Video Games
A Critical Analysis

Lowell Monke

In a new wave of publicity, the video game industry, backed by many university professors, argues that the games are highly educational. Actually, video games promote overly rational modes of thought and remove young people from the interaction they need with real people in the real world.

Lowell Monke, a founding Board member of the Alliance for Childhood, is Associate Professor of Education at Wittenberg University in Ohio. He has written numerous articles on the role of technology in education and is coauthor (with R. W. Burniske) of *Breaking Down the Digital Walls* (SUNY Press, 2001).

A recent development in the controversy over children's use of technology is the attempt to rehabilitate the image of video games. Long criticized for their violent content and for monopolizing children's free time, video games are now being defended not just as harmless entertainment but as positive educational experiences for youth. And the defense is coming not just from the video game industry and its enthusiasts but from university professors as well. As a result, newspaper and magazine articles reassure worried moms and dads that video games are among the things that once were thought to be bad for kids but really are good. Books with titles such as *How Computer Games Help Children Learn* and *Don't Bother Me, Mom – I'm Learning* go farther, portraying video games as essential models of learning that are particularly relevant for 21st century youth. Typically missing from these promotional tomes is any critical analysis of the claims. This essay is an effort to provide such an analysis.

Video Game Use and Abuse

According to a 2005 Kaiser Foundation survey, young people from the age of eight to 18 in the U.S. consume electronic screen media, on average, 6.5 hours per day. The only activity that takes up more of their time is sleeping. Of that 6.5 hours, the researchers found that a little over 1 hour is spent playing video games. Other estimates for video games are somewhat higher. It is likely that today the average amount of time young people play video games is approaching 2 hours per day (Roberts, Foehr, and Rideout 2005).

Even younger children spend considerable amounts of time playing games on screens. In a typical day, 83% of children from up to the age of six use some form of screen media. Children ages 4 to 6

spend just over an hour a day playing video games, nearly the same amount of time as older youth (Rideout and Hamel 2006).

Though the amount of time children spend playing video games is considerably less than watching TV, the amount of time that children spend watching television has remained fairly constant during the years that video gaming has grown (Roberts, Foehr, and Rideout 2005). Thus, the question of what activities children are giving up in order to play video games is an important one. For example, the Kaiser study found that youth now average only about ¾ hour reading print media each day (Roberts, Foehr, and Rideout 2005). Also, the amount of time children spend outside has diminished dramatically in the last two decades (Juster, Ono, and Stafford 2004). Of course, it is an over-simplification to pin these losses solely on the rise in video game usage. But it is important to keep in mind that children have only so many minutes in a day. Every choice to do one activity means less time for others. So it's difficult to dispute writers like Richard Louv (2005) who see the rise in video games and other electronic media as an important contributor to the reduction in outdoor play (and what Louv calls "nature deficit disorder").

Even video game supporters acknowledge that video games are notorious time sinks. Children and adults alike admit losing track of time while playing video games. Video game addiction, once considered a mislabeling of minor game-playing obsession, is becoming recognized as a serious pathology, not just in the U.S. but all over the world. It has created enough of a ripple in the medical community that in June 2007 the American Medical Association considered establishing video game addiction as a formal diagnosis. It eventually backed off, punting the issue to the American Psychiatric Association, asking them for advice. The APA punted as well, claiming that because the 1998 Manual of Mental Disorders does not have video games listed, it could not be diagnosed as one, though it might be considered for the 2012 edition.

Other countries are not so reluctant to designate video game addiction a real mental health problem. In South Korea, where 10 people died from the effects of compulsive video gaming in 2005 (most from disruption in blood circulation caused by sitting in a single, cramped position for too long) the government has set up a gaming addiction hotline (Faiola 2006). Hundreds of private units have also been set up by hospitals and psychiatric clinics to deal with the problem in that country. China, Japan, the Netherlands, Canada and Great Britain are among the nations that have recognized video game addiction as a real health problem. In the U.S. doctors have been formally treating video game addiction at least since 1996, when Dr. Maressa Hecht Orzack opened a computer addiction clinic associated with McLean Hospital in Belmont, Massachusetts (Marriott 1998).

Most researchers believe that video game addiction follows the same character as impulse control disorders like gambling and pornography addiction. But a recent report by researchers at the University of Bolton in Great Britain suggests that the traits of gaming addicts are more like Asperger's Syndrome, a form of autism ("Video Game Addiction 'Like Being on Drugs'", 2008). This is a particularly disturbing finding, given the explosion of children identified with autism in this country. Asperger's Syndrome has received special attention as the "Geek Syndrome," a mild form of autism that has reached epidemic status in Silicon Valley (Siberman 2001). No one is saying that video games, or extensive computer use, causes Asperger's Syndrome, but the British findings could mean that video game playing might amplify an otherwise mild tendency toward the condition.

There is much to be learned about video game addiction. What is clear is that thousands, if not millions of people's lives are being adversely affected by their inability to control their video game playing. Of course, that is not grounds for banning these activities; after all, we don't ban alcohol, gambling or pornography even though each has proven to have addictive qualities. But we do ban access to them by children. The odds of becoming addicted typically increase dramatically with early exposure. Any activity that is implicated in addictive behavior thus poses a particularly serious health risk for children.

Basic Arguments for Video Games

As mentioned, arguments are now being advanced that cast video games not as a destructive consumer of young people's time but a potentially

valuable educational tool. Can video games really help children learn? And are the benefits strong enough to offset the possible addictive qualities just described?

Two academicians who think so are James Paul Gee and David Williamson Shaffer, both professors at the University of Wisconsin. Gee has written several books describing the benefits of video game playing (Gee 2003; 2005; 2007). He argues that market forces compel designers of complex role-playing and adventure video games to figure out ways for players to learn how to navigate and negotiate their way through these games by solving series of increasingly difficult problems. In the process, the player learns how to think and act like an engineer, pilot, city manager, or soldier by actually taking on their roles. In the better games, solving the problems that arise may require research, collaboration with other players, trial and error, and a good deal of reasoning. All of these are characteristics that apply to good learning. Gee specifies 36 of these traits that are found in many of the better video games and claims that educators should look to video designs as models for 21st century learning.

Schaffer (2006) supports and extends Gee's educational claims by drawing heavily on the progressive ideas of philosopher John Dewey. Schaffer claims that Dewey's argument for experiential learning is valid but until now has been too difficult to put fully into practice. Computer and video games enable children to learn by doing without the expense or the dangers that often accompany real world experience. Indeed, video game simulations overcome one of the biggest hurdles schools have had in implementing Dewey's ideas: they allow children to undertake far more complex and remote learning experiences than was available through the educational media of Dewey's day.

These arguments recognize the inadequacies of the "traditional" practices found in many schools throughout the country. Most thoughtful educators — and parents — will sympathize with the preference for experiential learning over passive consumption of information; dialogue over one-way lecturing; interactive activities that spark enthusiasm over worksheets that generate boredom; customization over standardization.

There is, in fact, a strong strain of progressive philosophy at the heart of most of these arguments. Educational technologists have long been among the strongest critics of the standardized curriculum and testing that deadens so much of learning. A few video game advocates go even farther than taking the progressive side of the educational debate. They claim that good video games promise to overcome the longstanding dispute between progressives and traditionalists because they have built into them the best of both approaches to learning.

The arguments behind this and the other claims made by video game proponents are many and complex. I cannot review them all here, nor is this essay intended to offer a point-by-point rebuttal of all of their claims. Rather, I want to raise questions and concerns and some fundamental disputes with these claims to help the reader think through the controversy more carefully.

Because video games are built on computer technology and engage the user in much the same way (through video screens and some hand-held input device) many of the criticisms leveled at computer use by children also apply to video games. I refer you to the Alliance for Childhood's *Fool's Gold* (2001) for those criticisms. However, there are some issues related to both computer use and video games that warrant more detailed and focused comment.

Reduction to Abstractions

What takes place in any video game is not only mechanical but always at some level an abstraction — a symbolic representation, either through text or images. Many of the attributes that promoters cite as benefits of video games grow out of the ability to represent aspects of the world symbolically. A relatively simple game such as *Lemonade Stand* is able to create a virtual business environment through the creation of a number of symbolic representations that follow complex mathematical rules assigned to physical properties such as the weather, the cost of ingredients, and the price charged for the lemonade. In the far more complex simulation game, *Civilization*, everything from the characters to the terrain is represented visually on the screen, while stores of weapons and food and levels of production, commerce and pollution are represented graphically or

numerically. As Professor Schaffer (2006, 11) says, the great value of video games is their ability to offer children "parts of the real world that are too expensive, complicated, or dangerous for them except through computer simulations." In other words, the educational value of video games is achieved by reducing the costs, complexity, and danger of direct investigation.

But in many cases it is precisely the costs, complexity, and danger that are crucial elements in understanding how the real world works. For example, *The Oregon Trail*, perhaps the first, and certainly the most well known, educational video game, purports to teach students about the western migration across the U.S. by simulating the trip. But simulating that migration on a computer seriously distorts history. Essentially, children learn that success in crossing the Great Plains depended most heavily on managing one's resources, spiced by a dose of random good or ill-fortune. Other than blind luck, success in the game depends exclusively on making rational, calculated decisions about behavior based on precise measurements of one's assets; in other words, one must be a good accountant to be a good pioneer.

There is a germ of truth to this. But the program amplifies this aspect of the journey to the point that the real meaning of the great American migration completely disappears. One simply cannot comprehend the significance of this journey without coming to grips with the unrelenting heat, the deadly cold, the hunger, the fear, the heartache, the elation that accompanied this movement. The meaning of this historical event lies not in the calculating capabilities of the pioneers but in their heart, their faith and their will. In fact, it is only because of the extraordinary determination, ingenuity, desperation, hope, and capacity for both suffering and cruelty the settlers used to overcome their almost constant *mis*calculations. Because the computer governing *Oregon Trail* (or any computer-based simulation) can neither recreate nor inspire such deeply human qualities, they are severed from the simulation. What the students are left with is an image of pioneers as hyper-rational problem solvers, whose success depended on their management of cold, external data — an impression that completely misrepresents what is most significant about one of the great human dramas of all time.

Mechanistic Thinking

Long before students started playing *Oregon Trail*, or video game advocates linked game-playing with educational problem-solving, computer science pioneer Joseph Weizenbaum warned about the dangers of substituting mechanical calculation for human judgment. Alarmed that his colleagues were seriously using a program he had playfully designed to simulate conversation with a psychotherapist, he pointed out that "instrumental reason converts each dilemma, however genuine, into a mere paradox that can be unraveled by the application of logic, calculation" (Weizenbaum 1976, 13). The full, rich complexity of human decision-making gives way to a reductionistic, totally mechanical calculus, leaving much that is most precious to our stories behind.

"The introduction of computers into our already highly technological society," writes Weizenbaum,

> merely reinforced and amplified those antecedent pressures that have driven man to an ever more highly rationalistic view of his society and an ever more mechanistic image of himself (Weizenbaum 1976, 11).

The contribution of video games to this development of a mechanistic view of human thought is something that advocates have not been able to sort out in their own minds. Gee, for example, seems to think that the way computers function is, in fact, the way people think, and therefore provides a good model for children to emulate. "In part because they externalize the way in which the human mind thinks," he writes, "good video games often organize learning in deep and effective ways" (Gee 2007, 25). Later he adds, "Since fruitful thinking involves building simulations in our heads that prepare us for action, thinking itself is somewhat like a video game, given that video games are external simulations" (Gee 2007, 80).

In contrast, Shaffer echoes Weizenbaum's observation about the character of computer "thinking." "By definition," he writes,

> the things that a computer can do are things that can be represented by a well-formed algorithm. That is, they can do things that can be standardized. So learning to do what a computer can do

> by definition means learning some standardized skill.

But Shaffer isn't dissuaded by the limits of standardization. Instead, he believes that the computer's mechanized processes can supplement distinctly human thinking, making learning even more powerful.

Shaffer's claim may be true when the computer's remarkable capacity to crunch numbers or edit symbols is used to supplement work outside the artificial environment. But *video games* are essentially self-contained microworlds. One must think within the constraints of those logic-built "worlds" if one is to have any success at all. Any thinking beyond what can be expressed in mechanical, standardized, algorithmic form simply doesn't work in such an environment and is therefore framed out of the experience.

This is precisely what we see happening through the Oregon Trail simulation (or Civilization or the popular Sim series). As such, the traditional moral of the actual Oregon Trail story, which relies on the full scope of human experience, is also framed out of the game. It is replaced with a new and wholly technical lesson that the proper way to engage the world is through rational, calculated decision-making designed to increase our power and control over our environment. But it is not just any environment, but an environment that is itself created in the image of a machine.

Thirty years after Weizenbaum warned that computers could take us down a path where human judgment is usurped by mechanical calculation, we find video game advocates touting their ability to not only improve one's thinking skills but even one's ethical character. A popular press report quotes Justin Hall, a gaming consultant, who "credits games for teaching him morality." Hall, according to the article, found that

> Richard Garriot's 'Ultima IV' game helped him grasp that good behavior sometimes means choosing between competing virtues.... In a Garriot-designed universe, a person might lose the game by seemingly making all the right moves, but failing to give money to a pauper met along the way. (Rubin 2004)

Hall twists moral-ethical conduct into purely instrumental reasoning. The conception of compassion offered here is not an act of generosity based on some heart-felt connection with a fellow living being. Instead, the player feeds the hungry because it furthers his own interests. The pauper is just another object used, another investment made to gain success. Given the cold logic guiding this doctrine, it is not difficult to predict what will happen when Mr. Hall's real-life experience convinces him that giving to the poor doesn't help him become more successful in his real-world endeavors.

All decisions made by the computerized innards of video game technology are pure mathematical calculations. Any efforts to build human ethical conduct into the programming of these games requires redefining terms such as compassion, commitment, integrity, and dignity in ways that are divorced from any emotional, spiritual or other non-rational aspects of life. This is an instance of what social critic Theodore Roszak (1986, 78) has called the grand reductionary principle of computers: "If the computer cannot rise to the level of the subject, then lower the subject to the level of the computer."

Thus, one of the fundamental, and most dangerous, errors of the video game-as-educator argument is that what takes place on the screen is a fair and adequate model of what takes place in real life. By passing on to our children the illusion that video games simulate real-life experience, we teach them that what makes them most profoundly human doesn't really matter.

Collapse of Space and Time

One of the allures of video games-as-educators is their capacity to compress time and essentially obliterate the constraints of physical space. Collaboration between students living on opposite sides of the planet can take place almost instantaneously. The benefits from this hyper-compression of time and space are a strong part of the argument made for the educational use of video games.

Unfortunately, there is no consideration given to the possible problems related to this compression. As Piaget showed (and parents know from experience), children's perceptions of time and space are often confused, and getting accurate senses of time and space are developmental tasks that last into adolescence (Piaget 1969). Does early use of video games

and other time/space compression technologies interfere with that development? We don't know. There is little research into how this compression might affect young people's general concept of time and space. But there is enough anecdotal evidence of young people being unable to attend for any length of time to real-world activities, to raise suspicions (Brod 1984).

In my discussions with teachers and parents about the importance of nature in children's lives, one of the most often expressed frustrations is that young people today typically show little patience when they are taken out to a pond or forest. Having been raised on Discovery Channel-type nature programs that compress hundreds of hours of footage into a half hour of exciting video, they expect to see the deer drinking, the fish jumping, the otters playing, and the bears growling all at once and with no effort on their part. Real space is too big, real time is too slow to match the excitement the child experiences watching a video or playing a video game. When the simulation becomes preferable to the real, there arises a real question of the simulations' true educational value.

Moreover, video games devalue place entirely. Where one actually is in space has no impact on the game. Thus, the context of where one lives, including home life, neighborhood, school location, and natural setting, has no significance within a video game environment. Yet one of the most important things a child needs is a sense of belonging to a physical place. As philosopher Simone Weil put it, "To be rooted is perhaps the most important and least recognized need of the human soul" (Weil, Eliot, & Wills 1978, 41). Unfortunately, being rooted in a place (other than in front of a screen) is a need that video games do not recognize, much less promote, at all.

Motivation

We now come to the central premise of using video games for learning: Many young people seem wildly motivated to learn how to play them well. Given how poorly motivated many children are to learn in school, it is an attractive idea to use the same principles that are employed to design successful commercial games for developing educational games. We might see young people spending hours gladly immersed in learning history, science and math. So goes the argument. Unfortunately, it is a remarkably flimsy one, for a number of reasons.

First, there is no evidence that video games can be designed with the kind of deep and accurate content that young people need to learn while maintaining the level of excitement and challenge that draws them to high selling video games. When it comes to matching the seductive power of video games with serious academic content, proponents admit that they are selling *potential*, not actual existing programs that work. Given the sorry history of other highly touted technological saviors of education — from the motion picture to the Internet — all sold on speculative potential rather than existing evidence, there is good reason to be highly skeptical of the utopian picture painted of the future by enthusiasts.

Second, proponents claim that the motivating feature of video games has nothing to do with content matter at all. That's why university professors can point to games like *Grand Theft Auto* and *Full Spectrum Warrior* as examples of video games that are powerful learning environments (Gee 2007) . These games may portray extremely violent activities, but their creators understand what it takes to get young people to keep playing them. According to Gee, Shaffer, and other advocates speculate that the appeal has nothing to do with an attraction to violence, but an ever-enlarging sense of control. As Gee (2007, 49-50) puts it,

> When people are playing a computer or video game they are manipulating a character … at a distance in a very fine-grained way — in this case a virtual distance. They feel that their minds and bodies have been extended into this virtual world. This process appears to allow players to identify powerfully with the virtual character or characters they are playing in a game and to become strongly motivated to commit themselves to the virtual world the game is creating with their help.

Perhaps if young people could actually live in a virtual world, it would be fine for them to become committed to it. But this is, in fact, what strikes many critics as worrisome — that video game players

seem more devoted to a simulated world than the real one. If the power that comes from being drawn into a virtual reality is one of the major motivations for playing video games, it is difficult to imagine how that motivation could be helpful in directing young people's interest toward real-world learning.

Take, for example, the difficulties already discussed that are created when children who are used to playing fast paced simulation games dealing with the environment confront the much slower moving real thing. Science philosopher Stephen Talbott examines this problem in an essay titled "Impressing the Science Out of Children." He writes (1995, 146) that trying to motivate science students with awe-inspiring multimedia programs (the "wow" factor) is counterproductive because "special effects wonder" does not lead to the same reverent scientific curiosity generated by the wonder that accompanies prolonged contact with nature.

> The latter … grows from an awareness of one's immediate connection to the phenomenon — from a sense that the inner essence of what one is looking at is somehow connected to the inner essence of oneself.

Talbott goes on to argue that substituting the dazzle of special effects generated by a computer for a child's deep connection with the actual phenomenon will likely result in the child only being attracted to the special effects, not the phenomenon itself, nor science at all. In contrast to the fast moving, entertainment-saturated simulation, the much slower moving, more subtle, less controllable real world strikes the child as mundane, boring, incapable of inspiring awe and excitement. Teachers often find that the things themselves hold little interest for the students, and motivating their students to learn in unmediated situations becomes even more challenging. In many classrooms, the occasional use of glitzy computer activities that once seemed to be a teacher's surefire occasional means of motivation has already turned into the jaded child's means of extortion, with the unspoken threat echoing from kindergarten to college: "I won't learn from you unless you entertain me."

Moreover, Gee's idea of exploiting children's manipulative instincts as a way to motivate them may be a boon for commercial video game designers, but it should raise serious concerns among parents and educators who recognize that part of growing up is learning to *constrain* the urge to manipulate "at a distance." In fact, here we encounter an example of one of the most troubling aspects of video game design: a willingness to exploit the most immature qualities in children in order to sell the games. Marc Prensky (2006, 85) writes,

> Computer games are so engaging because the primary objective of the game designer is to keep the user engaged. They need to keep that player coming back, day after day, for 30, 60, or even 100+ hours, so that the person feels like he or she has gotten value for their money (and, in the case of online games, keeps paying). That is the measure of success.

It does not occur to Prensky that this description could also fit the strategy of a drug pusher, that the best means of keeping the user "engaged" is to get them hooked by appealing to users' baser, more immature instincts rather than their higher values. If the free market, rather than a concern for the health of the child, determines what motivational tools are built into video games, then anything goes.

An example of this can be found in *Virtual Laguna Beach*, the first of three on-line role-playing environments designed by MTV, in which participants create their own 3-D characters. When asked why young people would play the game, chief executive of MTV Networks, Judy McGrath, confidently remarked that it appealed to the same qualities that attracts them to her network. ''MTV," she said, "speaks uniquely to a group of people who are endlessly fascinated with watching themselves'' (Siklos 2006).

Advocates should consider that many of the key motivational characteristics unique to video games — the sense of overwhelming control, the ability to manipulate the one's personal "avatars," the customizability of the virtual environment to suit one's whims, the commitment to a world with oneself as a central character — may grow out of an unhealthy, adolescent self-regard that education should seek to diminish rather than exploit.

Finally, the newest motivational arguments claim that learning itself is the primary reason young people are flocking to these games. Video game promot-

ers provide no research to support this contention. Moreover, the argument strains credulity. *Grand Theft Auto 4*, one of the most violent video games, sold 3.6 million copies the first day it was out, breaking the record set by another violent video game, *Halo 3* ("Grand Theft Auto Reaps Record Sales" 2008). Are we to believe it sold in such record numbers because of a thirst for learning? It is equally difficult to square the educational argument with the fact that 7 million more copies of the bloody version of *Mortal Kombat* were sold than the non-bloody version (Goldstein 1999). It is far more likely that the appeal of these games comes from stimulating the adrenal glands rather than the cerebral cortex.

What little research there is on the impact of playing video games on learning doesn't seem to bear out Gee's claim either. A study undertaken by Vivek Anand found that "the amount of time a student spends playing video games has a negative correlation with students' GPA and SAT scores. As video game usage increases, GPA and SAT scores decrease" (Anand 2007, 552). GPA and SAT scores may not be the best indicators of learning, but they might provide some indication of an increased motivation to learn. At least in this study, there is no evidence of that.

Given all of this, it is not at all clear that the kinds of motivation drawing young people to video games are helpful to educators, or healthy for kids. Motivation is a complex issue. It rarely transfers cleanly from one context to another. Moving video games from entertainment to education is a much larger transfer than most advocates are willing to admit. To date, there is little evidence that the right kinds of motivation survive the move.

Play

One of the most appealing aspects of video game advocacy is the recognition of the importance of games as learning experiences for children.

Children *play* games. As advocacy groups like the Alliance for Childhood (Miller & Almon 2009) have shown, play is an essential element of child development as well as something children should be involved in for its own sake. It is good to see video game advocates cite child development experts like Piaget, Vygotsky, and Bruner on play's value for emotional, social, and cognitive development. But there are many types of play. Today's children need some types more than others. Most middle class American children play far too many highly structured, adult supervised games that rob them of their creative freedom. Too little time or space is allocated for self-directed, loosely or unsupervised play. Too much Little League Baseball and junior league soccer, too little tag and hide-and-seek.

A big mistake that many video game advocates make is insisting that video games belong in the latter category of self-directed, unstructured play. It's an easy mistake to make; after all, the child directs the action on the screen and adult supervision not only is not needed, it is typically scorned. But a closer look reveals that video game play is not so independent after all. It just isn't the adult in the room who is in control. Indeed, in one sense, there is no human in control at all. But the computer, X box, or Playstation establish relatively tight and extremely rigid parameters (not to mention physical space) within which the play must take place.

All games are rule-bound. That's what makes them games. But the rules in child devised games tend to be remarkably fluid. They are often revised on the fly. Not so with video games. Not only are the fundamental video game rules laid out by the designers, with whom there can be no negotiating, the computer running the game has to abide by a deeper and extremely narrow set of operating rules that even the designer can't ignore. The traditional supervisor (parent, teacher) may have been disposed of, but a hidden pedagogue has assumed the throne, and a new set of strict laws has been encased in silicon.

When Theodore Roszak examined educational software pioneer Seymour Papert's (1980) prophecies about the takeover of education by "microworlds," he found himself "haunted by the image of the prisoner who has been granted complete freedom to roam the "microworld" called jail: 'Stay inside the walls, follow the rules, and you can do whatever you want'" (Roszak 1986, 75). At the most fundamental level, video games do not liberate children from overly structured play, they simply shift the responsibility for structuring the play from humans to machines.

Even the claim that players get to direct the action within the game is overstated. It is more accurate to say that players manipulate objects and text on the screen, to which the program responds, in turn manipulating the action according to the programming code set by the designer. The nature of this feedback loop is not so troubling. It is similar to what happens in the real world — poke your playmate and he may poke you back. The possible responses allowed are far fewer in the video game, but the process is at least similar.

What isn't at all similar is the role of the player in the activity. In real-world play, children themselves engage in a wide variety of actions. In video game play, it is the child's avatar, an image that the child partly controls from a distance, that makes the moves. For some video game advocates, this is seen as an attractive collaborative relationship based on shared knowledge. Gee, for example, extols the virtues of his relationship with his avatar in a first-person shooting game: "He knows how to move and fight in the game world, while I know how and when to order him to do (Gee 2007, 72). Less favorably put, video game players are like virtual puppeteers who have no knowledge of how the strings they pull actually move their two dimensional puppets. This enforced role of directing and manipulating action from both a physical and cognitive distance is a very different way of engaging the world from hitting the ball, building the fort, setting the table, climbing the tree, sorting the coins, speaking and listening to another person, physically acting out roles in fantasy play. In an important sense, when a child plays a video game she gains control over a vast array of activities by giving up the capacity to actually do them herself.

Video game advocates are right that children need play. But what is missing from children's lives is not the kind of highly structured game playing that is programmed by video game developers. It is free play — the type of play that is truly open-ended and child-directed — that is missing from children's lives. This is the type of play that is also now widely recognized as an essential requirement for healthy child development (Miller and Almon 2009; Crain 2007). According to the American Academy of Pediatrics, free play is disappearing, in part, because today "in many communities, children cannot play safely outside of the home unless they are under close adult supervision and protection" (Ginsburg 2007, 185). But the decrease is also caused by "children being passively entertained through television or computer/video games" (Ginsburg 2007, 185). And the more that children are allowed, even encouraged, to stay inside and play video games, the more likely it is that the demand for safe outdoor spaces for free play will shrink.

Video Games for Physical Development

Though there has long been broad agreement that video games contribute to physical passivity, there have also long been arguments that video games provide some benefits to physical development. The early arguments were modest and often rather silly. Perhaps the most common, and unintentionally revealing, was the still often made claim that "shooter" games improve hand-eye coordination — as if children can't easily find activities, like throwing and catching balls, playing Jacks, coloring with crayons, stringing beads, building with wood blocks, that are far more effective at developing that skill. It is, in fact, a gross distortion to apply the traditional developmental use of the term "hand-eye coordination" to such slight movements of a single digit. That the claim persists and does not evoke hoots of derision from parents is sad evidence that those once ordinary childhood activities are not so common any more, that children's lives have become so sedentary and passive that twitching one's thumb now qualifies as skillful physical activity.

As the games and the equipment have become more sophisticated, however, video activities have grown more robust, to the point that children can now work up a good sweat playing games like Dance Dance Revolution. Devices can be attached to video game consoles to provide instant feedback to swinging a golf club, pounding on drums, even paddling a kayak. There are even "games" that monitor and supervise yoga exercises and running on treadmills. With such activities available, some video game supporters suggest that they could actually be an important component in counteracting the epidemic of child obesity.

Certainly, these kinds of games are an improvement over those that involve merely staring into a screen and moving a joystick. Still, video game exercise should not be mistaken for the kind of activity a child gets through free play, which typically entails much directional change, a wide assortment and often random movement of limbs and activity that takes place at a tempo and locations determined by the child, not a machine. Video games aren't video games unless the player is tethered to a screen in some way. Furthermore, recognizing and analyzing movement is a complex function for the computers at the heart of video games and, thus, only a very narrow range of human motion counts in any active video game. This is fine for a golfer practicing her basic swing or a contestant stepping on various "dance" pads in a certain order, but it should not be mistaken for the unrestricted, self-directed, wildly diversified movements that children, especially younger ones, need for healthy physical development (or real dancing, for that matter, which involves the development of *graceful* movement of all parts of the body, not just sequential foot stomps on sensors).

Consider video-enhanced treadmills. Video games are attached to a treadmill so that running on it becomes more fun and attractive to kids (the game automatically changes the speed and incline of the treadmill in concert with what is shown on screen — a sort of virtual reality jogging). Still, health professionals do not recommend that children exercise by running on a treadmill. Anyone who has ever watched children play tag can see why. Running on a treadmill simply cannot include the sudden changes in direction and bursts of speed, the ducking, twisting, turning, jumping, reaching, etc., that get every muscle in the body involved in the game. Whether it is virtual running, bowling, golfing or even dancing, those same limitations apply. They always reduce what counts as physical action to a small set of sensor-activating movements.

This reduction of physical activity to mere "exercise" allows promoters to ignore the qualities of childhood activity that lead to an appreciation of the outdoors: feeling the texture of grass under bare feet, breathing the fresh air, orienting oneself in panoramic three dimensional space, moving in ways that are restricted only by the strength of muscles and the pull of gravity. These are the kinds of qualities that children take such delight in *for their own sake* that we sometimes describe it as "frolicking." A child certainly may exercise in tandem with playing a video game, but she doesn't frolic.

Violence

No issue related to video games has created more parental concern, press attention, and scholarly research than the violence depicted in many of them. Much of the debate about the influence of this violent content flows along the same lines as the decades-long debate over violence in other media like TV and movies. However, because video game players do not just observe violence but actually participate in generating images depicting it, there is also a unique concern that this intimate involvement may cause even larger effects than other media. Real events, like the Columbine High School shootings where the two boys who went on the rampage seemed to emulate the violent video games they had spent hours playing, have added emotional fuel to the debate.

Video game defenders have countered that the number of incidents of violent video game players turning into mass murderers is infinitesimally small; that there is no strong scientific research indicating that playing video games cause young people to be more aggressive, much less commit violent crimes; and that there are far more critical factors that govern young people's decisions to act violently.

Sorting out all of the competing claims is difficult. Until recently, there had not been a sizeable enough body of scientific research to gain a very clear picture of the impact of violent video games on youth. But there has long been more than enough research on other forms of media violence to show that images of violent behavior do, indeed, affect young people. Craig Anderson, a long-time researcher into the effects of violent media, minces no words in claiming the conclusiveness of the evidence: "The scientific debate about whether exposure to media violence causes increases in aggressive behavior is over … and should have been over 30 years ago" (Anderson and Gentile 2008, 4) He cites, among other evidence, the work of a panel of media violence researchers organized at the request of the U.S. Sur-

geon General that found "unequivocal evidence that media violence increases the likelihood of aggressive and violent behavior in both immediate and long-term contexts" (Anderson and Gentile 2008, 282) These conclusions are echoed by many other (though not all) researchers, including Stephen Kirsh, whose summary of his exhaustive review of the literature in his book *Children, Adolescents, and Media Violence* (2006) found, among other evidence, that "violent television consumption is associated with increased levels of self-reported aggressive behavior" (p. 225); that "violent television can increase aggression behavior" (p. 225); and that repeated exposure to television violence can cause youth to be desensitized behaviorally, cognitively, emotionally, and physiologically.

Of course, the relevant question here is whether those same conclusions can be made about violent video games. Much less research has been accumulated in this specific area so there remains some controversy about just how strong an association can be drawn between playing the games and its effects on behavior and attitudes. Jeffrey Goldstein (2003) argues that much of the growing body of research showing a link between playing violent video games and subsequent aggressive behavior is badly flawed; that laboratory experiments cannot adequately simulate social activities; and that the number of studies showing no relationship between playing these games and violence have been underreported. He even makes the novel argument that playing violent video games may lead to less violent behavior than watching violence on TV because game players have control over some of what happens on a screen and therefore rather than passively consuming the violence learn to manage it in a positive, disciplined way.

This total repudiation of linkage is not widely shared in the research community. As studies have accumulated, and the methods of investigation have improved, there seems to be stronger evidence linking violent video games and violent behaviors and attitudes among young people. The strongest indication of this change comes from Anderson's 2001 and 2004 reviews of the research. Anderson and Bushman's 2001 meta-analysis (a statistical technique that combines individual studies) indicated that violent video games were associated with increases in aggressive behavior, aggressive thoughts, aggressive emotions and physical arousal, while diminishing helping behavior. This study was criticized by some for including too many poorly designed studies. When Anderson went back in 2004 and updated the meta-analysis there were many more studies available and he was able to separate them into strong and weak studies. He found that when the studies with the most flawed methods were removed, the negative effects from violent video games were actually stronger. In other words, the more poorly designed studies actually underestimated the effects of violent video games on young people rather than overestimated them.

Not only did Anderson's work indicate that the impact of violent video games was larger than previously thought, the link between playing violent video games and aggressive behavior was, according to Anderson, "alarming." The statistical connection is "larger than the effect of condom use on decreased HIV risk, the effect of exposure to passive smoke at work and lung cancer, and the effect of calcium intake on bone mass" (Anderson 2004, 120).

Of course, this has not settled the issue. Dmitri Williams (2005), who accepts the growing evidence of linkage between violent video games and aggressive behavior, cautions that statistical correlations do not automatically infer that playing the games *cause* people to be violent. It could be, for example, that violent people are drawn to violent video games.

It should be noted that even those like Anderson, who claim that these games cause aggression, are not suggesting that children play violent video games and then immediately go out and shoot people. As Anderson points out, "Extreme acts of violence typically involve the convergence of multiple risk factors, and even then are fairly rare. No single risk factor by itself predicts extreme violence very well." (Anderson and Gentile 2008, 295). This is one way to make sense of the noise created by all of the claims and counterclaims: that violent video games should be considered as one contributing factor, along with other factors, to an increased risk of aggressive, even violent activities.

As the scholarly debate continues, new research directions also support the connections between vio-

lent video games and aggression. For example, a study conducted in 2006 by a team headed by Rene Weber from Michigan State University used MRI technology to measure brain states while participants played violent video games. Their results "indicate that virtual violence in video game playing results in those neural patterns that are considered characteristic for aggressive cognition and behavior" (Weber, Ritterfeld, and Mathiak 2006, 51)

Other recent studies have shown that apart from the question of whether children become more aggressive after playing violent video games, they tend to become desensitized to violence (Carnagey, Anderson, and Bushman 2007). This may be an even more important finding than the direct link to aggression for it means that even if children do not become more violent themselves, they are more likely to accept violent behavior in others as normal. This view of the world is likely to result in children being more fearful, less trusting, and more willing to accept aggressive behavior on their behalf, even if they personally do not act aggressively.

In fact, this is the conclusion reached by Christine Ward Gailey (1993), based on her analysis of many of the most popular Nintendo video games in the mid-90's, before the explosion of ultra violent video games took place. She found that, even in these less brutal games, "the prevailing worldview … is one of extreme caution, even paranoia. The world is fraught with danger … a place where anything new is potentially dangerous; the new must be avoided or killed in order to survive or benefit from the world's hidden treasures" (p. 89). Even some of the supposed positive elements add to the fearful view. "The world, then, is certainly shown as a diverse place, but the diversity is threatening in most cases" (p. 91). Gailey summarizes her study by stating that, in general, these games present "a grim, even Hobbesian, picture of life, replete with sexism, racism, class hierarchy, competitive exclusion and other Social Darwinist notions. The room allowed for altruism and cooperation is limited" (p. 91).

Regardless of how conclusive the evidence is about the connection between violent video games and aggression, parents must ask themselves whether they want their children engaging in activities that vividly promote this sort of ugly, even sociopathic, view of the world. Even such an avid promoter of video games as Marc Prensky (2006) acknowledges that if children were constantly exposed to violent video games, "one could reasonably expect their behavior to be violent" (p. 21). But Prensky expects society to find ways to offset this problem. "And that," he writes, "is precisely our job as parents, teachers and society: to provide those counterbalancing influences" (p. 21). Thus, it would appear that the message to parents and teachers is this: Your role is not to shelter children from harmful influences; your role is confined to repairing the damage.

All of this points to the rather strange assumption characteristic of many video game proponents that playing video games is some sort of inalienable right, even for children; that regardless of the harm it may cause, there is nothing we can, or even should, do to control it; and, therefore, the best we can do is try to use it for the most positive, educational, purposes. This amounts to a form of technological fatalism that may have some purchase in society as a whole, but not when it comes to children. Parents have every right to choose and fight for the kind of environment they want their children to encounter. To argue that violent video games are another destructive influence in kids' lives that parents and teachers have to somehow compensate for rather than protect against is to make the jobs of parenting and teaching even more difficult than it already is.

Putting Video Games in Their Place

Gee (2003, 11) states that video games "reflect the culture we live in…." There is some truth to this statement. We are a society in which our children are engulfed by electronic technology; where they are bombarded by images and isolated from real things; where they constantly engage machines and rarely engage nature. They live in a world that glorifies violence and promotes greed. It is difficult to see how activities that draw children deeply into abstract, symbolic environments at the price of real-world interaction, that keep them indoors, that rely heavily on violent imagery and a mechanistic view of the world, will somehow provide the optimum educational environment for children. Especially in a world in which our relationship with the environment desperately needs to be repaired, children's

growing alienation from nature is hardly something that ought to be reflected in either their learning or play environments.

It is doubtful that the beneficial claims being made for video games would attract much support except for two factors: an educational system that remains rooted in a stale, dehumanizing, industrial standardization that is an easy and deserving target of criticism; and television, a technology that sets the bar so low for interactivity, both with the medium and other people, that just about anything looks healthy in comparison. Video games may offer a step up from either of those dismal environments. But there is no reason to settle for an environment that carries so much of the same destructive baggage.

Good schools, and even many good teachers in lousy schools, long ago moved far away from factory model "traditional" methods of instruction, trading in worksheets for collaborative activities, compensating for standardized testing with experiential learning, and working hard to develop the kinds of relationships with students and subjects that inspire a real love of learning. Many schools have recognized the foolishness of sacrificing art and music for expensive computer labs and are bringing them back into the curriculum. Recess is also making a comeback, as the related issues of obesity and nature deficit disorder finally penetrate school consciousness. Computer technology has played no essential role in any of this. In fact, video game proponents are oddly behind the times in this regard. They do not seem to recognize that computer technology is not the only alternative to "traditional" methods of learning.

Nor are video games the only, or anywhere near the best, alternative to passive TV watching. And just because children are drawn to video games does not mean that the only response available to parents is to direct them to good ones. Parents would do better to encourage children to play outside, where they can learn about the real world through *doing*, rather than just directing symbols on a screen.

Parents need not be concerned that playing *Halo* once or twice will turn their children into psychotic killers. Nor should this critique be taken as a blanket condemnation of all video games in all circumstances. There are many situations where adults and older youth can make good use of video game simulations for learning and certainly for entertainment. What has to be foremost in our consideration, however, is that unless those uses are preceded by years of contact with the real world and face-to-face relationships with real people, what may be beneficial on one level is likely to be detrimental at a deeper level. In a society saturated with second-hand symbols, all children, but younger ones especially, need as much time as we can give them experiencing the world directly, engaging people directly, playing their games physically. Indeed, in the high tech world of the 21st century, more than ever before, children need a high touch childhood.

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