

34. [Introduction] Video Games and Computer Holding Power

When video games became a major force in popular culture, in the early 1980s, everyone noticed. What Sherry Turkle noticed and elucidated, however, went a step beyond the popular thinking. In her influential first book on new media, *The Second Self*, she explored—alongside careful consideration of other aspects of popular, professional, and academic computing culture—how video games were a telling way in which children, teenagers, and adults encountered the computer.

Turkle, approaching computing from the discipline of psychoanalysis, considered how the computer enables people to enact personae that are different from the ones they use in non-computing situations. While others concerned with the social world were decrying video games as an evil influence, Turkle asked players about their experiences to determine why they played video games. She discovered that these games play a social and psychological role—and, more precisely, that games provide a way in which children can take on different roles that are important to them psychologically. The computer is not merely a tool used to accomplish tasks, Turkle explained, but an object that enters our individual and social lives; how we interact with computers influences our outlook on the world and our perspective on ourselves. This idea is explored in Turkle's book *Life on the Screen* in a different way, in the context of internetworked computing. Chapter 7 of that book, in particular, considers how explicit role-playing on MUDs allows play with aspects of the self.

In the selection that follows, Turkle also closely considers the nature of games themselves—noting several features that distinguish video games from sports and even from the previous dominant arcade amusement, pinball. She also considers, as Brenda Laurel has, the fantasy game *Dungeons and Dragons*, an important and little-studied antecedent to the computer adventure game that created a rule-based world in which play took place.

While adventure games which integrally involve stories are an interesting category, Turkle reported that adults found the stories associated with arcade video games to be “cute or funny but basically irrelevant to their play.” Further, while children project themselves into the roles of their characters more strongly, the story aspects may have had little influence beyond that. Yet video game makers of the last few years, desperately calling for more integration of stories, have not leant an ear to game-players as Turkle did. Designers hold out hope, instead, that action-oriented games, which people clearly do not play for narrative reasons, can be enhanced with good stories—as if “story” might be the *deus ex machina* that could arrive to save an otherwise incomplete gaming experience.

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The Internet has become a significant social laboratory for experimenting with the constructions and reconstructions of self that characterize postmodern life. In its virtual reality, we self-fashion and self-create. What kinds of personae do we make? What relation do these have to what we have traditionally thought of as the ‘whole’ person? Are they experienced as expanded self or separate from the self? Do our real-life selves learn lessons from our virtual personae? Are these virtual personae fragments of a coherent real-life personality? How do they communicate with one another? Why are we doing this? Is this a shallow game, a giant waste of time? Is it an expression of identity crisis of the sort we traditionally associate with adolescence? Or are we watching the slow emergence of a new, more multiple style of thinking about the mind? —Sherry Turkle, *Life On The Screen* (180)

Further Reading

Turkle, Sherry. *Life on the Screen: Identity in the Age of the Internet*. New York: Simon & Schuster, 1995.

Space War, the first modern video game, and *Adventure*, another computer game mentioned by Turkle during her description of *Dungeons and Dragons*, are both included on the CD (as is a selection of other historical computer and video games).

This focus on the shape of the simulation and interaction, rather than the details of the content, is also characteristic of the analysis of Bill Nichols (∇43).

Original Publication

The Second Self: Computers and the Human Spirit, 64-92. New York: Simon & Schuster, 1984.

Video Games and Computer Holding Power

Sherry Turkle

I watch a thirteen-year-old girl in a small family café in New York City's Little Italy. Four electronic games lined up near the door clash with the murals of Italian seacoasts. The child too seems out of place. She is angry and abusive to the café owner when he asks her if she would like something to eat. "Get the fuck away from me. I'm fucking playing your fucking games." The man shrugs, apparently used to the abuse of thirteen-year-olds.

The girl is playing *Asteroids*. A spaceship under her control is being bombarded by an asteroids shower. There are separate control buttons for steering, accelerating, and decelerating the spaceship and for firing its rocket guns against threatening asteroids and enemy ships. The player must keep up a steady stream of missiles as she maneuvers the ship. The finger on the "Fire" button must maintain a rapid staccato, an action that is tense and tiring.

The girl is hunched over the console. When the tension momentarily lets up, she looks up and says, "I hate this game." And when the game is over she wrings her hands, complaining that her fingers hurt. For all of this, she plays every day "to keep up my strength." She neither claims nor manifests enjoyment in any simple sense. One is inclined to say she is more "possessed" by the game than playing it.

The children playing with Merlin, Simon, Big Trak, and Speak and Spell at the shore—discussing whether their computer games could really cheat—were displaying that combination of innocence and profundity which leads many of us to believe in Piaget's model of "the child as philosopher." The scene on the beach had an aura of charming solemnity. The scene in the café, like that in thousands of arcades and in millions of homes, is more violent. Somewhat older children—from around nine or ten on—are in a relationship

to the machine that seems driven, almost evoking an image of addiction. Children musing about objects and their nature has given way to children in contest. Reflection has given way to domination, ranking, testing, proving oneself. Metaphysics has given way to mastery.

For the girl in the café, mastery of her game was urgent and tense. There is the sense of a force at work, a "holding power" whose roots are aggressive, passionate, and eroticized.

There has been controversy about video games from the days of *Space Invaders* and *Asteroids*, from the time that the games' holding power provoked people who saw it as a sign of addiction to become alarmed. The controversy intensified as it became clear that more than a "games craze" was involved. This was not the Hula-Hoop of the 1980s. By 1982 people spent more money, quarter by quarter, on video games than they spent on movies and records combined. And although the peak of excitement about the games may have passed with their novelty, video games have become part of the cultural landscape.

Not all of the arguments against video games can be taken at face value, for the debate is charged with feelings about a lot more than the games themselves. Protest against video games carries a message about how people feel about computers in general. In the past decade, and without people having had anything to do or say about it, computers have entered almost every aspect of daily life. By 1983 the computer had become so much and so active a part of the everyday that *Time* magazine chose it to fill the role usually given to a Man or Woman of the Year. Only one other gift of science has been so universally recognized as marking a new era of human life. That was atomic energy.

It is an understatement to say that people are ambivalent about the growing computer presence: we like new conveniences (automated bank tellers, faster supermarket lines), but on the eve of a new era we, by definition, do not know where we are. The changes have been rapid and disquieting. We are ill at ease even with our children, who are so much at ease with a technology that many of us approach at arm's length. They take it for granted. To them it is not a new technology but a fact of life. They come home from school and casually report that they are "learning programming." The comment evokes mixed feelings. Parents want their children to have every advantage, but this new expertise estranges them. It seems to threaten a new kind of generation gap that feels deep and difficult to bridge. And so,

for many people, the video game debate is a place to express a more general ambivalence: the first time anybody asked their opinion about computers was when a new games arcade applied for a license in their community or when the owner of a small neighborhood business wanted to put a game or two into a store. It is a chance to say, “No, let’s wait. Let’s look at this whole thing more closely.” It feels like a chance to buy time against more than a video game. It feels like a chance to buy time against a new way of life.

Video games are a window onto a new kind of intimacy with machines that is characteristic of the nascent computer culture. The special relationship that players form with video games has elements that are common to interactions with other kinds of computers. The holding power of video games, their almost hypnotic fascination, is computer holding power. The experiences of video game players help us to understand this holding power and something else as well. At the heart of the computer culture is the idea of constructed, “rule-governed” worlds. I use the video game to begin a discussion of the computer culture as a culture of rules and simulation.

The Myth of “Mindless” Addiction

Those who fear the games often compare them to television. Game players almost never make this analogy.* When they try to describe the games in terms of other things, the comparison is more likely to be with sports, sex, or meditation. Television is something you watch. Video games are something you do, something you do to your head, a world that you enter, and, to a certain extent, they are something you “become.” The widespread analogy with television is understandable. But analogies between the two screens ignore the most important element behind the games’ seduction: video games are interactive computer microworlds.

Using analogies with television or with drugs, the popular debate about video games is filled with images of game players caught in a “mindless addiction.” Half of this description is certainly wrong. There is nothing mindless about mastering a video game. The games demand skills that

are complex and differentiated. Some of them begin to constitute a socialization into the computer culture: you interact with a program, you learn how to learn what it can do, you get used to assimilating large amounts of information about structure and strategy by interacting with a dynamic screen display. And when one game is mastered, there is thinking about how to generalize strategies to other games. There is learning how to learn.

Consider *Pac-Man*, the first game to be acknowledged as part of the national culture. On the screen there is a maze that contains four monsters and the familiar yellow Pac-Man figure. Also scattered in the maze are pellets of food, represented as little dots. The player controls Pac-Man, or, as children usually express it, “You are Pac-Man.” Your job is to eat the food and avoid being eaten by the monsters. Doing so involves quick turns and good coordination. But even more important is strategy, figuring out the rules that govern the behavior of Pac-Man and his pursuing monsters.

Pac-Man needs to make quick decisions: eat this dot or flee that monster. His decisions are made more complicated by another factor: in the maze are four energy cookies. For a short period after eating a cookie, Pac-Man can turn the tables on the monsters and eat them. A master player shifts constantly between offensive and defensive strategies: when to go for a dot or a cookie and when simply to stay out of the monsters’ way. In addition, there are elements of bluff and trickery. Each monster has a different personality and can be more or less easily thrown off the trail by sudden reversals of direction.

Pac-Man shares with chess strategies that depend on executing standard sequences of moves. A well-informed *Pac-Man* player has a repertoire of these “patterns,” picked up from other players, from books, and from personal discovery. But just as you can’t play chess by rote, the same is true of a video game like *Pac-Man*, in which being off by a split second can throw you outside your pattern. Then you have to improvise, relying on your coordination and understanding of general principles of the game—for example, the differences in the monsters’ behavior and the “safe places” to hide out in the maze. But you always have to think faster than the monsters move, and this means that, in order for you to play successfully, the general principles, like the patterns, have to be more than memorized. It’s more than thinking—in a way it is beyond thinking. The hand learns what to do and does it

* I have been studying video games since 1980, both in arcades and in homes. Whenever possible, participant observation and conversations with players in the game setting were followed up by interviews in a quieter setting. This chapter is based on over one hundred hours of field research and on interviews (ranging from one to four hours) with thirty game players.

automatically, just as the hand “knows” after playing chord X on the piano to go directly and inexorably to chord Y.

People who have never played video games often think that success at them is like winning at a Las Vegas–style “one-arm bandit”; people who have played one game and given up acknowledge that they require “hand–eye coordination,” often adding that this is something that children, but not they, possess. But success at video games involves much more. Working out your game strategy involves a process of deciphering the logic of the game, of understanding the intent of the game’s designer, of achieving a “meeting of the minds” with the program. The video games reflect the computer within—in their animated graphics, in the rhythm they impose, in the kind of strategic thinking that they require. This “computational specificity” becomes clear when you contrast the games with their “grandparent,” pinball.

Computational Specificity

In some ways video games are reminiscent of pinball. You stand at them, reacting to a moving object by manipulating buttons and levers. Scores pile up. You try to do better. But there are important differences, differences that go back to how the games are made.

Making a new pinball game required designing and constructing new physical devices, a process that took time, tools, and mechanics. The video game—the characters on its screen, their behavior, the way they respond to a player’s actions—is made of logic; that is, of a program of tens of thousands of computer instructions. The new “logic technology” has made possible an explosion in the freedom of game designers to search for ways to capture the attention, the imagination, and the coins of players. If a designer wants to change the game, for example, to put a new monster on the screen, he or she doesn’t have to “make” a monster, but simply has to write a program that will trace out the monster’s shape. To have the new monster engage in a chase requires another program. Pinball games were constrained by mechanical limitations, ultimately by the physical laws that govern the motion of a small metal ball. The video world knows no such bounds. Objects fly, spin, accelerate, change shape and color, disappear and reappear. Their behavior, like the behavior of anything created by a computer program, is limited only by the programmer’s imagination. The objects in a video game are representations of objects. And a representation of a ball,

unlike a real one, never need obey the laws of gravity unless its programmer wants it to.

The liberation of the video game from the “real world” allows more than freedom for the designer’s imagination. It allows the games to become a more perfect expression of the player’s actions. A pinball machine has levers that can rust. It is tilted to a particular slant on a particular floor. It is a mechanism, with a weight, a certain balance. It vibrates differently depending on the noise level around it. The video game has no moving “parts.” Its graphics display is electronic, impervious to its surround. It is always the same, reacting almost instantaneously.

Watch pinball players at their game: they kick, they shake and thrust their hips, gently at first, then violently urge the machine to one side or another. Controlling the two bottom flippers by means of two buttons is the only movement in the game that feels discrete or precise. The rest is more like a dance. You have to feel how far you can go without tilting the machine. There is no indicator, no “tilt gauge” to show you the state of things—that is, nothing until it is too late. The physical pinball machine—the legs it stands on as well as its posts and flippers—are part of the game. The video game is different: here all of the action is in a programmed world, an abstract space. In an important sense, it is a space where the physical machine and the physical player do not exist. It is not easy for pinball players to describe their feelings of what makes the game respond. Some describe it as a “conversation”: there is a sense of give and take. But although it has become cliché to speak of the video game as “interactive,” players describe the experience of being with one as less like talking with a person and more like inhabiting someone else’s mind. Conversation gives way to fusion. In pinball you act on the ball. In *Pac-Man* you are the mouth.

Jarish and the Computer within the Game

By the time Jarish was five he already thought of himself as small for his age, small and very nearsighted and very different. In certain ways he likes being different: “Like my name, it’s special, my parents just made it up. Other names come from something . . . my name doesn’t come from anything.” But being different also had its price; different didn’t always feel better. Games became a way to mark different as better; pinball became a favorite and something at which he could be best.

Now Jarish is twelve, and two years ago pinball gave way to video games. His initials are up on almost all of the machines in the arcade closest to his home. He works at a game until he gets the highest score of anybody around, often having to stand on a stool to play. “You know,” Jarish remarks, “they really should put little steps on the games. Getting to see the screen can really be a problem.”

The old-fashioned pinball machines have no memory. However high your score one day, the machine treats you next time with the same neutral indifference it gives the clumsiest of beginners. And it certainly does not inform anyone else how well you did. Arcade-game manufacturers were quick to see the advantage of using the computers within the games to remember the names—or at least the initials—of the top players who have used it since its memory was last cleared. The players whose names are up on the screens of a game in “their” arcade form a competitive community, and one of mutual recognition. Jarish is pleased: “Everyone knows my initials.”

The amnesia of the pinball machine meant more than an inability to let players leave a trace of their prowess. No matter how high your score, you play your next ball on the same game. The video game’s computer power makes it possible for the game to respond to the level of the player’s skill. When you finish one round, another round, faster and more complex, awaits you.

Jarish was immediately impressed by this difference, enthusiastic about the increasing violence of the tests on successive rounds (in video talk known as “screens” because when you finish a round the screen usually changes, presenting to you an increasingly worthy opponent). “It’s great, the pace speeds up, the monsters usually get smarter or whatever, chasing you. Usually, they start chasing you closer.” By comparison, pinball “is fun but it belongs to the real world . . . it’s always the same.” Jarish describes his favorite video games as “crazy and weird,” not of the real world.

I have a favorite where there’s this little rocket ship and different colors and there is this dark layout. And you have this violet ray, so that you and all your clothes are changed purple and violet, that’s so neat, and you go around destroying the birds of the son of Satan and then there are whole packs of hounds and stuff, and you have to go around destroying them. And after every couple of screens, you meet the devil himself and you have to go and shoot him with your

laser. If you don’t hit the devil after a little while he starts spouting fire, and then he gets bigger and bigger and his face takes up the whole screen, and then there’s this little missile base, that is you, trying to destroy him, and this big face is coming at you, growing, starting to fill up the whole screen. It’s hilarious.

Jarish dreams about designing his own video games. He knows that this medium can satisfy his taste for excitement. Shift from one memory segment to another, and the whole world can change.

Like if you are being chased by a little dog, that would start to get boring after a while, but if like it changes screens and then you have your army of cats, let’s say [here Jarish laughs, really enjoying himself], and the dog is chasing the cats, you can shoot the dog or something and it could change into something else. It never has to be the same thing all the time.

Most adults describe the “stories” of video games as cute or funny but basically irrelevant to their play, saying that they like to play a particular game to work on a specific “skill.” Children identify more directly with the games’ characters as they are chased, besieged, or, as in the case of Jarish’s favorite game, *Robotron*, saving the last family on earth. This game assumes that 1984 has passed uneventfully but that one hundred years later, in 2084, science has almost destroyed humankind. Jarish explains how: “The scientists have perfected the robotron, which are these ingenious robots who go around, they’re supposed to be helping humanity, but they have a short circuit and they go around trying to destroy the last family on earth, and you have this laser and you have to go and destroy the robots and save the last family.” Jarish feels himself completely in the game: “Yeah, sometimes I think of myself as the kid of the family. I really care.”

The intensity of Jarish’s involvement has a price. Outside the world of the games he says “you feel sort of cut off. When I play the game, I start getting into it, and you start taking the role of the person . . . and then the game ends. And you have just put all of your energy into it. It doesn’t make me angry, more like depressed. You walk out of the arcade and it’s a different world. Nothing that you can control.”

Talking about *Robotron* evokes Jarish’s own feelings about being out of control. “A lot of the kids have girlfriends. I feel left out. I don’t have any best friends. It’s not my fault. It’s my size. Everybody thinks of me as a little kid.” Jarish also feels little power in his family. His parents were divorced, his father

remarried and then divorced again. Now he is with someone new. As when “the game ends,” as when “you walk out of the arcade,” there is a feeling of being “cut off.” Each change in his family means the start of something new where old investments seem lost. Jarish says that when he feels angry he plays *Robotron*. There he can really concentrate, feel in charge.

When Jarish goes into an arcade he looks for the craziest, most out-of-control game he can find, “let’s say a million little birds coming down and you have to fire your laser all over the place and in crazy different scenes,” and then he sets out to discover its strategies, its “secrets,” to find a way of bringing it under control. For Jarish knows that despite the complexity of the games, there is program behind, there are rules. There is the computer that Jarish mythologizes as the dream machine that can make anything possible and as the rule machine that makes everything that is crazy ultimately controllable.

For Jarish, the fact that a video game “has a computer inside” is of great importance. He feels himself to be a child of the computer generation. *Star Wars* was the hit movie of his eighth year; “computer special effects” were something he thought about before he ever saw a computer. “Comic strip” does not mean *Superman*, but tales of androids and robot brains, all of which assume, as he does, that “artificial intelligence” will become a fact of life. Jarish believes that scientists can do anything, but if you can do anything, something can always go wrong. He sees nothing improbable about the computer-out-of-control *Robotron* scenario. In his image of his own future he too will become a powerful person capable of anything by mastering the computer. Indeed, just as pinball gave way to video games for Jarish, video games are starting to give way to the computer. His interest in computers started when he began to think about ways to change video games, mostly to make them more complicated.

I would like to change games to make them crazier, like if you were in a two-player game, shooting another guy. I’d make it so like you’d fire these little weird rockets and then your friend could, let’s say, press a button, and the rocket would turn into a bunch of, let’s say, ants, and they’d fall around everything and you’d have little crater holes and missile silos coming out of the ground.

In science class Jarish dreams about how to use the “boring things we are learning” as materials for the video games he dreams of someday being able to make. “Like why a ball would

move and why it goes faster. You might need to use this stuff to make a video game . . . that comes into my mind very often.” But between knowing the physics and using it for a game there is, of course, a major step: programming. “Programming is what I need to know,” says Jarish. It’s how you get to the “real secrets.”

After he became involved with video games Jarish saved his money and bought a small personal computer that he uses to play games at home and to experiment with programming. But Jarish dreams of bigger things.

My biggest interest would be having a terminal. Like one that you can connect to any computer. That would be incredible. My friend has an Apple. She can attach it to a giant computer. It cost about a million dollars. If you can get into different computers you could get the different codes about the computers and different languages and things about it, and take games from them—you know, like games that you couldn’t find anywhere else—and transfer them to your own computer, and change the games into anything you like. That would be really terrific. That’s the stuff I’d like to do.

For now, Jarish finds games programs in computer magazines and types them into the computer, making small changes in the games, sometimes on purpose to suit his taste, more often by accident when he makes a typo. An object of current delight is a chase game that he modified to make a custom fit for his younger brother. “The program used to have Martians chasing the character, but after my brother heard the song ‘Valley Girls’ on the radio I changed the Martians to Valley Girls.” But when he made this change, something unexpected happened:

. . . the screen changed to fifty million different things. It was fantastic. And it made this snow effect that’s coming down all over the place. And I figured out how to change one of the screens to make it do different things when you eat the treasures. When you eat the treasure you leave this trail, and usually in this game the trail is just dots, but I erased this one line in the program so now it makes these crazy things.

Jarish feels cheated when manufacturers put the games in cartridges so that he has no access to the underlying program. He can’t change them the way he can when he finds a game program in a magazine and types it into his own computer.

There are so many great games and they're really protected. They're trying to not let people copy them. It's really frustrating, because there are so many exciting things you can do with a game. It has nothing to do with—I mean forget the moneymaking part [here Jarish is referring to an earlier part of our conversation in which he fantasized about “changing *Pac-Man* and making it better and making a million dollars”], it's for just having fun.

Jarish doesn't yet know enough about programming to really make his own game, but he is in the process of teaching himself and is encouraged by events like his accidental snow effect. The possibilities seem limitless if such marvelous things can happen by chance. “In computers there is always that random thing, that neat thing that you are going to find out. And you keep at it, trying to find these neat things. Video games showed me what you could do with computers, what you could program. They show you what you can do. It's really wonderful.”

To Joust and Beyond

In sports the player is held by the power of total concentration on action, the sense of melding body and mind. The television spectator's body is out of the picture. Here the sense of immersion is through imagination and identification.

The entertainment industry has long believed that the highest payoffs would come from offering the public media that combine action and imaginative identification. The manufacturers of pinball machines try to introduce a missing imaginative component by naming games to suggest exciting stories (you are controlling a pinball, but you are the “Black Knight”) and by the equally limited conceit of painted flashy pictures of monsters, pirates, and sexy ladies on the machine's surfaces.

Finally, however, the only objects to identify with in the pinball game are the shiny steel ball and a pair of flippers. A Disneyland ride tries to introduce the feeling of action: watching a space lift-off on television, you are entirely on the “outside.” In a Disney spaceship ride you are ushered into a simulated space cabin, you hear the rockets roar, you feel vibration in the seat. But, for all of this, there is nothing for you to do except use your imagination. In the end, the Disney ride is more passive than participatory drama. Once again, designers try, but the media resists.

But Jarish was able to enter the video game microworld through both doors. The polarization between action and

imaginative identification breaks down in the presence of the computer: with the computer behind them the video games provide imaginative worlds into which people enter as participants. Other kinds of microworlds—television, sports, Disney rides, pinball—might offer the holding power of action, of imaginative identification, of losing oneself in a world outside of the habitual. You can find elements of what makes a computer microworld powerful in other things. But the computer can bring it together, and video games were the first place where the culture as a whole, rather than just the culture of computer programmers, got to experience how powerful this is.

Video games began in the computer culture, at one of the places, in fact, where the computer culture itself got started. The first video game was *Space War*, built at MIT in the early 1960s. The screen shows two spaceships, each under the control of one of two players. The ships can be maneuvered and can fire missiles at each other. When *Space War* was first built, visiting computer scientists were amazed by its dynamic, interactive screen graphics—the kind of graphics display that twenty years later would be commonplace in shopping malls. At that time, however, the cost and size of the computer required for *Space War* made it impossible to move it beyond the research environments of such places as MIT.

Ten years later, microtechnology allowed Nolan Bushnell, who had himself been an MIT undergraduate and a *Space War* enthusiast, to surprise the world with *Pong*. Compared with *Space War* its action was extremely limited: a blip—a square ball (easier to make than a round one)—bounced backward and forward across the screen in a crudely simulated Ping-Pong. But, unlike *Space War*, which you could play only by having access to a large computer facility, *Pong* could be made generally available. Bushnell founded a company he called Atari, which manufactured *Pong* in a box smaller than a pinball machine. Soon it was everywhere. You could play it in movie theaters and bars. You could buy a version of it to play on your television set. *Pong* was a novelty, but it set the stage for the arrival of another game, one that had already taken Japan by storm. This was *Space Invaders*, the game that launched the video game culture.

It took another ten years for video games to catch up with the complexity of the original *Space War*. A game like *Joust*, a favorite of Jarish's, is of a generation of games that has begun to move beyond. *Space War* had a recognizable “generic” spaceship, but, with neither color nor detail, it was less a

spaceship than a spaceship ideogram. Just like the square ball in *Pong*, the spaceship was there to serve as a “marker.” In *Joust*, knights duel on flying ostriches, using medieval lances. The player controls his or her ostrich with a joystick. A tug on the stick causes an ostrich that has been trotting along the land to begin to fly, movements of the stick to left or right cause the ostrich to travel in either direction or to reverse direction in midair, digging its heels into the ground before trotting off the other way.

Technological advances have enabled designers to create games that provide visually appealing situations and demand a diverse and challenging set of skills. But the ambition is to have the appeal of Disneyland, pinball, and a Tolkien novel all at once. Games like *Joust* do not offer the imaginative identification with a character and a situation that literature does. The knights in *Joust* owe their appeal to associations the player makes with fantasies about medieval combat that have been sparked through other media. And even the graphically “advanced” *Joust* lacks the degree of individual characterization one has come to expect in animated cartoons.

Designers are starting to break out of these limitations. New generations of computer graphics will allow game characters to have more realistic gestures and facial expressions. New programming techniques offer the hope of creating characters who have more specific and interesting personalities than the monsters in *Pac-Man* so that players’ interactions with them may feel more like a social encounter and less like controlling a pinball. A computerized game of poker, for example, could create players who are individual and idiosyncratic. Some might easily fall for bluffs, others could try to bluff but betray themselves by facial expression, yet others allow themselves to be charmed by attractive opponents.

In the late 1970s Woody Allen wrote a classic short story about Kugelmass, a shy middle-aged professor who longs for romance.¹ A great magician comes to his aid. The magician has a box in which you place yourself and a book, open to any page. With a magic incantation you are instantly transported into that book. Kugelmass chooses *Madame Bovary* and has an affair with Emma in the relative safety of the pages before she meets Rodolphe and the competition gets too rough.

Woody Allen fantasized the interactive novel. Video game designers plan to implement it, perhaps less voluptuously, by putting the player in control of a character who lives not in a

maze but in a piece of literature. Already there is a game in which the player takes the role of a character, Jen, who is also the hero of the movie *The Dark Crystal*. The Jen of the game faces the same situation as the Jen of the movie. The world is in peril; he must find the magic crystal that will save it. The Jen of the game will wander through a landscape identical in its topography and inhabitants to that of the movie. But the player behind the game-Jen has a choice of how to proceed. You can follow in the footsteps of the movie character, or you can take an altogether different route, meeting different characters, different dangers, different challenges.

Certainly, “playing” *The Dark Crystal* is still a lot more like a game of *Pong* than a collaboration with Flaubert. But primitive though it is, it provides an image of one direction in which games microworlds could go. It is a direction that makes us ask whether it is accurate to call such things “games” at all.

As this book is published, traditional film images, stored on video disks, are replacing animated computer graphics. With such systems, easily indexed by computer, a given command—for example, “Enter this room” in response to the screen image of a room—can invoke the film image of what is in it. There are “tours” of cities where you are in the picture, “driving” your car through the streets, deciding what buildings to enter. Where things will go is hard to imagine: “movies” and “talkies” were, too. But once you let your imagination work and then let it run a little wild (as wild, for example, as the programmers who made the first *Space War*) the possibilities are intriguing. You are Scarlett O’Hara, opening the door to Tara. You are Rhett Butler, deciding to stay rather than leave.

In circles where people are trying to invent the future of interactive media there seems to be a great divide. Will the player of the games of the future be in a more complex world than is offered by today’s games, but still in a world that is created by someone else? Or will the player be the designer of his or her own game? In other words, will players continue to be “users” of someone else’s program or will they be programmers in their own right? Will they be able to create new characters and change the rules of the game? Both strategies are being pursued, and surely both will bear fruit. One leads to an image of an interactive *Gone With the Wind*, the other to children building computer worlds as today’s children build ferris wheels with Tinkertoys.

When Jarish began to talk about his new enthusiasm for the computer he offered a touching statement of his loyalty

to video games even as he sensed it being threatened: “I love the computer, but I love video games, and whatever happens I will always love them.” Unlike pinball, promised Jarish, these would never be abandoned. The breathy commitment was sincere, but should we take Jarish at his own word? It is difficult to imagine him playing anything like *Pac-Man* or *Joust* when he is thirty. What is possible is that he might be exploring interactive computer microworlds that erase the line between playing a game and writing a program, much as they erase the line between playing a game and making a movie.

Games, Gnomes, and Computer Culture

When today’s child stands in front of a video game, there is contact between the physical child and the physical machine. But there is another contact as well: between the child’s culture and a culture of simulation. Unlike the worlds of pinball machines or sports or literature, the computers within them make video games “rule-driven.” This was certainly a big part of what appealed to Jarish, who knew that behind each game there was a program that held the key to what he called “the secrets.” Video games offer a chance to live in simulated, rule-governed worlds. They bring this kind of experience into the child’s culture and serve as a bridge to the larger computer culture beyond. They are not the only agent to do so. Reinforcements come from surprising quarters. Children come to the video games from a culture increasingly marked by the logic of simulation.

Recall the dogs and cats of Jarish’s imaginary computer game. Animals are unusual images for him. More typically, his fantasies are populated by gnomes, wizards, and magic-users. When I was a child I knew about gnomes and wizards and spells from reading stories. Jarish knows about such things in a different way—he lives them. Most weeks are punctuated with marathon sessions of *Dungeons and Dragons*, a fantasy game where you create a character from medieval lore by rolling dice to determine its properties; among these are its level of charisma, its ability to use magic, its strength and dexterity. These qualities will be tested as you use your character to explore an intricate universe where there are monsters, adventures, wars, treasures, and a lot of hand-to-hand combat. Unlike the real world, the game universe always conforms to rules. There is violence, murder, and theft, but the rules for what can happen and how to handle it are precise. The charts and tables that allow you to design worlds

and play characters form a small library: “For a kid today,” says Jarish, “it’s very hard. You have to get the money together for four or five or seven books. Very thick books. Like about fifteen dollars each.” Jarish boasts of having read them all. He has become a master of this lore, an expert at manipulating the rules.

There are no computers in the dungeons. But these constructed worlds are permeated with the spirit of a computer program. Their constraints are those imposed by rule systems, not by physical reality or moral considerations. Time might go backward, people might have superhuman powers, everything is possible. What is required is consistency.

In the early 1970s, fantasy gaming grew from cult to culture in the worlds around computer programmers. They found an affinity between the aesthetic of building a large complex program, with its treelike structure, its subprograms and sub-subprograms, and working one’s way through a highly structured, constructed world of mazes and magic and secret, hidden rooms.² They played the fantasy games, used their considerable talents to build ever more complex dungeons, and began to translate the idea into their own medium. Soon fantasy games with complex underground universes began to appear on large computer systems. *Adventure* was the first of these game programs. In it players explore the labyrinth of Colossal Cave, fighting monsters, hoarding treasure, picking up and discarding tools, food, spells, and other supplies as they go.

Other games followed, and as personal computers became more powerful, with memories that could hold the large data bases the games required, fantasy games spread to home systems. By the late 1970s, *Adventure*-like games were a staple item in the program libraries of most home computer owners, and the *Dungeon* games played “live” had spread from the computer culture to the culture at large. College students all over the country were absorbed in role-playing fantasy games and soon their younger brothers and sisters caught on. *Dungeons and Dragons*, a game that most adults find too complicated to contemplate, with its rule books, contingency tables, and mathematical formulas, became a best-seller among sixth and seventh graders.

Jarish compares *Dungeons and Dragons*, “D and D,” to “regular” fantasy, the kind where you say, “You be Nancy Drew and I’ll be a Hardy Boy and let’s go off and solve a mystery.” For him the big difference is in the greater “reality” of the D and D simulation.

In *D and D* there is so much in the world. It's so big. There is an incredible amount of data. If you, say, you're playing *Hardy Boys*, there is only a certain level that you can go to—like you can't really go up to somebody and, you know, interrogate them, or say that you're with the Secret Service and tell them that they have to give you information. I mean, they wouldn't even have the information. You can't go that far with it. You know you have to stop at a certain point, whereas in *D and D* you can just go on, and you can bypass those limits. The game is just in your head, but from that it almost transfers to be real. So that you can go and really imagine, picture yourself going through this cave, and then, all of a sudden, this thing, glorpung all over the wall and dropping down on you, and you can throw a spell at it or something. You could almost imagine that.

Jarish is sure that *D and D* has more detail, is more complete, than *Hardy Boys* or pirates or cowboys. Beyond that, he is uncertain whether *D and D* is more real than reality. He hedges the question. "In *D and D* there's always a stopping point, in reality I guess it sort of happened." But he is not really sure. After reading seven *D and D* books "about twenty times each" he certainly knows more about the structure of dungeon universes than he does about any moment in history. He knows more about the behavior of magic users than about any person who ever lived. What he learns in social-studies class about real history is pale in contrast to what he experiences in *D and D*. "I mean," says Jarish, "in *D and D* there is so much data."

Jarish designs medieval dungeons and he devours science fiction. His dungeon worlds are meticulously drawn out on graph paper to scale with predetermined decision rules on how to respond to any player's actions. For him science-fiction worlds are of the same breed: the author is designing a future as Jarish designs a dungeon.

The computer programmers who felt such affinity for rule-driven fantasy games were as taken with science fiction as is Jarish, and somehow it all seemed to go together. A science-fiction writer is allowed to postulate time machines, intergalactic travel, or mental telepathy, but cannot do it arbitrarily. A planet can have any atmosphere, but its inhabitants must be adapted to it. The author must make every attempt to acknowledge the planet's atmospheric peculiarities when he or she designs the planet's life forms. You can postulate anything, but once the rules of the system have been defined they must be adhered to scrupulously. Such

are the rules for creating "rule-governed worlds." They are known to every computer programmer and are now being passed on as cultural knowledge to a generation of children. The aesthetic of rule-governed worlds is passed on through *Dungeons and Dragons* and science fiction before most children ever meet a computer.

This is the culture that Jarish and his peers bring to their first encounter with a video game. It is not just the games' TV screens that make them seem like old friends. Here is another world where everything is possible but where nothing is arbitrary. Ultimately there are programs that stand behind the action. They can be deciphered; children speak of learning their secrets, recognizing them as worlds of complex behavior that in the end are rule-driven—like science fiction, like *D and D*, and, as they are starting to learn, like computers.

Losing Oneself in a Simulated World

If there is a danger here, it is not the danger of mindless play but of infatuation with the challenge of simulated worlds. In the right circumstances, some people come to prefer them to the real. This danger is not specific to games; it reflects one of the ways in which the games are a microcosm of computation. Computers offer the possibility of creating and working within artificial worlds, whether to simulate the behavior of economies, political systems, or imaginary subatomic particles. Like Narcissus and his reflection, people who work with computers can easily fall in love with the worlds they have constructed or with their performances in the worlds created for them by others. Involvement with simulated worlds affects relationships with the real one.

For Jarish, *Dungeons and Dragons* is clearly superior to games where you take roles or make up a story freely as you go along. As he sees it, *Dungeons and Dragons* has more data and feels more real. But he has lost something in his structured, data-rich games, both in video games and in role-playing fantasy games like *Dungeons and Dragons*.

Video games encourage identification with characters—from science fiction, or sports, or war stories—but leave little room for playing their roles. For example, the screen that children face when they play *Asteroids* does not look very different from that which confronted Han Solo in *The Empire Strikes Back* as he rode through the meteor shower with the panache that marked him as the greatest space pilot in the galaxy. This allows a very immediate kind of identification with Solo—the video simulations put you "in the place" of the

spaceship pilot or the missile commander or the adventurer in the Tolkien world. But you are not allowed to play the part. Dungeons and Dragons allows much more of the personal role-playing that is missing from the video game. Yet it provides it in a way that is custom made for the computer generation: you identify with an alter ego as you play your role in the dungeon, but the process of play is mathematical and procedural. Beyond the fantasy, there are always the rules.

In all of this, something is missing, something that is abundantly present in the open-ended role playing that children offer each other when one says "You be the Mommy and I'll be the Daddy." The variations on this game are endless, the characters change with the issues on the children's minds and with the heroes and heroines of their culture: "You be Annie Oakley and I'll be Buffalo Bill." "You be Roy Rogers and I'll be Dale Evans." "You be Superman and I'll be Lois Lane." In this kind of play children have to learn to put themselves in the place of another person, to imagine what is going on inside someone else's head. There are no rules, there is empathy. There are no dice to roll, there is understanding, recognition, negotiation, and confrontation with others.

Children do not face an either/or choice. A child can play video games and Dungeons and Dragons and Hardy Boys. But in reality there is only so much time. Doing some things precludes others. And, even more important, an individual develops a style. In this case, there is good reason to think that a generation develops a style.

In Jarish we see such a stylistic preference. The Dungeons and Dragons way of thinking, with its thick books of rules, seems more exciting and more challenging than history or real life or fantasy play where the rules are less clear.

Altered States

When you play a video game you enter into the world of the programmers who made it. You have to do more than identify with a character on the screen. You must act for it. Identification through action has a special kind of hold. Like playing a sport, it puts people into a highly focused, and highly charged state of mind.³ For many people, what is being pursued in the video game is not just a score, but an altered state.

The pilot of a race car does not dare to take his attention off the road. The imperative of total concentration is part of the high. Video games demand this same level of attention. They can give people the feeling of being close to the edge

because, as in a dangerous situation, there is no time for rest and the consequences of wandering attention feel dire. With pinball, a false move can be recuperated. The machine can be shaken, the ball repositioned. In a video game, the program has no tolerance for error, no margin of safety. Players experience their every movement as instantly translated into game action. The game is relentless in its demand that all other time stop and in its demand that the player take full responsibility for every act, a point that players often sum up by the phrase "One false move and you're dead."

Executives, accountants, and surgeons stand behind the junior-high-schoolers in games arcades. For people under pressure total concentration is a form of relaxation.

Marty is a twenty-nine-year-old economist who works for a large Manhattan bank. He is a nervous, wound-up man. "I'm a real worrier. A real 'type A person.' That's me." He says he plays the game because he needs "to have something to do which is so hard that I can't think of anything else." The games force him into another mental space where the thoughts and the cares of his day cannot intrude. For many years, Marty used transcendental meditation to relax. Now he uses video games.

For me this is the same thing. It fills your mind. I can be peaceful. No decisions. I wasn't that good at keeping up the concentration for the TM. Thoughts kept breaking in. This is better. There is no way to think about anything but the game or it's all over. One false move or one false thought and you're dead. It makes my wife nervous to watch me play. She says I look so intense. She's afraid I'll have a heart attack. But when I play, inside I am cool. You have to be. You have to think about the patterns, the strategy. You wall the world out.

Marty used to play pinball, but, like TM, it was not sufficiently "coercive." In pinball, you can rest between sets, you can choose when to release your next ball. In *Asteroids*, the first game that Marty got hooked on, the pace is never yours. The rhythm of the game belongs to the machine, the program decides. When the play picks up, *Asteroids* pounds out a beat that stands between a pulse and a drum. "It's its heartbeat," says the twelve-year-old player standing next to Marty in the arcade. "It's what you have to play to." There is no time for pause. You play to the relentless pulse of a machine heart.

Video games allow Marty to feel swept away and in control, to have complete power and yet lose himself in something outside. The games combine a feeling of omnipotence and

possession—they are a place for manipulation and surrender. When Marty practiced TM, he felt it as “time out.” *Asteroids* gave him more of a sense of achievement. It is a world where you are “lost,” yet you have clear goals. “Unlike in the meditation, when I play games I feel that I’ve achieved something. I am getting good at something—in fact, I am always getting better. I love watching that score go up.”

The games require total concentration—to which he attributes their “meditative” qualities—at the same time as they provide a stage for excellence. You get to do what achievement-oriented people like to do: get better. And yet, in their own way, they are also “time out.” Marty calls it “meditation with macho”: “It’s the relaxation of forcing you to withdraw from the rat race, yet they give you a score that reassures you that you are a winner.”

Roger is a fifty-year-old businessman who seeks out video games to achieve the state of mind that he gets into when he skis. He plays a game until that point where “the strategies are part of you,” where he feels like an extension of the game or the game is an extension of him. Roger compares the feeling to being in touch with an unconscious self: “When I play the games I don’t think. My fingers think. As in skiing, you know the terrain, you feel the terrain. My mind is clear. Things pass through it. I make connections. They say it’s mindless, but for me it’s liberating. I am in control of the game, but my mind is free. The way I see it, I’m not wasting my quarters. It’s cheaper than psychoanalysis.”

To master a video game, conscious playing is not enough. You have to “think with your fingers.” As in sports, mental and physical action have to come together. An athlete thinks with the body. You feel the skis as part of you, you know their relationship to surrounding space, objects, and obstacles in the direct way that you feel your body in space. Call it “muscle memory,” call it “flow,” call it “trusting your instincts”—the experience of feeling a continuity between mind and body is part of the inner game of any well-played sport. Skilled video game players experience this immediacy of knowing their game with more than their head, and the experience is exhilarating.

David is a lawyer in his thirties. When he watches television, he says he is relaxed, lost in someone else’s world. When he plays video games, he experiences another kind of relaxation, the relaxation of being on the line. He feels “totally focused, totally concentrated.” And yet David, like Marty and Roger, indeed like all successful players of video games,

describes the sense in which the highest degree of focus and concentration comes from a letting go of both. David talks about playing best when he is not “directed.”

Well, it’s almost, at the risk of sounding, uh, ridiculous, if you will, it’s almost a Zen type of thing . . . where I can direct myself totally but not feel directed at all. You’re totally absorbed and it is all happening there. You know what you are supposed to do. There’s no external confusion, there’s no conflicting goals, there’s none of the complexities that the rest of the world is filled with. It’s so simple. You either get through this little maze so that the creature doesn’t swallow you up or you don’t. And if you can focus your attention on that, and if you can really learn what you’re supposed to do, then you really are in relationship with the game.

Being in relationship with the game means getting recentered on yourself. Every day before going home David stops off at his favorite arcade and plays for an hour or two. At first he says that he does it to unwind, but then he decides that “unwind” is the wrong word.

It’s not so much unwind as it is that I can sort of cleanse myself in a sense, in a very strange sense. Now I’m done with the day, and I go there, and I play these games, and I’ve found myself again. And then I can start on something new. Because if I go right home, I won’t be prepared to talk to my wife. All day I give people advice about their lives, about their divorces, just little pieces of advice. It’s very fragmented. It’s like being a psychologist, but I don’t get to hear it in the full way that a psychologist would. Just little fragments. A lot is going on for my wife now. She is expecting this baby and she needs to talk. I need to be able to communicate with her. And after I play the games I’m prepared to realize that I’m in the middle of the whole picture instead of just being on the outside looking in. OK, because when I play it is my picture. When I’m at work it’s not really my picture. When I get home it is my picture again. And after I play I can go back and share me. So, sometimes the games are a preparation for getting out and being aggressive in the rest of my life, and sometimes they are there for, um, getting back into my own video game.

Metaphysical Machines

The emotional power of video games draws heavily on the computer power within that supports a simulated world and a meditative environment, what David called a place for

“recentering.” But the power of the games draws on other aspects of the computer as well, some of them resonant with children’s fascination with computer toys as “metaphysical machines.” As a computational object, the video game holds out two promises. The first is a touch of infinity—the promise of a game that never stops.

Most video games give you three chances: three “men,” three “ships,” three “missiles.” Novice players get wiped out in seconds. And three chances to play for several seconds doesn’t add up to very much time. The new player dreams of actually being able to shoot the invader or capture the monster or steer the ship. The new player dreams of a respectable score, and imagines that this will feel like “winning.” But when the game skill becomes second nature, when the scores reach the hundreds of thousands, then it becomes clear that in a video game there is nothing except gaining more time, and, for some players, the idea that but for their growing fatigue, their “human limitations,” the game could go on forever.

When you face a game of pinball, there is a clearly demarcated point when the game is over. You may have achieved a high score, you may win a free game. A video game presents no such moment. Mastery of one level of the game, one “screen,” presents another screen, more difficult in its patterns or with the same task to do but at a faster rate. Some games give you an extra “man,” an extra character to play as a bonus if you succeed with a particularly difficult move, but another character comes to the same thing: more time. The game will go on as long as you have a character to play. Everyone knows that the game is going to end “sometime,” but sometime is potentially infinite.

Recall Matthew, the five-year-old who was frightened by the idea that a computer program could go on forever—frightened and also fascinated. Things that give a sense of contact with the infinite are held apart as privileged. They become charged with emotion. They are often imbued with religious feeling. The feeling can be evoked by a sunset, a mountain, the sea. It can be evoked by mathematical experiences, the idea of the infinite sequence of decimals of pi, the sight of two mirrors reflecting each other. And these feelings are evoked by the computer and by the experience of a game that need never stop.

The games hold out a related promise, also tied to the computer’s presence within them. This is the promise of perfection.

Perfect Mirrors

Jimmy is fourteen years old, and he has made his play into an intensely private ritual. He plays at home, alone, and only one game, an “old game,” *Space Invaders*. His manner of playing is disciplined and methodical. “I have my strategy and that’s that. Once you have your strategy, then you just have to be perfect in doing it.” Jimmy doesn’t think of the game in terms of losing or winning. “For me the game is to see how long I can be perfect. Every day I try to be perfect for ten minutes longer.”

Outside of the *Space Invaders* world, Jimmy is not perfect. Jimmy has a birth defect that has left him with an awkward gait and slightly slurred speech. He does not like the way he sounds. He has not made peace with his body. He fears that people are noticing him, “thinking that I am ugly. I especially hate being around girls.” And he feels at war with his mind. “I’m usually thinking crazy things, like I don’t even want to tell you what I’m thinking. Let’s just say it’s crazy.” But *Space Invaders* puts him in an altered state. The game is itself perfect in its consistent response. It will deliver this perfection to the deserving player, to the player who is uncompromising in his or her concentration on the game. When Jimmy plays he feels himself becoming “perfect” and calm. “I don’t, can’t think of my crazy things. It’s my discipline. I guess you might say I’m obsessed.”

Jimmy’s physical disabilities make his case dramatic, but what stands out in his relationship with *Space Invaders*—doing something that serves as a measuring stick for “perfection”—is not unique to him or to video games. Different people use different yardsticks. Some use their bodies as a material much as Jimmy uses his game, “playing with” their appearance, their dress, and their weight. Cara, for example, is a slightly overweight fourteen-year-old girl who defines her “discipline” as eating ten fewer calories every day, with many of the same feelings about it as Jimmy has about demanding ten more minutes each day from *Space Invaders*. There is the same desire to control the inside through action on the outside. Such efforts in control have a positive side. With them can come an enhanced sense of autonomy, self-esteem, a sense of being the “actor” in one’s life. But with every powerful and manipulable medium that we use to feel more in control—our bodies, our money, our games—the medium can get out of control.

Most people don’t become addicted to video games just as most people who diet don’t become anorexic. But when they

use these powerful materials to measure themselves, they are at risk. And, of course, some people come to the material more vulnerable than others. The greater the anxiety about being out of control, the greater the seduction of a material that offers the promise of perfect response. The body offers this kind of promise. So many fewer calories will cause so many pounds to drop. Part of the “holding power” of any diet is the sense of involvement with the process itself. People go on diets to improve their appearance. They begin regimens of exercise for the same reason. But the experience of molding the body, the experience of its response, its malleability, can take over. Similarly, the experience of a game that makes an instantaneous and exact response to your touch, or of a computer that is itself always consistent in its response, can take over. It becomes gripping, independent of anything that you are trying to “do” with it in an instrumental sense.

Itself seemingly perfect, the computer evokes anxiety about one’s own perfectibility. There is pressure from a machine that leaves no one and no other thing to blame. It is hard to walk away from the perfect mirror, from the perfect test. It is hard to walk away from a video game on which you could do better next time, it is hard to walk away from a computer program with an undiscovered “bug,” it is hard to walk away from an unproofread text on the screen of a word processor. Any computer promises you that if you do it right, it will do it right and right away.

People who try out video games and say they hate them, or who actively dislike their first experience with computer programming, are often responding to this same promise. Not everyone wants to be around the perfect mirror. Some people dislike what they experience as the precision, the unforgivingness of mathematics. Instead of being intrigued or reassured by the idea of there being a “right answer” in their first arithmetic class, they found it intolerable. It was felt as a pressure, as a taunt, as a put-down. Mechanical objects (they work if you handle them right, they don’t work if you handle them wrong) evoke the same anxieties. And when these people (in our culture, often women) meet the computer the problem is taken to a higher order. Here is a machine that goes beyond all others in its promise to reflect human competence. It is not always welcome. For some, its challenge may be felt as an alien contest. For others as a long-awaited chance to finally test one’s worth.

Perfect Contests

David, the lawyer who used the games to “recenter,” who saw them as a kind of Zen, knows that he looks successful in the eyes of the world, but he feels unsatisfied, at war with his work. He would like to be in control of things and fantasizes himself a warrior, a hero, an explorer. He would like to test himself against danger, against the elements, against an unexplored terrain. He chose law as a career and specialized in litigation, hoping that the adversary world of the courtroom would provide the thrill of hand-to-hand combat. But the reality of his job is very different.

There is no way I can challenge anybody in a pure mental challenge. Where you can really say, “This is it. This is me and this is you.” I can go into court and I can think of myself as fighting like that, one on one, but there is always some other factor. He’s got one set of facts and I’ve got another set of facts. I’m always constrained by those things.

In a video game there is no place to hide, no excuses of chance or accident. For someone like David, searching for the sense of urgency that comes from real danger, this is crucial to the games’ seduction. It is a place where there is “pure you.”

David’s hours in the arcade are part of his search for the perfect contest. It is a place in which to stand alone, “It’s you against it.” But it is a fixed entity. “So ultimately,” says David, “it’s you against you. My life is bound up in external constraints. With the games I face only myself. If I do well, it is pure me. If I do poorly . . . there’s nothing else I can blame for a failure or an unsatisfying experience with a video game. There’s no little person changing it. Playing the game is an assertion, completely pure individual competition.”

His medium offers a pure test. Unlike boxing, or golf, or tennis, there will be no change of partners, no new referee. David doesn’t like the “realm-of-infinite-possibilities kind of game.” He describes chess negatively as the kind of game where “you make a move and the other person responds, and the other person can respond in any one of, well, in any one of a thousand ways.” David wants a different kind of game, a game where the set of circumstances is going to be the same every time. The video games with their programmed responses are made to measure. Shoot the opponent from a certain distance and you get so many points. Move a little closer and you explode. With practice, the performance rules become transparent. David likes video games when they can serve as the perfect mirror, the perfect measure of who he is.

"I want the game as simple as it can be . . . not really simple, but fixed. Like how many times can I bounce the ball against the wall within the next twenty seconds? When I say 'simple,' what I mean is fixed, invariant. A true test in that respect."

He doesn't like it when random elements are programmed into video games. For he relies on the game's invariant nature to give him a measure of his state of mind. If he's calm and centered he'll do well. If he is tense, diffused, anxious, he'll do poorly. "The better I do at a game, the better I feel—not because I feel good for winning, but because I know that I am in a good state. It's not just what the games do for me, it's what they show me about what was there to begin with." Beyond this, they are a preparation for life. "It has to do with testing yourself; it has to do with the idea that basic training will make a man out of you, with the idea that you have never lived unless you've lived close to the edge. The games are that simple, 'close to the edge,' but they are not threatening. Do you understand? It's a peculiar sort of feeling."

David fears that all his life he has shied away from testing how hard and far he could push himself. "It's the thing of the moment that suits me for right now. . . . I'm growing up. I've been married a year and now we're expecting a baby." He wants reassurance that he can handle things. The games are his test.

David is deeply involved with video games. He has woven them into his most personal concerns. But it is not among adults that the weave is most dense. Although they play video games and work with the computer, they grew up in a culture built without these machines. Young people are building their generation's culture now; video games and computers are among their materials. Growing up with a technology is a special kind of experience. Although mastering new things is important throughout life, there is a time in growing up when identity becomes almost synonymous with it. Today's young people meet the games at that time. The games are not a reminder of a feeling of control over challenge. They are a primary source for developing it.

In the next chapters [of *The Second Self*] I turn to children who are doing more with computers than using them for games. These children are working with computer systems that turn the machines into a medium for self-expression. We shall see a child programming an animated scene of a space shuttle that is in no sense a simulation. The excitement here

is not in the process of deciphering the program, but of making it in a highly personalized way.

I introduced this chapter by speaking of the games as a window onto the culture of computation. But when you play a video game you are a player in a game programmed by someone else. When children begin to do their own programming, they are not deciphering somebody else's mystery. They become players in their own game, makers of their own mysteries, and enter into a new relationship with the computer, one in which they begin to experience it as a kind of second self.

Notes

1. Woody Allen, "The Kugelmass Episode," *The New Yorker*, May 2, 1977.
2. *Principles of Compiler Design*, by computer scientists Alfred V. Aho and Jeffrey Ullman (Reading, Mass.: Addison Wesley, 1977), has the following illustration on its cover: a knight (named Syntax Directed Translation) on a steed (named Data Flow Analysis) fights a dragon (named Complexity of Compiler Design). The knight's weapon is a lance called LALR Parser Generator. I show this cover illustration to my students majoring in computer science. Their comment: "Oh, sure, a lot of compiler people are into D and D."
3. Psychologist Mihaly Csikszentmihalyi studied people's inner states while pursuing activities that appear to contain rewards in themselves—chess, rock climbing, dance, sports, surgery. He discovered that central to all of them is an experience which he calls "flow." Its most marked characteristic is the "merging of action and awareness." Csikszentmihalyi's analysis of flow experience closely parallels many issues I found at the heart of the "holding power" of both video games and computer programming. See Mihaly Csikszentmihalyi, *Beyond Boredom and Anxiety* (San Francisco, Josey Bass, 1975). For a cognitive perspective on the psychology of game use, see also Thomas W. Malone, "What Makes Things Fun to Learn? A Study of Intrinsically Motivating Computer Games," Xerox Palo Alto Research Center, Cognitive and Instructional Sciences Series (August 1980).

