors are all very much part of the ethic and process.

Technology as Friend versus Technology as Foe

Finally, growing up with computers has engendered an overall attitude toward technology in the minds of the Digital Natives that is very different from that of their elders (Tapscott, 1998). To much of the older generation, technology is something to be feared, tolerated, or at best harnessed to one’s purposes. To the Digital Native, the computer is a friend. It’s where he or she has always turned for play, relaxation, and fun. It’s something they know—the huge generational reversal in technical skill, where parents must turn to their children for help in using their expensive equipment, is now legendary. To Digital Natives, owning or having access to a networked, game-enabled computer feels almost like a birthright—and certainly a necessity.

Attitude

In addition to all of the above, a defining characteristic of the Digital Native is “attitude”—an irreverent, often sarcastic, tell-it-like-it-is, don’t-try-to-pull-the-wool-over-my-eyes way of looking at things. This attitude is captured in many of their games and especially in Jellyvision’s game series You Don’t Know Jack. (“What were you thinking?”) Attitude may have originated as a reaction to all the commercials and other television that Digital Natives grew up with. But however it started, it is certainly now part of their language (“Duh!”) and almost a sine qua non for communicating with them effectively. In fact, not having attitude—or, worse, doing it wrong—is definitely part of the “Digital Immigrant accent” and is sure to be mocked.

In all these ways—and there are many others—the Digital Natives are cognitively different from their predecessors. There is strong scientific evidence from neuroscientists and social psychologists on brain plasticity and malleability to back this up.6

Digital Natives accustomed to the twitch speed, multitasking, random-access, graphics first, active, connected, fun, fantasy, and quick payoff world of their video games, MTV, and Internet feel bored by most of today’s approaches to learning, well-meaning as they may be. Worse, the many skills that new technologies have actually enhanced, such as parallel processing, graphics awareness, random access, and so on—that have profound implications for their learning—are almost totally ignored by educators.

All these cognitive differences, resulting from years of “new media socialization” and profoundly affecting and changing the generations’ learning styles and abilities, cry out for new approaches to learning with a better “fit” for the Digital Natives. Although certainly not the only way, computer and video games provide one of the few structures we currently have that is capable of meeting many of the Digital Natives’ changing learning needs and requirements. This is the key reason why digital game-based learning is beginning to emerge and thrive.

Why It Works

In today’s education, the process of learning is rarely the motivating or engaging factor. Although there are clearly some situations in which Digital Natives find learning interesting and are eager to remain engaged in the learning process (say a course in computers, or how to get a higher income), there are many more situations in which they do and are not. Their motivation to exert the effort needed to learn typically comes externally, from punishment and rewards.

Game playing, of course, is just the opposite. The main reason people play games is because the process of game playing is engaging. So engaging, in fact, that I would argue that computer and video games are possibly the most engaging pastime in the history of mankind. These games bring together combination of
motivating elements not found together in any other medium:

- They are a form of fun. That gives us enjoyment and pleasure.
- They are form of play. That gives us intense and passionate involvement.
- They have rules. That gives us structure.
- They have goals. That gives us motivation.
- They are interactive. That gives us doing.
- They are adaptive. That gives us flow.
- They have outcomes and feedback. That gives us learning.
- They have win states. That gives us ego gratification.
- They have conflict/competition/challenge/opposition. That gives us adrenaline.
- They have problem solving. That sparks our creativity.
- They have interaction. That gives us social groups.
- They have characters and story. That gives us emotion.

Because of all these factors, combining games and learning can potentially add enormously to the motivation of students to learn what they may not be otherwise motivated to learn, and increase their engagement in the learning process. How? For a start, fun in the learning process creates relaxation. It enables them to put forth effort without resentment. Play has a deep biological, evolutionarily important function, which has to do specifically with learning—it is nature's way of making it engaging for both humans and animal children learn (Hillis, 2000). "Children are expected to play because we recognize (perhaps unconsciously) the fundamental utility of games as an educational tool," says Chris Crawford, noted game designer (Crawford, 1980).

Games provide the formal, structured way we harness and unleash all the power of fun and play in the learning process. Games engage and motivate us through their goals and our struggle to achieve them, through the decisions we make and the feedback we get from them, through the opponents and challenges we have to overcome, and through the emotions and connections with others we feel when playing. It is this powerful stuff that keeps kids glued to their computers and consoles for those countless hours.

Consciously combining all this engaging power of computer games with a set of interactive learning processes (that can take several different forms depending on the learning goals) is what creates digital game-based learning. The key of course, is to manage how the two are put together into a whole package. Another big part of the picture is bow that package is used as part of a learning process. In most cases, digital game-based learning isn't designed to do an entire training or teaching job alone, and is often part of larger educational initiatives and approaches, often including teachers and other types of learning. But increasingly, the game portion is taking up a more up-front, more primary, larger role in the process.

A final requirement—and this is no different than any learning—is that the content and the learner be well matched. If they are not, little or no learning will happen with any method.

Should Learning Be Fun?

I have spoken a lot about “fun” in the learning process. Should learning be fun? Not everyone thinks so. A. P. Herbert has said, “People must not do things for fun. We are not here for fun. There is no reference to fun in any act of Parliament.” (2001). Clifford Stoll, in his book High Tech Heretics (1999) says, “I may be old fashioned, but learning is hard work.” Yale Professor David Gelernter calls education “the hardest work most of us will ever do.”

Digital game-based learning doesn’t dispute this. What it takes issue with in “hard work” is not the “hard” part—no one seriously disputes that effort and energy is involved in learning. And all of the best games are hard to master. The change, rather, is in the word “work.” Learning, as great teachers have known throughout the ages, does not feel like work when you’re having fun. The MIT Media Lab’s term for this is “hard fun” (taken from the comment of a third-grader) (Negroponte, 1996, p. 196). Digital game-based learning can certainly be hard fun. But at its very best, even the hard part goes away, and it becomes all fun, a really good time from which, at the end, you have gotten better at something, through a process that Doug Crockford of LucasArts has referred to as “stealth learning.” As the keen motivator of people Dale Carnegie observed, “People rarely succeed unless they have fun in what they are doing” (1964).

Not Everyone “Gets It”

Yet although digital game-based learning has been slowly making its way into education and training for over twenty years—for kids as “edutainment” and for adults as simulation and military games—many managers and leaders in the education world still do not fully accept its premises and utility. Many of these
people are strong believers in "traditional" learning—the essentially nineteenth-century methods of rote learning, telling, and testing, and so on. One of the most frustrating things for digital game-based learning advocates is to bump heads with such people, many of whom are the potential purchasers of these products, who just "don't get it."

It is important that we help those raised on traditional educational and training theory understand that because digital technology is such a discontinuity, much, if not most of the data collected and the theories formulated in the past about how people think and learn no longer apply. This is one reason why our entire learning system, which worked well for hundreds of years, is breaking down. The "stuff" to be learned can no longer be just "told" to today's learners. It must be learned by them, through questions, discovery, construction, interaction, and, above all, fun. Digital game-based learning is a great way for these leaders to begin to create this. Although certainly not the only way, it represents one of the first effective and doable means to alter the learning process in a way that appeals to, and excites, Digital Natives.

Effectiveness
But how effective is it? Many criticize today's learning games, and there is much to criticize. But if some of these games don't produce learning it is not because they are games, or because the concept of game-based learning is faulty. It's because those particular games are badly designed.

As anyone who has ever looked at the problem of measuring "true learning" knows, it is no easy task. The real measure of learning is behavior change—would this individual, when faced with an identical or similar problem in the future, do something different (mentally or physically) from before? Because we can never know this until it happens, the proxy that we typically use to measure learning is the test: a series of questions, problems, and hypotheticals that let the learner demonstrate, although in a somewhat artificial context, the new behaviors and approaches they have learned. (When observing and measuring behaviors is possible, this is a better way to determine effectiveness.)

So what people really want to know is: are the test scores the same as with the other methods of learning? Although there have only been a few head-to-head comparisons between digital game-based learning and alternatives conducted in this way, the studies that have been done show that learning games that are well designed do produce learning, and lots of it, by and while engaging players.

The Lightspan Partnership, now part of Plato Learning, which created PlayStation games for curricular reinforcement in elementary school, measured that when one strips out the recesses and the lunch and the in-between times, a typical 9-3 school day actually consists of about three hours of instruction time.9 So if they could get kids to play their games for six hours over a weekend, and the games were only 50 percent educational, they'd effectively add a day a week to their schooling. This would, they hoped, be reflected in higher test scores. Lightspan conducted studies in over four hundred individual school districts and performed a meta-analysis of all of them. They found increases in vocabulary and language arts of 24 and 25 percent respectively over the control groups, whereas math problem solving and math procedures and algorithms scores were 51 and 30 percent higher.10

Click Health, which made games to help kids self-manage their health issues, did clinical trials funded by the National Institutes of Health. They found, in the case of diabetes, that kids playing their games (as compared to a control group playing a pinball game) showed measurable gains in self-efficacy, communication with parents, and diabetes self-care. And more important, urgent doctor visits for diabetes-related problems declined 77 percent in the treatment group (Lieberman, 1998).

Scientific Learning's Fast ForWard game-based program for retraining kids with reading problems conducted National Field Trials using sixty independent professionals at thirty-five sites across the United States and Canada. Using standardized tests, each of the thirty-five sites reported conclusive validation of the program's effectiveness, with 90 percent of the children achieving significant gains in one or more tested areas.11

Over and over it's the same simple story. Practice—time spent on learning—works. People don't like to practice. Games capture their attention and make it happen. And of course they must be practicing the right things, so design is important.

The U.S. military, which has a quarter of a million eighteen-year-olds to educate every year, is a big believer in learning games as a way to reach their Digital Natives. They know their volunteers expect this: "If we don't do things that way, they're not going to want to be in our environment."12 What's more, they've observed it working operationally in the field. "We've seen it time and time again in flying airplanes, in our
mission simulators," practical-minded Department of Defense trainers say. They are, in fact, perplexed by educators who say "We don't know that educational technology works—we need to do some more studies." "We know the technology works," they retort. "We just want to get on with using it."13

Today's educators with the most crucial learning missions—teaching the handicapped and the military—are already using custom-designed computer and video games as an effective way of reaching Digital Natives. In the end, much of the reason comes down to one simple thing: time spent on the task. Computer and video and games are incredibly powerful and effective learning tools, mainly because of the thousands of hours kids spend playing them.

But perhaps the most important reason why we can say for sure that digital game-based learning works as a learning tool is that all games already cause players to learn. Let's look now at what the players of computer and video games are already learning.

What Players Learn from Playing Computer and Video Games
Some observers express the opinion that computer and video games are "mindless," that kids don't learn anything beyond hand-eye coordination from the thousands of hours they spend playing video games. Others assert that although players may learn about the game (e.g., how to use a Pokeball on a Squirtle), they learn nothing about real life from these games. Still others express the opinion that violent video games "teach our kids to kill."

All of these positions are, I think, wrong. For whenever one plays a game—video, computer or otherwise—and whatever game one plays, learning happens constantly, whether the players want it to, and are aware of it, or not. And it is not just about the game that players are learning, but "about life." Learning about life is one of the great positive consequences of all game playing. Learning takes place every time one plays, in every game, continuously and simultaneously, on several levels. One need not even be paying much conscious attention. But we do have to pay some attention in order to analyze how and what players learn.

Five Levels of Learning in Games
I will focus here on five levels in which learning happens in video and computer games. My goal is not to be exhaustive, and it's quite clear that these levels intertwine.

I'll call these five levels the "How," "What," "Why," "Where," and "When" levels of game learning. There are no doubt more sophisticated names for them, but I'd prefer to avoid jargon as much as possible. Because I think these five levels apply, to a greater or lesser extent, to all game players, at any age, I will generally not distinguish here between older kids and younger kids, except in one or two specific instances. However, I think this distinction is sometimes useful, and can be broken down even further.

Let us examine what kids actually learn about real life from the video and computer games with which they spend so much of their time.

Learning Level 1: Learning How
The most explicit level of learning that takes place as one plays a video or computer game is that one is learning how to do something. As one plays, one learns, gradually or quickly, the moves of the game. One learns how the various characters, pieces, or anything else, can move, and what you can make them do. One learns how to drag tiles to build up a virtual city or theme park. One learns how to protect oneself in a fighting game and what weapons to use to defeat your enemies. One learns how to train a creature and make it evolve and fight. One learns how to use weapons. And of course one learns the physical manipulations of the controllers involved in doing all this.

An additional, nonconscious message that one learns playing a game, of course, is that in video and computer games one has control of what goes on on the screen, unlike when watching movies or TV. Even infants learn this and are fascinated by this ability to control the screen. Many of us have watched infants and toddlers sit moving the mouse and watching the screen with glee for long periods. This is, it seems to me, real world learning.

What else do players learn about the real world at the how level? If the games are pure fantasy, then the explicit "how to do it" moves may be pretty useless in the schoolyard or workplace. But learning how to flip Tetris pieces may enhance their mental spatial processing abilities, which could help them on a real world nonverbal test.

The more a game simulates anything in the real world, the more one learns about how to do things in that world. One early computer game, Life and Death, was about doing an appendectomy—in great detail, from diagnosis to surgery. The game was designed by a surgeon, and had a skillful player been called upon to do an emergency operation, I bet that he
or she would have acquitted his or herself reasonably well.

Designers of simulation games pride themselves on the games’ becoming ever more realistic and “lifelike.” One may not be able to learn to do everything—there are kinesthetic cues, for example that you need to learn in a real airplane simulator or on a real horse—but what you can learn how to do is huge, and still vastly under-explored. Can you learn to monitor and use the controls and gauges of a real life airplane or train? Can you learn your way around a real-life oil platform? Can you learn via a game to trade financial instruments? To manage a theme park? To aim a gun and be stealthy? You bet you can. And gamers often choose their games because they are interested in learning these things.

Typically in games, players not only learn how to do these things in terms of knowing the procedures, but they also practice them over and over, until the learning is internalized and becomes second nature. Game critic Dave Grossman (1999) highlights the aiming accuracy of a young mass killer, which he attributes to such practice, which may, in fact be the case. But just because one learns how to do something, it doesn’t mean one has learned when or whether one should do it. I will get to this later.

The How level also extends deeper, to more transferable learning, by enhancing non-game-specific skills. Heavy video and computer game players learn how to parallel process and multitask because they have to in order to succeed at the game. They learn how to take in many sources of information at once, such as the zoomed view, the overall view, the rear view mirror in a driving or flying game. Through practice in games they get better at integrating these perspectives simultaneously into a single world view. They learn how to incorporate peripheral information, a skill that has been shown to be enhanced by computer game-playing as well.

So, for example, we can ask “What, at the How level, does a kid learn about real life from playing Pokémon?” Principally, I think, he or she learns how to use and manage a large database of information. (He or she learns this, of course, nonconsciously, and without thinking of it at all in those terms.) This is a quite socially useful type of learning that we could easily apply to other large bodies of information such as to real plants and animals, or geographic data, if the context were as compelling!

Before we leave this first level, we should ask: “How do we know the learning at the How level actually takes place?” This is easy: we can observe it. People who practice something over and over learn it and get better. This is common knowledge.

So at just the How level, the video or computer game player learns quite a bit. But we have barely even scratched the surface of the learning that goes on in video and computer games.

Learning Level 2: Learning What At the next level of learning in video and computer games, players learn about what to do in any particular game (and, equally important, what not to do). In other words they learn the rules. The rules of any game teach you what is possible and/or doable in the game environment, and video and computer games are no exception. The very process of game-playing can be viewed as learning to understand the “rules code,” according to Sherry Turkle of MIT (1995).

Prior to the advent of computer and video games, players typically learned the rules of a game before they started playing it. However this is typically not true in electronic games—in these games the rules are built in to the programming, and you learn them as you play. Players typically learn the rules by trial and error, by playing and finding out what they can and can’t do, rather than by reading the list ahead of time. One finds out by playing, for example whether a shooting game allows you to attack someone on your own team, or whether a simulation game allows you to do destructive (or self-destructive) acts.

Some critics have found video and computer rules to be “restrictive,” and therefore limiting of learning. But an interesting feature of many video and computer games is that you can frequently change the built-in rules, by using the easily findable codes—known, to the dismay and misunderstanding of adults, as “cheat codes”—which are part of most games and passed around from player to player via the web, magazines, and word of mouth. These codes give you extra weapons, lives, power, and so on that let you essentially alter the rules.

So game players learn rules aren’t necessarily fixed, but can be changed, and that games provide different challenges with different resources at your command.

What do a video game’s rules teach kids about real life? Plenty! Above all, I think, they make a player, no matter what his or her age, reflect—at least subconsciously—and compare the game to what they already know about life. Players are constantly comparing the rules of whatever game they are playing to what they have learned elsewhere about life. When there is a conflict, players ask themselves “Is this a dumb rule,” or
"Is it a rule that is good for the game even though it is
dumb one in life?" Game players constantly ask them-
sew, "Are the rules of this game fair, accurate, etc., in
terms of what I know?" And the more the rules do re-
fect the real world kids know, the more they believe
the games reflect reality, and vice versa.

How do we know this comparison happens? Be-
cause games with wildly unfair or inaccurate rules get
quickly identified by players as "bogus" and don't get
played very much. If the rules were that small, under-
equipped forces could defeat superior forces (except by
stealth, guerrilla, or other special tactics) no one would
accept them. If Sim City allowed you to build a modern
City without electricity, no one would care. Game
designers spend a lot of time tweaking the rules of
games to make them seem reasonable—this is known
as "balancing" a game.

Gamers of all ages often argue heatedly whether
game rules reflect the real world. This happens in terms
of physics (e.g., "What is the true trajectory of a missile
in space?"); it happens in terms of the reality the game
is modeling ("Could a person really sustain that hit and
live?"); and it happens in terms of human behavior ("Would an opponent actually do or say that?") among
other things. And the rules of games certainly get ap-
plied to real life. That's why the Duke Of Wellington
could say that "The battle of Waterloo was won on
the playing fields of Eton."

Direct examination of game rules is a component
of "metagaming," or "thinking outside the game."
Part of metagaming is about asking "What rule changes
would make the game better?" and then implementing
those changes. In video and computer games designers
and players are constantly trying to tweak the rules to
improve the game.

And before we leave the What level, there is also
some learning that goes on in video and computer
games about rules in general, such as "What if we
break them?" Kids learn to shout "That's not fair!" or
"You can't do that" at a very early game-playing age,
and this is precisely what they are learning about.

So, we've already seen a great deal of learning in
video and computer games, much of which applies
readily to the real world. But still, we are not even close
to all the learning that goes on in these activities.

**Learning Level 3: Learning Why** A third level of
learning in video and computer games is learning why
you do something. Players learn the strategy of a game
as they play it (which, of course, depends on, and flows
from, the rules).

Successful players learn that in some games and sit-
uations to succeed you need to attack openly, and in
others stealthily. They learn in some games you need
to horde and be selfish, in others you need to cooper-
ate, and that in some there are multiple winning stra-
 tegies. They learn that small pieces have more power
when used as a group. They learn that "combination
moves" are more effective than single moves. They
learn that buying everything in sight or building as fast
as you can either works or doesn't. They learn that
reserving some of your resources for defense can be
important. They learn that some bosses need to be
attacked in groups. They learn that hitting the head or
the torso with a weapon is a more effective way to hurt
someone than hitting an arm or leg. They learn that
eyes and underbellies are vulnerable. They learn to
keep their guard up, be prepared, and not attack until
they have amassed the force required.

These, it seems to me, are all real-life lessons.
Game strategy (and tactics) are full of such learning
about real life, like the rules, the strategy in games
needs to be lifelike for the games to make sense, even
if the characters, such as Pokémons, are purely imagi-
ary. Again, players are always making their uncon-
scious comparisons. They know from life, for example,
that a hierarchy of strength among species typically
depends on size. If a smaller character can defeat a
bigger one, they know he has to have something—
strength, endurance, weapons, spells—that makes him
more powerful.

Militaries have been aware for millennia that stra-
 tegy can be learned by playing games, and recently they
have adapted and adopted video and computer games
to their own learning needs far ahead of the curve. To
help their people learn better and faster, they use a
combination of existing off-the-shelf games, specially
modified games, and games specifically commissioned
from game-makers. All branches of the U.S. military
use video and computer games for learning at all levels
from recruit to commander. Military video and com-
puter games are used to learn squad-based teamwork,
fighting, safety, shooting, submarining, commanding
multibranch forces, and countless other things. The
Air Force now just takes it for granted that its pilot can-
didates have used every military flight simulator game
there is. They expect these people to have learned not
so much "how" to fly a plane, but why—what are the
strategies for fighting in one. That sports and business
strategy and tactics can be learned by playing video
and computer games hopefully needs little or no expla-
nation. It is now commonplace.
Just as in the other levels, there are also deeper \textit{Why} lessons that are learned from video and computer games as well. Among these important and valuable real-life lessons are:

- Cause and effect.
- Long term winning versus short term gains.
- Order from seeming chaos.
- Second-order consequences.
- Complex system behaviors.
- Counterintuitive results.
- The value of persistence.

All this, and still two more learning levels to come!

\textbf{Learning Level 4: Learning Where} The “Where” level is the “context” level, as in learning about where you are. This level encompasses the huge amount of cultural learning that goes on in video and computer games. Psychologists tell us that games are one means through which kids learn to understand their world. At the \textit{Where} level, the player learns about the world of the game and the values it represents. He or she acquires cultural metaphors and images to use in describing the real world. It is on this level that kids learn, both consciously and nonconsciously as they play, their games’ ideas.

Video and computer games certainly reflect the big ideas—or myths—of our culture: right versus wrong. Good versus evil. Victory versus defeat. Skill versus luck. Our desire to help. Our striving to rise. “[A player learns] to handle myth, lore … danger, betrayal, the fact that there’s always someone bigger and more powerful than you are, and the existential inevitability that—even if you kill the bad guys and save the girl—you eventually will die,” wrote one observer (Katz, 1999). Players learn through their games to handle cultural relativity, and deal with different peoples and roles. They learn that on one planet, in one society, in one world you can’t do X, even though it may be perfectly normal in their own world. They learn their culture’s ideas about achievement and leadership. It’s at this level that game playing kids can learn that enemies are hard to defeat, but that if you persevere and learn enough, you \textit{can} defeat all the enemies and beat the game.

Many thinkers, from Plato to McLuhan, have described our games as a reflection of our society. Those who deplore violent games, for example, might take a look at the statistics that show that American society—despite what some might like to think—is still a reasonably violent and not especially law abiding one, with a higher percentage of its population incarcerated than anywhere on earth. As with other forms of expression, video and computer games reflect and interpret the culture(s) and subculture(s) in which they are created. They reflect the ideas and fantasies of their makers—their heroes, their villains. Game players learn this. They learn to identify with the game characters, and with the cultures they inhabit.

Do kids playing video games really \textit{learn} these things? I have watched young kids signing in to a game that requires a name, fight over who gets to be Link, the hero of the \textit{Zelda} games. Link is their hero, the person they want to be. The qualities he possesses—courage, the desire to search, explore, overcome all enemies, and get to the end to save the princess—are the ones they want to possess. Game learning goes right into kids’ language and concepts; one writer reports a six-year-old Nintendo player referring to his teacher as “the boss” (Provenzo, 1991).

For better or for worse, kids use video and computer games as a filter through which to understand their lives. This is not so different from the past, where their hero and filter for interpreting life might have come from a story (e.g., “I want to be Lancelot”). But one big difference between games and stories is that kids learn they have control over this life.

One of the most effective game techniques for transmitting the \textit{Where}—that is, the contextual information—is \textit{immersion}. It seems that the more one feels one is actually “in” a culture, the more one learns from it—especially nonconsciously. With recent improvements in graphics, sound, smells, and “force feedback” controllers, video and computer games have become incredibly immersive. (Soon there’ll be appropriate food or gum to chew, I predict.) Language teachers are especially aware of how much learning goes on in immersive situations. So it is not surprising that the many immersive games are causing kids to learn a lot.

Because no simulation is ever perfect, and designers must make choices, the learning in these immersive worlds is \textit{extremely controllable by the designers}, via what the designers choose to amplify, and what they decide to reduce. For example, if the designers amplify the difficulty of defeating enemies in order to increase the challenge or prolong the game, the message the player will get is that “enemies are hard to defeat.” Kids will learn whatever messages are in the game.

And this is the importance of the fifth, and most important, learning level of all.
Learning Level 5: Learning When and Whether

We have now arrived at the ultimate level, the When and Whether level of learning. The learning at this level is the deepest, most interesting learning that goes on in video and computer games. For it involves the non-conscious emotional messages—the “subtext,” as actors say. It is the level where game players learn to make value-based and moral decisions—decisions about whether doing something is right or wrong. It is therefore the most problematic of the learning levels, and the one that causes the most controversy.

The mechanisms for creating the learning at the When / Whether level range from the extremely simple and obvious to the most complex and subtle. At the simplest level, learning comes through the game's amplification of certain factors (through repetition and other means) and reduction of others, as we have already seen. At more complex levels it comes through the use of allegory and symbols, and through the manipulation of images, situations, sounds, music, and other emotion-producing effects and combinations of effects, just like a novel or movie.

It is hard to argue, I think, that the combination of “amplification” and “emotional” cues in certain games doesn't lead players to learn that the answer to “Is it OK to kill this character?” in the game context is “Yes.” But to me the more important question is “Are kids also learning this about real life?” Do they generalize these messages to the actual world they live in?

I would argue that they don't, at least not in our society. Just as with the rules, game players are constantly cross-checking, automatically and non-consciously (and occasionally consciously as well) with whatever else they know or have heard for consistency. Messages that are consistent get accepted, messages that are in conflict get further examination.

So in a warped culture where killing was encouraged, the messages in a killing game could indeed, I think, encourage a young player to kill in real life. But in a culture such as ours, where the message “do not kill” is profoundly a part of our cultural context, people—even kids—think more than twice about whether to do it in real life, unless they are already severely disturbed (although here we many have to distinguish the very youngest children). My friend the game designer is right when he says, “We have to be careful about buying into the rhetoric of people who blame Doom for Columbine and ignore the fact that those guys were building pipe bombs in their garage and their parents never noticed.” We will always have kids on the edges, who do not get society's message from their parents or elsewhere. But they are the exception.

An excellent illustration of this consistency checking comes via a player who told me that one lesson he had learned from games is that “in a video game, it's usually more fun to be the outlaw or bad guy.” This would, of course, also be true in life, were there no restrictions. But he, like most players, gets the message that the penalties society imposes make it a lot less fun later on, and so he is not an outlaw in real life.

This comparison of the When / Whether learning in the game with the When / Whether learning in the rest of life is the reason why shooting games can help kids learn how to aim, without their learning to kill. To really learn the latter, a player would have to have to overcome an awful lot of disconnects with the messages he or she hears in the rest of life—at least in civilized countries. I think it is certainly in the public interest to keep these counter-messages as frequent and strong as possible, because as reality and simulation blur (and games are not the only place where this is happening), we get help keeping them straight. This has important implications for policy makers.

Positive or Negative?

So I hope that it is clear that players learn a lot from the computer and video games they play. By now the idea that people who play these games, especially people who play them a great deal as so many kids do, learn from them will not cause very much disagreement. But it is worth taking a minute to discuss an area where there is a great deal of fundamental disagreement. That is whether the learning in computer and video games is positive or negative for games players—especially those who are kids—and for the society they live in. The major concerns of those who think the learning in video and computer games is negative are, I think, as follows:

- At the How level, people are concerned that kids are learning how to do “inappropriate” things (such as aim guns accurately).
- At the What level, people are concerned that the rules of the video games are too restrictive, that games don't give kids enough room for their imaginations.
- At the Why level, people are concerned that the strategies for winning many of the games contain too much violence, too many “cheats,” and many other undesirable elements.
- At the Where level, people are concerned that kids are being socialized to be loners, misogynists, and social deviants.
At the *Whether* level, people are concerned that kids are learning to be “amoral killers.”

Although all these concerns should be listened to, I do not think they are as valid as the critics claim. There are many appropriate things to do in video games. And even for those things the critics dislike, the games are, in the opinion of many, a useful defuser. Every day games are becoming less restrictive and more open to players’ imaginations and personalities, with many more open-ended toylike elements that kids can use to exercise their own imaginations and tell their own stories. Newer games have multiple winning strategies. So-called “cheats” are, in reality, only alternative games. As network technology proflates, video and computer games are quickly going back to the social orientation that games have always had. Video games are becoming more open to girls, and girls are becoming more open to video games. And tons of other messages exist, and more can be created, to counter the “killing is the answer” message that some games impart to a small number of players.

The problem for me with all the nay-sayers’ arguments is that they generally ignore all the positive learning that goes on, and, more importantly, *could go on*, in video and computer games. In my view, this far overwhelms any negatives.

**Designing Games as Learning Tools**

*One wonders whether there’s any limit to what can be done in merging the addictive elements of computer games with effective instruction.*

—Bob Filipczak

Is it possible to take all the engagement of computer and video games and all the kinds of learning that go on when one plays them, and design computer games that produce reliable learning of given academic or training material? This has been the Holy Grail of many educators almost ever since there were computer games. However, many of the initial attempts produced—to be charitable—mixed results. Designers and players of entertainment-oriented computer and video games—and therefore the computer and video games companies—typically turn up their noses at anything that even smacks of education or learning—and with some justification. Most of the educational and learning “games” marketed under the heading of “edutainment,” are hardly real games from the perspective of consumer game designers.

With only a few notable exceptions (see the end of this chapter), what are sold as “learning games” are not real games at all in the commercial sense, but rather short multimedia pieces containing problems to be found and solved, with varying amounts of graphics and animated rewards for getting problems right. These edutainment games have little in common with the exciting and challenging thirty to one hundred-hour experiences of *Quake*, *Unreal*, *Roller Coaster Tycoon*, *The Sims*, *Command and Conquer*, *Black and White*, and the gamut of sports games.

Why is this the case? In the opinion of one game designer, the “instructional designers” brought into the creation of a learning game because they supposedly know how to get people to learn, typically “suck the fun out” of any game they get their hands on. Although learning games can fail as real games in many ways, the failure happens mostly commonly in their lack of gameplay—the fun things that the player gets to decide, control, and do. Although this is not as much true for the preschool set, who, in my experience, enjoy many of the edutainment offerings available, it becomes increasingly true once kids get their hand on real entertainment games in consoles, arcades, movie theaters, and so on.

**Why It’s Hard**

Although it is definitely possible to combine the fun of a real game with educational content, it is certainly not easy. The reason it’s not easy is this: When a designer sits down to create an entertainment game (a new one, as opposed to a sequel), he or she starts, ideally with a blank slate and a single goal. The designer’s “prime directive” is to make something that will engage players for as much time as possible, usually thirty, sixty, even a hundred or more hours. The designer invents all the content of the game—worlds, characters, puzzles—to help reach that goal. In the process of designing the game any element or idea can be accepted into the game if it furthers the goal of engagement, rejected if it doesn’t. At the end of the process one can—and publishers often do—write a book about the game’s content, often to help players understand the world in the game and succeed in it.

In educational games, on the other hand, the book of content is sitting on the desk before the designer even starts, and the game has to somehow be about that book. So the designer has at least two prime directives to follow simultaneously, to be engaging and to follow the book (i.e., be accurate). He (or she) can’t just go about jiggling a concept here, changing a fact
there, because it will enhance the game. And to make matters even harder, in addition to the two masters of engagement and accuracy, there is a third master, effectiveness. Does the game cause people to learn?

How do we deal with this three-headed problem? The answer, I suggest, is with gameplay. Of the major elements that make a computer or video game—the graphics the player sees (known as the “eye candy”) and the actions the player takes (known as the gameplay)—it is the gameplay that really makes the difference between bad games, good games, and great games. Game players do expect great graphics, but the world is littered with failed, pretty games. Yet many games with little or no eye-candy but great gameplay, such as Pong, Asteroids, and its early arcade cousins, and of course Tetris, live on as classics. Over 200 million eye candy—poor GameBoys have been sold in the world. Any game designer will tell you gameplay is much more important than eye candy, and many of them wait eagerly for the day when graphics are so good that designers can forget about improving them in every game and go back to concentrating on creating exciting gameplay.

How does this help us in designing “Educational Games that Don’t Suck” (the title of a well-attended session I held at a Game Developers Conference)? It challenges us as digital game-based learning designers to take whatever material is our starting point and design a series of great gameplay experiences to get it across. Although our games will certainly involve graphics and even characters, it is what the gameplay has those characters do and, more importantly, has you, the player, do that really counts. One great advantage of this approach is that it can potentially bring our costs way down, because state-of-the-art graphics take up by far the greatest part of any game’s budget.

How Do We Combine Gameplay and Learning?

How can two so seemingly disparate phenomena as good gameplay and effective, rigorous learning (because that’s what we want, of course) be combined? The answer, happily, is, in a great variety of ways.

It is useful to think of digital game-based learning along the two dimensions that need to be combined to make it work: Gameplay / engagement and Learning, as figure 6.1 shows.

If an electronic learning product delivers both low gameplay and low learning, it is probably “traditional” computer-based training (CBT) or “e-Learning” (lower left quadrant). “Pure” (i.e., consumer) games typically deliver high gameplay but no learning of “traditional” educational content (upper left quadrant). Digital game-based learning occupies the high gameplay and high learning upper right quadrant. And I have yet to see something, online or elsewhere, that is really high learning with low engagement. I think it is a “null” category that just doesn’t exist.

But even within the digital game-based learning quadrant, there can be a lot of variation. Each dimension is a continuum, and each project has a different amount of both learning and engagement. Ideally, you want to move out continuously on a 45° line balancing the two. Although there might be reasons in a given case to lean more towards one or the other, I’m not sure this is a good idea, although I have always thought it would be nice to have a slider as part of the interface, so the user could choose his or her own mix between learning and engagement based on their mood at the time (figure 6.2).

As we design learning games, we have to continually consider both the gameplay and learning dimensions. Not enough emphasis on learning and we risk sliding into being just a game; not enough emphasis on gameplay and we risk falling into CBT. It is much better to think about keeping both dimensions high than
to think about trading them off, as some suggest we need to do.

So our process in creating digital game-based learning is the following: (1) Find or create a game with great gameplay that will engage our audience. (2) Find the learning activities and techniques that will teach what is required (doing each with the other in mind), and then (3) successfully blend the two. (We also need to take into account the political context, the technology, and the resources available, but that is outside the scope of this chapter.)

Understanding Your Players

Let us begin, as any game designer would, with our audience. Most learners will be excited when they hear you are designing a game for them, but they will also be skeptical. So much learning is boring and done to learners, that people need to be clear that the game is being made to engage them and that ideally they have a real say in its design. In the end, the audience will quickly determine whether the game is engaging, and if it isn’t, they will basically ignore it or throw it away, wasting a lot of your effort, time, and money. So we begin by considering our particular type of audience, from whom we will select a representative group to work with.

In some fortunate situations we may have an audience that is reasonably homogeneous. The Monkey Wrench Conspiracy, for example, was designed for a relatively homogeneous audience of mechanical engineers, over 95 percent of whom are young (twenty to thirty years old) male and experienced gamers. The military’s Joint Force Deployment was designed for a relatively homogeneous group (at least in their training) of midlevel military unit commanders. Other games have been designed specifically for people with MBAs and/or strategy backgrounds. Still others have been aimed at highly competitive professionals, or at a particular type of student. But some audiences are not as easy. We often need to face the reality of fairly diverse audiences for any given type of learning. When this is true, among the most important variables that make a difference to choosing a type of digital game-based learning are:

- age
- gender
- competitiveness
- previous experience with games.

If the audience is diverse along one or more of these dimensions, there are alternative strategies for dealing with creating games for such groups:

1. Seek a “lowest common denominator” game style, a game format that appeals to both men and women, or to both competitive and noncompetitive employees. Among game formats that may serve this purpose are detective games, adventure and puzzle games, and strategy games.
2. Create more than one game, for example, one more competitive and one more cooperative. The commercial Virtual World game centers in America began by offering two games—a highly aggressive shooting game and a much less aggressive racing game. Games 2train has created a template in which the user can choose from among eight different games to learn the same content.

3. Provide a nongame alternative for those in the audience who are not engaged by the game you choose. This is valuable in every case.

Of course, the danger with the first strategy is that it may involve too much compromise, resulting in a game that pleases no one. The second may be too expensive. In such cases the third alternative, building the best game you can for the most people, but allowing those who don’t like the game to learn another way, may be the best solution.

One of the most important things one can do in designing digital game-based learning is to get representatives of the audience involved very early on in the process. This can be done through focus groups, informal interviews, and/or by including audience members on the design team. More than anything else, player input and preferences will determine the game’s ultimate acceptance and success.

Selecting a Game Style

The types of games we have to choose from to engage our audience include all the standard categories of computer games: action, adventure, fighting, puzzle, role-playing, simulation, sports, and strategy. Selecting a game style from these categories can be done in a number of ways. There may be a commercial game you are aware of (for children or adults) that immediately makes sense in terms of the content. However, it is best not to stop with the games you know, but to look at a wide variety of options, to speak with a lot of gamers, and especially to play as many games as possible. The variety of gaming experiences between, say, The Sims, Alpha Centauri, Baldur’s Gate, and Roller Coaster Tycoon, for example, is very wide. The reason these and other “hit” games are good models, is that their gameplay is proven. However, it is also possible,
if you have a good idea, to create an entirely new game from scratch combining gameplay elements from many, but you must be very careful to make the gameplay great. In the words of Ashley Lipson (creator of the legal game *Objection!*), “To be an entertaining and educational game, it must first be a game, and only then, a teacher” (Lipson, no date).

**Game Elements?**
A number of people studying games have come up with lists of game “elements” to put into a learning game to make it successful. In 1981, in a paper entitled “What Makes Computer Games Fun?” Tom Malone provided a checklist of elements for designing enjoyable educational experiences whose overall categories are challenge, fantasy, and curiosity.

Robert Ahlers and Rosemary Garriss, of the U.S. Navy’s Submarine School, have come up with a longer list of “critical characteristics for fun learning and gameplay,” including imaginary situation, rule-governed, goals specified, competitive/cooperative, progressive difficulty, sound effects, dynamic graphics, user control, outcome uncertainty, simulated danger, performance feedback, high response rates, and informational complexity.

This is helpful information. But the trouble with an elements approach is that although these elements are indeed found in good games, just having a list of elements does not guarantee you a good game—that’s one reason why there are so many boring and ineffective “learning games” that thought they were “doing it right.” A better approach is to look at the games that work and try to capture these games’ style of putting the elements together successfully. (Of course if you can design a completely original game that has all the elements and great gameplay, more power to you!)

Do not take this phase of the process lightly—consider many options. The type of game you finally choose, and your skill in integrating it with the learning, will determine the level of engagement. Find the potential game styles that will engage, consult, and reconstrue your audience.

**Offering a Choice**
We don’t all like the same game, so offering the player options is often a good idea. One option is to give users a choice of more than one game, and/or a nongame alternative or path through the material to the endpoint as well. I have found this latter strategy, giving users a choice of not playing, to be very important, particularly if they have the option of opting in and out whenever they choose. This probably relates not only to the fact that some people may prefer not to play games or may not like the game you have, but also to the fact that one of the defining characteristics of play is that it is free—you don’t have to do it, you can opt out.

The option of having more than one game may sound difficult, but in some instances it is not. It is not that hard to create parallel interfaces that allow you to create content once and have it flow into a number of game formats, offering the player a choice of style.

**Understanding Your Content**
Second in the process, not because it is less important, but because game-based learning the audience comes first, you need to consider the kind of learning you are trying to make happen, and select your interactive processes for doing so (the steps can also be done in parallel). “Learning doesn’t happen incidentally,” says one psychologist. “You have to set out to teach those specific skills.”

There are many different kinds of content to learn and the types of content and learning require different methodologies. The types of content will also have an effect on your choice of game.

Whatever your subject, you should begin by looking generically at the different kinds of learning content you want to teach to see what kinds of learning are really going on, such as learning knowledge (facts), skills, judgments, behaviors, theories, reasoning, process, procedures, creativity, language, systems, observation, or communication. For any subject there will no doubt be more than one, and probably many. We can then take the different kinds of games, and line them up against these requirements. Then we can decide if our game (and its subgames) can support these types learning, and iterate as required.

Table 6.1 shows types of things to learn, and some of the options for learning them through gameplay.

**Choosing Your Learning Activities and Techniques**
For the “learning” part of digital game-based learning, one can employ many interactive activities techniques that have been shown to work both in nongame forms of interactive learning such as CBT and in digital games (in many cases, that’s where the CBT designers got them!). Additionally, we can and should invent new interactive learning techniques as they are needed. Continuous addition of new interactive activities and learning techniques to our repertoire will make digital game-based learning increasingly effective as time goes on.
Table 6.1  
Types of learning and potential games styles

<table>
<thead>
<tr>
<th>&quot;Content&quot;</th>
<th>Examples</th>
<th>Learning activities</th>
<th>Possible Game Styles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facts</td>
<td>Laws, policies, product specifications</td>
<td>questions</td>
<td>game show competitions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>memorization</td>
<td>flashcard type games</td>
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<tr>
<td></td>
<td></td>
<td>association</td>
<td>mnemonics</td>
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<tr>
<td></td>
<td></td>
<td>drill</td>
<td>action, sports games</td>
</tr>
<tr>
<td>Skills</td>
<td>Interviewing, teaching, selling,</td>
<td>Imitation</td>
<td>Persistent state games</td>
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<td></td>
<td>running a machine, project management</td>
<td>Feedback</td>
<td>Role-play games</td>
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<tr>
<td></td>
<td></td>
<td>coaching</td>
<td>Adventure games</td>
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<tr>
<td></td>
<td></td>
<td>continuous practice</td>
<td>Detective games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>increasing challenge</td>
<td>Role play games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reviewing cases</td>
<td>Detective games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>asking questions</td>
<td>Multiplayer interaction</td>
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<tr>
<td></td>
<td></td>
<td>making choices (practice)</td>
<td>Adventure games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>feedback</td>
<td>Strategy games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>coaching</td>
<td>Role playing games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>practice</td>
<td></td>
</tr>
<tr>
<td>Judgement</td>
<td>Management decisions, timing, ethics, hiring</td>
<td></td>
<td></td>
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<tr>
<td>Behaviors</td>
<td>Supervision, self-control, setting examples</td>
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<tr>
<td>Theories</td>
<td>Marketing rationales, how people learn</td>
<td>Logic</td>
<td>Open ended simulation games</td>
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<td></td>
<td></td>
<td>Experimentation</td>
<td>Building games</td>
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<td></td>
<td></td>
<td>questioning</td>
<td>Constructing games</td>
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<tr>
<td>Reasoning</td>
<td>Strategic and tactical thinking, quality</td>
<td>problems</td>
<td>Reality testing games</td>
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<tr>
<td></td>
<td>analysis</td>
<td>examples</td>
<td>Puzzles</td>
</tr>
<tr>
<td>Process</td>
<td>Auditing, strategy creation</td>
<td>System analysis and deconstruction</td>
<td>Strategy games</td>
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<tr>
<td></td>
<td></td>
<td>Practice</td>
<td>Adventure games</td>
</tr>
<tr>
<td>Procedures</td>
<td>Assembly, bank teller, legal</td>
<td>imitation</td>
<td>Timed games</td>
</tr>
<tr>
<td>Creativity</td>
<td>Invention, Product design</td>
<td>practice</td>
<td>Reflex games</td>
</tr>
<tr>
<td>Language</td>
<td>Acronyms, foreign languages, business or</td>
<td>Imitation</td>
<td>Role playing games</td>
</tr>
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<td></td>
<td>professional jargon</td>
<td>Continuous practice</td>
<td>Reflex games</td>
</tr>
<tr>
<td>Systems</td>
<td>Health care, markets, refineries</td>
<td>immersion</td>
<td>Flashcard games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Understanding principles</td>
<td>Simulation games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Graduated tasks</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Playing in microworlds</td>
<td></td>
</tr>
<tr>
<td>Observation</td>
<td>Moods, morale, inefficiencies, problems</td>
<td>Observing</td>
<td>Concentration games</td>
</tr>
<tr>
<td>Communication</td>
<td>Appropriate language, timing,</td>
<td>Feedback</td>
<td>Adventure games</td>
</tr>
<tr>
<td></td>
<td>involvement</td>
<td>Imitation</td>
<td>Role playing games</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Practice</td>
<td>Reflex games</td>
</tr>
</tbody>
</table>

From Digital Game-Based Learning (McGraw-Hill, 2001).

Among the activities and learning techniques used in digital game-based learning (and games) are:

- **Practice and feedback.** Computers are very good at presenting a series of problems and keeping track, statistically, of how people answer them. Used poorly, this is often labeled “drill and kill.” Yet practice and feedback has its place in digital game-based learning because it can be, in the right contexts, an excellent way of learning things that require lots of repetitive practice. (Anyone who denies there are such things should go out and learn to play a musical instrument.) Examples can include facts (e.g., anatomy), physical skills (e.g., typing), and reflex skills (including many aspects of language). Practice and feedback has become a lot more acceptable with the advent of adaptive programming techniques, which shift the difficulty level of the tasks or problems on the fly depending on how the user is doing.

- **Learning by doing.** Most who reject “telling” as a methodology want to replace it with “learning by doing.” This works well for digital game-based learning,
because "doing" is one of the things both the computer and games are especially good at—we interact with them. (When was the last time you played a game that spent a lot of the time "telling" you anything?) Of course, there is doing, and there is doing. The "drill and kill" is, of course, one form of "doing." Exploring, discovery, and problem solving are others. The common element is active participation and decision making by the learner.

- **Learning from mistakes.** In this interactive learning technique, a user moves toward his or her goal until he or she comes to a "failure point" and then gets some kind of feedback. Of course, this is precisely what happens in many games. Anyone who has ever tried and failed over and over again to solve a puzzle or an adventure game or to beat a boss in an action game or get somewhere in a flying simulation knows that doing and failing—trial and error—is often a successful way to learn. It is something games are full of because it gives players the motivation to keep trying. One difference between games and learning applications is the way the feedback comes. In most learning apps, it is through some form of telling, be it video-based war stories, coaching, or written feedback. In most games feedback comes via action: something happens. You die. You lose. Your company fails. You go back to the beginning. You are mocked. Designing feedback to be less learning-like and more game-like is often a big paradigm shift and challenge for digital game-based learning designers. Game designers almost always make the failure consequences interesting, and often fun.

- **Goal-oriented learning.** Some interactive learning designers distinguish learning that is fact oriented (learning about something) from learning that is goal oriented (learning to do something). Those who use the term "goal-oriented" or "goal-based" learning have adopted a concept that has been in games since the beginning. A goal is a key element of a game; it's what makes free play into a game. The goals in a game, which players usually consider worth reaching, are what give players the incentive to push on through repeated failure.

- **Discovery learning and guided discovery.** Discovery learning is based on the idea is that you learn something better if you find it out for yourself, rather than having it told to you. In learning applications, discovery learning usually implies some sort of problem to solve, which is usually accomplished by searching through data or structures for pieces or clues. This is yet another kind of learning that has a long history in games—discovery learning is what many games, and certainly all adventure games, are all about. Discovery learning can be frustrating to some people, particularly those who are very linear in their approach and thinking, so some learning designers structure the discovery, retaining the need for the player to discover the solutions for themselves, but giving the players a very clear idea at any time of the problem they need to solve, rather than letting them work even that out for themselves, as in many games. Structured or not, discovery learning is better for some things than others.

- **Task-based learning.** Traditional learning of systems and procedures (i.e., "how to do something") typically starts with conceptual explanations and demonstrations and only then moves on to problems or tasks one actually does. Task-based learning is a different approach, a variation of learning by doing. Here the approach is to skip (or greatly truncate) the generalized explanations and go straight to a series of tasks or problems that build on each other and gradually increase in difficulty. By doing the tasks, with strong specific guidance and modeling, the user gradually learns the skills. A potential downside of this methodology is that users may learn less of the theory behind the skills, although this can be made available as well in a number of ways.

- **Question-led learning.** Although questions are most often used in interactive learning applications as some form of test (pre, post, mastery, etc.) they can also be a form of learning. Attempting to respond as best you can to a question whose answer you don't know forces you to think about the information and reason among the answers, rather than just being told the response. Question-based learning is traditionally associated with one particular type of game, the quiz or trivia game. The fact that these types of games are so popular in the world, and so easily grab people's time and attention, makes them obvious vehicles for digital game-based learning.

- **Situated learning.** Situated learning sets the learning in an environment that is similar to where the learning material will be applied in the future. According to this approach, when students learn in such an environment they benefit not only from the learning material that is taught but also from the culture that is in that environment, the vocabulary used, and behavior associated to that environment. This obviously marries well with immersive style games.

- **Role playing.** Role playing is often used as a strategy in interactive training, particularly for skills such as interviewing, communication coaching, sales, and the like. Role playing, of course, is so much a part of games that it has its own genre, role-playing games, or RPGs.
One of the differences between role-playing in training and role-playing in games is that training role plays tend to be much shorter and more structured than those in games, which are often multihour, multiday, or even open-ended.

- **Constructivist learning.** Building on the work of Jean Piaget, the MIT Media Lab has long championed a kind of learning they call “constructivist.” What they mean by this is first, that we learn best when we actively construct ideas and relationships in our own minds based on experiments we do, rather than being told; and second, that we learn with particular effectiveness when we are engaged in constructing personally meaningful physical artifacts. Games in which players construct worlds use this approach, which takes discovery learning even further.

- **Multisensory learning.** The original ideas of including multiple senses in the learning process began in language learning. This type of learning is also related to theories of “multiple intelligences.” The introduction of new technologies such as locatable sound and force feedback have greatly increased the game and learning options in this area.

- **Learning objects.** The idea of learning objects grows out of object-oriented programming, where pieces of a program are built as stand-alone units with input and output “hooks” to link them together in whatever order is needed for the particular larger task at hand. The concept is to design pieces of content and, hopefully, certain interactions that are independent, and then to hook them up in whatever sequence needed. Learning objects fit nicely with games, which are becoming much more object-oriented themselves.

- **Coaching.** Coaching is a growing part of interactive learning applications. Although this was formerly a role left almost entirely to the instructor, designers are now finding ways to build useful coaches into learning programs. Coaching has also existed in games for a long time. It often comes from various characters in the game that happen across as you are madly searching around, or that you encounter when you have hit a failure point.

- **Intelligent tutors.** An “intelligent tutor” is able to look at a learner’s responses, decide why he or she made the error, and give specific feedback, usually based on an inference engine with a cognitive model from expert problem solvers. Essentially, the tutor compares a user’s behavior to that of an expert. The tutor understands most common misconceptions and tries to correct them early on, as well as giving problems and hints to mediate the misconceptions. Second generation intelligent tutors add the ability not only to go out and find the information the user needs, but to filter it and present it in the ways that are most helpful.

You should be consider and use all of the above techniques as necessary as you design your learning.

In the end, the learning and the gameplay must be merged. There are a number of structures to consider when doing this. I present them here as a series of choices, but in reality none are purely binary “either-or” choices; one must find an appropriate place on each continuum.

### Learning Game Structures: Different Means for Different Ends

**Intrinsic versus Extrinsic Games**

In 1981, Tom Malone published a second landmark paper based on his doctoral research. It was entitled “Towards a Theory of Intrinsic Motivation” (Malone, 1981b). In it, Malone made the argument that there are two main categories of learning games: intrinsic and extrinsic. In an intrinsic game, Malone argued, the content is an integral part of the game structure. His example is a math game, where things go up as you get to higher quantities and down as they are lower. A more contemporary example is a flight simulation game, where the game itself is about flying a plane, or *Sim City*, where you learn the rules of urban development by trying and succeeding or failing. Most simulation-type games fall into this category.

Extrinsic games, on the other hand, are games where the context and the game structure are less tightly linked, or not linked at all. The paradigm here is the question or trivia game, where the questions can be about any subject, but the game remains essentially the same. Bingo, *Jeopardy!* and other often-used training games fit into the extrinsic model.

Which model, intrinsic or extrinsic, is better? Proponents of each will give you reasons why theirs is superior, and this is a highly controversial topic among digital game-based learning designers. “Intrinsic games,” says one designer, “may provide the most powerful learning experiences technology can support. These are perhaps the most noble and worthwhile applications of technology in the learning field.” Another argues that “the real power is when you capture the rules at an algorithm level and have people understand them through constant exposure to different circumstances and then they really know the rules.” By contrast, anyone who’s ever used a typing game to relieve boredom knows it can be fun and help you learn.
I believe that both intrinsic and extrinsic games have their value in different situations. The trade-off is that although intrinsic games enhance certain kinds of learning and add to the engagement, they are typically created on a custom basis and are therefore more costly and often difficult to change or update. Extrinsic games, although lacking the learning power that may come from tightly linking the content into the game, lend themselves well to templatization and rapid content changes, often at lower cost. Remember that intrinsic/extrinsic is not an either/or proposition, but rather a continuum. There are a number of states between the two, one of which I refer to as loosely linked.

**Tightly Linked Games versus Loosely Linked Games**

This view of learning games is somewhat similar to the intrinsic/extrinsic classification, but is actually a different perspective. A tightly linked game is one constructed specifically around a fixed set of content. The content is built in to the game, and knowing the content is vital to succeeding in and winning the game. A tightly linked game can still be extrinsic, and the entire game might be able, with a fair amount of effort, to be repurposed for other content. A detective game where the clues are pieces of information about the product might be an example.

A loosely linked game, on the other hand is one where the content is essentially separate from the game, but there are hooks in the game that bring the two together, and send the player from the game to the content and back again. In repurposing the game to new content, only the hooks must be changed, not the whole game. An example of a loosely linked game is the *Monkey Wrench Conspiracy*, a task-based learning game where the tasks, which are done outside the game in the software to be learned, are initiated by encountering flashing objects, which although part of the story line, can easily be changed to add, eliminate, or change a task.

Like extrinsic games, loosely linked games often allow content to be changed much more easily than tightly linked games. That means you would use them in situations where, say, the content was still in development, or changing rapidly. A tightly linked game is better for incorporating unchanging content.

**Hard-Wired Games versus “Engines,” “Templates,” or “Shells”**

The ultimate tightly linked game is the so-called hard-wired game. Here the designers and programmers sit down with the goal of building only this particular game. Reusability is not a consideration. Everything in the game is designed and optimized around the game, the content, and the player experience. In many ways, if done well, this will produce the best game of all, just as a custom tailored suit is likely to look and fit better. But it is a very expensive way to do things.

The opposite of the hard-wired game is the template, or shell. In this approach the content, be it text, graphics, video clips, or whatever, sits somewhere external to the game and is “read in” or “called” by the program at the appropriate time and displayed on screen. This allows the construction of “content editor” software, where a trainer or teacher can just type in various pieces of the content, which are automatically displayed in the correct place in the game.

An approach between hard-wiring and pure templates is to use what programmers refer to as an “engine.” An engine can be, for example, the software that lets you run around a three-dimensional world realistically, not walking through walls and encountering objects and things that move and have various properties. Such an engine can underlie or drive equally well either a shoot em up such as *Doom, Quake*, or *Unreal*, or a nonviolent, more politically correct game such as *Straight Shooter* from Games2train. A number of game engines are available commercially—game companies often amortize the large expense of developing them by licensing them to other companies for other games. The latest *Doom, Quake*, and *Unreal* engines are all on the market (typically at high prices for commercial use), as are many individually developed versions.

Some vendors often take the trouble to turn what were originally custom-developed, hard-wired games into engines, so they can resell them in a number of different contexts (this is also referred to as “templatizing” a game.) In this case, the interactions in the game make up the engine, and all the graphics and words change according to the new context.

The least happy result of all comes when a game is hard-wired not because it makes sense to do things in a unique way from a design or programming perspective, but because the designers or programmers are inexperienced with games and just plunge ahead building it as they go without considering reusability. This can happen either because they don’t think they have to make things reusable, or because they don’t know how to, or both. For maximum flexibility and reusability, hard-wiring should be avoided as much as possible in a final product. Prototypes, however, are often built hard-wired because doing so is faster and cheaper in this very limited case.
Reflective Games versus Action Games

There are a number of genres of games, ranging from action to role playing to strategy. One of the differentiating characteristics among these types of games that has an important bearing on digital game-based learning design is the degree of reflection they allow, because reflection is an important part of the learning process (for certain things) that is often under-included. Non-action games (aka “twitch” games), offer the least opportunity for reflection in themselves, whereas role playing, adventure, simulation, strategy, and puzzle games often proceed at a slower pace and offer more built-in reflective “space.” (There are, nevertheless, twitch puzzles, such as Tetris and Devil Dice, as well as less reflective real time strategy games.)

In role playing games, one typically gets to make choices in various types of dialogues, which provide reflection points. Adventure games, where one goes around finding objects that allow you to solve puzzles, also give time for reflection around “how do I solve this—what do I need?” Simulation games, such as “running a company” sims, often allow one to make decisions at your leisure, although some do provide “real time” time constraints, and strategy, and god games often give one all the time in the world to make up and change one’s mind.

Does this mean we can or should never use a twitch game as part of digital game-based learning? Not necessarily. The important thing is that the gameplay be suited to the content, and there be the right balance of action and reflection in the final product. Too much action, and there’s no time to reflect. Too much reflection, and it can get boring. We need to find the flow path between the two. This is part of pacing, which is so important to novels, movies, games, and all devices meant to hold our attention.

Synchronous (Real-Time) Games versus Asynchronous (Turn-Based) Games

The distinction between real-time and turn-based (aka synchronous and asynchronous) games is important to digital game-based learning in at least two ways. In a single player mode, a player must pause a real-time game, or put it into a pause state to interrupt it, either for reflection or to do something else. This usually involves saving the game-state (everything that is happening) at that point. Some games—for example with virtual pets—do not allow this, and the game continues whether or not one is playing. Stop playing long enough and one loses. In a turn-based game, on the other hand—Chess for example, but also many strategy games—the machine will wait forever for a player to figure out his or her next move, unless one is playing by the clock.

The distinction between synchronous and asynchronous becomes even more important in multiplayer games. A game where everyone is playing with or against each other at the same time—say a real-time battle or a competitive business simulation—can be very interesting, but for learning it can usually only happen when learners are in the same situation at the same time, such as in a class, orientation, offsite, and so on. When this is not the case, turn-based games, which allow each player to play whenever he or she has the time, may be a better solution. A turn-based game, though, may lack some of the immediate excitement of a real-time game, so the engagement has to be produced in other ways, such as a real interest in the outcome and other types of gameplay such as highly meaningful decisions.

Single Player Games versus Multiplayer versus Massively Multiplayer

Games today can be either single player, multiplayer on the same computer (such as some You Don’t Know Jack games), two or multiplayer over a network or the Internet, or massively multiplayer with hundreds, thousands, or potentially even millions playing either at once, or on an in-and-out basis.

Most digital game-based learning to date has been single player, except in the military, where the goal has always been to link people. One issue for multiplayer games is getting the people together in real time. In consumer games this is often done via a virtual “lobby” where you first go when you want to play. When enough people are there for a game it starts, and in some games people can join while the game is ongoing. Another option for large multiplayer games is the “persistent state” game.

Session-Based Games versus Persistent-State Games

Session-based games exist only as long as the initial players are playing. Although the game may be able to be paused and resumed, it pauses for all players at the same time. When somebody wins, the game is over, and must be played again. In persistent-state games, on the other hand, the world of the game never goes away. Each player moves in and out of it as they wish, but like the real world, it continues. In persistent-state games such as Ultima Online or EverQuest (they tend to be role playing games) you can build up skill and experience over time, which has obvious implications for
learning. Because the world is always continuing, and opportunities may come and go, there can also be penalties for not playing, but this too, has clear connections to real life.

**Video-Based Games versus Animation-Based Games**

Another interesting choice that designers of learning games must make is whether whatever representations of characters and places they include will be video or animation based. These are two very different styles, often reflecting whether or not the designers have a video background. The advantage of using video is absolute realism. Its disadvantages include size of the "assets," which are large and limit what can be put on a CD or sent over the Internet, and limits on interactivity, because the scenes needed to be prerecorded and play out when they are chosen by the player's choices. Both of these limitations have been overcome to some degree by proponents; the first by better compression and streaming methods, and the second by techniques for cutting videos into pieces as short as one or two seconds, and assembling video sequences on the fly. An additional issue to consider with video is that if any changes need to be made, the video may need to be re-shot, necessitating reassembling the same cast, sets, lighting conditions, and more. If much time has elapsed, the actors may have aged considerably!

Animated characters and graphics, on the other hand, allow designers a great deal of freedom. They can be made to look and sound any way you want. They never become "unavailable," like live actors. Their behaviors and actions can be programmed. "If I want a character to storm out," says a developer "I can just hit the 'storm out' key." Animated characters and graphics are less expensive and, of course are totally lacking in ego (although that’s not necessarily true of their creators).

Which to use in a digital game-based learning project? Of course it depends, but here are a couple of factors to consider. First, animated characters are fast approaching real ones in the details of what they can do (their voices, which are recorded actors, have always been real; computer generated voices are at present only good for robots.) If you look at football or soccer games on today's advanced consoles, you will see almost TV-like characters. However, in their total nuances, it is important to remember that these characters will never (at least not in our lifetimes) be perfectly like real people. Yet there is an interesting trade-off between specificity and universality that is explained well by Scott McCloud (1993) in his book *Understanding Comcis*. As McCloud explains, the more abstract a character is (the most abstract face being a circle), the easier it is for us to identify ourselves with it. As we get more and more photorealistic, characters take on identities that are more and more specific and become more difficult for us to project ourselves onto. So in some cases video, which is totally photorealistic (i.e., it's a photo) may, actually *hinders* player identification with a character. This may or may not be important in a specific instance. If the perspective of the game is first-person (through your eyes) and you never see yourself, it may not matter. If it is "over the shoulder," where you do see yourself continually as you play, it may.

Some find that using animation improves gameplay. You can fit so many more possibilities on the same CD. Says one developer, "My product is animation based, my competitor's product is video-based. My game has thousands of potential paths, theirs has one." But others feel the technique of chopping the video into very small chunks and assembling them on the fly as needed produces similar results that are more lifelike.

**Narrative-Based Games versus Reflex-Based Games**

Another interesting question is how much story to include in the game. Should it be like a movie, with an "inciting incident" at the start that makes you want to see the conclusion, and complex character development along the way? Or should it be a series of unconnected scenarios, puzzles, or interactions in a game-like context. The answer here depends on what you are trying to accomplish. The more you want to create something that is long-term and builds, the more story is a useful motivator. The alternative, of course, is to have lots of ever-increasing levels of puzzle difficulty, as in *Tetris*.

Although narrative and characters add emotional impact to a game, it is worth noting that there are many categories of content where reflex action, that is, the ability to react very quickly to a stimulus, is what is important. Language learning is one example (How are you? Fine.) Legal objection is another. Acronyms are a third. For such content, reflex-based games, where the computer rapidly presents stimuli (with or without a story-based context) and judges and times responses, can often provide a good, fun, solution.

**Evaluating Your Work in Progress: Digital Game-Based Learning Principles**

As you create your digital game-based learning, how do you go about evaluating what you are doing, so that you
can make in-course corrections and iterations? Is there a set of digital game-based learning principles, things that any effective digital game-based learning would have to include?

Below is a short list of such principles. Following these concepts will enable you to take any subject matter and design a successful game-based learning experience on the computer. Although I could have phrased them as prescriptions (“Users should . . .”), I think they work better as questions for you to keep asking yourself throughout the entire creation process. I suggest you put them on your wall and reflect on them as you are considering, designing, building, testing, and rolling out digital game-based learning.

1. Is this game fun enough that someone who is not in its target audience would want to play it (and would learn from it)?
2. Do people using it think of themselves as “players” rather than “students” or “trainees”?
3. Is the experience addictive? Does it produce great “word of mouth” among users? Do users rush out after they try it and tell their colleagues or classmates, “You’ve got to try this—it’s way cool.” Do users want to play again and again until they win, and possibly after?
4. Are the players’ skills in the subject matter and learning content of the game—be it knowledge, process, procedure, ability, etc.—significantly improving at a rapid rate, and getting better the longer he or she plays? Does the game encourage reflection about what has been learned?

Notice the order of the above. Fun (i.e., gameplay) first, learning second. Others have “fun” on their lists, but generally much further down. The result is that many programs that purport to be game-based learning really aren’t—they are just someone’s theories of learning or some dry simulation dressed up with game-like graphics. Believe me, users know the difference.

Where Are We and Where Do We Go From Here?
The process of creating digital game-based learning is certainly well on its way. There are scores, and sometime hundreds of examples—of varying quality, to be sure—already built for K–12 education, post-secondary education, business and the military (see www.socialimpactgames.com for a list). Digital game-based learning is marching into the consumer gaming world as well. No longer confined to pure fantasies, commercial computer and video games are beginning to contain content that students or other learners might need to know. A growing number of commercial games, such as Start Up, Aviation Tycoon, Pizza Tycoon, Wall Street Trader, and even Sim City are filled with content that can be very useful for certain types of education and business training. Games such as Age of Empires have much historically correct content that can potentially be used in schools. The military expects budding pilots to be proficient at consumer military flight simulator games.

Still, the fact is that most commercial games would require major revision to make them fully useful as either education or training that could replace other types of learning. But the process has begun, because it works. Although as yet far from mainstream, digital game-based learning is becoming an alternative, with amazing and increasing success, in a large number of areas. Almost all genres and styles of games have been used for learning. A new learning paradigm—learning via play—is gradually emerging:

- Preschoolers learn the alphabet and reading through computer games.
- Elementary students learn the K–6 curriculum on Playstations.
- Computer chess becomes a big part of K–12 curriculums.
- Typing (“keyboarding”) games are high-selling software products.
- High-schools students play a multiplayer online game to learn electoral politics.
- Financial traders use computer games to hone their skills.
- Policymakers play a Sim City–style game to understand the health care system.
- Business executives play at running simulated humor resources departments and oil refineries.
- Engineers use a consumer-style videogame to learn new CAD technology.
- Military trainees fight realistic battles in video game-like simulators.

True digital game-based learning—learning that feels exactly like a “real game”—is finally beginning to emerge. Some examples include:

The Typing of the Dead: An action-packed game for the Sega Dreamcast in which mummies attack you and you must type phrases more and more quickly and accurately in order to stay alive.
The Monkey Wrench Conspiracy: A first-person shooter game for learning to use CAD software.

Joint Force Employment: A real-time strategy game put out by the Office of the Joint Chiefs to teach local commanders in chief and their staffs to combine land, air, sea, and space forces effectively in combat.

Objectives: A twitch game for lawyers in which you have only seconds to decide whether each sentence a witness says is “proper” or should be objected to, and if the latter, for which of a dozen reasons.

Qin: An adventure-style game for learning about ancient China.

There is no doubt that even as I write many more of these “true” learning games are already in development.

The Future of Digital Game-Based Learning

With demographics clearly on its side, the future of digital game-based learning is likely to be a bright one. By 2025, there will be almost no one left in the educational system—student, teacher, or administrator—who has not played computer games pretty much all his or her life.

I expect that by then the learning world will resemble the games world in many ways, with a wide variety of choices and styles of effective learning games for every subject, and users getting to decide (in conjunction with teachers) which approach, style, and learning game they want to play to learn the material.

For me, this is the promise of digital game-based learning:

- That motivation will finally be found for learning the subjects and content that are the most difficult to teach or train—either because they are extremely dull and dry or extremely complicated, or both—and to get people to train themselves.
- That small groups of trainers, teachers, content experts, and game designers working together will create experiences that will radically improve the learning, and ultimately the competence and behavior of thousands, and potentially millions of learners—not only entire companies, but entire industries, grade levels, even countries and populations, and that this will ultimately affect the market value of companies, and perhaps even nations.
- That the free market will create, through a user-evaluated process of marrying the engagement-driven, experience-centered, “fun” approach of the interactive entertainment and games world with effective techniques for teaching the material that students and workers are required to learn, a phenomenon of highly effective learning “hits,” that move through target populations at the epidemic speeds of best-selling novels, movies, or games, leaving a lasting educational impact.
- That eventually any individual trainer, teacher, or educator will have at his or her disposal the tools and colleagues to work with to create such phenomena, and that “talent will out,” with successful, effective instruction no longer being confined to those a single fantastic teacher or trainer can reach in person, but to all the learners in his or her entire potential target market, worldwide. Such target markets could be all sales people, all managers, all third graders, all elementary school students, all math students, all college-level chemistry students, etc.
- That, consequently, there will be training and learning brands based not just on publishers, but also on authors and designers, subjects and styles, as there are in books, movies, and games.
- That this user-driven learning phenomenon will not only move from company to company and school to school nationally, but will be worldwide, like movies and videogames.
- That the Internet, the wireless networks, and their successors will not just be the conduit for boring courses that people are forced to take or force themselves to suffer through. Rather they will be a competitive forum, much like the games and movie businesses, where talent, creativity, and the ability to hold the audience and deliver a compelling experience is what wins, where the best combination of game play, learning methodology and eye candy is what people seek.
- That we will have a learning world tomorrow, like the games and movies worlds of today, where there are both classic learning hits and exciting newcomers; where a plethora of magazines and reviewers cover what’s in development and help learners choose the very best; where makers create their experiences with the goal of holding their audience and being successful in learning, and thereby making money and attracting capital; and where learners look forward to the next release as eagerly as they wait for an upcoming game, console, or movie.

All this is not only possible, but it is definitely coming. Some of it is already here.

We are fortunate, I think, to find ourselves at the beginning of something very new and powerful. Digital game-based learning is like the auto industry in 1890,
airplanes in 1910, and computers in 1950. Visionaries then would have been able to paint a picture of phenomena just getting started, with a lot of promise. They could have cited only a relatively few pioneering instances, several of which had failed. Yet in each case, within less than a single lifetime, huge numbers of ordinary people around the world were doing previously unimaginable things: controlling vehicles moving at over sixty miles per hour a few feet apart over vast interconnected highway systems; flying to anywhere in the world in only hours often on a minute's notice; accessing—in seconds, at little cost—the entire network of human information and knowledge from little boxes in their laps.

I believe it will be the same with digital game-based learning. Long before the readers of this book grow old, digital game-based learning—or, more precisely, its infinitely more sophisticated successors—will be totally taken for granted as the way people learn.

Why? Because to be effective with tomorrow's learners, the "fun" component of all learning will have to go through the roof. Because digital game-based learning is enormously versatile, it is adaptable to almost any subject, information, or skill to be learned, and, when used correctly, it is extremely effective.

There is also a strong economic argument. A large and potentially hugely profitable opportunity exists to combine the multitrillion-dollar worldwide entertainment business with the multitrillion-dollar worldwide learning business. Although this may currently seem anathema to educators who see learning as a serious activity, and a strange business proposition to entertainment executives focused single-mindedly on the commercial mass market, it makes perfect sense to today's learners. The key premise of digital game-based learning is that by marrying the engagement of games and entertainment with the content of learning we can fundamentally improve the nature of education and training for the world. This is something people want, and, I think, will pay for.

So congratulations! In finishing this chapter you have made it to the high scorers' list of those who now understand more about games and learning.

Notes

1. For more, see Prensky 2001.
2. These numbers are intended purely as "order of magnitude" approximations; they obviously vary widely for individuals. They were arrived at in the following ways:

   a. Video games: Average play time: 1.5 hours/day (Source: "Interactive Videogames, Mediascope, June 1996) It is likely to be higher five years later, so 1.8 x 365 days x 15 years = 9,855.

   b. TV: "Television in the Home," 1998: Third Annual Survey of Parent and Children, Annenberg Policy Center, June 22, 1998, gives the number of TV hours watched per day as 2.55. M. Chen, in the Smart Parents Guide to Kid's TV (1994), gives the number as 4 hours/day. Taking the average, 3.3 hours/day x 365 days x 18 years = 21,681.

   c. Reading: Eric Leuliette, a voracious (and meticulous) reader who has listed online every book he has ever read (www.csx.utexas.edu/personal/leuliette/ftwablehome.html), read about 1,300 books through college. If we take 1,300 books x 200 pages/book x 400 words per page, we get 10,400,000 words. Read at 400 words/that gives 260,000 minutes, or 4,333 hours. This represents a little over 3 hours/ book. Although others may read slowly, most have read far fewer books than Leuliette.

3. Dr. Bruce D. Berry, Baylor College of Medicine.
4. Dr. Susan Chipman, Researcher, Office of Naval Research.
5. William D. Winn, director of the Learning Centre at the University of Washington's Human Interface Technology Laboratory.
7. David Gelernter, in Online Learning Magazine.
8. Reported by Noah Falstein.
11. Scientific Learning Corporation, National Field Trial Results (pamphlet). See also Merzenich et al., 1996 and Tallal et al., 1996.
13. Ibid.
14. Dr. Ray Perez, cognitive psychologist, Department of Defense.
15. Michael Allen, President, Allen Communications.
17. Richard Barkey, CEO, Imparta, Ltd.
18. Ashley S. Lipson, Esq. CEO, TransMedia, Inc.
20. Through programs such as Sesame Street Letters, Jumpstart Learning Games ABC’s, and Jumpstart Phonics, Toddlers, and Preschool.
21. The Lightspan Partnership.
24. AOL’s Election 96 and Reinventing America, created by Crossover Technologies and funded by the Markle Foundation.
25. Straight Shooter! by Games2train for Bankers Trust Company.
27. Training simulation from Andersen Consulting, Sim Refinery for Chevron from Thinking Tools.
28. The Monkey Wrench Conspiracy, by Games2train for think3 software.
29. For example, SIMNET tank simulators.

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WHAT VIDEO GAMES HAVE TO TEACH US ABOUT LEARNING AND LITERACY

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WHAT VIDEO GAMES HAVE TO TEACH US ABOUT LEARNING AND LITERACY
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First published in hardcover in 2003 by Palgrave Macmillan
First PALGRAVE MACMILLAN™ paperback edition: May 2004
175 Fifth Avenue, New York, N.Y. 10010 and
Houndmills, Basingstoke, Hampshire, England RG21 6XS.
Companies and representatives throughout the world.

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ISBN 1-4039-6538-2

Library of Congress Cataloging-in-Publication Data
Gee, James Paul.
What video games have to teach us about learning and literacy / James Paul Gee.
p. cm.
Includes bibliographical references and index.
ISBN 1-4039-6538-2

GV1469.3 .G44 2003
794.8'01'9—dc21
2002038153

A catalogue record for this book is available from the British Library.

Design by Letra Libre.

First PALGRAVE MACMILLAN paperback edition: May 2004
10 9 8 7 6 5 4 3 2 1

Printed in the United States of America.
Appendix

THE 36 LEARNING PRINCIPLES

1. Active, Critical Learning Principle
All aspects of the learning environment (including the ways in which the semiotic domain is designed and presented) are set up to encourage active and critical, not passive, learning.

2. Design Principle
Learning about and coming to appreciate design and design principles is core to the learning experience.

3. Semiotic Principle
Learning about and coming to appreciate interrelations within and across multiple sign systems (images, words, actions, symbols, artifacts, etc.) as a complex system is core to the learning experience.

4. Semiotic Domains Principle
Learning involves mastering, at some level, semiotic domains, and being able to participate, at some level, in the affinity group or groups connected to them.

5. Metalevel Thinking about Semiotic Domains Principle
Learning involves active and critical thinking about the relationships of the semiotic domain being learned to other semiotic domains.

6. “Psychosocial Moratorium” Principle
Learners can take risks in a space where real-world consequences are lowered.
7. **Committed Learning Principle**
Learners participate in an extended engagement (lots of effort and practice) as extensions of their real-world identities in relation to a virtual identity to which they feel some commitment and a virtual world that they find compelling.

8. **Identity Principle**
Learning involves taking on and playing with identities in such a way that the learner has real choices (in developing the virtual identity) and ample opportunity to meditate on the relationship between new identities and old ones. There is a tripartite play of identities as learners relate, and reflect on, their multiple real-world identities, a virtual identity, and a projective identity.

9. **Self-Knowledge Principle**
The virtual world is constructed in such a way that learners learn not only about the domain but about themselves and their current and potential capacities.

10. **Amplification of Input Principle**
For a little input, learners get a lot of output.

11. **Achievement Principle**
For learners of all levels of skill there are intrinsic rewards from the beginning, customized to each learner’s level, effort, and growing mastery and signaling the learner’s ongoing achievements.

12. **Practice Principle**
Learners get lots and lots of practice in a context where the practice is not boring (i.e., in a virtual world that is compelling to learners on their own terms and where the learners experience ongoing success). They spend lots of time on task.

13. **Ongoing Learning Principle**
The distinction between learner and master is vague, since learners, thanks to the operation of the “regime of competence” principle listed next, must, at higher and higher levels, undo their routinized mastery to adapt to new or changed conditions. There are cycles of new learning, automatization, undoing automatization, and new reorganized automatization.
14. “Regime of Competence” Principle
The learner gets ample opportunity to operate within, but at the outer edge of, his or her resources, so that at those points things are felt as challenging but not “undoable.”

15. Probing Principle
Learning is a cycle of probing the world (doing something); reflecting in and on this action and, on this basis, forming a hypothesis; reprobing the world to test this hypothesis; and then accepting or rethinking the hypothesis.

16. Multiple Routes Principle
There are multiple ways to make progress or move ahead. This allows learners to make choices, rely on their own strengths and styles of learning and problem solving, while also exploring alternative styles.

17. Situated Meaning Principle
The meanings of signs (words, actions, objects, artifacts, symbols, texts, etc.) are situated in embodied experience. Meanings are not general or decontextualized. Whatever generality meanings come to have is discovered bottom up via embodied experiences.

18. Text Principle
Texts are not understood purely verbally (i.e., only in terms of the definitions of the words in the text and their text-internal relationships to each other) but are understood in terms of embodied experiences. Learners move back and forth between texts and embodied experiences. More purely verbal understanding (reading texts apart from embodied action) comes only when learners have had enough embodied experience in the domain and ample experiences with similar texts.

19. Intertextual Principle
The learner understands texts as a family (“genre”) of related texts and understands any one such text in relation to others in the family, but only after having achieved embodied understandings of some texts. Understanding a group of texts as a family (genre) of texts is a large part of what helps the learner make sense of such texts.
20. **Multimodal Principle**  
Meaning and knowledge are built up through various modalities (images, texts, symbols, interactions, abstract design, sound, etc.), not just words.

21. **“Material Intelligence” Principle**  
Thinking, problem solving, and knowledge are “stored” in material objects and the environment. This frees learners to engage their minds with other things while combining the results of their own thinking with the knowledge stored in material objects and the environment to achieve yet more powerful effects.

22. **Intuitive Knowledge Principle**  
Intuitive or tacit knowledge built up in repeated practice and experience, often in association with an affinity group, counts a great deal and is honored. Not just verbal and conscious knowledge is rewarded.

23. **Subset Principle**  
Learning even at its start takes place in a (simplified) subset of the real domain.

24. **Incremental Principle**  
Learning situations are ordered in the early stages so that earlier cases lead to generalizations that are fruitful for later cases. When learners face more complex cases later, the learning space (the number and type of guesses the learner can make) is constrained by the sorts of fruitful patterns or generalizations the learner has found earlier.

25. **Concentrated Sample Principle**  
The learner sees, especially early on, many more instances of fundamental signs and actions than would be the case in a less controlled sample. Fundamental signs and actions are concentrated in the early stages so that learners get to practice them often and learn them well.

26. **Bottom-up Basic Skills Principle**  
Basic skills are not learned in isolation or out of context; rather, what counts as a basic skill is discovered bottom up by engaging in more and more of the game/domain or game/domains like it. Basic skills are genre elements of a given type of game/domain.
27. **Explicit Information On-Demand and Just-in-Time Principle**
The learner is given explicit information both on-demand and just-in-time, when the learner needs it or just at the point where the information can best be understood and used in practice.

28. **Discovery Principle**
Overt telling is kept to a well-thought-out minimum, allowing ample opportunity for the learner to experiment and make discoveries.

29. **Transfer Principle**
Learners are given ample opportunity to practice, and support for, transferring what they have learned earlier to later problems, including problems that require adapting and transforming that earlier learning.

30. **Cultural Models about the World Principle**
Learning is set up in such a way that learners come to think consciously and reflectively about some of their cultural models regarding the world, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models that may conflict with or otherwise relate to them in various ways.

31. **Cultural Models about Learning Principle**
Learning is set up in such a way that learners come to think consciously and reflectively about their cultural models of learning and themselves as learners, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models of learning and themselves as learners.

32. **Cultural Models about Semiotic Domains Principle**
Learning is set up in such a way that learners come to think consciously and reflectively about their cultural models about a particular semiotic domain they are learning, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models about this domain.

33. **Distributed Principle**
Meaning/knowledge is distributed across the learner, objects, tools, symbols, technologies, and the environment.
34. Dispersed Principle
Meaning/knowledge is dispersed in the sense that the learner shares it with others outside the domain/game, some of whom the learner may rarely or never see face-to-face.

35. Affinity Group Principle
Learners constitute an “affinity group,” that is, a group that is bonded primarily through shared endeavors, goals, and practices and not shared race, gender, nation, ethnicity, or culture.

36. Insider Principle
The learner is an “insider,” “teacher,” and “producer” (not just a “consumer”) able to customize the learning experience and domain/game from the beginning and throughout the experience.