## Joseph Corrado

Professor, Department of Philosophy Portland Community College | SS-F51

# The Perversity of Virtual Violence According to Albert Borgmann

## Abstract

Many video games today enable users to engage in various forms of virtual violence—often displayed in extreme detail under the users' interactive control. The broad availability of these systems provokes concern about how best to promote the measured development of reason and to protect the ethical innocence of our children and other vulnerable people, without jeopardizing freedom of speech. Albert Borgmann offers a sturdy conceptual framework for understanding the virtual ambiguity and fog of these entertainment devices and for reframing our discourse. Borgmann reveals the perversion of our ambivalence about the ethical squalor and brilliant excitement of virtual violence.

If Albert Borgmann's analysis of technological information is essentially correct, then a recent U. S. Supreme Court decision on violent video games is a perverse turn in our cultural dialogue about our children's access to virtual violence.

On June 27, 2011, the U.S. Supreme Court struck down a California law that prohibited the sale or rental of M-rated ("mature") video games to minors (under 18 years old).<sup>1</sup> Speaking for the majority in this 7-2 decision, Justice Antonin Scalia said: "...minors are entitled to a significant degree of First Amendment protection...Government has no free-floating power to restrict the ideas to which they may be exposed."<sup>2</sup>

Our communal concern about appropriate access for children to violent, amoral, or scandalous stories extends back to at least Plato's arguments in *The Republic*<sup>3</sup>. And still today, there is a continuing dialogue about how best to promote the measured development of reason and to protect the ethical innocence of our children and other vulnerable people without jeopardizing freedom of speech.

In commenting on the decision to strike down California's attempt to balance between prudent protection and free speech, Scalia seems dismissive of concerns about violent video games:

Like protected books, plays and movies, they communicate ideas through familiar literary devices and features distinctive to the medium...Grimm"s Fairy Tales, for example, are grim indeed...And Hansel and Gretel (children!) kill their captor by baking her in the oven.<sup>4</sup>

Scalia's crude analogy between stylized depictions of violence in a children's book and the effortless procurement of simulated cruelty and crime in graphically vivid and interactive media betrays a dangerous naiveté about the nature of technological information and today's virtual reality (VR) devices.

In contrast, Albert Borgmann offers a sturdy conceptual framework for understanding the virtual ambiguity and virtual fog of these entertainment devices and for reframing the

protection versus free-speech debate. Although his philosophical research and writing on technology's effects on our world are complex and nuanced, a brief sketch of his framework will reveal a very compelling and fruitful explanation of our ethical concerns about VR violence.

# Forms of Information

To anchor his framework, Borgmann defines information as "a relation of at least five terms: *intelligence* provided, a *person* is informed by a *sign* about some *thing* within a certain *context*."<sup>5</sup> Note that *person, sign,* and *thing* form the core relation, with *intelligence* related to the *person,* and *context* related to the *thing*.

Further, information can be *about, for,* or *as* reality. An example of information *about* reality would be a magazine ad for the latest version of *Grand Theft Auto: The Lost and the Damned*. We see that the first exciting and shocking episode is now available for download for PlayStation 3, Xbox 360, and Games for Windows-Live. But this low-resolution report conveys little information about the excitement and shock we might expect or want.

At a higher resolution, an example of information *for* reality would be a collection of the scripts, storyboards, software code, and other design specifications for this GTA episode. In comprehending this design documentation, we would realize the information through our imaginations, memories, and other cognitive faculties.

Finally, an example of information *as* reality would be a copy of the GTA episode on CD. Through the machinery of the game device, the high-resolution information on the CD is realized for us; and the structure of the sign (the CD's data) is as detailed as the structure of the thing the sign refers to (a realistic audio-video simulation of exciting and shocking events). Borgmann asserts:

The technological information it [the CD] contains is distinctively information *as* reality. Information gets more and more detached from reality and in the end is offered as something that rivals and replaces reality.<sup>6</sup>

Referring to Justice Scalia's analogy between the tale of Hansel's and Gretel's dispatch of the witch to the oven (information *about* reality) and the simulated violence in *Grand Theft Auto* (information *as* reality), one observer noted: "The distinction, lost on Scalia, is that technology has taken violence many steps beyond those charming little home bakers in their dead tree book."<sup>7</sup>

## **Vividness and Interactivity**

Borgmann notes that "…where information becomes virtual reality, new dimensions need to be traced, and new terms have to be found." To these ends, Borgmann adopts the ideas of vividness and interactivity as developed by Jonathan Steuer.<sup>8</sup> Vividness, the force that virtual reality exerts on a person, has two dimensions: depth and breadth. *Depth* refers to resolution, and *breadth* is the number of human senses a VR device addresses.<sup>9</sup>

Regarding vividness, consider *Manhunt*, a third-person stealth horror video game. This "game" lets users select from an array of weapons: plastic bags, baseball bats, crowbars, various sharp blades, chainsaws, and of course, guns. If the user runs out of virtual health, virtual painkillers can also be had. Squeamish beginners can "lock on" to the white level of violence. Acclimated users can progress to the bloodier yellow level and finally to the red level.

If the lock-on is red, then the player strangles, punches, and snaps the enemy's neck while the enemy groans in pain and suffers from lack of oxygen. The game's graphic presentation of the executions are accentuated in a style reminiscent of a snuff film, and the game encourages players to execute enemies as brutally as possible.<sup>10</sup>

As an example of interactivity—the force that a person exerts on virtual reality—consider *Mortal Kombat*,<sup>11</sup> a fantasy series of fighting games with high levels of blood and in-your-face guts. Very graphic *fatalities*, as killings are called, require a series of interactive button-pressing. For even more interactivity, plug into *Scarface: The World Is Yours* on a Wii device.<sup>12</sup> Now, the user's whole body can engage Tony Montana's world of selling cocaine,

paying off the police, killing, stealing, and other bad behaviors necessary to take complete control of Miami's Little Havana.<sup>13</sup>

Borgmann observes:

Supernatural brilliance, limitless variety, and unreal availability constitute the normative identity and charm of virtual reality. The actual world seems drab, poor, and hard in comparison.<sup>14</sup>

### **Disburdenment and Disengagement**

Classical philosophers of technology, Heidegger for example, take a transcendentalist approach: examining the conditions for the possibility of technology. Instead, Borgmann uses a phenomenological and empirical method: observing the functions and features of concrete technological artifacts or devices. Borgmann articulates the paradigm of technology as the *device paradigm*. He notes that "what distinguishes a device is its sharp internal division into a machinery and a commodity procured by that machinery."<sup>15</sup>

For Borgmann, devices are distinct from pre-technological things. He says:

A thing, in the sense in which I want to use the word here, is inseparable from its context, namely, its world, and from our commerce with the thing and its world, namely engagement. The experience of a thing is always and also a bodily and social engagement with the thing's world.<sup>16</sup>

In contrast to the engagement that things invite and the focal force they can exert, a device necessarily disburdens and disengages us. Borgmann cites a clear example:

A device such as a central heating plant procures mere warmth and disburdens us of all other elements. These are taken over by the machinery of the device. The machinery makes no demands on our skill, strength, or attention, and it is less demanding the less it makes its presence felt.<sup>17</sup>

VR devices disburden and disengage by eliminating the need for human realization skills.

Technological information is self-realizing if we include in it not only the pure structure of information but also the input, processing, and output devices in which it is embedded,... Evidently, since technological information realizes itself, the demands on the realization skills of people decline to nothing.<sup>18</sup>

# Ambiguities

Within the conceptual framework traced above, Borgmann identifies distinct dimensions of ambiguity. First, Borgmann claims that there is real ambiguity in actual reality that: "… is resolved through engagement with an existing reality, with the wilderness we are disagreed about, the urban life we are unsure of, or the people we do not understand.<sup>19</sup> Further, he identifies at least three forms of information ambiguity: symbolic, technical, and virtual.

### Symbolic Ambiguity

When a *person* is informed by a *sign* about some *thing*, sometimes the sign wobbles. Borgmann notes that an object can oscillate "between sign and thing or suddenly revert from reference to presence." He cites the example of puns as a "play on sign and thing, letting two references collide in one and the same thing..." Distress and unnatural scale can also make a sign lose its reference.<sup>20</sup> Symbolic ambiguity is also evident in the "…leveling of the distinction between direct and indirect knowledge and of the difference between the nearness and farness of reality..."<sup>21</sup> When the VR user says that he knows Little Havana in Miami, does he merely mean that he has information about it?

#### **Technical Ambiguity**

Borgmann understands technical ambiguity in the context of Claude Shannon's pioneering work, "The Mathematical Theory of Communication"—that proposed a way to measure information and to judge the fidelity and economy of information transmission. As Borgmann puts it, Shannon's theory "suggested that the value of information lies in its contingency, its unpredictability."<sup>22</sup> Expanding on the implications of Shannon's theory, Warren Weaver claims: (T)his word *information* in communication theory relates not so much to what you do say, as to what you could say. That is, information is a measure of one's freedom of choice when one selects a message.<sup>23</sup>

So, technical ambiguity is the trade-off between the probability of a particular message and its "news" value. A surprise has high information value, but it generates ambiguity in our assessments of the probability of how often, or even if, it will occur again.

#### **Virtual Ambiguity**

A clear example of virtual ambiguity is the experience of Jennifer Kahn who, together with Jaron Lanier (a digital pioneer in VR), visited the Virtual Human Interaction Lab, a new VR lab at Stanford University. The lab manager, Cody Karutz, escorted Kahn to the lab's "experimental room." She reports:

A squat chamber paneled in gray-and-tan fabric. A thin orange carpet covered a "haptic floor" that can vibrate and judder...in one corner of the room, a plastic headset and goggles hung droopily from a long black cable. Karutz clamped them firmly to my head, tight enough to block out the light. When he launched the first simulation, I found myself standing in what appeared to be the same room as before, but there was a deep rectangular pit in front of my feet.

The pit simulation, Karutz explained, can be used to test the degree to which cognitive knowledge—in this case, the knowledge that the floor does not contain a pit—is capable of overriding gut instincts and fear. Because the simulation realistically mimics the visual experience of a fall, many people do topple over, and may even feel their gorge rising, as though they were falling through space.<sup>24</sup>

Borgmann explains Kahn's experience at the edge of the virtual pit as a divergence of actual and virtual reality—a new kind of ambiguity in contemporary culture. He observes that

The symbolic ambiguity of texts, scores, or plans is resolved through realization, through an enlargement or enrichment of reality that is instructed by cultural

information. Real ambiguity is resolved through engagement... In either case, the resolution of ambiguity leads to clarity—the splendor of reality.<sup>25</sup>

But "...virtual reality provides no information about the world out there and is in this regard totally ambiguous. At the same time it is or aspires to be richly and engagingly informative within." For Borgmann, virtual reality elicits a "sense of wealth" that results from the user's resolution of symbolic and real ambiguity. The characteristic ambiguity of virtual reality reflects the comingling of this sense of wealth with "...the sense of unencumbered freedom that registers the disburdenment from reality. We can call it virtual ambiguity."<sup>26</sup>

Borgmann claims that VR evokes an ambiguity that is proportional to the VR device's complexity:

But it is characteristic of virtual reality that as resolution and engagement grow, so does ambiguity. That detachment from reality and ambiguity of information must rise together is clear from the technical sense of ambiguity in information theory.<sup>27</sup>

## The Ethical Fog of Virtual Violence

Inevitably, the VR user encounters virtual ambiguity—ambivalence about attending to the gravity of reality or the triviality of his disburdened world:

To secure the charm of virtual reality at its most glamorous, the veil of virtual ambiguity must be dense and thick. Inevitably, however, such an enclosure excludes the commanding presence of reality. Hence the price of sustaining virtual ambiguity is triviality.<sup>28</sup>

The allure of virtual reality leads the user down a path of sustained ambiguity into a virtual fog of confusion—an "impossible union of unencumbered glamour and profound engagement (that) must sooner or later fall apart and settle for triviality or gravity."<sup>29</sup> Escaping into a virtual fog, the VR user can become disoriented by ethical ambiguities. As

examples, Borgmann cites the distortions of *eros* (the erotic life), and *thanatos* (the solemnity of death), through glamorization and trivialization.<sup>30</sup>

And what Borgmann says about the corruption of *eros* in virtual sex, he could have said just as easily of the perversion of *thanatos* in virtual violence:

Virtuality has extricated sex from the depths of real life and made it available as a diversion that would be harmless if it were not for the disabilities and displacements it abets in real life.<sup>31</sup>

In a virtual fog, the VR user is in a twilight zone somewhere between fact and fiction between knowing there is no pit in the experimental room and a gut instinct to avoid the edge of the apparition.

Borgmann's conception of virtual fog leads to the conclusion that virtual violence can be morally precarious—in part because of its trivialization of horror, its glamorization of physical force, and its ambivalence about ethical import. Indeed, Borgmann, notes that VR entertainment devices "may be more seductive and addictive" than games, novels, and television and "so intensify the familiar moral concerns about distraction, isolation, debilitation, and indoctrination."<sup>32</sup>

Borgmann's theory of technological information is essentially coherent methodologically as well as congruent with VR users' experiences. Of course, some philosophers have voiced misgivings about some of Borgmann's philosophical and semiotic assumptions.<sup>33</sup> Other philosophers challenge the claim that VR can be morally precarious by encouraging disabilities and displacements in real life.<sup>34</sup>

But substantial empirical and statistical data support Borgmann's general explanation of the virtual fog of VR. For example, there is extensive neurological research on the left and right hemispheres of the human brain—research that extends back to Herbert Krugmann in 1969.<sup>35</sup> In the neurological language game, the virtual ambiguity of VR violence is an oscillation between the taboos of the left hemisphere and the unconscious associations of the right.<sup>36</sup>

Borgmann's views are also bolstered by substantial psychological research on the effects of VR violence on the real aggression of users.<sup>37</sup> Craig Anderson notes: "Studies provide converging evidence that exposure to media violence is a significant risk factor for aggressive and violent behavior."<sup>38</sup>

Discerning the cognitive ambiguity of virtual violence and its linkage with moral hazard is not possible without a theory and ethics of information like Borgmann's. Some philosophers, scientists, and legal savants see only another Grimm, albeit virtually realized, tale. Others discern a form of information that displaces reality, and they glimpse the ethical fog that can engulf immature or impaired users. Commenting on the Supreme Court's recent decision striking down the California law limiting sales of M-rated VR violence, one observer writes:

In his dissent...Justice Stephen Breyer declares that this is not a case, as the majority claims, about "depictions of violence"; rather it is a case about "protection of children." ... Breyer frames the issue precisely when he declares, "This case is ultimately less about censorship than it is about education."<sup>39</sup>

In *Call of Duty: Modern Warfare 2*, the user of the gaming device—the "player" of the "game"—can add a tactical nuke to his arsenal if he has advanced to the 25 kill streak level.<sup>40</sup> Of course, it's not a real nuke like the horrific weapon we know has been really used. But in offering information *as* reality, the VR device procures the commodity of choice: entertainment, diversion, and disengagement from a relatively drab, slow, and flat world. As the user confronts manifold ambiguities—from symbolic fuzziness and sensory and narrative surprises, to the tension between the gravity of reality and the lightness of brilliant and trivial entrancement—he is drawn into deeper disengagement.

The ugly alien that has just launched a surprise attack might remind the user of that jerk down the block. Of course, the world inhabited by the unpredictable alien precludes deliberation and produces no real consequences—a world of moral vacuity. Immersed in the virtual fog of doing his virtual duty, the user can easily stumble into a bog of ethical ambiguity. Perhaps this would be a good time to launch the nuke and give that jerk what he deserves?

The device's VR machinery that is realizing the information that encodes the sensible elements of the fantasy is not designed to procure habits of self-awareness and other reflections. The user wants to escape to a less mundane and less shabby world—not to think about himself in the real one. Moreover, in a liberal democratic society that is enthralled by the freedom to consume virtually anything, almost any proposed restriction appears to be an infringement of a basic right. Speaking of the significance of human rights within the natural world, Borgmann emphatically rejects the idea that every conceivable human right takes precedence over every conceivable natural right:

It is this... principle that is acted out in technology when it is held that anything and everything is to be procured for human consumption. This is a perversion of the notion of human rights and a corruption of the significance embodied in human beings.<sup>41</sup>

With analytic perspicuity, Albert Borgmann"s theory of information reveals the perversion of our ambivalence about the ethical squalor and brilliant excitement of virtual violence.

## NOTES

#### The Perversity of Virtual Violence According to Albert Borgman

- 1. BROWN, GOVERNOR OF CALIFORNIA, Et Al. V. ENTERTAINMENT MERCHANTS ASSOCIATION Et Al." *FindLaw.com*. 27 June 2011. Web. 30 July 2011. <a href="http://laws.findlaw.com/us/000/08-1448.html">http://laws.findlaw.com/us/000/08-1448.html</a>.
- "BBC News US Court Rejects California Ban on Violent Video Games." BBC Homepage. 27 June 2011. Web. 3 July 2011. <a href="http://www.bbc.co.uk/news/world-us-canada-13933670">http://www.bbc.co.uk/news/world-us-canada-13933670</a>>.
- 3. Plato, and G. M. A. Grube, *Republic*. Indianapolis: Hackett Pub., 1992. 377c. Print.
- Timothy Egan, "Sex, Violence and the Supreme Court." *Opinionator NYTimes.com*. 7 July 2011. Web. 14 July 2011. <a href="http://opinionator.blogs.nytimes.com/2011/07/07/sex-and-the-supremes/?ref=opinion">http://opinionator.blogs.nytimes.com/2011/07/07/sex-and-the-supremes/?ref=opinion</a>>.
- 5. Albert Borgmann, *Holding On to Reality: the Nature of Information at the Turn of the Millennium.* Chicago: University of Chicago Press, 2000. 22. Print.
- 6. Ibid., 182.
- 7. Eagan, Sex, Violence and the Supreme Court
- 8. See: Jonathan Steuer, "Defining Virtual Reality: Dimensions Determining Telepresence." *Journal of Communication* 42.4 1992. 73-93. Print.
- 9. Borgmann, *Holding*, 183.
- 10. See: "Manhunt (video Game)." *Wikipedia, the Free Encyclopedia*. Web. 24 Aug. 2011. <a href="http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>">http://en.wikipedia.org/w/index.php?title=Manhunt\_(video\_game)>"
- 11. See: "Mortal Kombat." *Wikipedia, the Free Encyclopedia*. Web. 24 Aug. 2011. <a href="http://en.wikipedia.org/wiki/Mortal\_Kombat">http://en.wikipedia.org/wiki/Mortal\_Kombat</a>>.
- 12. See: "Scarface: The World Is Yours." *Wikipedia, the Free Encyclopedia*. Web. 24 Aug. 2011. <a href="http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=Scarface:\_The\_World\_Is\_Yours>">http://en.wikipedia.org/w/index.php?title=S
- 13. For examples of the vividness and interactivity of violent VR, see: "Manhunt -Executions." YouTube - Broadcast Yourself. Web. 24 Aug. 2011. <a href="http://www.youtube.com/watch?v=PGuhX5AmjuA">http://www.youtube.com/watch?v=PGuhX5AmjuA</a>. Also see: "The Most Violent Game in the Internet." YouTube - Broadcast Yourself. Web. 24 Aug. 2011. <a href="http://www.youtube.com/watch?v=S0izF0DD3tk">http://www.youtube.com/watch?v=S0izF0DD3tk</a>.

- 14. Borgmann, *Holding*, 185. Borgmann believes that a virtual reality system represents a "hyperreality" as exemplified by the contrast between the rough and flawed sound of a live music performance and the preternatural purity and perfection of music realized by a CD and its attendant machinery.
- 15. Albert Borgmann, *Technology and the Character of Contemporary Life: a Philosophical Inquiry*. Chicago: University of Chicago Press, 1984. 33. Print.

16. Ibid., 41-42.

- 17. Ibid., 42.
- 18. Borgmann, Holding, 182.
- 19. Ibid., 185
- 20. Ibid., 19-20.
- 21. Ibid., 15
- 22. Ibid.,132-3.
- 23. Warren Weaver, "Recent Contributions to the Mathematical Theory of Communication," in Claude Shannon and Warren Weaver, *The Mathematical Theory of Communication*. Urbana: University of Illinois Press, 1949. 100. Print.
- 24. Kahn, Jennifer, "The Visionary." *The New Yorker* 18 July 2011: 46-53. Web. Speaking of her experience in the labs experimental room, Kahn poignantly notes: "Karutz offered to spot me if I wanted to try stepping off the edge, but, to my bafflement and shame, I found that I was paralyzed. When I admitted this to Lanier, he confessed that he had had the same experience—,,I build these things and I couldn"t do it!" Few people in fact can. "The pit is a great example of how you can use virtual reality to really get at something deep in how people perceive the world," he said. "It"s such a richly detailed window into what works and doesn"t work in our own psyches.""
- 25. Borgmann, *Holding*, 185.
- 26. Ibid., 185.
- 27. Ibid., 185.
- 28. Ibid., 186.
- 29. Ibid., 189.
- 30. Ibid., 191.
- 31. Ibid., 191.

#### 32. Ibid., 189.

- 33. For example, see the report of Peter-Paul Verbeek's objections cited in: Phil Mullins, "Introduction: Getting a Grip on Holding on to Reality." *Techné: Research in Philosophy and Technology*. scholar.lib.vt.edu, 6.1, 2002. Web. 4 Aug. 2011.
  <a href="http://scholar.lib.vt.edu/ejournals/SPT/spt.html">http://scholar.lib.vt.edu/ejournals/SPT/spt.html</a>. Also see: Myron Truman, "Holding on and Letting Go: A Review of Holding on to Reality: The Nature of Information at the Turn of the Millennium." *Techné:Research in Philosophy and Technology* 6.1 2002.
- 34. Matthew Stockton, "Ethically Defensible Acts of Immorality: Rethinking Ethics in Virtual Realms." Unpublished paper presented at the 61st Annual Northwest Philosophy Conference-Pacific University, Forest Grove, OR. 2009. Print. Referring to virtual acts of crime and cruelty, Stockton asserts that: "participation in these virtual acts represent a type of playing in the moral sandbox where users are able to better reflect on and strengthen their own moral reasoning both inside and outside of these virtual experiences."
- 35. Joyce Nelson, *The Perfect Machine: Television and the Bomb*. Philadelphia: New Society Publishers, 1992. 69-70. Print. In a revolutionary experiment, Krugmann attached electrodes to TV viewers' heads, and in repeated trials, he noted that: ...the brain waves switched from predominantly beta waves, indicating alert and conscious attention, to predominantly alpha waves, indicating an unfocused, receptive lack of attention: the state of aimless fantasy and daydreaming below the threshold of consciousness." In Krugmann's and similar experiments, the beta waves produced by the left hemisphere (the locus of sequential, rational thinking), are submerged by the alpha waves generated by the right hemisphere (the locus of pattern recognition and unconscious emotional involvement). "The individual's world-view, or basic feeling-orientation in the world, seems to be consolidated in the right hemisphere, which functions according to imagery, analogy, feeling-states, moods, and sensations."
- 36. Borgmann, *Technology*, 228. Speaking of the current legal system in America, Borgmann observes that it fosters or protects two kinds of pluralism: "...the shallow pluralism afforded by the availability of many different commodities and the more profound pluralism of a diversity of focal practices. Certain laws or parts of the Constitution serve both goals... Thus freedom of speech serves shallow pluralism in allowing the mining of taboos on sex and violence for the production of entertainment."
- 37. Supporters of the 2005 California law argued that psychological research offered clear evidence that people who play violent video games have more aggressive thoughts, beliefs and behaviors than people who don't—a conclusion reconfirmed in a 2010 meta-analysis of "violent video game effects on aggression. See: Craig A. Anderson, et al., "Violent Video Game Effects on Aggression, Empathy, and Prosocial Behavior in Eastern and Western Countries: A Meta-analytic Review." *Psychological Bulletin / APA* 136.2, 2010. 151-173. Print.

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