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Rethinking Virtual Reality: Simulation and the Deconstruction of the Image

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□—*From its beginnings, virtual reality has been proposed as the apex of image production, completing, as many scholars and artists have argued, the search for the ultimate visual display medium. This essay examines the technology and possibilities of virtual reality by investigating these conceptual maneuvers that connect computer simulated environments to the history of mediated communication and the logic of representation. The essay examines the conceptual history of image production in mediated communication, locates contemporary discussions of virtual reality within this tradition, and offers a deconstructive critique of representation, proposing alternative visions of virtual reality and computer simulation.*

In their "Vision of Virtual Reality," the initial essay in *Communication in the Age of Virtual Reality,*[1] Frank Biocca, Taeyong Kim, and Mark Levy (1995) situate VR in the larger context of what they call, in a gesture that alludes to Ivan Sutherland's seminal paper on image technology, the "2000 year search for the ultimate display" (p. 7). According to Biocca et al. (1995), "the dream of the 'ultimate display' accompanies the creation of almost every iconic communication medium ever invented" (p. 7) which includes painting, photography, cinema, and most recently television. What makes VR so compelling, consequently, is that it not only participates in this rich tradition but seems to promise substantial developments towards the fulfillment and final realization of the ultimate visual display medium. In situating the issue in this fashion, VR is immediately and almost unconsciously subsumed under the concept and technique of representation. Even if, as Biocca and Levy (1995) suggest, this new technology eventually "challenges our most deeply held notions of what communication is or can be" (p. vii), VR is still located within and assumed to be a form of iconic representation. This assumption not only makes examinations of VR possible by framing recognizable approaches and deploying well established methodologies but, like any unexamined presupposition, also has the potential to restrict inquiry to a limited set of predetermined possibilities.

As long as the concept and technology of VR remains within the restricted horizon of iconic communication, we

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will miss the radical possibilities and fundamental challenges that virtual reality poses to our most deeply held ideas of what communication is or can be. For what is at stake in VR is not a new form of mediated representation, but a specific kind of computer-generated *simulation* that deconstructs the metaphysical system that institutes and regulates the very difference between representation and reality. I, therefore, agree with Biocca and Levy (1995) that VR may become too important, too wondrous, and too powerful to permit disciplinary ignorance and passivity (p. vii). However, this essay maintains that their general approach, that is considering VR as a medium of iconic communication, is itself part and parcel of this ignorance and passivity. In other words, to begin to understand the impact of VR on the discipline of communication studies, we cannot simply presume that it is a medium of representation but must consider how the concept and technology of VR also challenge our deepest held convictions about communication media and mediated images.

The Metaphysics of Representation

The quest for the ultimate display, according to Biocca et al., is animated and underwritten by the desire for what Bryson (1983) called the *essential copy:* "Seeking the *essential copy* is to search for a means to fool the senses–a display that provides a perfect illusory deception" (Biocca et al., 1995, p. 7). By situating their investigation in this fashion, Biocca et al. not only position virtual reality as a natural and inevitable outgrowth of the past, making connections to familiar values and ideology, but package the technology in familiar cultural wrapping constructing a historical narrative where VR is the necessary outcome and conclusion (Chesher, 1993, p 2). In particular, the "essential copy" simultaneously connects the ultimate display of VR to the history and situates it as the fulfillment of a concept of imitation and reproduction that is at least as old as Plato.

According to a logic initially formalized in Book X of Plato's *Republic* (1987), the image has been understood as a kind of derived reproduction, the value of which is determined by proximity and similarity to the original or real. In the initial moments of this text, Socrates proposes an image by which to examine and explain the nature of imitation. This image consists of a three stage hierarchy of artisans and their products, in this case, home furnishings (couches). At the apex, Socrates locates the εἰδος, the real and true form that is created by the deity. Subordinate to the singular εἰδος, he situates a first order replication which is produced through the art of the craftsman. The craftsman, Socrates reasons, produces his creation by looking to and following the information provided by the original εἰδος (Plato, 1987, 596b). The derived product of the craftsman is subsequently copied by the painter who creates not a couch per se but the appearance [φαινομενα] of a couch (Plato, 1987, 596e). Although the craftsman copies the εἰδος, the name imitator or copier is reserved for the painter, for as Glaucon, Socrates' interlocutor, argues, "he is the imitator of the thing which the others produce" (Plato, 1987, 597e). For this reason, imitation is situated in the phenomenal product that is three removes from the reality of the εἰδος. According to this schema, the value of any copy comes to be assessed on the basis of its proximity and attention to the real, or its "realism." Rely-

ing on this illustration, Socrates eventually proposes two alternatives for dealing with the imitative practice. Either imitation is to be expelled from the city, for, as he proposes, "it is a deception and corruption of the mind" (Plato, 1987, 595b), or imitation must be strategically employed as a tool capable of serving and representing the real and true nature of things. Indeed, Socrates cleverly deploys both alternatives in Book X. On the one hand, he reiterates the banishment of the imitative artists which had already been suggested in Book III, and on the other hand, he justifies this exile by employing an image in order to represent and explain the true nature of imitation.

The "essential copy" comprises a technique of imitation that attempts to close the distance separating the copy from its formal referent by producing an image or icon so accurate that it could be confused with the real thing. Indeed, the primary example provided by Biocca et al. (1995) to illustrate the "essential copy" entails this kind of confusion. The illustration is derived from a story that is recounted in Pliny's *Natural History,* and it concerns a contest of skill undertaken by two Greek painters.

> The contemporaries and rivals of Zeuxis were Timanthes, Androcydes, Eupompus, and Parrhasius. This last, it is recorded, entered into a competition with Zeuxis. Zeuxis produced a picture of grapes so dexterously represented that birds began to fly down to eat from the painted vine. Whereupon Parrhasius designed so lifelike a picture of a curtain that Zeuxis, proud of the verdict of the birds, requested that the curtain should now be drawn back and the picture displayed. When he realized his mistake, with a modesty that did him honor, he yielded up the palm, saying whereas he had managed to deceive only birds, Parrhasius had deceived an artist. (pp. 7–8)

What makes VR so compelling is that it promises to supply an even greater sense of realism and consequently confusion, for VR removes the frame that distinguishes and quarantines the space of imitation. As Penny (1992) points out, VR endeavors to dissolve the proscenium: "Through painting, sculpture, drama, cinema, TV, the separation of audience from art was complete. VR effects a melding of experience and representation rather than the separation effected by the proscenium" (p. 2). This dissolution of the enframing proscenium has been one of the distinctive characteristics of early VR development. As Jaron Lanier has pointed out on several occasions, "With a VR system you don't see the computer anymore–it's gone" (Lanier & Biocca, 1992, p. 166). It is this "invisibility of the computer," as Brenda Laurel (1991, p. 143) calls it, that renders the representations of VR virtually indistinguishable from reality.

Under the conceptualization of the essential copy, virtual reality does not challenge the Socratic formulation that distinguishes the real from its derivative imitations, but operates within its logic, striving to produce more accurate and nearly perfect reproductions. In this way, VR is understood as a medium of almost perfect imitation, a flawless and transparent medium through which one sees and comprehends the referent in its original presence. In VR, iconic representation is not experienced as such but as the delegate of something else to which the image defers and refers. As Marie-Laure Ryan (1994) points out, "the 'virtual reality effect' is the denial of the role of signs in the production of what the user experiences as unmediated presence" (p. 3). VR, therefore, is often described as an "interface that disap-

pears," opening a doorway to another world (Fisher quoted in Rheingold, 1991, p. 131). Understood in this way, the fundamental difference between VR and the other iconic media (i.e. painting, photography, cinema, and television) would consist in effectiveness which is usually defined as the degree of achieved "realism." A mark of quality in VR design, therefore, is the extent to which the experience of a representation disappears as such and the system "duplicates the viewer's act of confronting a real scene" (Fisher, 1981, p. 94).[2] In this way, VR portends the creation of the ultimate communication media promising to provide images of the real so perfect that for all intent and purposes they are experienced *as* if they were the real thing.

The essential copy imaged through the "ultimate display" of VR has prompted two responses both of which follow the contours of the Socratic assessment of imitation. On the one hand, virtual reality can be a tool employed for the sake and in the service of the real. For the scientific and engineering communities, VR is, in the words of Frederick Brooks (1988), primarily a means for "grasping reality through illusion" (p. 1). As an illustration of this concept, Howard Rheingold (1991) describes the University of North Carolina's (UNC) molecular-docking simulation, a haptic-VR system that permits users to experience and to navigate complex chemical interactions intuitively, learning molecular bonding not by abstract formulas but through direct manipulation of the molecules (pp. 13–46). Similar applications have been proposed in the field of medical imaging to assist physicians in performing diagnosis and treatment planning (Pimentel & Teixeira, 1993, pp. 194–208). In an interview with Rheingold (1991), Stephen Pizer, a medical imaging researcher at UNC, provides the following imaginative account of the future possibilities of VR applications in the medical profession:

> Once you are putting 3D virtual worlds in front of the surgeon or diagnostician, why not put them where they belong–namely, in the patient, superimposed on where the organs are located? One could imagine a situation where surgeons can see their surgical instruments, can see the real tissue of the patient as they operate, and can simultaneously see an augmented image that allows them to see behind the blood and opaque surfaces. (pp. 33–34)

Two proven applications of VR technology can be found in military training simulators, like SIMNET, and architectural design and walk-through systems. SIMNET comprises a network of tank and aircraft simulators scattered across the globe that can interact and perform maneuvers with each other:

> In the computer-generated battlefield displayed on the simulator screen, other tanks and aircraft that appear are 'driven' by other crews in other simulators, the data on their movements and actions passed along the network so that all the simulated tanks and planes seem to be sharing the same space. (Woolley, 1992, p. 192; also cf. Rheingold, 1991, p. 360)

Architectural walk-through software facilitates the evaluation of an edifice by placing designers and clients within a virtual representation of the building prior to construction (Aukstakalnis & Blatner, 1992; pp. 185–195, and Rheingold, 1991, pp. 29–31). Similar instrumental applications have been proposed for education, entertainment, data visualization and management, and hazardous-environment telepresence. The logic animating these instrumental applications is in complete

agreement with the Socratic tradition. Because the copy seeks to represent a real system, it can be employed as a way to get a grasp on and perceive reality. Like the Socratic representation that was employed to get a grasp on the reality of imitation, the technology of VR has been perceived as a tool by which to understand the intricacies and to manipulate the elements of reality.

On the other hand, no matter how useful or perfect the VR representation is, it is still an imitation and, as such, necessarily remains a counterfeit and illusion. Indeed, the degree of achieved realism in the imitation is directly proportional to its potential for deception. ". . .As VR simulations grow more realistic," Rheingold (1991) points out, "their potential for being dangerously misleading also increases. No model can ever be as complex as the phenomena it models, no map can ever be as detailed as the territory it describes, and more importantly, as semanticist Korzybski noted, 'the map is not the territory' " (p. 44). This "fact" has become the foundation not only of popular reactions to VR but of scholarly criticism and hesitations concerning the import and significance of imaging technologies. According to this assessment, VR, although a useful tool for some applications, is still a deceptive illusion and, therefore, "not really real." If used improperly or excessively, the argument concludes, one may be in danger of losing oneself in an artificial fantasy cut-off from the real situation. This argument is in complete compliance with the Socratic denigration of imitation. Namely, a copy, no matter how useful or beneficial, is misleading and, therefore, essentially dangerous and potentially corrupt.

The netploitation film *Lawnmower Man* (1992), for instance, comprises a cautionary tale about the potent risks of VR. At the beginning of the narrative, virtual reality is introduced as an instrument for enhancing education and accelerating learning. The film's climax, however, demonstrates the dangers implicit in this undertaking. At the apex of his "cyberlearning," Jobe endeavors to upload his consciousness into the electronic matrix leaving "reality" altogether and becoming virtually immortal. His virtual transcendence[3] is, however, interrupted:

> What prevents the virtual-entity Jobe from being completely divine–what preserves his humanity–is the memory of a person he loved as a child when in his former human body. Little Peter, Jobe's young friend, remains a remembered and valued human being in the *primary world.* With a bomb threatening the body of little Peter, Jobe suspends his omniscient tyranny and commands, 'Go save Peter!' And so the bridge between the primary and the virtual world establishes once again the importance of existential care, of personal pain and loss, of limited lifetimes. (Heim, 1993, p. 146)

The narrative trajectory traversed by Jobe illustrates while employing the Socratic argument against imitation. Reiterating the Socratic dialogue, *Lawnmower Man* reminds us that representations are potentially dangerous, and for this reason, one must always return to and remain grounded in the real and the true.

This reaction to the dangerous "unreality of VR" is not limited to popular media. It has also been deployed within and has informed the texture of critical research. Michael Heim (1993), for example, like all good modern philosophers, always retreats to the real, the essential, and the true. At the end of his metaphysical investigation of the ontol-

ogy of cyberspace, Heim recognizes the potential deceptions instituted within the virtual information system and, as a result, issues an imperative that once again privileges and exonerates the "primary world":

> As we suit up for the exciting future in cyberspace, we must not lose touch with [William] Gibson's Zionites, the body people who remain rooted in the energies of the earth. They will nudge us out of our heady reverie in this new layer of reality. They will remind us of the living genesis of cyberspace, of the heartbeat behind the laboratory. . . . (p. 107)

For Heim, as well as for other VR theorists and critics, virtual reality may be an exciting new medium of representation, but like all imitations, it must always be distinguished from and grounded in a clear sense of reality. A similar criticism is deployed at the conclusion to Shapiro and MacDonald's "I'm not a Real Doctor, but I Play One in Virtual Reality: Implications of Virtual Reality for Judgments about Reality" (1995): "Obviously spending too much time in virtual reality could be damaging to those who need to confront reality and not escape it. It could be particularly damaging to children and adolescents. But in some cases living in a VR could be therapeutic" (p. 342). The concern over excessive employment as opposed to restricted therapeutic usefulness, the potential dangers confronting children and adolescents, and the assumption that all this is somehow obvious is animated and substantiated by the Socratic assessment of imitation. It should be no surprise that similar arguments have been deployed against other media of representation from the novel to cinema and from photography to television (cf. Lubar, 1992, and Marvin, 1988).

Under these conceptualizations, VR not only resides within the metaphysical distinction that divides reality from derivative imitations but retains and validates the privilege that has been granted to the real. Imitation is either submitted to and made an instrument of the real or its is distinguished from reality as a deception and, as such, constitutes a potential depravation. In this way, virtual reality is restricted to a replication or imitation of western metaphysics. Appropriately, Michael Heim (1993) suggests that "cyberspace is Platonism as a working product" (p. 89). VR designates a practice of imitation that is located at the zenith of iconic communication by creating copies that are so close to the original as to fool even the best metaphysicians. Understood in this way, VR is nothing new. It only reiterates and reinforces Platonic metaphysics. As Simon Penny (1994) has pointed out, "While VR is technically advanced, like most computer graphics practices it is philosophically retrogressive" (p. 231). It must be remembered, however, that the metaphysical formulation of imitation that informs and substantiates this evaluation of VR is itself introduced through an image initially created by Socrates. Consequently, the reality of imitation is itself only virtually real.

Simulation and the Deconstruction of Representation

The conception of VR as a medium of near-perfect representation, although certainly useful for scientific research, medical procedures, military operations, education, and such, appears to be rather limited. Theorists like Michael Heim (1993) suggest that virtual reality should be able to do more than merely mirror reality. "It should," he

writes, "evoke the imagination, not repeat the world. Virtual reality could be a place for reflection, but the reflection should make philosophy, not redundancy" (p. 137). Also Myron Krueger (1977), the artist-scientist who designed and constructed the virtual environments of GLOWFLOW, METAPLAY, and VIDEOPLACE, has made a similar statement, distinguishing between the usual instrumental understanding of technology and its transforming ideological potential: "We are incredibly attuned to the idea that the sole purpose of our technology is to solve problems. But it also creates concepts and philosophy" (p. 423). Virtual reality, therefore, may be more than a medium of representation that is submitted to the order and rule of the real. It also has the potential to become a laboratory in which to challenge and investigate the metaphysics of representation.

The majority of contemporary VR equipment originates in and was created for simulator systems. For this reason, simulation has been from the beginning intimately connected to the concept and tools of VR. In fact, throughout the scientific community, the term "simulation" has been routinely substituted for the more cryptic and seemingly less scientific "virtual reality" (Biocca et al., 1995, p. 4). Etymologically, the word "simulate," from the Latin verb *simulare,* indicates to copy, to imitate, or to feign. In this way, simulation appears to be nothing more than another name for imitation and, as a result, would be appropriated as an instrument of mimetic reproduction. Indeed the techniques and technologies of computer simulation follow this formulation. "Simulation," as defined by Shannon (1975), "is the process of designing a model of a real system and conducting experiments with this model for the purpose either of understanding the behavior of the system or of evaluating various strategies for the operation of the system" (p. 2). Yet, simulation somehow exceeds and is differentiated from what is understood as imitation. As Woolley (1992) suggests, "The distinction between simulation and imitation is a difficult and not altogether clear one. Nevertheless, it is vitally important. It lies at the heart of virtual reality" (p. 44).

Simulation is neither simply identical to nor the dialectical opposite of imitation. Although etymologically connected to and informed by the concept of imitation and the techniques of computer modeling, simulation is always more and less than what is meant by imitation. "Simulation," writes Baudrillard in his now famous essay *Simulations* (1983), "is no longer that of a territory, a referential being or a substance. It is the generation by models of a real without origin or reality . . . " (p. 1). This formulation of simulation no longer reproduces the Socratic logic of imitation. Indeed it inverts while it displaces the usual position and status granted the real and its mimetic delegate creating a situation in which "neither image nor the world is 'first' " (Morse, 1998, p. 21). Understood in this way, simulation *deconstructs*[4] imitation. Deconstruction, however, does not indicate "to take apart." It does not mean "to break up" or "to un-construct." These endeavors are indicated by another name–analysis. Analysis (from the Greek αναλυειν) connotes "to break apart" or "to loosen up." Deconstruction may include something like an analytical moment, but it will be nothing more than a moment. Analysis, therefore, does not exhaust deconstruction which is always more and less than analysis. On the contrary, decon-

struction comprises a kind of general operation by which to intervene in the closed field of metaphysical knowledge.

Metaphysics, which is not one region of knowledge among others but that upon which such distinctions have been founded, is animated and informed by a network of dualities. "The fundamental faith of the metaphysicians," wrote Nietzsche (1966) in the preface to *Beyond Good and Evil,* "is the faith in opposite values" (p. 2). A sample of these "opposite values" that have been persistent in and constitutive of the western tradition has been collected in Donna Haraway's "Cyborg Manifesto" (1991). They include, among others, "self/other, mind/body, culture/nature, male/female, civilized/primitive, reality/appearance, whole/part, agent/resource, maker/made, active/passive, right/wrong, truth/illusion, totality/partiality . . ." (p. 177). Within the western, metaphysical tradition, these dualities are never situations of peaceful coexistence. Rather, they constitute hierarchies. As Derrida has explained in "Signature Event Context" (1982), "an opposition of metaphysical concepts is never the face-to-face of two terms but a hierarchy and an order of subordination" (p. 329). Deconstruction, therefore, comprises a general strategy for intervening in these metaphysical dualities that avoids either simply neutralizing the hierarchical relationship or residing within its closed field and thereby confirming it.

According to the Derridian characterization (1981), deconstruction always proceeds by an irreducible double gesture:

> On the one hand, we must traverse a phase of *overturning.* To do justice to this necessity is to recognize that in a classical philosophical opposition we are not dealing with the peaceful coexistence of a *visa vis,* but rather with a violent hierarchy. One of the two terms governs the other, or has the upper hand. To deconstruct the opposition, first of all, is to overturn the hierarchy at a given moment. (p. 41)

The first "phase" of deconstruction is inversion. In a traditional metaphysical opposition the two terms are not equal. One is always given precedence and therefore rules over the other. For example, within the western tradition, the real is not only opposed to but rules over and determines its mimetic copies. The inversion of this opposition would "bring low what was high" (Derrida, 1981, p. 42). This revolutionary gesture would invert the relative positions of the real and the imitation making reality a product of representation. This is precisely the position advocated by social or symbolic constructivism. James Carey (1989), for example, has argued that "reality is not given, not humanly existent, independent of language and toward which language stands as a pale refraction. Rather, reality is brought into existence, is produced by communication–by, in short, the construction, apprehension, and utilization of symbolic forms" (p. 25). This formulation of the symbolic construction of reality, which Carey indicates is indebted to the writings of Burke (1966) and the work of Berger and Luckmann (1966), inverts the hierarchical relationship traditionally situated between the real and its mimetic delegate. This inversion, however, like all revolutionary operations, does little or nothing to challenge the system that is overturned. In exchanging the positions of the cause and the effect, one still maintains, albeit in an inverted form, the causal relationship situated between imitation and reality. Inversion, therefore, does not dispute the essential structure of the binary system in question but only

exchanges the relative positions occupied by the two terms. For this reason, Derrida (1981) argues that mere inversion essentially changes nothing for it still operates on the terrain of and from the deconstructed system (p. 42).

Although deconstruction begins with inversion, inversion alone is not sufficient. Rather, deconstruction comprises an irreducible *double gesture* or what Biesecker (1997) calls "a two-step" (p. 16) of which inversion is only the first phase. "We must," Derrida (1981) insists, "also mark the interval between inversion, which brings low what was high, and the irruptive emergence of a new 'concept,' a concept that can no longer be, and never could be, included in the previous regime" (p. 42). Deconstruction, therefore, comprises both the overturning of a classical metaphysical opposition and the irruptive emergence of a new concept that is displaced outside the scope and comprehension of the system in question. This new "concept" is, strictly speaking, no concept whatsoever (which does not mean that it is simply the opposite of the conceptual order), for it always and already exceeds the system of metaphysical dualities that define the scope and structure of the conceptual order as well as the nonconceptual order with which the conceptual order is articulated (Derrida, 1982, p. 329). This "concept," can only be called a concept by a kind of deliberate and transgressive paleonymy which is marked in writing by quotation marks.

Deconstruction takes place in the interval between inversion, which brings low what was high, and the eruptive emergence of a "new concept," which is necessarily displaced outside the system in question. Marking this interval requires a peculiar kind of inscription that exceeds the logos (understood as both logic and discourse) of western metaphysics. For this purpose, Derrida (1981) often employs the term *undecidable*. The *undecidable* is that "that can no longer be included within philosophical (binary) opposition, but which, however, inhabit philosophical opposition, resisting and disorganizing it, without ever constituting a third term, *without ever* leaving room for a solution in the form of speculative dialectics" (p. 43). The undecidable, then, has two characteristics. First, it occupies a position that is in-between or in/at the margins of traditional, metaphysical oppositions. It is simultaneously neither/nor and either/or. It does not resolve into one or the other of the two terms that comprise a binary opposition nor constitute a third term that would mediate their difference in a synthetic unity, a la Hegelian or Marxian dialectics. The undecidable, therefore, is positioned in such a way that it both inhabits and operates in excess of the binary oppositions by which and through which western systems of knowledge have been organized and articulated. Consequently, it cannot be described or marked in language except (as is necessarily exemplified here) by engaging in a kind of "bifurcated writing" (Derrida, 1981, p. 42) that compels the traditional philosophemes to articulate, however incomplete and insufficient, what necessarily resists and displaces all possible articulation. Second, the undecideable, although situated at the extreme limit of metaphysics, is not simply liberated from or situated outside the metaphysical dualities on which and in which it operates. Rather, it "inhabits philosophical opposition." Consequently, deconstruction is never simply finished with or constitutes the outside of metaphysics. Rather, it comprises an

"interminable analysis" (Derrida, 1981, p. 42) of metaphysical oppositions–interminable because the traditional, binary system, insofar as it constitutes the very possibility of meaning, always seeks to reestablish itself. For example, Derrida (1981) says the following about the deconstructive reading of Hegel: "We will never be finished with the reading or rereading of Hegel, and, in a certain way, I do nothing other than attempt to explain myself on this point" (p. 77). Consequently, deconstruction does not constitute the completion or termination of metaphysics but comprises an unceasing critique of the works and workings of metaphysical knowledge.

Deconstruction comprises a general strategy for intervening in the closed network of metaphysical dualities. It entails, as Derrida (1982) succinctly describes it, both "an *overturning* of a classical opposition *and* a general *displacement* of the system" (p. 329). This abstract and rather schematic characterization is necessarily incomplete and insufficient. "We must," as Briankle Chang (1996) points out, "note that deconstruction cannot be adequately understood in the abstract. . . . What we ought to do, when trying to understand what deconstruction is all about, is to focus on the actual operation of deconstruction, on what happens when deconstruction takes place" (p. 119). The proper way to characterize deconstruction, then, is by tracing its work on and within a specific context, say for example, simulation. By placing emphasis on a term that is originally and etymologically associated with imitation, simulation effectively inverts the system that subjects imitation to the rule and order of the real. However, simulation, as Woolley is quick to point out, has never been simply identical to imitation. It is this almost imperceptible difference or dissonance that displaces simulation outside the metaphysical system opening it to new and previously inconceivable possibilities. Simulation, therefore, consists in a double gesture that on the one hand inverts the duality real/imitation in an almost absolute proximity to symbolic constructivism and on the other hand displaces the system that has been overturned by employing a "concept" that exceeds the scope of the conceptual field in question.

At the beginning of *Simulations* (1983), Baudrillard provides an illustration of this necessary double gesture by alluding to a fable about cartography written by Luis Jorge Borges. By beginning with a fable that problematizes the relationship between maps and territory, Baudrillard not only mocks the Socratic gesture that initiates the investigation of the nature of imitation through an image but also parodies the cartographic image Rheingold had appropriated from Korzybski in order to reiterate the potential dangers of imitation: "The territory no longer precedes the map, nor survives it. Hence forth it is the map that precedes the territory–Precession of Simulacra–it is the map that engenders the territory . . ." (Baudrillard, 1983, p. 2). This formulation inverts the usual positions occupied by the real territory and image of the map granting precedence to the imitation over and against the so-called real-world referent. As a result of this inversion, the territory is derived from and becomes the product of the map. As the symbolic constructivists describe it, "maps not only constitute the activity know as mapmaking; they constitute nature itself" (Carey, 1989, p. 28). Simulation, however, does not stop at mere inversion,

which would simply swap the relative positions of map and territory. In addition to this reversal, simulation also displaces the relationship between these two terms. In this second phase of the deconstruction, the map does not simply take up the position once occupied by the territory, which is the case in all simple revolutions–the ruled becomes the ruler or the dominated becomes the dominator. With simulation, Baudrillard (1983) continues, "It is no longer a question of either maps or territories. Something has disappeared: the sovereign difference between them . . ." (p. 2). Simulation, therefore, not only inverts the relative positions of imitation and reality but also disperses or dissolves the very difference that would hold them in dialectical opposition. It "threatens the difference between 'true' and 'false', between 'real' and 'imaginary' " (Baudrillard, 1983, p. 5). Simulation, therefore, is neither map nor territory but an undecidable that exceeds and disturbs the very relationship that has been situated between the "real world" and its cartographic images. As Mark Taylor and Esa Saarinen (1994) suggest:

> The point is not simply that truth and reality have been absorbed by illusion and appearance. Something far more subtle and unsettling is taking place. Somewhere Nietzsche suggests that when reality is effaced, appearance disappears as well. What emerges in the wake of the death of oppositions like truth/illusion and reality/appearance is something that is neither truth nor illusion, reality nor appearance but something else, something other. (p. 15)

Simulation, therefore, does not announce the mere substitution of images for reality which is not only the practice of symbolic constructivism but the concern of all who worry about and propose to resist the "virtual life" (Brook & Boal, 1995). Rather, it designates a radical intervention that not only suspends the very difference that would oppose imitation to reality in the first place but results in an undecidable and irreducible alternative that is neither one nor the other.

Understanding VR under the concept of simulation requires not only a different perspective on the technology but researchers and research projects that are capable of perceiving virtual reality systems differently, that are capable of perceiving the logic and limitations of imitation as such. Such an undertaking will depend less on those who have a vested interest in the "truth of iconic media" or the creation of an "essential copy," namely, scientists, engineers, philosophers, and imitative artists. Exploring this other possibility that is neither simply real nor mere representation will require a new kind of virtual art–the virtues of which lay beyond the metaphysical dualisms that have traditionally structured the practice and techniques of imitation. As a result, VR can no longer be understood as a technology to be evaluated or judged according to the criteria of *realism.* As Michael Heim (1998) argues, "We no longer need to believe we are re-presenting the real world of nature. Virtual worlds do not re-present the primary world. They are not realistic in the sense of photo-realism" (p. 47–48). Although a majority of VR technology and experimentation appear to affirm the "search for the essential copy" and the criteria of realism, there are a number of innovative projects that undermine and interrogate this purely imitative employment.

Architect Michael Benedikt (1993), for example, finds in the constructed environments of cyberspace the poten-

tial to reprogram and experiment with reality for the sake of empowerment:

> Because virtual worlds–of which *cyberspace* will be one–are not real in the material sense, many of the axioms of topology and geometry so compellingly observed to be an integral part of nature can there be violated or re-invented, as can many of the laws of physics. A central preoccupation of this essay ["Cyberspace: Some Proposals"] will be the sorting out of which axioms and laws of nature ought to be retained in cyberspace, on the grounds that humans have successfully evolved on a planet where these are fixed and conditioning of all phenomena (including human intelligence), and which axioms and laws can be adjusted or jettisoned for the sake of empowerment. (p. 119)

Benedikt's proposal is situated on the threshold of simulation. On the one hand, he sees in the images of VR the opportunity to modify and redesign what has been called and understood as reality for the sake of empowerment. Understood in this way, VR comprises not merely a technological innovation for "grasping reality through illusion" but, more importantly, a fundamental intervention that questions and revolutionizes what has been defined as real. On the other hand, Benedikt's particular approach remains at the first phase of deconstruction. In proposing that one employ VR to interrogate and redesign the real, Benedikt, like the symbolic constructivists, advocates overturning the traditional relationship that submits imitation to the rule and dictate of reality. Although potentially useful for new allocations of power, this inversion still operates within and leaves untouched the metaphysical system that distinguishes artificial images from the real. Indeed, Benedikt's proposal demonstrates the way in which inversion is always open to the risk of reinscription in the very system that it works against and proposes to overturn, for his particular approach to VR design is still limited and ruled by a restricted formulation of the real that remains beyond question by being elevated to the status of "natural law." According to this formulation, the adjustments and alterations that can be introduced in cyberspace, although potentially useful for empowerment, remain nothing more than strategic variations deployed from and delimited by what is already called and legislated as real.

Benedikt's approach remains limited to the first phase of deconstruction. Although he advocates employing VR to introduce potentially revolutionary alterations in the definition of the real, these modifications remain structured by a system that maintains the metaphysical opposition that distinguishes imitations from reality. Myron Krueger's experimentation in *Artificial Reality* (1991) pushes the operation one step further. Artificial reality (AR), a name that actually predates Lanier's "virtual reality" by some 18 years, intervenes in and deconstructs the logic of imitation that has come to define and delimit virtual reality systems. This radical intervention is not only designated by the moniker "artificial reality" but is explained in the introduction to the text that first described and developed the concept: "The promise of artificial realities is not to reproduce conventional reality or to act in the real world. It is precisely the opportunity to create synthetic realities, for which there are no real antecedents, that is exciting conceptually and ultimately important economically" (Krueger, 1991, p. xiv). Artificial reality, according to Krueger, seeks neither to reproduce reality nor

to facilitate operations in the so-called natural or real world. Unlike the "essential copy" proffered in the work of Biocca et al., Krueger's AR comprises artificial constructions that not only do not seek to represent the real but, more importantly, have no real antecedent whatsoever. Artificial reality, therefore, participates in the deconstruction of imitation. It inverts the hierarchy real/imitation by privileging synthetic artificiality over the real and displaces the system that had been overturned by the additional qualification that this artificiality not only does not refer to a real referent but is utterly without any realistic attachments. Artificial reality is neither image nor reality but something other, something that is neither/nor and either/or. It is another name for *simulation*. Similar employments of virtual reality technology have recently been explored and promoted by the Banff Centre for the Arts (cf., Moser & MacLeod, 1996) and Simon Penny (1994).

Simulation intervenes in the metaphysics of representation by deconstructing the binary opposition real/imitation. This deconstruction comprises a double gesture that, like symbolic constructivism, inverts the relationship between representations and the "real world" and, unlike constructivism, introduces a new and undecidable concept that is displaced outside the very system that had been inverted. As a result, simulation constitutes a significant challenge to the concept of the "essential copy" and the criteria of realism by which the technology of virtual reality has been evaluated, understood, and explained. Understood as a technology of simulation, VR can no longer be restricted to the "2000 year search for the ultimate display" or delimited by the Socratic logic that has substantiated and informed this essentially metaphysical project. Consequently, VR is not necessarily a tool for grasping the real through illusion nor a potentially dangerous delusion. Rather, it is something other, something that is both more and less, and something that exceeds the metaphysical system that opposes reality and imitation. This does not mean, however, that the mimetic understanding of virtual reality has somehow simply collapsed or been exhausted. Indeed, the representational employments of VR will continue to be valuable in physics, biomedicine, chemistry, applied mathematics, and such. What this does mean, however, is that the instrumental or representational employments of VR are not somehow natural, unavoidable, and beyond question. Although VR can be and has been employed to duplicate western metaphysics, it also exceeds this employment and in doing so interrogates the hegemony of metaphysics by posing alternatives to its rather restricted set of binary possibilities. Simulation, therefore, does not constitute a competing theoretical position that opposes imitation. To do so would mean nothing less than a relapse into the metaphysical oppositions that simulation always and already deconstructs. Simulation, rather than simply being identical with or opposed to imitation, occupies a monstrous position that places the entire structure and system of metaphysics in question. As Baudrillard (1983) points out, "The representational imaginary, which both culminates in and is engulfed by the cartographer's mad project of an ideal coextensivity between map and the territory, disappears with simulation . . ." and with

this dissolution, he concludes, "goes all of metaphysics" (p. 3).

Conclusion

From the beginning, the concept and technology of VR has been incorporated into the metaphysics of representation and the 2000 year search for the ultimate communication medium. In pursuing this course, however, virtual reality remains philosophically retrogressive by participating in distinctions and architectonics that have been in place at least since Plato. A new technology like VR always runs the risk of this kind of appropriation, for it is by this very gesture that a new medium can be said to make sense and have recognizable meaning. Under this formulation, VR has been comprehended as an illusion instrumental for perceiving and working in reality. Affirming this mode appears to be both understandable and necessary. It informs all those discourses that divide the virtual world from the real and argue either against its deceptive corruption or in favor of its instrumental benefits. Understood as simulation, however, VR exceeds this restricted formulation by deconstructing the metaphysical system that opposes imitation to reality. In this way, VR does not remain philosophically retrogressive or a mere application of Platonism. Rather, it comprises a critical intervention in the history of thought effecting and infecting every aspect of what has been considered to be real or not. Consequently, virtual reality is, as Krueger (1991) argues, "not just another technology; it is a powerful idea with possible implications for every human transaction" (p. xv). This conclusion engenders several consequences.

First, virtual reality is not just a technological amusement, even if the majority of users still encounter it in the form of computer games. Like all imaging systems, VR is necessarily hardwired into politics. In fact, the duality opposing the real and the true to its other, the imitation or copy, is fundamentally a political matter. This facet is initially evident in the *Republic.* The opposition between the real and imitation is not only situated in the context of a work on the political (The title of the text in Greek is Πολιτεια.), but the discussion of imitation that is instituted in Book X is itself framed by a political agenda. Socrates' discussion of imitation is undertaken in order to justify the expulsion of the imitative art of poetry from the well-governed city. Imitation, he argues, poses a threat to the *polis* because it deceives, posing illusory alternatives to the real. Plato's *Republic,* therefore, is a text that not only considers the reality of the political but, more importantly, the politics of the real. The imitative arts and media have always been recognized as posing alternatives that threaten and promise to alter the status quo. Today we speak of fiction that challenges or seeks to change social reality (cf. Haraway, 1991) and struggle within communities that debate the banning of representations, literary or visual, that do not accord with a particular vision/version of reality (i.e. the Maplethorpe controversy surrounding the National Endowment for the Arts). VR has been entwined in this political debate from the beginning. For example, in *War of the Worlds: Cyberspace and the High-Tech Assault on Reality,* Mark Slouka (1995) delivers the following warning concerning the dangers of virtual representation and the "politics of virtual reality":

> By flooding the culture with digitally manipulated images, I'm saying, we risk de-

valuing *all* visual representations and, by extension, the reality they pretend to depict, which is no small thing. Allowed to run unchecked, the crisis I am describing could come to have a profound effect on western democratic culture. (p. 124)

In the end, virtual reality is fundamentally a political matter. It, therefore, can neither be contained behind the screen nor will its significance be limited to technical discourses and research. Research and development in VR constitutes fundamental interventions in real politics and the politics of the real. Consequently, critical investigations of and practical experimentation with VR cannot and should not avoid this fundamental political dimension.

Second, VR challenges not only "our most deeply held notions of what communication is or can be" but the theoretical framework by which such a challenge would be formulated and recognized. For Biocca and Levy, the "challenge" posed by VR is delimited by metaphysics and restricted to its binary possibilities. Under this conceptualization, VR comprises the fulfillment of the metaphysics of representation, portending the achievement of the essential copy and the completion of the 2000-year search for the ultimate medium of imitation. This formulation does not, strictly speaking, challenge our most deeply held notions of what communication is or can be but situates the technology of VR within a 2000-year-old tradition that is firmly anchored in and informed by Platonism. For Biocca and Levy, the "challenge" VR introduces into communication is in complete compliance with the metaphysical system from which our most deeply held notions of what communication is or can be have been derived and regulated. As long as communication research remains within the restricted parameters of the quest for the ultimate medium or the desire for the essential copy, we essentially blind ourselves to the radical possibilities that VR presents to the theory and practice of communication. Understood as simulation, however, VR poses a significant challenge to this tradition. As simulation, VR critiques the very foundation of mediated representation and iconic communication by deconstructing the metaphysical system that opposes imitation to reality. This fundamental intervention in the field of metaphysics exceeds the mere revolutionary possibilities posed by the social and symbolic constructivists for it not only inverts the causal relationship situated between imitation and reality but suspends the very difference that would hold them in binary opposition. This deconstruction not only has repercussions for future work in communication technology but effects the very history of the concept of representation and mediated communication. In this way, the *challenge* posed by simulation to the theory and practice of communication cannot be contained within or limited to the present technology of VR. Rather, it effects and infects the entire history and future prospects of the mediated image and iconic communication. Consequently, the simulated environments of VR do not simply portend the completion of the 2000-year search for the essential copy but deconstruct this tradition by inverting and displacing its very metaphysical foundation. Tracing the effects of this deconstruction constitutes the on-going task of communication in the age of virtual reality.

Finally, although it is tempting to credit or even blame the technology of virtual reality for instituting this decon-

struction, it would be a mistake or at least an exaggeration to do so. For deconstruction is neither a "voluntary decision" (Derrida, 1981, p. 82) nor an accidental occurrence. Deconstruction, therefore, is not something that, at a certain point, is done or happens to a previously well established and pure concept. Rather, deconstruction has always and already been underway within the texture of the metaphysical system in which and on which it operates. For this reason, deconstruction has been characterized not as an activity in which one voluntarily or coercively engages but "as the vigilant seeking-out of those 'aporias,' blind spots or moments of self-contradiction where a text involuntarily betrays the tension between rhetoric and logic, between what it manifestly *means to say* and what it is nonetheless *constrained to mean*" (Chang, 1996, p. 119). Such an *aporia* is already evident in the *Republic,* the text that not only introduces and delimits the critical difference between imitation and reality but organizes the entire metaphysical system by which iconic media have been understood and evaluated. As indicated, the Socratic argument against imitation situated in this text is made possible through the employment of an image. This inconsistency between what the Platonic text means to say and what it is nonetheless constrained to mean, an inconsistency which Derrida demonstrates in a number of other places in the Platonic corpus, opens the space for and already releases the play of deconstruction within the tradition of metaphysics. The deconstruction of the image, therefore, is not something that is caused by or limited to VR. Rather, VR participates in a general movement of deconstruction that is always and already underway within the tradition of metaphysics and, as such, comprises nothing more than a technique by which to identify, articulate, and participate this operation. □

Notes

[1]Although numerous texts have been published on the subject of VR and cyberspace, Biocca and Levy's text is privileged here because it constitutes the first monograph explicitly connecting virtual reality to the discipline of communication.

[2]This disappearance of the interface and immediate experience of another world is also one of the attributes of fiction according to recent work in literary theory, cf. Ryan (1994).

[3]According to Biocca et al. (1995), the "desire for physical transcendence" (p. 7) is one of the fundamental ideologies animating the development of virtual reality. For a sustained examination of technological transcendentalism, cf. Featherstone and Burrows (1995), and Gunkel (1998).

[4]On the theory and practice of deconstruction within the discipline of communication, cf. Chang (1996) and Biesecker (1997).

References

Aukstakalnis, S., & Blatner, D. (1992). *Silicon mirage: The art and science of virtual reality.* Berkeley: Peachpit.

Baudrillard, J. (1983). *Simulations* (P. Foss, P. Patton & P. Beitchman, Trans.). New York: Semiotext(e). (Original work published in 1980).

Benedikt, M. (1993). Cyberspace: Some proposals. In M. Benedikt (Ed.), *Cyberspace: First steps* (pp. 119–224). Cambridge: MIT.

Berger, P., & Luckman, T. (1966). *The social construction of reality.* New York: Doubleday.

Biesecker, B. (1997). *Addressing postmodernity.* Tuscaloosa: University of Alabama.

Biocca, F., Kim, T., & Levy, M. (1995). The vision of virtual reality. In F. Biocca & M. R. Levy (Eds.), *Communication in the age of virtual reality* (pp. 3–14). Hillsdale: Lawrence Erlbaum Associates.

Biocca, F., & Levy, M. (1995). Preface. In F. Biocca & M. R. Levy (Eds.), *Communication in the age of virtual reality* (pp. 3–14). Hillsdale: Lawrence Erlbaum Associates.

Brook, J., & Boal, I. (1995). *Resisting the virtual life.* San Francisco: City Lights.

Brooks, F. (1988). Grasping reality through illusion: interactive graphics serving science. *CHI'88 Proceedings,* pp. 1–11. Reading: Addison-Wesley.

Bryson, N. (1983). *Vision and painting: the logic of the gaze.* New Haven: Yale University.

Burke, K. (1966). *Language as symbolic action: Essays on life, literature, and method.* Berkeley: University of California.

Carey, J. (1989). *Communication as culture.* New York: Routledge.

Chang, B. (1996). *Deconstructing communication: Representation, subject, and economies of exchange.* Minneapolis: University of Minnesota.

Chesher, C. (1993). Colonizing virtual reality: Construction of the discourse of virtual reality, 1984–1992. *Cultronix 1*(1), pp. 1–29. (Internet–http://www.eng.cmu.edu/cultronix/chesher/).

Derrida, J. (1981). *Positions* (A. Bass, Trans.). Chicago: University of Chicago. (Original work published in 1972).

Derrida, J. (1982). *Margins of philosophy* (A. Bass, Trans.). Chicago: University of Chicago. (Original work published in 1972).

Featherstone, M., & Burrows, R. (1995). *Cyberspace, cyberbodies, cyberpunk: Cultures of technological embodiment.* London: Sage.

Fisher, S. (1981). Viewpoint dependent imaging: an interactive stereoscopic display. *Proceedings SPIE,* pp. 360–367.

Gibson, W. (1984). *Neuromancer.* New York: Ace.

Gunkel, D. (1998). Virtually Transcendent: Cyberculture and the Body. *Journal of Mass Media Ethics 13*(2), pp. 111–123. London: Lawrence Erlbaum Associates.

Haraway, D. (1991). *Simians, cyborgs, women: The reinvention of nature.* New York: Routledge.

Heim, M. (1994). *The metaphysics of virtual reality.* Oxford: Oxford University.

Heim, M. (1998). *Virtual realism.* Oxford: Oxford University.

Krueger, M. (1977). Responsive environments. *Proceedings of the national computer conference,* pp. 423–433.

Krueger, M. (1991). *Artificial reality II.* Reading: Addison-Wesley.

Lanier, J., & Biocca, F. (1992). An insider's view of the future of virtual reality. *Journal of communication 42*(4), pp. 150–172.

Laurel, B. (1991). *Computers as theatre.* Reading: Addison-Wesley.

Lubar, S. (1993). *Infoculture.* Boston: Houghton Mifflin.

Marvin, C. (1988). *When old technologies were new: Thinking about electric communication in the late nineteenth century.* New York: Oxford University.

Morse, M. (1998). *Virtualities: Television, media art, and cyberculture.* Bloomington: Indiana University.

Moser, M., & MacLeod, D. (Eds.). (1996). *Immersed in technology: Art and virtual environments.* Cambridge: MIT.

Nietzsche, F. (1966). *Beyond good and evil* (W. Kaufmann, Trans.). New York: Vintage. (Original work published in 1886).

Penny, S. (1992). Virtual reality as the end of the enlightenment project. (Internet–http://www.art.cfa.cmu.edu/www.penny/text/VR_Dia_.html).

Penny, S. (1994). Virtual reality as the completion of the enlightenment project. In G. Bender & T. Druckrey (Eds.), *Cultures on the brink: Ideologies of technology* (pp. 231–248). Seattle: Bay.

Pimentel, K., & Teixeira, K. (1993). *Virtual reality: Through the new looking glass.* New York: Intel/Windcrest/McGraw-Hill.

Plato. (1987). *Republic* (P. Shorey, Trans). Cambridge: Harvard University.

Rheingold, H. (1991). *Virtual reality.* New York: Summit.

Ryan, M. (1994). Immersion vs. interactivity: Virtual reality and literary theory. *Postmodern Culture 5*(1), pp. 1–20. (Internet–http://muse.jhu.edu/journals/postmodern_culture/v005/5.1ryan.html).

Shannon, R. (1975). *System simulation: The art and science.* Englewood Cliffs: Prentice-Hall.

Shapiro, M., & McDonald, D. (1995). I'm not a real doctor but I play one in virtual reality: Implications of virtual reality for judgments about reality. In F. Biocca & M. R. Levy (Eds.), *Communication in the age of virtual reality* (pp. 323–346). Hillsdale: Lawrence Erlbaum Associates.

Slouka, M. (1995). *War of the worlds: Cyberspace and the high-tech assult on reality.* New York: Basic.

Sutherland, I. (1965). The ultimate display. *Proceedings of the international federation of information processing congress* 2, pp. 506–508.

Taylor, M., & Saarinen, E. (1994). *Imagologies: Media philosophy.* New York: Routledge.

Woolley, B. (1992). *Virtual worlds.* New York: Penguin.

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