

Procedural Rhetoric

In 1975, Owen Gaede created *Tenure*, a simulation of the first year of secondary school teaching, for the PLATO computer education system.¹ The program was intended to give new high school teachers an understanding of the impact of seemingly minor decisions on the teaching experience. The goal of the game is to complete the first year of teaching and earn a contract renewal for the next. During play, the player must make successive decisions, each of which affects different people in different ways. Some decisions may please the students but contradict the principal's educational philosophy. Others may provide a higher quality educational experience but put performance pressure on fellow teachers, causing workplace conflict. The player can monitor the state of affairs by listening to student reactions, requesting a conference with the principal, or overhearing gossip in the teacher's lounge.

The game is played primarily through responses to multiple-choice questions whose aggregate answers change principal, teacher, and student attitudes. For example, at the start of the game, the player must take a job interview with his prospective principal. The principal may ask about the player's educational philosophy or his willingness to advise student organizations. Later, the player must choose a grading methodology, classroom rules, student seating arrangements, and a curriculum plan. The simulation then presents the player with very specific quandaries, such as how to manage another teacher's students at a school assembly, whether or not to participate in the teacher's union, dealing with note-passing in class, contending with

parents angry about their children's grades, and even managing students' difficult personal issues, such as home abuse.

No decision is straightforward, and the interaction of multiple successive decisions produces complex social, educational, and professional situations. Situations are further influenced by the gender of the teacher, the influence of the principal, student learning styles, and other subtle, social factors. In one run of a recent PC port of *Tenure*, Jack, one of my best students, had been arriving late to class.² I could choose to ignore his tardiness, talk to him privately, or give him detention. I chose to talk with Jack about the problem, which earned me praise from the principal, whose progressive philosophy encouraged direct contact and student empathy. However, after speaking with the student, I learned that his tardiness was caused by Mr. Green, the math teacher, who had been holding class after the bell to complete the last problem on the board. Now I was faced with a new decision: confront Mr. Green, make Jack resolve the issue and accept the necessary discipline, or complain to the principal. Asking the student to take responsibility would avoid conflict with my colleague and principal on the one hand, but would put Jack in an uncomfortable situation on the other, perhaps changing his opinion of me as a teacher. Confronting Mr. Green might strain our relationship and, thanks to lounge gossip, my rapport with other teachers as well. Complaining to the principal might cause the same reaction, and might also run the risk of exposing me as indecisive. All of these factors might change given the outcome of other decisions and the personalities of my fellow teachers and principal.

Tenure makes claims about how high school education operates. Most notably, it argues that educational practice is deeply intertwined with personal and professional politics. Novice teachers and idealistic parents would like to think that their children's educations are motivated primarily, if not exclusively by pedagogical goals. *Tenure* argues that this ideal is significantly undermined by the realities of school politics, personal conflicts, and social hearsay. The game does not offer solutions to these problems; rather, it suggests that education takes place not in the classroom alone, but in ongoing affinities and disparities in educational, social, and professional goals. *Tenure* outlines the *process* by which high schools really run, and it makes a convincing argument that personal politics indelibly mark the learning experience.

I suggest the name *procedural rhetoric* for the new type of persuasive and expressive practice at work in artifacts like *Tenure*. *Procedurality* refers to a way

of creating, explaining, or understanding processes. And processes define the way things work: the methods, techniques, and logics that drive the operation of systems, from mechanical systems like engines to organizational systems like high schools to conceptual systems like religious faith. *Rhetoric* refers to effective and persuasive expression. Procedural rhetoric, then, is a practice of using processes persuasively. More specifically, procedural rhetoric is the practice of persuading through processes in general and computational processes in particular. Just as verbal rhetoric is useful for both the orator and the audience, and just as written rhetoric is useful for both the writer and the reader, so procedural rhetoric is useful for both the programmer and the user, the game designer and the player. Procedural rhetoric is a technique for making arguments with computational systems and for unpacking computational arguments others have created.

Procedural and *rhetoric* are both terms that can impose ambiguity and confusion. Before trying to use the two together in earnest, I want to discuss each in turn.

Procedurality

The word *procedure* does not usually give rise to positive sentiments. We typically understand *procedures* as established, entrenched ways of doing things. In common parlance, *procedure* invokes notions of officialdom, even bureaucracy: a procedure is a static course of action, perhaps an old, tired one in need of revision. We often talk about procedures only when they go wrong: *after several complaints, we decided to review our procedures for creating new accounts*. But in fact, procedures in this sense of the word structure behavior; we tend to “see” a process only when we challenge it.³ Likewise, procedure and the law are often closely tied. Courts and law enforcement agencies abide by *procedures* that dictate how actions can and cannot be carried out. Thanks to these common senses of the term, we tend to think of procedures as fixed and unquestionable. They are tied to authority, crafted from the top down, and put in place to structure behavior and identify infringement. Procedures are sometimes related to ideology; they can cloud our ability to see other ways of thinking; consider the police officer or army private who carries out a clearly unethical action but later offers the defense, “I was following procedure.” This very problem arose in the aftermath of American brutalization of Iraqi war prisoners at Abu Ghraib in 2004. Field soldiers claimed they followed orders,

while officers insisted that the army did not endorse torture; rather individual soldiers acted alone. No matter the truth, the scenario raises questions about the *procedures* that drive military practice. In his report on prison practices, Major General Marshal Donald Ryder noted the possibility of altering “facility procedures to set the conditions for MI [military intelligence] interrogations.”⁴ In this case, the procedures in question dictate the methods used to interrogate prisoners. One might likewise think of interactions with line workers in retail establishments. When asked to perform some unusual task, such employees may be instructed to balk, offering excuses like “that’s not our policy.” Policy is a synonym for procedure in many cases: an approach, or a custom; a process for customer relations. In both these cases, procedures constrain the types of actions that can or should be performed in particular situations.

In her influential book *Hamlet on the Holodeck*, Janet Murray defines four essential properties of digital artifacts: procedurality, participation, spatiality, and encyclopedic scope.⁵ Murray uses the term *procedural* to refer to the computer’s “defining ability to execute a series of rules.”⁶ Procedurality in this sense refers to the core practice of software authorship. Software is composed of algorithms that model the way things behave. To write procedurally, one authors code that enforces rules to generate some kind of representation, rather than authoring the representation itself. Procedural systems generate behaviors based on rule-based models; they are machines capable of producing many outcomes, each conforming to the same overall guidelines. Procedurality is the principal value of the computer, which creates meaning through the interaction of algorithms. Although Murray places procedurality alongside three other properties, these properties are not equivalent. The computer, she writes, “was designed . . . to embody complex, contingent behaviors. To be a computer scientist is to think in terms of algorithms and heuristics, that is, to be constantly identifying the exact or general rules of behavior that describe any process, from running a payroll to flying an airplane.”⁷ This ability to execute a series of rules fundamentally separates computers from other media.

Procedurality in the computer-scientific sense preserves a relationship with the more familiar sense of *procedure* discussed above. Like courts and bureaucracies, computer software establishes rules of execution, tasks and actions that can and cannot be performed. I have argued elsewhere that procedurality can be read in both computational and noncomputational structures.⁸ As cultural

critics, we can interrogate literature, art, film, and daily life for the underlying processes they trace. But computational procedurality places a greater emphasis on the expressive capacity afforded by rules of execution. Computers run processes that invoke interpretations of processes in the material world.

For my purposes, procedural expression must entail symbol manipulation, the construction and interpretation of a symbolic system that governs human thought or action. As Steven Harnad argues, computation is “interpretable symbol manipulation” in which symbols “are manipulated on the basis of rules operating only on the symbols’ shapes, which are arbitrary in relation to what they can be interpreted as meaning.”⁹ The interpretation of these systems, continues Harnad, “is not intrinsic to the system; it is projected onto it by the interpreter.”¹⁰ Computation is representation, and procedurality in the computational sense is a means to produce that expression. As Murray suggests, computer processes are representational, and thus procedurality is fundamental to computational expression. Because computers function procedurally, they are particularly adept at representing real or imagined systems that themselves function in some particular way—that is, that operate according to a set of processes. The computer magnifies the ability to create representations of processes.

The type of procedures that interest me here are those that present or comment on processes inherent to human experience. Not all procedures are expressive in the way that literature and art are expressive. But processes that might appear unexpressive, devoid of symbol manipulation, may actually found expression of a higher order. For example, bureaucracy constrains behavior in a way that invokes political, social, and cultural values. Consider the example of retail customer service as an invocation of processes. Imagine that you bought a new DVD player from a local retailer. Upon installing it, you discover that the device’s mechanical tray opens and shuts properly, but no image displays on the television. You assume it is defective. Most stores offer a return policy in such cases, so you take the player back to the store and exchange it for a new one.

Now imagine that you buy the DVD player late one evening on the way home from work. You lead a busy life, and unpacking a DVD player isn’t the first thing on your mind. You leave it in the box for a week, or two, and then finally take it out and connect it, discovering that it doesn’t work properly. You are frustrated but still pressed for time, and you don’t get back to the retailer for the return until the following week. The store would be happy to

take your return, but they note that you purchased the item more than fourteen days ago. The store's stated policy is to accept consumer electronics returns only within two weeks of purchase. In this case, the retailer's employees may try to enforce their return policy, invoking the rules of a process. But you might reason with the clerk, or make a ruckus, or ask to see a supervisor, or cite your record of purchases at the store in question. Swayed by logic, empathy, or expediency, the store might agree to accept the return—to bend the rules or *to break procedure*, as we sometimes say.

Let's replace the human agents with computational ones. Now imagine that you purchased the DVD player from an online retailer. The return process is no less codified in procedure, but this time a computer, not a human, manages your interface with the procedure. You receive the package and, as before, you delay in opening and installing it. By the time you realize the item is defective, you have exceeded the stated return window. But this time, the return is managed by the retailer's website software. Instead of speaking with a person, you must visit a website and enter your order number on a return authorization page. A computer program on the server performs a simple test, checking the delivery date of the order automatically provided by the shipping provider's computer tracking system against the current date. If the dates differ by more than fourteen days' time, the computer rejects the return request.

Situations like this help explain why we often despise the role of computers in our lives. They are inflexible systems that cannot empathize, that attempt to treat everyone the same. This is partly true, but it is not a sufficient explanation of *computational* procedural expression. When the human clerks and supervisors in the retail store agree to forgo their written policy, they are not really "breaking procedure." Instead, they are mustering new processes—for example, a process for promoting repeat business, or for preventing a commotion—and seamlessly blending them with the procedure for product returns. This distinction underscores an important point about processes in general and computational processes in particular: often, we think of procedures as tests that maintain the edges of situations. Disallow returns after two weeks. Diffuse customer incidents as quickly as possible. This also explains why we think of procedures as constraints that limit behavior. Max Weber pessimistically characterized the rationalist bureaucratization of society as an "iron cage." When the asceticism of Puritanism was extended into daily life, argues Weber,

it did its part in building the tremendous cosmos of the modern economic order. This order is now bound to the technical and economic conditions of machine production which today determine the lives of all the individuals who are born into this mechanism. In [Calvinist Richard] Baxter's view the care for external goods should only lie in on the shoulders of the "saint, like a light cloak, which can be thrown aside at any moment." But fate decreed that the cloak should become an iron cage.¹¹

Weber's point is that mechanization overemphasizes rationalism. But in fact, procedures found the logics that structure behavior in *all* cases; the machines of industrialization simply act as a particularly tangible medium for expressing these logics. The metaphor of the cloak may suggest easy shedding of procedure, but the saint must immediately don a new cloak, symbolizing a new logic. Both cloak and cage brandish processes; one is simply nimbler than the other.

While we often think that rules always limit behavior, the imposition of constraints also creates expression. In our example, the very concept of returning a defective product is only made possible by the creation of rules that frame that very notion. Without a process, it would perhaps never even occur to us that defective or unwanted products can be returned. And yet, this state of affairs too implies a process, which we give the shorthand *caveat emptor*, let the buyer beware. When we do things, we do them according to some logic, and that logic constitutes a *process* in the general sense of the word.

This clarification in mind, there is no reason one could not model the more complex, human-centered product return interaction computationally. For example, the computer system might also recall the customer's previous purchases, forgoing the cutoff policy for frequent buyers. It might even reason about the customer's future purchases based on a predictive model of future buying habits of similar customers. We think of computers as frustrating, limiting, and simplistic not because they execute processes, but because they are frequently programmed to execute simplistic processes. And the choice to program only a simplistic process for customer relations exposes yet another set of processes, such as corporate information technology operations or the constraints of finances or expertise that impose buying off-the-shelf software solutions instead of building custom solutions.

Processes like military interrogation and customer relations are cultural. We tend to think of them as flexible and porous, but they are crafted from a multitude of protracted, intersecting cultural processes. I have given the name

unit operations to processes of the most general kind, whether implemented in material, cultural, or representational form.¹² Unit operations are characterized by their increased compression of representation, a tendency common over the course of the twentieth century, from structuralist anthropology to computation. I use this term to refer to processes in the general sense, for example, the coupling of a cultural process and its computational representation. I also use *unit operation* to distinguish one process in interleaved or nested procedural systems, for example, the concept of customer loyalty as distinct from transaction age in the case of a process for managing product returns.

Since processes describe the way simple and complex things work, sometimes they are nonobvious. In some cases, we want to conceal procedure—for example, many people read the U.S. Army’s ambiguous response to Abu Ghraib as a sign that high-ranking officials in the military, those with the authority to set the procedure, endorsed torture. In other cases, the process is too complex to apprehend immediately. We tend to ask the question *how does this work?* in relation to such processes. This sentiment probably conjures images of mechanical devices like wristwatches, where procedural understanding implies taking a set of gears apart to see how they mesh. But proceduralism can also entail the operation of cultural, social, and historical systems. In these cases, asking *how does this work?* requires taking a set of cultural systems apart to see what logics motivate their human actors.

A notable example comes from microbiologist Jared Diamond’s Pulitzer Prize-winning book *Guns, Germs, and Steel*, an alternative approach to understanding history (discussed further in chapter 9).¹³ Instead of recording the events of human history, Diamond looks at configurations of material conditions like geography and natural resources and asks how they produce structural, political, and social outcomes. These outcomes in turn recombine with their underlying material conditions to produce new historical moments. For example, the lush agricultural conditions in the fertile crescent, along with the similar climates in the east–west axis of Eurasia, set the stage for rapid advances in agriculture across that continent, leading to adequate food surpluses that allowed societies to pursue activities like politics and technology. Such an approach to history goes far beyond the relation between contemporaneous events, asking us to consider the systems that produce those events.

Steven D. Levitt’s work on microeconomies also exposes processes. Levitt and Stephen J. Dubner authored the *New York Times* bestseller *Freakonomics*, a

populist account of Levitt's sometimes unusual microeconomic analysis. Levitt claims that human behavior is fundamentally motivated by incentives.¹⁴ He uses this assertion to explain the seemingly incomprehensible function of numerous communities of practice, from real estate agents to sumo wrestlers to drug dealers. In one of his more controversial claims, Levitt argues that the massive drop in crime across the United States in the 1990s was caused by the legalization of abortion in 1973.¹⁵ Levitt and Dubner explain:

In the early 1990s, just as the first cohort of children born after *Roe v. Wade* was hitting its late teen years—the years during which young men enter their criminal prime—the rate of crime began to fall. What this cohort was missing, of course, were the children who stood the greatest chance of becoming criminals. And the crime rate continued to fall as an entire generation came of age minus the children whose mothers had not wanted to bring a child into the world. *Legalized abortion led to less unwantedness; unwantedness leads to high crime; legalized abortion, therefore, led to less crime.*¹⁶

Using written rhetoric, Levitt and Dubner walk us through an explanation of the causal relationship that leads, in their proposition, from legalized abortion to reduced crime. They are describing a social process, the operation of interrelated legal policy and social welfare. Notably, the two end this explanation with a formal logical syllogism (italicized above), a structure I will return to below in the context of rhetoric.

These abstract processes—be they material like watch gears or cultural like crime—can be recounted through representation. However, procedural representation takes a different form than written or spoken representation. Procedural representation explains processes *with other processes*. Procedural representation is a form of symbolic expression that uses process rather than language. Diamond and Levitt make claims about procedural systems like history and crime, but they do not inscribe those claims in procedure—they write them, just like I wrote the description of product returns above. In fact, each and every analysis of videogame-based procedural rhetoric I will perform in this book necessarily *describes* the function of processes. These written descriptions attempt to explain the procedural ones, which are made up of rules rather than letters.

Procedural representation itself requires inscription in a medium that actually enacts processes rather than merely describe them. Human behavior is one

mode of procedural inscription. Human actors can enact processes; we do so all the time. The clerk, the supervisor, and the army private all enact procedures. Even very young children can consciously enact procedures with great success: crossing the street, tying one's shoes, and setting the table are all unit operations in cultural and social processes. Nondigital board and card games offer further examples of human-enacted processes; the people playing the game execute its rules. But human behavior is a challenging medium to muster for arbitrary expression. It is difficult to coerce even a small group of people to execute a particular process again and again, without rest and without incentive. Because procedurality is intrinsic and fundamental to computers, and because computers are much more flexible as an inscription medium than human agents, they are particularly suited to procedural expression.

In her call for meaningful interactive drama, Janet Murray advocates for procedural authorship. Such effort, says Murray, "means writing the rules by which the text appears as well as writing the texts themselves. It means writing the rules for the interactor's involvement, that is, the conditions under which things will happen in response to the participant's actions." Murray cites Joseph Weizenbaum's *Eliza* program as an early example of this kind of procedural expression.¹⁷ *Eliza* modeled a therapist, responding to users' text-based input in much the same way one would expect from a real Rogerian psychologist. Here is a sample exchange from Weizenbaum's original *Eliza*, which ran on MIT's MAC time-sharing system in the mid-1960s (capitalized lines are computer responses):

Men are all alike.

IN WHAT WAY?

They're always bugging us about something or other.

CAN YOU THINK OF A SPECIFIC EXAMPLE?

Well, my boyfriend made me come here.

YOUR BOYFRIEND MADE YOU COME HERE

He says I'm depressed much of the time.

I AM SORRY TO HEAR YOU ARE DEPRESSED

It's true. I am unhappy

DO YOU THINK COMING HERE WILL HELP YOU NOT TO BE UNHAPPY

I need some help, that much seems certain.

WHAT WOULD IT MEAN TO YOU IF YOU GOT SOME HELP

Perhaps I could learn to get along with my mother.

TELL ME MORE ABOUT YOUR FAMILY

My mother takes care of me.¹⁸

As a technical experiment, *Eliza* is an example of natural language processing (NLP); the computer takes the user's input, parses it into units of meaning that the program can understand, and then assembles and presents a response, including the proper grammatical transformations to maintain the illusion of language fluency. *Eliza* seeks out keywords such as "I am" or "you" and manufactures transformations based on them. The computer program has no real understanding of the meaning of the user's input; rather, it is taking that input and spinning it into a possible conversation. *Eliza* is a machine for generating conversations according to procedures.

Of course, the Rogerian psychologist is not the most meaningful real-life interlocutor—such a therapist converses with the patient, encouraging him or her toward "self-actualization" through empathy, mostly in the form of repetition intended to encourage reflection. Since *Eliza*, considerable research in the field of artificial intelligence has centered on the creation of similar agents. Some agents are meant merely to process bits of data, like keyword searches or security tools. Other agents have more lofty goals, hoping to create believable characters whose behavior is authored procedurally with special-use computer languages.¹⁹ These are expressive agents, meant to clarify, explore, or comment on human processes in the same vein as poetry, literature, and film. No matter their content, these computer programs use processes for expression rather than utility. As an inscriptive practice, procedurality is not limited to tool-making.

Procedurality versus the Procedural Programming Paradigm

Speaking of computer languages, I would like to make a few notes to help reduce confusion for readers who come equipped with different (although not incompatible) notions of procedure, especially for those who come from a background in computer science. I am using *procedural* and *procedurality* in a much more general sense than it sometimes takes on in that field. In computer science, a *procedure* is sometimes used as a synonym for a subroutine—a function or method call. A procedure contains a series of computational

instructions, encapsulated into a single command that can be called at any time during program execution. Some imperative computer languages, such as Pascal, even reserve the word *procedure* to declare a subroutine in code, as the following example illustrates.

```
procedure foo(var n: integer)
begin
    writeln('foo outputs ', n);
end;

begin
    i := 1;
    while i <= 10 do foo(i);
end.
```

In other cases, *procedural* is used to describe a particular approach to computer programming, one typically called the *procedural programming* paradigm. Procedural programming is a paradigmatic extension of the notion of *procedure* as subroutine. As a programming method, procedural programming became privileged over unstructured programming, in which all code exists in a single continuous block. In Assembly and early versions of BASIC, programs were written as long lists of code with branches (Assembly's BNE, BEQ, and JMP) or execution flow statements (BASIC's GOTO).²⁰ Procedural programming allowed increased readability and management of complexity, at a slight cost in program performance. Procedural programming also offered the ability to reuse the same code throughout a program through procedure calls, functions, and multiple files. Strong proponents of the more recent paradigm of object-oriented programming may shudder at my liberal use of the term *procedural*, but I am not referring to the programming paradigm. Object-oriented programming extends the modularity introduced by procedural programming and therefore owes the latter a conceptual debt, but this relationship is not relevant to my purposes here. Rather, I understand procedurality as the fundamental notion of authoring processes.

Procedural Figures, Forms, and Genres

Just as there are literary and filmic figures, so there are procedural figures. These are distinct from and prior to forms and genres. Procedural figures have much

in common with literary figures like metaphor, metonymy, or synecdoche; they are strategies for authoring unit operations for particularly salient parts of many procedural systems. Noah Wardrip-Fruin has used the term *operational logics* to refer to the standardized or formalized unit operations that take on common roles in multiple procedural representations.²¹ He identifies two operational logics that are particularly common, graphical logics and textual logics. Graphical logics are very frequently found in videogames; they include such procedural figures as movement, gravity, and collision detection. These fundamental figures ground innumerable videogames, from *Spacewar!* to *Pong* to *Pac-Man* to *Doom*. In many videogames, the player controls an object, agent, or vehicle that he must pilot in a particular manner—toward a goal or to avoid enemies or obstacles. Graphical logics frequently encapsulate procedural representations of material phenomena, such as moving, jumping, or firing projectiles. Object physics and lighting effects offer additional examples, meant to depict changing environments rather than character movement. In the videogame industry, sets of graphical logics are often packaged together as a *game engine*, a software toolkit used to create a variety of additional games.²²

Wardrip-Fruin also cites textual logics as a common procedural trope. NLP, mentioned above, is an example of a textual logic, as are the text parsers inherent to Z-machine text adventure games and interactive fiction, such as *Zork*.²³ Additional logics include those procedural tropes used for text generation, such as n-grams, a probability distribution derived from Markov chains and first suggested by cyberneticist Claude Shannon. N-grams are sequences of a specified number (*n*) of elements from a given sequence, where probabilities determine which members of the sequence are most likely to be selected next. They are really sequential logics, but when applied to text generation they can be used to predict and construct textual phrases based on probability distributions of the subsequent word or phrase given a starting word or phrase. For example, in the sequence “where are” a likely subsequent word might be “you.”²⁴

Outside of videogames, procedural tropes often take the form of common models of user interaction. Elements of a graphical user interface could be understood as procedural tropes, for example, the scrollbar or push-button. These elements facilitate a wide range of user interactions in a variety of content domains. Operational logics for opening and saving files are also reasonable candidates; these tropes encapsulate lower-level logics for getting handles to filestreams and reading or writing byte data. We might call the

former group of procedural tropes *interface logics*, and the latter *input/output (IO) logics*. Just as game engines accumulate multiple, common graphical logics, so software frameworks like Microsoft Foundation Classes (MFC) and Java Foundation Classes (JFC) accumulate multiple, common interface logics, IO logics, and myriad other logics required to drive the modern computer operating system.

Taken together, we can think of game engines, frameworks, and other common groupings of procedural tropes as commensurate with forms of literary or artistic expression, such as the sonnet, the short story, or the feature film. These collections of procedural tropes form the basis for a variety of subsequent expressive artifacts. On its own, the sonnet is no more useful than the physics engine, but both can be deployed in a range of expressive practices. A classical Newtonian mechanics simulation can easily facilitate both war (projectile fire) and naturalism (ballooning), just as a sonnet can facilitate both religious (John Donne) and amorous (Shakespeare) expression.

Procedural genres emerge from assemblages of procedural forms. These are akin to literary, filmic, or artistic genres like the film noir, the lyric poem, or the science fiction novel. In videogames, genres include the platformer, the first-person shooter, the turn-based strategy game, and so forth. When we recognize gameplay, we typically recognize the similarities between the constitutive procedural representations that produce the on-screen effects and controllable dynamics we experience as players.

Procedural representation is significantly different from textual, visual, and plastic representation. Even though other inscription techniques may be partly or wholly driven by a desire to represent human or material processes, only procedural systems like computer software actually represent process with process. This is where the particular power of procedural authorship lies, in its native ability to depict processes.

The inscription of procedural representations on the computer takes place in code. Just like *procedure*, the term *code* can take multiple meanings. Lawrence Lessig has taken advantage of the term's ambiguity to address the similarity between code in the legal sense and code in the programmatic sense: "In real space we recognize how laws regulate—through constitutions, statutes, and other legal codes. In cyberspace we must understand how code regulates—how the software and hardware that make cyberspace what it is *regulate* cyberspace as it is."²⁵ But in legal systems, code is regulated through complex social and political structures subject to many additional procedural influences, just

like the soldiers in Abu Ghraib and the clerk at the retail return counter. In computational systems, code is regulated through software and hardware systems. These systems impose constraints, but they are not subject to the caprice of direct human action.

Rhetoric

Like procedurality, rhetoric is not an esteemed term. Despite its two and a half millennia-long history, *rhetoric* invokes largely negative connotations. We often speak of “empty rhetoric,” elaborate and well-crafted speech that is nevertheless devoid of actual meaning. *Rhetoric* might conjure the impression of *hot air*, as in the case of a fast-talking con who crafts pretentious language to hide barren or deceitful intentions. Academics and politicians are particularly susceptible to this sort of criticism, perhaps because we (and they) tend to use flourish and lexis when coherence runs thin, as in this very sentence. Rhetoric is often equated with a type of smokescreen; it is language used to occlude, confuse, or manipulate the listener.

However, turgidity and extravagance are relatively recent inflections to this term, which originally referred only to persuasive speech, or oratory. The term *rhetoric* (ῥητορικη) first appears in Plato’s *Gorgias*, written some 2,500 years ago, in reference to the art of persuasion. The term itself derives from the rhetor (ῥήτωρ), or orator, and his practice, oratory (ῥητορεύω).²⁶ Rhetoric in ancient Greece—and by extension classical rhetoric in general—meant public speaking for civic purposes. Golden age Athenian democracy strongly influenced the early development of rhetoric, which dealt specifically with social and political practices. Rhetoric was oral and it was public. The rhetor used his art on specific occasions and in particular social contexts—the law court and the public forum. A well-known example of this type of rhetoric is Plato’s *Apology*, in which Socrates defends himself against accusations that he has corrupted the youth of Athens—*apology* here refers to the Greek term ἀπολογία, a defense speech. In the context of public speech and especially legal and civic speech, rhetoric’s direct relation to persuasion is much clearer. Spoken words attempt to convert listeners to a particular opinion, usually one that will influence direct and immediate action, such as the fateful vote of Socrates’ jury.

In golden age Athens, there was good reason to become versed in rhetorical technique. Unlike our contemporary representative democracies, the Athenian system was much more direct. Citizens were required to participate

in the courts, and anyone (i.e., any male) could speak in the assembly. Unlike our legal system, with its guarantees of professional representation, Athenians accused of a crime were expected to defend themselves (or to find a relative or friend to speak on their behalf). Furthermore, Athenian juries were huge—usually 201 members but often many hundreds more depending on the importance of the case. The average citizen untrained in oratory not only might find himself at a loss for words but also might experience significant intimidation speaking before such a large group.

Rhetorical training responded to this need, partly motivated by lucrative business opportunities. The title character in Plato's *Phaedrus* speaks of books on the subject of rhetoric (ἐν τοῖς περὶ λόγων τέχνης), and Socrates subsequently recounts the technical advice these books proffer:²⁷

Socrates: Thank you for reminding me. You mean that there must be an introduction [προοίον, *proemion*] first, at the beginning of the discourse; these are the things you mean, are they not?—the niceties of the art.

Phaedrus: Yes.

Socrates: And the narrative [διήγησιν, *diegesis*] must come second with the testimony [τεχὴ ἤματα] after it, and third the proofs [πίστωσιν, *pistis*], and fourth the probabilities [ἐπιπίστωσιν, *epipistis*]; and confirmation and further confirmation are mentioned, I believe, by the man from Byzantium, that most excellent artist in words.

Phaedrus: You mean the worthy Theodorus?

Socrates: Of course. And he tells how refutation [ἐλέγγχον, *elenkbos*] and further refutation [ἐπεξέλεγγχον, *epexelenkbos*] must be accomplished, both in accusation and in defense. Shall we not bring the illustrious Parian, Evenus, into our discussion, who invented covert allusion and indirect praises? And some say that he also wrote indirect censures, composing them in verse as an aid to memory; for he is a clever man.

...

But all seem to be in agreement concerning the conclusion of discourses, which some call recapitulation [ἐπάνοδον, *epanodos*], while others give it some other name.

Phaedrus: You mean making a summary of the points of the speech at the end of it, so as to remind the hearers of what has been said?

Socrates: These are the things I mean, these and anything else you can mention concerned with the art of rhetoric.²⁸

Socrates' negative opinion of textbook rhetoric notwithstanding (see below), the *Phaedrus* offers evidence of the method by which fifth-century Greeks

thought oratory could be best composed. Speakers should begin with an introduction (*prooemion*), then continue with a description or narration of events (*diegesis*), followed by proof and evidence (*pistis*) and the probabilities that such evidence is sound (*epipistis*). The speaker should then refute the opposing claim (*elenkbos*), and then refute it once more (*epexelenkbos*). Finally, the speech should end with a conclusion, including a recapitulation (*epanodos*) of the argument.

These techniques form the basis for rhetorical speech; they describe how it works and they instruct the speaker on how best to use rhetoric in any situation. Technical rhetoric, as this type is sometimes called, is useful for the layperson but perhaps too simplistic for the professional orator. Numerous other techniques developed around imitating skilled orators. These experts usually charged for their services, and they were called *sophists*. Sophistic rhetoric was taught by demonstration and practice, not by principle like technical rhetoric. In some cases, a demonstration of sophistic rhetoric resembled the performance of epic poetry, where narrative fragments were memorized and reassembled during recitation.²⁹ Other techniques included parallelism in structure, syllabic meter, and tone.³⁰

The popularity of books and sophistry bred critique. Such approaches motivated the work of Socrates, Plato, and Aristotle, who rejected the social and political contingency of the court and the assembly in favor of more lasting philosophical truths. Socrates and Plato privilege *dialectic*, or methods of reasoning about questions toward unknown conclusions, over rhetoric, which crafts discourse around known or desired conclusions. In Plato's *Georgias*, Socrates exposes rhetoric as a form of flattery, intended to produce pleasure, not knowledge or justice.³¹

Aristotle resuscitated rhetoric, joining it with his notion of causality. In the *Physics*, Aristotle articulates four causes, the material, formal, efficient, and final. The material cause is the material out of which a thing is made; the formal cause is the structure that makes it what it is; the efficient cause is that which produces the thing; and the final cause is the purpose for which it is produced.³² A table, for example, is made of wood (material cause), crafted to have four legs and a flat surface (formal cause) by a carpenter (efficient cause) for the purpose of eating upon (final cause). For Aristotle, rhetoric has three possible ends, or final causes, and therefore he distinguishes three varieties of rhetoric: *forensic*, *deliberative*, and *epideictic*. Forensic (or judicial) rhetoric aims for justice, as in the purview of the law courts. Deliberative (or political) rhetoric strives for public benefit, as in the case of the assembly. Epideictic (or

ceremonial) rhetoric aims for honor or shame, as in the case of a private communication.³³ Aristotle avoids Plato's dismissal of rhetoric, arguing that rhetorical practice as a whole has the final cause of persuasion to correct judgment.

In the *Rhetoric*, Aristotle accomplishes this corrective through an approach to rhetorical practice that aligns it with knowledge instead of sophistry. Responding to Plato, Aristotle attempts a systematic, philosophical approach to the art of persuasive oratory. This approach borrows much from the idea of oratory process from technical rhetoric, and a great deal of Aristotle's rhetorical theory addresses the style, arrangement, and organization of persuasive speech. For Aristotle, rhetoric is defined as "the faculty of observing in any given case the available means of persuasion."³⁴ The adept rhetorician does not merely follow a list of instructions for composing an oratory (technical rhetoric), nor does he merely parrot the style or words of an expert (sophistic rhetoric), but rather he musters reason to discover the available means of persuasion in any particular case (philosophical rhetoric). This variety of rhetoric implies an understanding of both the reasons to persuade (the final cause) and the tools available to achieve that end (the efficient cause), including propositions, evidence, styles, and devices. Most importantly, Aristotle offers a philosophical justification for rhetoric that moves it closer to dialectic, the philosophical practice of reason that Socrates and Plato deliberately opposed to rhetoric. In particular, Aristotle draws a correlation between two modes of human reason, induction (*ἐπαγωγή*) and deduction (*συλλογισμός*, *sylogism*). In rhetoric, the equivalent to induction is the example (*παράδειγμα*, *paradigm*), and the equivalent to deduction is the enthymeme (*ἐνθύμημα*). Examples advance the claim that a certain proposition is a part of a set of such (allegedly true) cases, and therefore equally true. Enthymemes advance the claim that a certain proposition is true in light of another's truth value. Unlike syllogisms, in which both propositions and conclusions are given explicitly, in enthymeme the orator omits one of the propositions in a syllogism.³⁵ For example, in the enthymeme "We cannot trust this man, as he is a politician," the major premise of a proper syllogism is omitted:

Politicians are not trustworthy. (Omitted)

This man is a politician.

Therefore, we cannot trust this man.

The enthymeme and the example offer instances of a broad variety of rhetorical figures developed by and since Aristotle. Like procedural figures, rhetorical figures define the possibility space for rhetorical practice. These figures are many and a complete discussion of them would be impossible in the present context. However, many rhetorical figures will be familiar by virtue of our common experience with them: antithesis (the juxtaposition of contrasting ideas); paradox (a seemingly self-contradictory statement that produces insight or truth); oxymoron (a highly compressed paradox); aporia (feigning flummox about the best way to approach a proposition); irony (evoking contrary meaning to yield scorn). These and other rhetorical figures found the basis of rhetorical tactics. Combining these with the structural framework of introduction, statement, proof, and epilogue, Aristotle offers a complete process for constructing oratory.³⁶

Rhetoric Beyond Oratory

Unlike his Roman counterparts Cicero and Quintilian, Aristotle does not explicitly define rhetoric as the art of *verbal* persuasion, although it is unlikely that any other rhetorical mode occurred to him. Classical rhetoric passed into the Middle Ages and modern times with considerable alteration. The use of rhetoric in civil contexts like the court never disappeared entirely, and indeed it remains a common form of rhetoric today; our modern politicians soapbox just as Plato's contemporaries did. But the concept of rhetoric was expanded beyond oratory and beyond direct persuasion. Effectively, rhetoric was extended to account for new modes of inscription—especially literary and artistic modes. Rhetoric in writing, painting, sculpture, and other media do not necessarily make the same direct appeals to persuasion as oratory. Rhetoric thus also came to refer to *effective expression*, that is, writing, speech, or art that both accomplishes the goals of the author and absorbs the reader or viewer.

Persuasion as a rhetorical goal persists, but it has changed in nature. In classical rhetoric, oral persuasion primarily served political purposes. It was enacted when needed and with particular ends in mind. The effectiveness of oratory related directly to its success or failure at accomplishing a particular, known goal. And because citizens often got only one shot at oratory—as is the case in Socrates' defense speech—one can point to the clear success or failure of rhetorical techniques. In discursive rhetoric, persuasion is not necessarily so teleological. Writers and artists have expressive goals, and they

deploy techniques to accomplish those goals. The poststructuralist tendency to decouple authorship from readership, celebrating the free play of textual meanings, further undermines the status of persuasion. Here, persuasion shifts from the simple achievement of desired ends to the effective arrangement of a work so as to create a desirable possibility space for interpretation. In contemporary rhetoric, the goal of persuasion is largely underplayed or even omitted as a defining feature of the field, replaced by the more general notion of elegance, clarity, and creativity in communication. When understood in this sense, rhetoric “provides ways of emphasizing ideas or making them vivid.”³⁷ Success means effective expression, not necessarily effective influence.

Despite the apparent dichotomy between classical and contemporary rhetorics, the two share one core property: that of technique. Rhetorics of all types assume a particular approach to effective expression, whether it be oral, written, artistic, or otherwise inscribed. Today, spoken and written expression remain deeply relevant to culture. The spoken and written word enjoys a long rhetorical tradition—Aristotle’s techniques remain equally useful, and indeed equally put to use, by contemporary orators. Sonja Foss, Karen Foss, and Robert Trapp have attempted to reposition rhetoric outside of any particular mode of inscription. The three define rhetoric “broadly as the uniquely human ability to use symbols to communicate with one another.”³⁸ However, as Kevin DeLuca points out, on the “very next page”³⁹ Foss, Foss, and Trapp also argue that “the paradigm case of rhetoric is the use of the spoken word to persuade an audience.”⁴⁰ While rhetoric might include nonverbal transmission, these modes still maintain a tenuous relationship, and are at risk of appearing inferior to verbal discourse.

The influential twentieth-century rhetorician Kenneth Burke marks an important change in the understanding of rhetoric. Because people are inherently separate from one another, we seek ways to join our interests. Burke identifies this need as the ancestor of the practice of rhetoric. He extends rhetoric beyond persuasion, instead suggesting “identification” as a key term for the practice.⁴¹ We use symbolic systems, such as language, as a way to achieve this identification. Burke defines rhetoric as a part of the practice of identification, as “the use of words by human agents to form attitudes or induce actions in other human agents.”⁴² While rhetoric still entails persuasion for Burke, he greatly expands its purview, arguing that it facilitates human action in general. Persuasion is subordinated to identification (or the more obscure term *consubstantiality*, which Burke uses to characterize identification), and

using rhetoric to achieve an end is only one possible use of the craft for Burke.⁴³ Rhetoric becomes a means to facilitate identification and to “bridge the conditions of estrangement that are natural and inevitable.”⁴⁴

In addition to expanding the conception of rhetoric, Burke also expands its domain. Following the tradition of oral and written rhetoric, he maintains language as central, but Burke’s understanding of humans as creators and consumers of symbolic systems expands rhetoric to include nonverbal domains. He does not explicitly delineate all the domains to which rhetoric could apply; instead, he embraces the broadness of human symbolic production in the abstract. “Wherever there is persuasion,” writes Burke, “there is rhetoric. And wherever there is ‘meaning,’ there is ‘persuasion.’”⁴⁵

Visual Rhetoric

The wide latitude Burke affords rhetoric won him both champions and critics, but his approach advances the rhetorical value of multiple forms of cultural expression, not just speech and writing.⁴⁶ Thanks to the influence of Burke, and amplified by the increasingly inescapable presence of non-oral, nonverbal media, increasing interest has mounted around efforts to understand the rhetorical figures and forms of these other, newer modes of inscription that also appear to serve rhetorical ends. In particular, the emergence of photographic and cinematic expression in the nineteenth and twentieth centuries suggests a need to understand how these new, nonverbal media mount arguments. This subfield is called *visual rhetoric*. Marguerite Helmers and Charles A. Hill explain:

Rhetoricians working from a variety of disciplinary perspectives are beginning to pay a substantial amount of attention to issues of visual rhetoric. Through analysis of photographs and drawings, graphs and tables, and motion pictures, scholars are exploring the many ways in which visual elements are used to influence people’s attitudes, opinions, and beliefs.⁴⁷

Visual communication cannot simply adopt the figures and forms of oral and written expression, so a new form of rhetoric must be created to accommodate these media forms. Helmers and Hill argue that visual rhetoric is particularly essential in the face of globalization and mass media. Visual images on television, clothing, retail storefronts, and public spaces are nearly

ubiquitous, offering a strong incentive to understand the rhetoric of such media. Moreover, the profusion of photographic, illustrative, and cinematic images increases with the rise in cheap, accessible digital photography and video techniques coupled with the instant, worldwide distribution on the Internet. Politicians and advertisers use visual images as much as, if not more than, they use spoken and written words. In reference to these and related uses of images, visual rhetoricians ask, “how, exactly, do images persuade?”⁴⁸

Aristotle took great pains to reconnect rhetoric with philosophical discourse. A common thread in visual rhetoric addresses the relative merit of visual communication as emotional versus philosophical. As Hill explains,

It is likely that verbal text, because of its analytic nature (being made up of discrete meaningful units) and because it is apprehended relatively slowly over time, is more likely to prompt systematic processing, while images, which are comprehend holistically and almost instantaneously, tend to prompt heuristic processing.⁴⁹

Images may lack the kind of deep analysis afforded by textual interpretation, a sentiment that resonates with concerns over the use of images in propaganda. According to Hill, images are more “vivid” than text or speech, and therefore they are more easily manipulated toward visceral responses.⁵⁰ This use of images has been especially popular in advertising, a subject to which I will return in chapter 5. Advertisers, notes Hill, “don’t want to *persuade* people to buy their products, because persuasion implies that the audience has given the issue some thought and come to a conscious decision. Instead, advertisers want to . . . compel people to buy a product without even knowing why they’re buying it—as a visceral response to a stimulus, not as a conscious decision. And this is best done through images.”⁵¹ Hill offers no final conclusions about the potential for images to serve more reflective rhetorical purposes, but he does point out that visual rhetoric should not strive “to banish emotional and aesthetic concerns.”⁵²

J. Anthony Blair argues that visual rhetoric needs a theory of visual argument to escape this trap. Blair argues that, like Hill’s psychological vividness, “symbolic inducement” alone is inadequate for a theory of rhetoric.⁵³ Rather, visual rhetoric requires visual “arguments” which “supply us with *reasons* for accepting a point of view.”⁵⁴ Blair advances the rather ambiguous view that visual images cannot make propositional claims—the very notion of a “visual argument” stands at the edge of paradox.⁵⁵ The acid test for a visual argu-

ment, according to Blair, is “whether it would be possible to construct from what is communicated visually a verbal argument that is consistent with the visual presentation.”⁵⁶ Blair admits that such an argument could never be equivalent to the visual argument, but that the test is necessary to determine whether an image has propositional content. Verbal rhetoric remains privileged, with images mainly useful for “evocative power.”⁵⁷

The preferential treatment afforded to verbal rhetoric underscores the continued privilege of speech over writing, and writing over images. Philosopher Jacques Derrida argued against the hierarchy of forms of language, giving the name *logocentrism* to the view that speech is central to language because it is closer to thought.⁵⁸ In the Western tradition, speech is thought to derive from thought, and writing from speech. Detractors of visual rhetoric like Blair could be seen as logocentric in arguing that images derive from writing and are thus more distant from thought, less conducive to persuasive expression.

David S. Birdsell and Leo Groarke oppose this position. Visual argument does exist, but it takes a necessarily different form from that of verbal argument; images are, after all, a different mode of inscription from writing. Birdsell and Groarke call the “prevalent prejudice that visual images are in some way arbitrary vague and ambiguous” a “dogma that has outlived its usefulness.”⁵⁹ Objections claiming that images are sometimes vague are unconvincing, for spoken and written language is also vague at times. Visual argument, argue Birdsell and Groarke, is simply constructed differently than verbal argument. The two also observe that the rapid changes in visual culture make visual cultural contexts crucial in considerations of visual argument.

Randall A. Lake and Barbara A. Pickering offer several tropes for visual argument and refutation, including substitution, in which an image is replaced in part of a frame with connotatively different ones, and transformation, in which an image is “recontextualized in a new visual frame, such that its polarity is modified or reversed through association with different images.”⁶⁰ Examples of transformation include the “reframing” and “mobile framing” techniques used by filmmakers. Keith Kenney points out that documentarian Ken Burns liberally uses these gestures to reveal portions of an image in order to draw selective attention to its constituent parts, which then complete the visual argument.⁶¹ Editorial cartoons, a favorite example of visual rhetoricians, use similar techniques, encouraging the viewer to break down the image into constituent parts, each of which advances a portion of the argument.

Kevin Michael DeLuca attempts to address visual argument through the concept of “image event,” a kind of visual documentation of a rhetorical strategy.⁶² He draws examples from large-scale environmental demonstrations, such as the (failed) 1975 Greenpeace attempt to disrupt the Soviet whaling vessel *Vlastny* by positioning activists in inflatable boats between the harpoon and the whale. DeLuca argues that despite the failed actions of Greenpeace’s Save the Whales campaign, they succeed in their rhetorical purpose, namely drawing massive worldwide attention to the problem in question. DeLuca makes convincing claims that these situationist-style interventions actually influence future policy, but I would argue that they do not deploy visual rhetoric in the true sense of the word. To be sure, images of the Greenpeace actions appear to be partly, even largely responsible for subsequent protests and rejoinders toward environmental policy changes, but the actions themselves are designed to generate provocation, not to make arguments for policy changes.

The profusion of visual images recommends a subfield of rhetoric, but visual rhetoric remains an emerging discipline. The very notion of a visual rhetoric reinforces the idea that rhetoric is a general field of inquiry, applicable to multiple media and modes of inscription. To address the possibilities of a new medium as a type of rhetoric, we must identify how inscription works in that medium, and then how arguments can be constructed through those modes of inscription.

Digital Rhetoric

Visual rhetoric offers a useful lesson in the creation of new forms of rhetoric in the general sense. One would be hard pressed to deny that advertisements, photographs, illustrations, and other optical phenomena have some effect on their viewers. To be sure, visual rhetoric is often at work in videogames, a medium that deploys both still and moving images. A study of visual rhetoric in games would need to address the disputes of the former field, especially the rift between psychological and cultural discourses about manipulation and phenomenal impact on the one hand and logical deliberation on the other. But despite its possible value to digital media, visual rhetoric cannot help us address the rhetorical function of procedural representation. To convincingly propose a new domain for rhetoric, one is obliged to address the properties of the persuasive medium in particular, and the general practice of persuasion

on the other. Visual rhetoric simply does not account for procedural representation. This is not a flaw in the subfield of visual rhetoric; there is much value to be gained from the study of images in all media. But in procedural media like videogames, images are frequently constructed, selected, or sequenced in code, making the stock tools of visual rhetoric inadequate. Image is subordinate to process.

Unfortunately, many efforts to unite computers and rhetoric do not even make appeals to visual rhetoric, instead remaining firmly planted in the traditional frame of verbal and written rhetoric in support of vague notions of “the digital.” *Digital rhetoric* typically abstracts the computer as a consideration, focusing on the text and image content a machine might host and the communities of practice in which that content is created and used. Email, websites, message boards, blogs, and wikis are examples of these targets. To be sure, all of these digital forms can function rhetorically, and they are worthy of study; like visual rhetoricians, digital rhetoricians hope to revise and reinvent rhetorical theory for a new medium. James P. Zappen begins his integrated theory of digital rhetoric on this very note: “Studies of digital rhetoric,” he writes, “help to explain how traditional rhetorical strategies of persuasion function and are being reconfigured in digital spaces.”⁶³ But for scholars of digital rhetoric, to “function in digital spaces” often means mistaking subordinate properties of the computer for primary ones. For example, Laura J. Gurak identifies several “basic characteristics”⁶⁴ of digital rhetoric, including speed, reach, anonymity, and interactivity.⁶⁵ Of these, the first three simply characterize the aggregate effects of networked microcomputers. On first blush the last characteristic, interactivity, appears to address the properties of the computer more directly. But Gurak does not intend *interactivity* to refer to the machine’s ability to facilitate the manipulation of processes. Instead, she is thinking of the more vague notion of computer-mediated discussion and feedback, essentially a repetition and consolidation of the other three characteristics.⁶⁶

Other digital rhetoricians likewise focus on the use of digital computers to carry out culturally modified versions of existing oral and written discourse; letters become emails, conversations become instant message sessions. Barbara Warnick has argued that the more populist, nonhierarchical structure of the web facilitated opposition to the standards of traditional media. For example, Warnick explores zines and personal websites as welcome alternatives to top-down commercial media like print magazines.⁶⁷ Others want educators,

especially secondary and postsecondary instructors, to provide stylistic training in increasingly indispensable digital forms like email and the web. Richard Lanham has made a case for digital rhetoric's place in the broader "digital arts," encouraging higher education to address the changing composition practices brought on by so-called new media.⁶⁸ Both Warnick and Lanham's proposals are reasonable and valuable. But they focus on revisions of existing cultural and expressive practices; the computer is secondary. What is missing is a digital rhetoric that addresses the unique properties of computation, like procedurality, to found a new rhetorical practice.

This challenge is aggravated by the fact that rhetoric itself does not currently enjoy favor among critics of digital media. In one highly visible example, new media artist and theorist Lev Manovich has argued that digital media may sound a death knell for rhetoric. Writing about web interfaces, Manovich doubts that hypertext could serve a rhetorical function:

While it is probably possible to invent a new rhetoric of hypermedia that will use hyperlinking not to distract the reader from the argument (as is often the case today), but rather to further convince her of an argument's validity, the sheer existence and popularity of hyperlinking exemplifies the continuing decline of the field of rhetoric in the modern era. . . . World Wide Web hyperlinking has privileged the single figure of metonymy at the expense of all others. The hypertext of the World Wide Web leads the reader from one text to another, ad infinitum. . . . Rather than seducing the user through a careful arrangement of arguments and examples, points and counterpoints, changing rhythms of presentation, . . . [hypertext] interfaces . . . bombard the user with all the data at once.⁶⁹

One can raise numerous objections to Manovich's claims. For one, he has a rather curious view of hypertext that seems to equate hypermedia with media gluttony. Manovich seems to think that web pages present links in an attempt to substitute their linkage for their content, causing endless, haptic clicking on the part of the user. Meaning is tragically, "infinitely" deferred. This claim is especially curious given the prehistory of hypertext in Vannevar Bush's conceptual Memex and Ted Nelson's Xanadu.⁷⁰ These systems were conceived largely as tools to *increase* the correlation between documents, as material manifestations of manual cross-reference. Today, hypertext on "ordinary" websites is frequently used in this fashion; they provide additional information or resources to the user who wishes to confer them. Frequently, these resources

take the form of supporting arguments, evidence, or citation, very old and very traditional tools in written rhetoric.

While Manovich considers the nature of the hyperlink, he ignores the computational system that facilitates hypermedia in the first place. Chris Crawford has used the term *process intensity* to refer to the “degree to which a program emphasizes processes instead of data.”⁷¹ Higher process intensity—or in Crawford’s words a higher “crunch per bit ratio”—suggests that a program has greater potential for meaningful expression. While hypertexts themselves exhibit low process intensity, the systems that allow authorship and readership of web pages exhibit high process intensity. A web browser must construct a request for a page using the proper format for the Hypertext Transfer Protocol (HTTP) that carries requests between the computer and a server. The computer must then create a connection to the server via Transmission Control Protocol (TCP), which in turn communicates the request via Internet Protocol (IP), the communication convention that transports data across the packet-switched network that comprises the Internet. The server hosting the requested web page must then interpret the request, retrieve the requested document, and prepare it for transmission back to the user’s computer via the same protocols, HTTP atop TCP/IP. IP guarantees delivery of all packets in a request, so the receiving computer’s network layer must determine—all in code—whether all the packets have been received, which ones are out of order, and which need to be resent owing to corruption or loss. Once received, reordered, and reconstructed, the web browser must then take the textual data that the server has returned and render it in the browser. This too takes place in code. The web page is made up of Hypertext Markup Language (HTML), which the browser must parse, making decisions about which elements to place where and in what format on the user’s screen. Then the web browser repeats the process for other resources referenced in the HTML document, such as other embedded HTML pages, images, script files, or stylesheets.

These technical details may appear to have little to do with Manovich’s claims about the endless progression of hyperlinks on a web page. But the aggregate software systems that facilitate web-based hypertext are what make it possible to link and click in the first place. The principal innovation of the web is the merger of a computer-managed cross-referencing system with a networking system that supports heterogeneous clients. More plainly put, Manovich ignores the software systems that make it possible for hyperlinks

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.”⁷² 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.”⁷³ 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.⁷⁴ 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



Figure 1.1 In Molleindustria's *The McDonald's Game*, players must use questionable business practices to increase profits.

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 temptation 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 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. 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 explanation 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 represented 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 characterize 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 significant 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 reasonable 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 put 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 archetypal 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.⁷⁸ 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.⁷⁹ 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).⁸⁰

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 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.”⁸¹ 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.”⁸² 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.”

Most Vivid Information	actual experience
	moving images with sound
	static photograph
	realistic painting
	line drawing

narrative, descriptive account
descriptive account
abstract, impersonal analysis
statistics

Least Vivid Information

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.⁸³ 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.⁸⁴ 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.”⁸⁵ 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.”⁸⁶ 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.”⁸⁷

Blair argues that this visual image *does* make an argument “in the sense of adducing a few reasons in a forceful way.”⁸⁸ 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.”⁸⁹

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.⁹⁰

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 criticized⁹¹ *Sim City*⁹² for its failure to include alternative taxation-to-social services dynamics, a debate I have discussed in detail elsewhere.⁹³ 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.⁹⁴ 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.⁹⁵

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

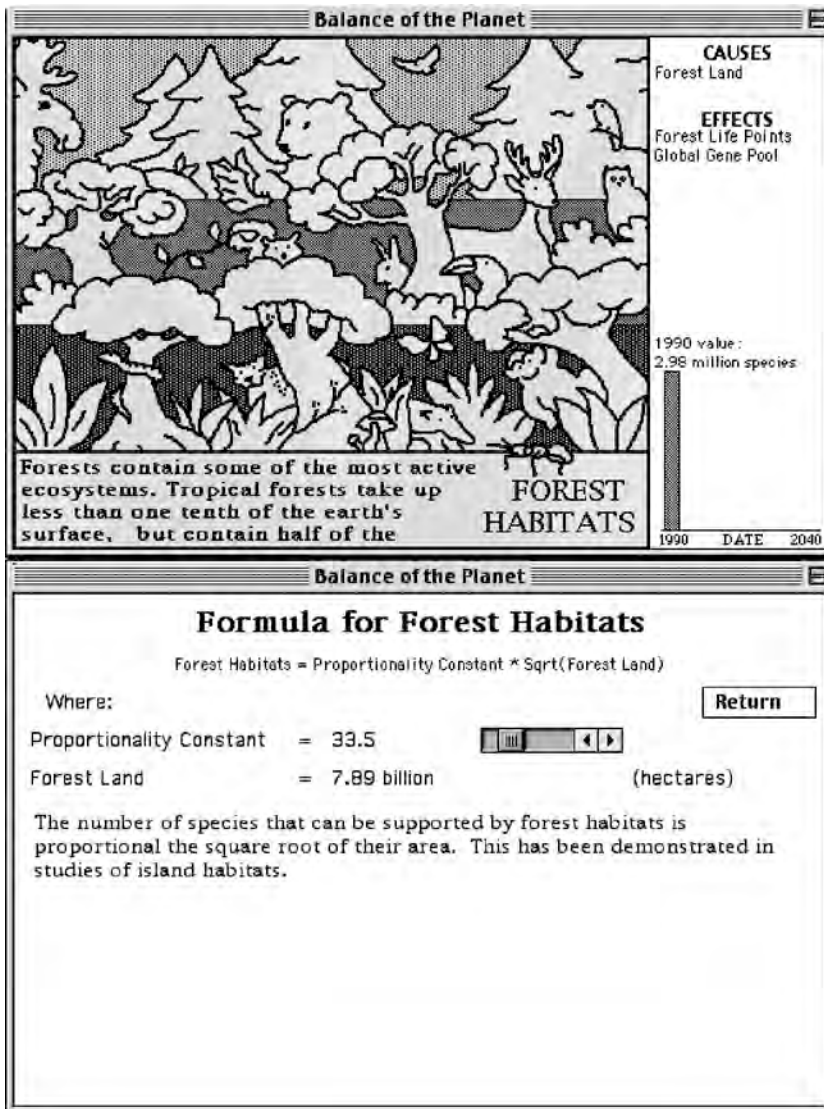


Figure 1.3 Chris Crawford's 1990 title *Balance of the Planet* offers a sophisticated model of interrelated environmental issues.

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.⁹⁹ 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.”¹⁰⁰

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.”¹⁰¹ 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 (GTAVIII)*¹⁰² as a game that allows the player to “go anywhere, do anything.”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, “GTAVIII let you do anything you wish, within the parameters of the game.”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 *GTAVIII*, 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.”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)."106 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—*GTAVIII* 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.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).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 *Civilization*, has argued that gameplay is “a series of interesting choices.”¹⁰⁹ Interesting choices do not necessarily entail *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, *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.¹¹⁰ 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.”¹¹¹ 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*:¹¹²

[*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.¹¹³

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.¹¹⁴ 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.¹¹⁵ 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:¹¹⁶

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.¹¹⁷

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 repack 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.¹¹⁹ The game borrows its gameplay from 2D platform games of the *Super Mario Bros.* variety.¹²⁰ 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.¹²¹ 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.”¹²² 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).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.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

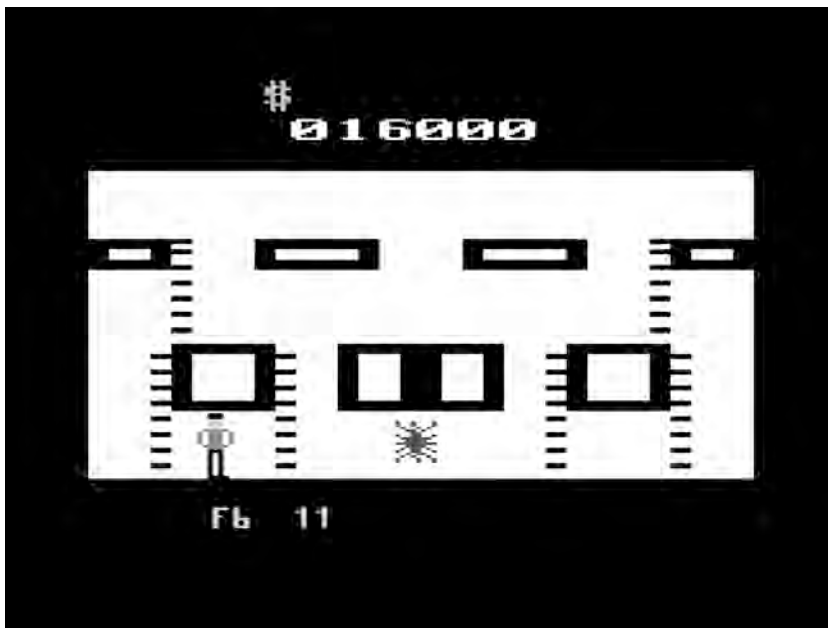


Figure 1.4 Although the Atari VCS title *Tax Invaders* may look simplistic, it constructs a sophisticated procedural rhetoric about tax strategy.

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.¹²⁵

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.”¹²⁶ 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.”¹²⁷ 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 ostensible name (hence the ambiguity).¹²⁸ Sutton-Smith musters these rhetorics to attempt to explain the reasons people play, and the cultural function of that play.¹²⁹ 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.¹³¹ 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.¹³² 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."¹³³ But on

further investigation, he argues that “the contrast between play and seriousness proves to be neither conclusive nor fixed.”¹³⁴ Huizinga notes that one can “play seriously,” that is, with great devotion and resolve,¹³⁵ but seriousness does not seem to include the possibility of play, making the latter of a “higher order” than seriousness.¹³⁶ 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.”¹³⁷ 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.¹³⁸ Schrage cites Abt in his book, and Rejeski, perhaps influenced by conscious or unconscious memory of that reference, suggested “Serious Games” as a title.¹³⁹ Since then, Woodrow has founded and funded the Serious Games Initiative, an ad hoc networking and knowledge-sharing group with a thriving membership.¹⁴⁰ 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."¹⁴¹ 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.¹⁴²

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 sophistic and technical rhetoric in the fifth century BCE—suggests that persuasive

games might also interrogate those institutions *themselves*, recommending correctives 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 presented offers a fundamental insight into the nature, even the apotheosis of the thing in general.¹⁴³ “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 institutions, 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 particularly compatible with the concept of procedurality. Procedural representation 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.¹⁴⁴ 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*.¹⁴⁵ I have previously correlated the count-as-one with the unit operation, the gesture of conceiving of a particular process as an encapsulated concept.¹⁴⁶ 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.¹⁴⁷ It is the state that is commensurate with “seriousness” 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 organizing logic, a topic I will return to in chapter 11.¹⁴⁸

Despite the possibility of rescuing serious games under the definition I have just offered, I do not want to preserve the name. Instead, I would like to advance persuasive games as an alternative whose promise lies in the possibility of using procedural rhetoric to support *or* challenge our understanding of the way things in the world do or should work. Such games can be produced for a variety of purposes, be they entertainment, education, activism, or a combination of these and others. The concept of serious games as a counter movement apart from and against the commercial videogame industry eliminates a wide variety of games from persuasive speech. It is a foolish gesture that wrongly undermines the expressive power of videogames in general, and highly crafted, widely appealing commercial games in particular. As I will show in the following chapters, many games carry messages, make arguments, and attempt meaningful expression. This should not surprise us; indeed, all media resonate on a variety of registers. I want to encourage developers and critics to pay more mind to the way such messages, arguments, and expressions are constructed through procedural rhetorics, in videogames of all kinds.

Persuasive Games versus Persuasive Technology

Since the late 1990s, Stanford University experimental psychologist B. J. Fogg has been advancing a concept he calls *captology*. The simple definition Fogg gives on his research group's website is this: "Captology is the study of computers as persuasive technologies. This includes the design, research, and analysis of interactive computing products created for the purpose of changing people's attitudes or behaviors."¹⁴⁹ Fogg's research has produced a book entitled *Persuasive Technology: Using Computers to Change What We Think and Do*.¹⁵⁰ Given the strong similarity between the phrases *persuasive technology* and *persuasive games*, I would like to address the differences between my approach and that of Fogg.

The most important distinction mirrors the difference between persuasive games and serious games. Just as the Serious Games Initiative implicates videogames in the service of existing goals, so captology does for computer technology in general. Captology, says Fogg, "does not include . . . unintended outcomes; it focuses on the attitude and behavior changes *intended* by the designers of interactive technology products."¹⁵¹ Admittedly, this understanding is far closer to my goals than that of the Serious Games Initiative; Fogg does not appear to explicitly correlate captological persuasion with

institutional ideologies. However, further interrogation shows that captology is not fundamentally concerned with altering the user's fundamental conception of how real-world processes work. Rather, it is primarily intended to craft new technological constraints that impose conceptual or behavioral change in users.

To this end, Fogg suggests seven types of persuasive technology tools, which I list, define, and exemplify below.

Reduction—“using computing technology to reduce complex behavior to simple tasks,” exemplified by the capitoladvantage.com website, which simplifies political participation by presenting a user with contact information for all of his elected officials based on zip code input.¹⁵²

Tunneling—“leading users through a predetermined set of actions, step by step,” illustrated by the registration or electronic payment systems on many websites.¹⁵³

Tailoring—“provid[ing] information relevant to individuals to change their attitudes or behaviors or both,” as by scorecard.org, which provides information about polluting institutions local to a user based, again, on zip code input.¹⁵⁴

Suggestion—“an interactive computing product that suggests a behavior at the most opportune moment,” such as roadside speed-monitoring radar systems, which display a driver's speed as he passes.¹⁵⁵

Self-Monitoring—“[a] type of tool that allows people to monitor their attitudes or behaviors to achieve a predetermined goal or outcome,” for example, digital heart-rate monitors.¹⁵⁶

Surveillance—“computing technology that allows one party to monitor the behavior of another to modify behavior in a specific way,” such as Hygiene Guard, a system that monitors hand washing in the retail service industry.¹⁵⁷

Conditioning—“a computerized system that uses principles of operant conditioning to change behaviors,” such as [Telecycle](http://Telecycle.com), an exercise bike which, when pedaled to a target speed, clarifies the image on a television screen in front of the cycle.¹⁵⁸

Perhaps these tools offer valid ways of using technology to alter behavior. But not one of them deploys rhetoric; instead, all of Fogg's techniques use technology to alter actions or beliefs without engaging users in a discourse about

the behavior itself or the logics that would recommend such actions or beliefs. Some techniques are more obviously guileful than others, such as the hand washing surveillance system or the website registration system. The approaches that do admit user awareness assume that the user has already understood and accepted the larger reason that the technology inscribes. For example, a self-monitoring technology like a heart-rate monitor assumes an understanding and acceptance of the relationship between cardiovascular exercise and long-term health. Thus, while captology does not explicitly align itself with the service of existing social, political, or corporate institutions, its formal structure—as tactics given a particular, established situation—only allows persuasive technology to work in the service of existing material ends, rather than the reasons one would want to pursue those ends.

More strongly, captology appears to rely only on psychological, not dialectical user responses. This is not surprising given Fogg's background as an experimental psychologist, but he seems generally dismissive of the tradition of philosophical rhetoric, which aligns persuasion with logical argument and discourse. In the nearly three hundred pages of *Persuasive Technology*, Fogg devotes only a half-page sidebar to the subject of rhetoric, dismissively labeled "A Brief History of Persuasion Studies."¹⁵⁹ In this sidebar, Fogg exposes his opinion that psychological methods are inherently more desirable than philosophical ones:

Today the formal study of persuasion continues to be advanced, primarily through research in social psychology, which began during the early part of the 1900s. Inspired largely by the U.S. government's need to persuade citizens to support war efforts, social psychologists established ambitious research programs to determine what caused people to change their attitudes and behaviors. Later, marketers and advertisers built on the insights gleaned from social psychology, systematically investigating how influence works and often applying their findings to help corporations prosper.¹⁶⁰

The lack of irony and scrutiny in the discussion of government-funded social science studies for covert manipulation suggests that Fogg is perhaps unaware of the ideology he himself inhabits: one in which existing power structures always devise ethical and desirable goals. Fogg himself is caught in a worldview that limits his understanding of computational persuasion, one driven partly by corporate and government grant funding for his own research. Despite Fogg's suggestion that *captology* acronymizes "computers as persuasive

technologies,” the phrase itself conjures the sense of *capture*, of arrest and incarceration by an authority. A better name for Fogg’s work would perhaps be *manipulative technology*.

On a less critical note, persuasive technology differs from persuasive games because the former does not deal fundamentally with procedurality. Fogg does discuss the use of simulations in persuasion, including nods to videogames (principally as examples of conditioning, “keeping the player playing,” the broader context of which coin-drop is an example), but the majority of his examples rely on presenting data to the user (turning zip codes into lists of data) or mirroring the result of sensor input back to the user (the speed check or the heart-rate monitor).¹⁶¹ Reduction and tunneling might provide useful frames for procedural rhetorics, but Fogg does not explicitly align them with procedural representation; as is, his examples all exhibit low process intensity.

Black and White Boxes

As a final note of clarification, I would like to say a few things about the function of computer code in my analysis of procedural rhetoric. If computational expression is fundamentally procedural, and if computational procedural expression is crafted through code, then what is the role of code in the practice and analysis of procedural rhetoric?

Since each figure and form of a procedural rhetoric in software and videogames must be constructed with code, it might seem impossible to analyze or discuss them without digging into the code itself. Verbal rhetoric, after all, has identified dozens of figures for the authorship of spoken and written arguments with an eye toward persuasion. Is the same not possible for procedural rhetoric? I believe that it is, but nevertheless none of the analyses you will read herein cites or extrapolates code.

Code is not usually available in compiled software like videogames. Software subsystems are closely held trade secrets, and one simply cannot “open up” *The Sims* or *Grand Theft Auto III* to look at the code running beneath. In software development and testing, there is a name for this distinction. To watch a program’s effects and extrapolate potential approaches or problems (in the case of testing) in its code is called *black-box* analysis. Such analysis makes assumptions about the actual operation of the software system, assumptions that may or may not be true. To watch a program’s effects and identify actual approaches or problems in its code is called *white-box* analysis

(or sometimes, *glass-box* analysis). Such analysis observes the effects of the system with a partial or complete knowledge of the underlying code that produces those effects. Some white-box analysis can be performed without direct access to code. Examples include architectural descriptions from conference presentations about development techniques, as have been made about *The Sims*, or commonalities in documented subcomponents, as could be done for the Renderware engine at the heart of *Grand Theft Auto*. I have previously discussed the way early arcade console games use of common hardware components, and first-person shooters' use of common game engines, each influenced the design of multiple games built on the same platform.¹⁶² Publicly documented hardware and software specifications, software development kits, and decompiled videogame ROMs all offer possible ways of studying the software itself. Such study can shed important light on the material basis for videogame experiences. An understanding of code supplements procedural interpretation. In particular, a procedural rhetorician should strive to understand the affordances of the materials from which a procedural argument is formed. For attorneys, this means understanding the legal code and judicial process. For computational critics, it means understanding the affordances of hardware, software frameworks, and programming languages.¹⁶³ This type of expertise is a subset of both procedural criticism and procedural rhetoric, and it is a worthwhile course of study in both fields. But such resources are hardly guaranteed for every computational artifact.

This lack of visibility concerns some critics. Part of Sherry Turkle's criticism of *Sim City* had to do with the simulation's black-box nature, which she saw occluding its position on such matters as tax policy. "Opening the box," in Turkle's opinion, would allow players to see how the simulation runs, providing better ability to critique. The problem with this objection is that the player *can* see how the simulation runs: this is, in no trivial way, what it means to play the game. Turkle's real beef is not with *Sim City*, but with the players: they do not know how to play the game critically. Understanding the simulation at the level of code does not necessarily solve this problem. Even understanding the simulation via some intermediary system poised between the code and the existing interface—some have proposed "policy knobs" that could alter the simulation rules of a game like *Sim City*—does not guarantee an understanding of making and interacting with arguments as processes rather than words. Rather than addressing this problem from the bottom up through code literacy, we need to address it from the top down through

procedural literacy, a topic I will return to in chapter 9. Part of that practice is learning to read processes as a critic. This means playing a videogame or using procedural system with an eye toward identifying and interpreting the rules that drive that system. Such activity is analogous to that of the literary critic interpreting a novel or the film critic reviewing a film—demanding access to a computer program’s code might be akin to asking for direct access to an author’s or filmmaker’s expressive intentions. Despite the flaws of twentieth-century critical theory, one notion worth keeping is that of dissemination, the irreversible movement of the text away from the act of authorship.¹⁶³ “Simulation authors,” says Gonzalo Frasca, “do not represent a particular event, but a set of potential events. Because of this, they have to think about their objects as systems and consider which are the laws that rule their behaviors. In a similar way, people who interpret simulations create a mental model of it by inferring the rules that govern it.”¹⁶⁴ In such simulations, says Frasca, “the goal of the player would be to analyze, contest and revise the model’s rules according to his personal ideas and beliefs.”

Persuasive Games and Procedural Rhetoric

As examples like *Tax Avoiders*, *P.o.N.G.*, and *Congo Jones and the Raiders of the Lost Bark* suggest, procedural rhetoric is not automatically a part of computational expression, and a great deal of attention is required to construct coherent—let alone effective—procedural rhetorics. In the three sections that follow, I will consider approaches to and examples of procedural rhetorics in three domains, namely, politics, advertising, and education. I have chosen these fields for several reasons. For one part, they are areas I know something about—I have worked professionally in all these areas, I have done academic research and writing in all these areas, and I have created videogames in all these areas. For another part, these represent typical domains for discussions of rhetoric and persuasion in general, and thus are low-hanging fruit for procedural rhetoric and persuasive games. For yet another part, they offer clear goals and referents in the material world. Exposure to procedural rhetorics in politics, advertising, and education should plant the seeds for the interrogation of other, perhaps more subtle expressive domains. And finally, together these three areas cover a broad swath of human social experience, areas that have become largely broken in contemporary culture, and areas I believe videogames can help restore, and not just in small part.