Handbook of Computer Game Studies

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COMPUTER GAMES AS EVOCATIVE OBJECTS: FROM PROJECTIVE SCREENS TO RELATIONAL ARTIFACTS

Sherry Turkle

Computers offer themselves as models of mind and as evocative objects, "objects to think with," for thinking about a range of philosophical and psychological questions, including questions about knowing, selfhood, and what we mean when we say something is "alive." They do this through the field of artificial intelligence, in which some researchers explicitly endeavor to use computers to model the human mind. And they do this in a far more concrete way: we are continually shaped by our hands-on engagement with computational objects, among these the objects of the computer "games" culture that have come to include the landscapes of online role-playing and simulation worlds as well as robotic pets and digital creatures. We relate to such objects as psychological machines, not only because so many of these new objects might be said to have primitive psychologies, but because they cause us to reflect upon our own.

Claude Lévi-Strauss (1966) described a process of theoretical tinkering, or "bricolage," through which individuals and cultures may use the objects around them to develop and assimilate ideas. Computational toys and games are key elements in today's cultural bricolage: What are we thinking about when we are thinking about computational toys and games? What does their "holding power" suggest about our emerging sensibilities?

In this chapter I draw on arguments and language from my writing (1984, 1995, 1997, 2005) to illustrate how computational toys and games have served as both a reflection of and emissary for computation in the wider culture. Here I have chosen three themes that make clear the central role of games in the development of computer culture: the shift from transparency to opacity in interface design, the growing use of the Internet as a landscape for identity play, and our evolving relationships with artificial creatures.

Thinking about Thinking by Thinking about Interfaces

What are we thinking about when we are thinking about computer game interfaces? For one thing, we are thinking about ways of knowing (Turkle, 1995). The earliest computer games were written for the interfaces of the early personal computers that supported them. Indeed, many of the children and teenagers who played the early games soon wanted to write games of their own on these same machines. The personal computers of the 1970s and the first generations of the IBM PC presented themselves as open, "transparent" objects, potentially reducible to their underlying mechanisms. These systems invited users to imagine they could understand the machines' "gears" as they turned, even if very few people ever tried to reach that level of understanding. In the spirit of traditional modernist ways of knowing, the technology encouraged users to think of understanding as reaching beyond the magic to the mechanism. In contrast, the 1984 introduction of the Macintosh's iconic style presented the public with simulations (the icons of file folders, a trashcan, and a desktop) that did nothing to suggest how their underlying structure could be known. As one user said, "The Mac looked perfect, finished. To install a program on my DOS machine, I had to fiddle with things. It clearly wasn't perfect. With the Mac, the system told me to stay on the surface." This is the kind of involvement with computers that has come to dominate the field; no longer associated only with the Macintosh, it is nearly universal in personal computing.

We have become accustomed to opaque technology; we have learned to take things at interface value. If the transparent early IBM PC modeled a modernist technological aesthetic, the Macintosh-style interface was consistent with a postmodern one whose theorists have suggested the search for depth and mechanism is futile, and that it is more realistic to explore the world

of shifting surfaces than to embark on a search for origins and structure. It would not be an exaggeration to say that, to date, the Macintosh style of simulated desktop has been our most widely disseminated cultural introduction to the epistemology of simulation and virtuality. It has served as what Bruno Latour (1988) called "foot soldier" for new ideas. Culturally, the new computer interfaces have served as such foot soldiers or idea-emissaries. We are increasingly accustomed to navigating screen simulations and have grown less likely to ask of the computers around us, "What makes you work?"

In the 1980s, most computer users who spoke of transparency were referring to a transparency analogous to that of traditional machines, an ability to "open the hood" and poke around. But when, in the mid 1980s, Macintosh computer users began to talk about transparency, they were talking about seeing their documents and programs represented by attractive and easy-to-interpret icons. They were referring to an ability to make things work without needing to go below the screen surface. This was, somewhat paradoxically, a kind of transparency enabled by complexity and opacity. Today, the word "transparency" has taken on its Macintosh meaning in both computer talk and colloquial language. In a culture of simulation, when people say that something is transparent, they mean that they can easily see how to make it work. They don't mean that they know why it is working by reference to an underlying process. This is true of the interfaces of computer operating systems and it is true of the simulation games we play.

"Your orgot is being eaten up," flashes the message on the screen. It is a rainy Sunday afternoon and I am with Tim, age thirteen (Turkle, 1995). We are playing *SimLife*, Tim's favorite computer game, which sets its users to the task of creating a functioning ecosystem. "What's an orgot?" I ask Tim. He doesn't know. "I just ignore that," he says confidently. "You don't need to know that kind of stuff to play." I suppose I look unhappy, haunted by a lifetime habit of not proceeding to step two before I understand step one, because Tim tries to appease me by coming up with a working definition of orgot. "I think it is sort of like an organism. I never read that, but just from playing, I would say that's what it is."

The orgot issue will not die. A few minutes later the game informs us: "Your fig orgot moved to another species." I say nothing, but Tim reads my mind and shows compassion: "Don't let it bother you if you don't understand. I just say to myself that I probably won't be able to understand the whole game any time soon. So I just play." I begin to look through dictionaries in which orgot is not listed and finally find a reference to it embedded in the game itself, in a file called READ ME. The text apologizes for the fact that orgot has been given several and in some ways contradictory meanings in this version of *SimLife*, but one of them is close to organism. Tim was right—enough.

Tim's approach to *SimLife* is highly functional. He says he learned his style of play from video games: "Even though *SimLife*'s not a video game, the user can play it like one." By this he means that in *SimLife*, as in video games, one learns from the process of play. You do not first read a rulebook or get your terms straight. Tim is able to act on an intuitive sense of what will work without understanding the rules that underlie the game's behavior. At one point in the game he says, "My trilobytes went extinct. They must have run out of algae. I didn't give them algae. I forgot. I think I'll do that now." Tim can keep playing even when he has no very clear idea what is driving events. When his sea urchins become extinct, I ask him why.

Tim: I don't know, it's just something that happens.

ST: Do you know how to find out why it happened?

Tim: No.

ST: Do you mind that you can't tell why?

Tim: No. I don't let things like that bother me. It's not what's important.

Fifty years ago, a child's world was full of things that could be understood in simple, mechanical ways. A bicycle could be understood in terms of its pedals and gears, and a wind-up car in terms of its clockwork springs. Many of the people who built or bought the first generation of personal computers understood them down to the bits and bytes. The operating systems that followed were far more complex, but invited that "old-time" reductive understanding. Today, computer users such as Tim can completely ignore such understandings. Tim can stay on the surface, taking things at (inter)face value.

Another aspect of this aesthetic is clear when I interviewed a tenth-grader named Marcia about another of the "Sim" games, *SimCity*, which asks the game player to act as the mayor of a virtual town, with its own economy, politics, social life, and problems with energy and pollution (Turkle, 1997). Marcia boasts of her prowess as mayor and reels off her "Top ten most useful rules of Sim." Among these, number six grabs my attention: "Raising taxes always leads to riots."

Marcia seems to have no language for discriminating between this rule of the game and the rules that operate in a "real" city. She has never programmed a computer. She has never constructed a simulation. She has no language for asking how one might write the game so that increased taxes lead to increased productivity and social harmony. And she certainly does not see herself as someone who could change the rules. Like Tim confronted with the orgot, she does not know how to "read" a simulation; she does not know how to measure, criticize, or judge what she is learning. Marcia's situation—she is a fluent "user" of simulations but not a fluent thinker about them—confronts us with the problematic nature of our current moment. Marcia may not need to see the registers on her computer or the changing charges on a computer chip, but she needs to see something. She needs to be working with simulations that teach her about the nature of simulation itself.

Thinking about Identity by Thinking about Virtuality

When I write on a computer, I shuffle the text on my computer screen. Once I would literally have had to cut and paste. Now I call it cut and paste. Once I would have thought of it as editing. Now with computer software, moving sentences and paragraphs around is just part of writing. This is one reason I now remain much longer at my computer than I used to with a pen in hand or at my typewriter. When I want to write and don't have a computer around, I tend to wait until I do. In fact, I feel that I must wait until I do.

Why is it so hard for me to turn away from the screen? The windows on my computer desktop offer me layers of material to which I have simultaneous access: fieldnotes, previous drafts of this chapter, a list of ideas not yet elaborated but which I want to include, transcripts of interviews with computer users and game players. When I write at the computer, all these are present and my thinking space seems somehow enlarged. The dynamic, layered display gives me the comforting sense that I write in conversation with my computer. After years of such encounters, a blank piece of paper can make me feel strangely alone.

There is something else that keeps me at the screen. I feel pressure from a machine that seems itself to be perfect and leaves no one and no other thing but me to blame. It is hard for me to walk away from a not-yet-proofread text on the computer screen. In the electronic writing environment in which making a correction is as simple as striking a delete key, I experience a typographical error not as a mere slip of attention, but as a moral carelessness, for who could be so slovenly as not to take the one or two seconds to make it right? The computer tantalizes me with its holding power—in my case, the promise that if I do it right, it will do it right, and right away.

I am held by the possibilities of "conversation" among the multiple windows on my screen and the way an instantly responsive machine allays my anxieties about perfection. But other people are drawn by other sirens. Some are captured by virtual worlds that appear to be unsullied by the messiness of the real. Some are enthralled by the sense of mind building mind or merging with the mind of the computer. If one is afraid of intimacy yet afraid of being alone, even a stand-alone computer offers an apparent solution. Interactive and reactive, the computer offers the illusion of companionship without the demands of friendship. One can be a loner yet never be alone (Turkle, 1984).

Just as musical instruments can be extensions of the mind's construction of sound, computers can be extensions of the mind's construction of thought. A novelist refers to "my ESP with the machine. The words float out. I share the screen with my words." An architect who uses the computer to design goes further: "I don't see the building in my mind until I start to play with shapes and forms on the machine. It comes to life in the space between my eyes and the screen." Musicians often hear the music in their minds before they play it, experiencing the music from within before they experience it from without. The computer can be similarly experienced as an object on the border between self and not-self. Or, in a new variant on the story of Narcissus, people are able to fall in love with the artificial worlds that they have created or that have been built for them by others. People are able to see themselves in the computer. The machine can seem a second self, a metaphor first suggested to me by a thirteen-year-old girl who said, "When you program a computer there is a little piece of your mind, and now it's a little piece of the computer's mind." An investment counselor in her mid-forties echoes the child's sentiment when she says of her laptop computer: "I love the way it has my whole life on it."

The computer, of course, is not unique as a compelling extension of self. At each point in our lives, we seek to project ourselves into the world. The youngest child will eagerly pick up crayons and modeling clay. We paint, we work, we keep journals, we start companies, we build things that express the diversity of our personal and intellectual sensibilities. Yet the computer

offers us new opportunities as a medium that embodies our ideas and expresses our diversity.

In the early years of the computer culture, the most dramatic instances of such projections of self onto computers occurred in the esoteric domain of programming. Now, as in the case of the novelist and architect, it is quite common for people to project themselves into the simulations that play on their screens, into screen images and actions. Computer holding power, once closely tied to the seductions of programming, today is tied to the seductions of the interface. When video games were very new, I found that the holding power of their screens often went along with a fantasy of a meeting of minds between the player and the program behind the game. In Internet gaming, the program no longer has this presence; one enters the screen world as Alice stepped through the looking glass.

To take an example that began in the early 1990s, networked game software known as MUDs (short for MultiUser Domains), enabled people from all over the world to join online virtual communities that existed only through and in the computer. The key element of "MUDding," the creation and projection of a "persona" into virtual space, also characterizes more recent online gaming communities (sometimes known as Massively Multiplayer Online Role Playing Games) such as *Everquest*, *Ultima Online*, and *Sims Online*. Thus, my description of life in MUD environments illustrates psychological aspects of online role-playing games in general.

When you join a MUD, you create a character or several characters, you specify each one's gender and other physical and psychological attributes. Other players in the MUD can see its description. It becomes your character's self-presentation. Created characters need not be human and there may be more than two genders. In the course of play, characters have casual and romantic sex, hold jobs, attend rituals and celebrations, fall in love and get married. To say the least, such goings-on are gripping: "This is more real than my real life," says a character who turns out to be a man playing a woman who is pretending to be a man. As players participate in MUDs, they become authors not only of text, but also of themselves, constructing selves through social interaction.

In traditional role-playing games in which one's physical body is present, one steps in and out of character; MUDs, in contrast, offer a parallel life. The boundaries of the game are fuzzy; the routine of playing them becomes part of their players' everyday lives. MUDs blur the boundaries between self and game, self and role, self and simulation. One player says: "You are what you pretend to be ... you are what you play." Players sometimes talk about their "real" selves as a composite of their characters and sometimes talk about their MUD characters as means for working on their "real" lives. Some of the most active participants in online gaming work with computers all day. It is common practice for them to periodically put their virtual personae to "sleep" and remain logged on to one or several games while pursuing other activities, returning to the games from time to time. In this way, they experience their lives as a "cycling through" between the "real world" and a series of games, each in its own "window." Their identity on the computer is the sum of their distributed presence.

This certainly is the case for Doug, a Dartmouth College junior who when I met him was playing four characters distributed across three different MUDs (Turkle, 1995). One is a seductive woman. One is a macho, cowboy type whose self-description stresses that he is a "Marlboros rolled in the tee shirt sleeve kind of guy." Then there is "Carrot," a rabbit of unspecified gender who wanders through its MUD introducing people to each other. Doug says, "Carrot is so low-key that people let it be around while they are having private conversations. So I think of Carrot as my passive, voyeuristic character." Doug's fourth character is one that he plays on a FurryMUD (MUDs on which all the characters are furry animals). "I'd rather not even talk about that character because its anonymity there is very important to me," Doug says. "Let's just say that on FurryMUDs I feel like a sexual tourist." Doug talks about playing his characters in windows that have enhanced his ability to "turn pieces of my mind on and off."

I split my mind. I'm getting better at it. I can see myself as being two or three or more. And I just turn on one part of my mind and then another when I go from window to window. I'm in some kind of argument in one window and trying to come on to a girl in a MUD in another, and another window might be running a spreadsheet program or some other technical thing for school.... And then I'll get a real-time message [that flashes on the screen as soon as it is sent from another system user], and I guess that's RL [real life]. It's just one more window.

The development of the windows metaphor for computer interfaces was a technical innovation motivated by the desire to get people working more effi-

ciently by "cycling through" different applications, much as time-sharing computers cycle through the computing needs of different people. But, in practice, windows have become a potent metaphor for thinking about the self as a multiple, distributed, "time-sharing" system. The self is no longer simply playing different roles in different settings, something that people experience when, for example, one wakes up as a lover, makes breakfast as a mother, and drives to work as a lawyer. The life practice of windows is of a distributed self that exists in many worlds and plays many roles at the same time. MUDs extend the metaphor. Now, in Doug's words, "RL" can be just "one more window." Today's game worlds blur distinctions between the real and the artificial. Vandals "really" do damage in the virtual world of *Sims Online*; political protest about real world globalization takes place on its virtual streetcorners. Infidelities committed in virtual relationships with online partners feel transgressive, causing stress to the physical bodies that lie beyond the game.

When people adopt online personae they cross a boundary into highly charged territory. Some feel an uncomfortable sense of fragmentation, some a sense of relief. Some sense the possibilities for self-discovery, even self-transformation. A twenty-six-year-old history graduate student says, "When I log on to a new MUD and I create a character and know I have to start typing my description, I always feel a sense of panic. Like I could find out something I don't want to know" (Turkle, 1995). A twenty-year-old undergraduate says, "I am always very self-conscious when I create a new character. Usually, I end up creating someone I wouldn't want my parents to know about. It takes me, like, three hours." Online personae are objects-to-think-with for thinking about identity as multiple and decentered rather than unitary.

In the 1990s, online experiences with "parallel lives" were part of the cultural context for social scientists theorizing healthy, "flexible" selves (Gergen, 1991; Lifton, 1993; Martin, 1994) that cycle through multiple states of being. The philosopher Daniel Dennett (1991) spoke of the flexible self in his "multiple drafts" theory of consciousness. Dennett's notion of multiple drafts is analogous to the experience of several versions of a document open on a computer screen with the user able to move among them at will. Knowledge of these drafts encourages a respect for the many different versions, while it imposes a certain distance from them. The historian and social theorist Donna Haraway (1991a) equated a "split and contradictory self" with a "knowing self," and was optimistic about its possibilities: "The knowing self is partial in all its guises, never finished, whole, simply there and original; it is always constructed and stitched together imperfectly and is therefore able to join with another, to see together without claiming to be another." Ian Hacking (1995) wrote about an increase in cases of Multiple Personality Disorder (MPD), characterized by aspects of self split off from each other. What most characterizes the Dennett and Haraway models of the self is that the lines of communication between its various aspects are always open. In their work, this open communication is presented as encouraging an attitude of respect for the many within us and the many within others.

A similar attitude animates the work of the psychoanalyst Philip Bromberg (1994), who insisted that our ways of describing "good parenting" must shift away from an emphasis on confirming a child in a "core self" and onto helping a child develop the capacity to negotiate fluid transitions between self states. The healthy individual knows how to be many, but smoothes out the moments of transition between self states. Bromberg wrote, "Health is when you are multiple but feel a unity. Health is when different aspects of self can get to know each other and reflect upon each other. Health is being one while being many." Here, within the American psychoanalytic tradition, is a model of multiplicity without dissociation, that is, multiplicity as a conscious, highly articulated cycling-through. Its contours are illuminated by a case study of a man deeply involved with computer gaming. I refer to him as Case, a thirty-four-year-old industrial designer (Turkle, 1995).

Case reports that he likes participating in online virtual communities as a female because (some would think paradoxically) it makes it easier for him to be aggressive and confrontational. Case's several online female personae—strong, dynamic, "out there" women—remind him of his mother, whom he describes as a "Katherine Hepburn type." His father was a mild-mannered man, a "Jimmy Stewart type." Case says that in "real life" he has always been more like his father, but he came to feel that he paid a price for his low-key ways. When he discovered MUDs, he recognized a chance to experiment:

For virtual reality to be interesting, it has to emulate the real. But you have to be able to do something in the virtual that you couldn't in the real. For me, my female characters are interesting because I can say and do the sorts of things that I mentally want to do, but if I did them as a man, they would be obnoxious. I see a strong woman as admirable. I see a strong man as a problem. Potentially a bully.

For Case, if you are assertive as a man, it is coded as "being a bastard." If you are assertive as a woman, it is coded as "modern and together."

My wife and I both design logos for small businesses. But if I say "I will design this logo for $3,000, take it or leave it," I'm just a typical pushy businessman. If she says it, I think it sounds like she's a "together" woman. There is too much male power-wielding in society, and so if you use power as a man, that turns you into a stereotypical man. Women can do it more easily.

Case's gender-swapping gives him permission to be more assertive within his virtual community and more assertive outside of it as well: "I've never been good at bureaucratic things, but I'm much better from practicing [in the online world] and playing a woman in charge. I am able to do things—in the real, that is—that I couldn't have before because I have played Katherine Hepburn characters."

Case says his Katherine Hepburn personae are "externalizations of a part of myself." In one interview with him, I use the expression "aspects of the self," and he picks it up eagerly, for his online life reminds him of how Hindu gods could have different aspects or subpersonalities, all the while being a whole self. In response to my question, "Do you feel that you call upon your personae in real life?" Case responds:

Yes, an aspect sort of clears its throat and says, "I can do this. You are being so amazingly conflicted over this and I know exactly what to do. Why don't you just let me do it?" MUDs give me balance. In real life, I tend to be extremely diplomatic, nonconfrontational. I don't like to ram my ideas down anyone's throat. On the MUD, I can be, "Take it or leave it." All of my Hepburn characters are that way. That's probably why I play them. Because they are smart-mouthed, they will not sugarcoat their words.

In some ways, Case's description of his inner world of actors who address him and are capable of taking over negotiations is reminiscent of the language of people with MPD. But the contrast is significant: Case's inner actors are not split off from each other or his sense of "himself." He experiences himself very much as a collective self, not feeling that he must goad or repress this or that aspect of himself into conformity. He is at ease, cycling through from Katherine Hepburn to Jimmy Stewart. To use Bromberg's language, online life has helped Case learn how to "stand in the spaces between selves and still feel one, to see the multiplicity and still feel a unity." To use the computer scientist Marvin Minsky's (1987) phrase, Case feels at ease cycling through his "society of mind," a notion of identity as distributed and heterogeneous that undermines traditional notions of identity. Identity, after all, from the Latin *idem*, has been habitually used to refer to the sameness between two qualities. On the Internet, however, one can be many and usually is.

An experience with online role-playing can begin very simply—with assuming a new name. Yet it may lead to exploring previously unexamined aspects of one's sexuality or to challenging the idea of a unitary self. Such experiences can be compelling, so compelling that they are widely feared as "addictive" and discussed in the popular media in terms usually reserved for the discussion of drugs.

In my own studies of Internet social experience, I have found that the people who make the most of their "lives on the screen" are those who approach online life in a spirit of self-reflection. They look at what they are doing with their virtual selves and ask what these actions say about their desires, perhaps unmet, as well as their need for social connection, perhaps unfilled. If we stigmatize the computational medium as "addictive" (and try to strictly control it as if it were a drug), we will not learn how to more widely nurture this discipline of self-reflection.

For some people, cyberspace is a place to act out unresolved conflicts, to play and replay personal difficulties on a new and exotic stage. For others, it provides an opportunity to work through significant problems, to use the new materials of "cybersociality" to reach for new resolutions. These more positive identity effects follow from the fact that for some, cyberspace provides what Erik Erikson would have called a "psychosocial moratorium," a central element in how Erikson thought about identity development in adolescence. Today, the idea of the college years as a consequence-free time-out seems of another era. But if our culture no longer offers an adolescent time-out, virtual communities often do. It is part of what makes them seem so attractive. Time in cyberspace reworks the notion of the moratorium because it may now exist on an always available window.

Online games thus created new landscapes for personal growth; they were also philosophically rich environments. In 1995, in *Life on the screen*, I told how in the late 1960s and early 1970s, I was first exposed to notions of identity and multiplicity of self. My introduction to these ideas, most notably that there is no such thing as "the ego"—that each of us is a multiplic-

ity of parts, fragments, and desiring connections—took place in the intellectual hothouse of Paris; they presented the world according to such authors as Jacques Lacan, Gilles Deleuze, and Félix Guattari. But despite such ideal conditions for absorbing theory, my "French lessons" remained merely abstract exercises. These theorists of poststructuralism, and what would come to be called postmodernism, spoke words that addressed the relationship between mind and body, but from my point of view had little to do with my own.

In my lack of personal connection with these ideas, I was not alone. To take one example, for many people it is hard to accept any challenge to the idea of an autonomous ego. Although in recent years many psychologists, social theorists, psychoanalysts, and philosophers have argued that the self should be thought of as essentially decentered, the normal requirements of everyday life exert strong pressure on people to take responsibility for their actions and to see themselves as unitary actors. This disjuncture between theory (the unitary self is an illusion) and lived experience (the unitary self is the most basic reality) is one of the main reasons why multiple and decentered theories have been slow to catch on—or when they do, why we tend to settle back quickly into older, centralized ways of looking at things.

By the early 1990s, I was using my personal computer and modem to join online communities. In this new context, I experienced my French lessons in action. What had been theoretical, was brought almost shockingly down to earth. Online, my textual actions were my actions—my words made things happen. In different communities I had different routines, different friends, different names. Different personae explored different aspects of self. In this context, the notion of a decentered identity was concretized by experiences on a computer screen.

One day on a MUD, I came across a reference to a character named "Dr. Sherry," a cyber-psychotherapist who had an office in the rambling house that constituted this MUD's virtual geography. There, I was informed, Dr. Sherry administered questionnaires and conducted interviews about the psychology of MUDding. I had every reason to believe that the name "Dr. Sherry" referred to my own career as a student of the psychological impact of technology. But I did not create this character. Dr. Sherry was me but she was not mine. On the MUD, my character had another name—and did not give out questionnaires or conduct interviews. Dr. Sherry was a character name someone else created as an economical way to communicate an interest in a certain set of questions about technology and the self. I experienced Dr. Sherry as a little piece of my history spinning out of control. I tried to quiet my mind—I told myself that surely one's books, one's public intellectual persona, are pieces of oneself in the world for others to use as they please. Surely this virtual appropriation was flattering. But my disquiet continued. Dr. Sherry, after all, was not an inanimate book, an object placed in the world. Dr. Sherry was a person, or at least a person behind a character who was meeting with others in the world. Well, in the MUD world at least.

I talked my disquiet over with a friend who posed the conversation-stopping question: 'Well, would you prefer if Dr. Sherry were a 'bot' [an intelligent computer program that roams cyberspace] trained to interview people about life on the MUD?" This had not occurred to me, but in a flash I realized that this, too, was possible. It was even likely to be the case. Many bots or "puppets" roamed this MUD. They appeared in the game as though they were human characters. Players create these programs for many reasons: bots help with navigation, pass messages, and provide background animation in a MUD. When you enter a virtual café, you are usually not alone. A waiter bot approaches who asks you if you want a drink and delivers it with a smile.

Characters played by people are sometimes mistaken for these little artificial intelligences. I myself have made this mistake several times when a character's responses seemed too automatic. And sometimes bots are mistaken for people. I have made this mistake too, fooled by a bot that offered me directions or flattered me by remembering our last interaction. Dr. Sherry could indeed have been one of these. I was confronted with a double that could be a person or a program.

As things turned out, Dr. Sherry was neither: it was a composite character created by several college students who wished to write a paper on the psychology of MUDs and who were using my name as a kind of trademark or generic descriptor for the idea of cybershrink. So not only are MUDs places where the self is multiple and constructed by language, they are places where people and machines are in a new relation to each other, indeed can be mistaken for each other.

Thinking about Aliveness by Thinking about Computational Companions

Children have always used the objects of their play to create models for understanding their world. The genius of Jean Piaget (1960) showed that it is the business of childhood to take objects and use how they "work" to construct theories of space, time, number, causality,

life, and mind. When Piaget was formulating his theories through the mid-twentieth century, a child's world was full of things that could be understood in simple, mechanical ways. A bicycle could be understood in terms of its pedals and gears, a windup car in terms of its clockwork springs. Children were able to take electronic devices such as basic radios and (with some difficulty) bring them into this "mechanical" system of understanding.

Since the end of the 1970s, however, with the introduction of electronic toys and games, the nature of objects and how children understand them has changed. When children today remove the back of their computer toys to "see" how they work, they find a chip, a battery, and some wires. Children sense that trying to understand these objects "physically" will lead to a dead end and try to use a "psychological" kind of understanding (Turkle, 1984). Children ask themselves if the games are conscious, if the games know, if they have feelings, and even if they "cheat." Earlier objects encouraged children to think in terms of a distinction between the world of psychology and the world of machines, but the computer does not. Its "opacity" encourages children to see computational objects as psychological machines.

Over the last thirty years, I have observed and interviewed hundreds of children as they have interacted with a wide range of computational objects, from computer programs on the screen to robots off the screen (Turkle, 1984, 1995, 2005). My methods are ethnographic and clinical. In the late 1970s and early 1980s, I began by observing children playing with the first generation of electronic toys and games. Since the mid 1990s, I have worked with children using new generations of computer games and software, including virtual and robotic "pets," and with children experimenting with online life.

Among the first generation of computational objects was Merlin, which challenged children to games of tic-tac-toe. For children who had only played games with human opponents, reaction to this object was intense. For example, although Merlin followed an optimal strategy for winning tic-tac-toe most of the time, it was programmed to make a slip every once in a while. So when children discovered strategies that allowed them to win, when they tried these strategies a second time, they usually would not work. The machine gave the impression of not being "dumb enough" to let down its defenses twice. Robert, seven, playing with his friends on the beach, watched his friend Craig perform the "winning trick," but when he tried it, Merlin did not make its slip and the game ended in a draw. Robert, confused and frustrated, accused Merlin of being a "cheating machine" (Turkle, 1984). Children were used to machines being predictable. But this machine held surprises.

Robert threw Merlin into the sand in anger and frustration. "Cheater. I hope your brains break." He was overheard by Craig and Greg, aged six and eight, who salvaged the by now very sandy toy and took it upon themselves to set Robert straight. Craig offered the opinion that "Merlin doesn't know if it cheats. It won't know if it breaks. It doesn't know if you break it, Robert. It's not alive." Greg adds: "It's smart enough to make the right kinds of noises. But it doesn't really know if it loses. That's how you can cheat it. It doesn't know you are cheating. And when it cheats it doesn't even know it's cheating." Jenny, six, interrupted with disdain: "Greg, to cheat you have to know you are cheating. Knowing is part of cheating."

In the early 1980s, such scenes were not unusual. Confronted with objects that spoke, strategized, and "won," children were led to argue the moral and metaphysical status of machines on the basis of their psychologies: Did the machines know what they were doing? Did they have intentions, consciousness, and feelings? These first computers that entered children's lives were evocative objects: they became the occasion for new formulations about the human and the mechanical. For despite Jenny's objections that "knowing is part of cheating," children did come to see computational objects as exhibiting a kind of knowing. Children's discussions about the computer's aliveness came to center on what the children perceived as the computer's psychological rather than physical properties. To put it simply, physics gave way to psychology as the criteria for aliveness. Jenny was part of the first generation of children who were willing to invest machines with qualities of consciousness as they rethought the question of what is alive in the context of "machines that think."

Over the past decades, the objects of children's lives have come to include machines of even greater intelligence, toys and games and programs that make these first computer toys seem primitive in their ambitions. The answers to the classical Piagetian question of how children think about life are being renegotiated as they are posed in the context of computational objects (simulation games, robots, virtual pets) that explicitly present themselves as exemplars of "artificial life."

Although the presence of the first generation of computational objects (the games such as Merlin,

Simon, and Speak and Spell) disrupted the classical Piagetian story for talking about aliveness, the story children were telling about such objects in the early 1980s had its own coherency. Faced with intelligent toys, children took a new world of objects and imposed a new world order in which psychology had given way to physics as the discourse children used for talking about aliveness.

By the 1990s, computational objects that evoked evolution and "artificial life" (for example computer programs such as the games of the *Sim* series, which stress decentralized and "emergent" processes) strained that order to the breaking point (Turkle, 1995). Children still try to impose strategies and categories, but they do so in the manner of theoretical bricoleurs or tinkerers, making do with whatever materials are at hand, making do with whatever theory can fit a prevailing circumstance. When children confront these new objects and try to construct a theory about what is alive, we see them cycling through theories of "aliveness." We have met Tim, who at thirteen says of *SimLife*: "The animals that grow in the computer could be alive because anything that grows has a chance to be alive." Laurence, fifteen, agrees. "The whole point of this game," he tells me, "is to show that you could get things that are alive in the computer. We get energy from the sun. The organisms in a computer get energy from the plug in the wall. I know that more people will agree with me when they make a *SimLife* where the creatures are smart enough to communicate. You are not going to feel comfortable if a creature that can talk to you goes extinct."

An eleven-year-old named Holly watches a group of robots with "onboard" computational intelligence navigate a maze. The robots use different strategies to reach their goal, and Holly is moved to comment on their "personalities" and their "cuteness." She finally comes to speculate on the robots' "aliveness" and blurts out an unexpected formulation: "It's like Pinocchio. First Pinocchio was just a puppet. He was not alive at all. Then he was an alive puppet. Then he was an alive boy. A real boy. But he was alive even before he was a real boy. So I think the robots are like that. They are alive like Pinocchio (the puppet), but not 'real boys.'"

She clears her throat and sums up her thought: "They [the robots] are sort of alive."

Robbie, a ten-year-old who has been given a modem for her birthday, uses her experience of the game to develop some insight into those computer processes that led adults to use the term "virus" for programs that "traveled." She puts the emphasis on mobility instead of communication when she considers whether the creatures she has evolved on *SimLife* are alive.

I think they are a little alive in the game, but you can turn it off and you cannot "save" your game, so that all the creatures you have evolved go away. But if they could figure out how to get rid of that part of the program so that you would have to save the game and if your modem were on, then they could get out of your computer and go to America Online.

Children cycle through evolution and psychology in their new discourse of aliveness. In children's talk about digital "travel" via circulating disks or over modems, in their talk of viruses and networks, biology and motion are resurfacing in a new guise, now bound up in the ideas of communication and evolution. Significantly, the resurfacing of motion (Piaget's classical criteria for how a child decides whether a "traditional" object is alive) is now bound up with notions of a presumed psychology: children were likely to assume that the creatures on *Sim* games have a desire to "get out" of the system and evolve in a wider computational world.

Comments about life by children who have played with the popular artifacts of artificial life (small mobile robots, the games of the *Sim* series, and *Tierra*, a program that simulates evolutionary selection through survival of the fittest) includes the following notions: the robots are in control but not alive, would be alive if they had bodies, are alive because they have bodies, would be alive if they had feelings, are alive the way insects are alive but not the way people are alive; the Tierrans are not alive because they are just in the computer, could be alive if they got out of the computer and got onto America Online, are alive until you turn off the computer and then they're dead, are not alive because nothing in the computer is real; the *Sim* creatures are not alive but almost-alive, they would be alive if they spoke, they would be alive if they traveled, they're alive but not "real," they're not alive because they don't have bodies, they are alive because they can have babies, and finally, for an eleven-year-old who is relatively new to *SimLife*, they're not alive because these babies don't have parents. She says, "They show the creatures and the game tells you that they have mothers and fathers, but I don't believe it. It's just numbers, it's not really a mother and a father." There is a striking heterogeneity of theory here. Different children hold different theories and individual children are able to hold different theories at the same time.

In the short history of how the computer has changed the way we think, it has often been children who have led the way. For example, in the early 1980s, children, prompted by computer toys that spoke, did math, and played Tic-Tac-Toe, disassociated ideas about consciousness from ideas about life. These children were able to contemplate sentient computers that were not alive, a position that grownups are only now beginning to find comfortable. By the 1990s children were pointing the way toward multiple theories of aliveness in the presence of computational artifacts that are designed to seem like creatures.

Sara, a fifth-grader, jumped back and forth from a psychological to a mechanistic language when she talked about a small robotic creature she had built out of Lego blocks and programmed with the Logo computer language. Sometimes she called it a machine, sometimes a creature. When Sara considered whether her machine would sound a signal when its "touch sensor" was pushed, she said, "It depends on whether the machine wants to tell ... if we want the machine to tell us ... if we tell the machine to tell us" (Resnick, 1989, p. 402). In other words, within a few seconds, Sara "cycled through" three perspectives on her creature (as a psychological being, as an intentional self, and as an instrument of its programmer's intentions). These perspectives are equally present for her; for different purposes, she finds one or another of them more useful.

In his history of artificial life, Steven Levy (1992, pp. 6–7) suggested that one way to look at where artificial life can "fit in" to our way of thinking about life is to envisage a continuum in which *Tierra*, for example, would be more alive than a car, but less alive than a bacterium. My observations suggest that children are not constructing hierarchies but are heading toward parallel, alternating definitions of life, which they "alternate" through rapid cycling. Multiple and alternating definitions, like thinking comfortably about one's identity in terms of multiple and alternating aspects of self, become a habit of mind.

Today's adults grew up in a psychological culture that equated the idea of a unitary self with psychological health, and in a scientific culture that taught that when a discipline achieves maturity, it has a unifying theory. When adults find themselves cycling through varying perspectives on themselves (as when they cycle through a sequence such as "I am my chemicals" to "I am my history" to "I am my genes"), they usually become uncomfortable (Kramer, 1993). But such alternations may strike the generation of children who are growing up today as "just the way things are."

Children speak easily about factors that encourage them to see the "stuff" of computers as the same "stuff" of which life is made. For example, the seemingly ubiquitous "transformer toys" shift from being machines to being robots to being animals (and sometimes people). Children play with these plastic and metal objects and, in the process, they learn about the fluid boundaries between mechanism and flesh.

I observe a group of seven-year-olds playing with a set of plastic transformer toys that can take the shape of armored tanks, robots, or people (Turkle, 1995). The transformers can also be put into intermediate states so that a "robot" arm can protrude from a human form or a human leg from a mechanical tank. Two of the children are playing with the toys in these intermediate states (that is, in their intermediate states somewhere between being people, machines, and robots). A third child insists that this is not right. The toys, he says, should not be placed in hybrid states. "You should play them as all tank or all people." He is getting upset because the other two children are making a point of ignoring him. An eight-year-old girl comforts the upset child. "It's okay to play them when they are in-between. It's all the same stuff," she said, "just yucky computer 'cy-dough-plasm.'" This comment is the expression of a cyborg consciousness as it expresses itself among children: a tendency to see computer systems as "sort of" alive, and to fluidly "cycle through" various explanatory concepts (Haraway, 1991b).

When my daughter was seven years old, I took her on a vacation in Italy. We took a boat ride in the postcard-blue Mediterranean. She saw a creature in the water, pointed to it excitedly, and said, "Look Mommy, a jellyfish. It looks so realistic." When I told this story to a research scientist at Walt Disney, he responded by describing the reaction of visitors to Animal Kingdom, Disney's newest theme park in Orlando, populated by "real," that is, biological, animals. He told me that the first visitors to the park expressed disappointment that the biological animals were not realistic enough. They did not exhibit the lifelike behavior of the more active robotic animals at Disney World, only a few miles away. What is the gold standard here? Have we given up the notion of such standards to make boundary transgression the norm?

A recent *New Yorker* cartoon summed up recent anxieties about such transgressions: Two grown-ups face a child in a wall of solidarity, explaining, "We're neither software nor hardware. We're your parents." It reminded me of a young woman I once interviewed whose position on simulation and authenticity was:

"Simulated thinking can be thinking, but simulated feeling can never be feeling. Simulated love is never love." The more our artifacts seek pride of place beside us as social and psychological equals, the more we are confronted and challenged by the issue of authenticity. Authenticity is becoming to us what sex was to the Victorians—an object of threat and obsession, taboo and fascination.

Looking toward the future, children's willingness to transgress traditional boundaries may increasingly involve relationships with "virtual pets" and robots (Turkle, 2005). The first of these on the American market were the tiny virtual pet Tamagotchis, which asked their owners to feed them, play games with them, inquire about their health and mood, and, when they are still babies, clean up their virtual "poop." Good parenting of a Tamagotchi produced a healthy offspring; bad parenting led to illness, deformity, and finally, to the pet's virtual death. The Tamagotchis were only the first in a series of computational objects designed for children that ask children for nurturance. And each demands that children assess its (the object's) "state of mind" in order to play with it. For example, in order to grow and be healthy, Tamagotchis need to be fed, cleaned, and amused. The Furbies simulate learning and loving. They are cuddly, they speak and play games with the child. Furbies add the dimensions of human-like conversation and tender companionship to the mix of what children can anticipate from computational objects. In my research on children and Furbies, I found that when children play with these new objects they want to know their "state," not to get something "right," but to make the Furbies happy. Children want to understand Furby language, not to "win" in a game over the Furbies, but to have a feeling of mutual recognition. They do not ask how the Furbies "work," but take the affectively charged toys "at interface value."

In the case of the toys, the culture is being presented with computational objects that elicit emotional response and that evoke a sense of relationship. As the culture apprehends these objects, call them "relational artifacts," there is less a concern with whether these objects "really" know or feel and an increasing sense of connection with them. In sum, we are creating objects that push our evolutionary buttons to respond to interactivity by experiencing ourselves as with a kindred "other."

In my previous research on children and computer toys, children described the lifelike status of machines in terms of their cognitive capacities (the toys could "know" things, "solve" puzzles). In my studies on children and relational artifacts, among these Furbies, I have found that children describe these new toys as "sort of alive" because of the quality of their emotional attachments to them and because of their fantasies about the idea that the toys might be emotionally attached to them. So, for example, when I ask the question, "Do you think the Furby is alive?" children answer not in terms of what the Furby can do, but how they feel about the Furby and how the Furby might feel about them.

Ron (age six): Well, the Furby is alive for a Furby. And you know, something this smart should have arms. It might want to pick up something or to hug me.

Katherine (age five): Is it alive? Well, I love it. It's more alive than a Tamagotchi because it sleeps with me. It likes to sleep with me.

Jen (age nine): I really like to take care of it. So, I guess it is alive, but it doesn't need to really eat, so it is as alive as you can be if you don't eat. A Furby is like an owl. But it is more alive than an owl because it knows more and you can talk to it. But it needs batteries so it is not an animal. It's not like an animal kind of alive.

Today's children are learning to distinguish between an "animal kind of alive" and a "Furby [or robot] kind of alive." The category of "sort of alive" becomes used more and more. Will they also talk about a "people kind of love" and a "computer kind of love"?

With relational artifacts we are in a different world from the old "AI debates" of the 1960s to 1980s in which researchers argued about whether machines could be "really" intelligent. The old debate was essentialist; the new objects sidestep such arguments about what is inherent in them and play instead on what they evoke in us: When we are asked to care for an object, when the cared-for object thrives and offers us its attention and concern, we experience that object as intelligent, but more important, we feel a connection to it. The old AI debates were about the technical abilities of machines. It appears that the new AI debates, with roots in children's relationships with toys, games, and robotic creatures, may be more about the emotional vulnerabilities of people.

Coda: Artificial Worlds and the Psychology of Scary/Safe

The pioneers of computing, and those who referred to themselves as computer "hackers" (when this term

connoted virtuosity, not criminality) had a style of computer mastery that played with risk and with a style of virtuosity that was characterized as "flying by the seat of one's pants." For hackers the holding power of computing was that it was a superb medium for playing with issues of control. Playing with control means constantly walking the narrow line between having it and losing it. This has been termed the psychology of "scary/safe." Life is danger and triumph, screen to screen of it, a constantly shifting drama that can provide strong defenses against anxiety.

First, scary/safe helps to deny vulnerability. It is reassuring to have a medium that offers reassurance through a promise of total mastery. It is reassuring to play in safe microworlds where the rules are clear. This makes computer worlds powerful. You go from one block of intransigent code to another. You debug one part of the program; you debug another. This emotional aesthetic translated into the classic computer games culture. Each screen, each level of a computer game, presents a new danger. Each screen is mastered in its turn, yet you always return to danger again. Life is exhausting, but the repetition of microworld triumphs is reassuring

When I first began studying the computer culture, hackers were commonly called "computer people." No more. In a certain sense, if we take the computer to be a carrier of a way of knowing, of a way of seeing the world and what is important, we are all computer people now. We live much of our lives in artificial worlds. They tend to be complex, multilayered, and self-referential. However, we are at a moment in history when playing in closed systems of our own devising may reinforce dangerous habits of mind. The real world is messy and painted in shades of gray. In that world we need to be comfortable with ambivalence and contradiction. We need to be able to put ourselves in the place of others in order to understand their motivation.

Immersion in programmed worlds and relationships with digital creatures and robotic pets puts us in reassuring microworlds where the rules are clear. When we think about artificial worlds we are too often not thinking about ambivalence, complex human relationships, about moral dilemmas that aren't battles between good and evil. To cultivate these things requires the discipline to resist all binary formulations. This is not a discipline well practiced in the company of any computer toy, virtual game world, or robotic creature we have ever experienced. It is a discipline well practiced in the socially situated, physically embodied, always complex, and often irrational presence of other people. To acknowledge that computational relationships do not provide us with all that we need does not devalue their contributions. It does, however, put them in their place.

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