Abstract

From the computer-mediated realms of on-line "chats" to immersive virtual reality (VR), the experiential aspects of cyberspace generally, and VR in particular, seems to confound description and provoke discourses revolving around issues of identity, human agency and the body. These experiences both reify and disrupt boundaries between the "real" and "virtual" worlds. Screen-based multimedia often assumes the user is in a fixed position, capable of interaction on a limited basis. Thus, there is little or no need to represent the user - he or she is simply a point-of-view, able to interact through a simple representation of a mouse or multi-participant cursor. In computer-mediated worlds, which range from text-based MOOs and graphical chats to three-dimensional and immersive VR, the user must choose an avatar to define and distinguish herself as a discrete entity. Thus, avatars are the very site where a user brings, modifies, problematizes and constructs a sense of self as distinct from others. Yet, the avatar is a representation, a simultaneous "I" and "not I." Avatars, broadly defined, may range from textual representations to graphic, or much less often, aural representations. This paper examines notions of subjectivity as they relate to users' experience, particularly through their representations, or "avatars," as a technological intervention in subjectivity.

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Virtual Avatars: Subjectivity in Virtual Environments

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Introduction

Students in an English class spent untold hours in a fictive, on-line world they created, inspired by the writings of William S. Burroughs. They continue to create and participate in this world, long after the class ended, creating a community which includes the instructor as only one of many participants.[1] The case of the "Rape in Cyberspace"[2] generated hotly contested debate in academic discourse, engaging a community of scholars from computer science to the humanities, and inspiring articles in the popular press, to the degree that it has assumed the stature of cultural myth. The incident occurred in an on-line virtual community, with the victims and perpetrator(s) acting through their textual representations. Thousands regularly queue up in long lines in order to experience mere minutes of immersive virtual reality (VR). Unable to immediately deliver upon promises alluded to by extensive media coverage, VR seems to have been a passing fad; yet the entertainment industry, among others, continues to heavily invest in this area. New simulations are developed, affecting some users so profoundly, it is said, that they weep.[3] The popularity of non-immersive virtual worlds, such as on-line social "chats" continue to surprise industry analysts, who banked on home shopping applications, rather than social spaces, to drive the growth of online use.

From the computer-mediated realms of online "chats" to immersive VR, the experiential aspects of cyberspace generally, and VR in particular, seems to confound description and to provoke discourse revolving around issues of subjectivity, human agency and the body. These experiences, it is argued, both reify and disrupt boundaries between the "real" and "virtual" worlds, allow users to engage multiple and unexplored aspects of the self, and create a profound shift in the way we understand and experience self, body and technology. How do the sustained experiences of computer-mediated communication in general, and the specific use of "avatars"

1 Dalgren, the text-based multi-user domain, object-oriented (MOO), is "an electronic community devoted to the exploration and criticism of virtual reality and postmodern science fiction." It was initiated and is maintained by students of Professor Steve Shaviro's class at the University of Washington. telnet://dahlgren.washington.edu:7777/

2 The incident occurred in one of the oldest, heavily populated, text-based virtual environments, LambdaMOO. telnet://lambda.xerox.com:8888/
Refer to Julian Dibbell, "A Rape in Cyberspace or How an Evil Clown, A Haitian Trickster Spirit, Two Wizards and a Cast of Dozens turned a Database into a Society." Mark Dery. editor. 1994 **Flamewars: The Discourse of Cyberculture**. Durham: Duke University Press, 237-261.

3 Reported by the creators of the immersive virtual environment, Osmose: ". . .the after-effect of immersion in Osmose can be quite profound. Many individuals feel as if they have rediscovered an aspect of themselves, of being alive in the world, which they had forgotten. http://207.68.137.9:80/softimage/frameless/News/Events/Osmose/osfront.htm

— virtual representations of a user — function in regard to subjectivity? What are the limits of these new opportunities for technologically-mediated experience, how do they affect users' perceptions, and what do they suggest about users' subjectivities? This paper examines the use of avatars as a situated discourse, a specific site of technological intervention in subjectivity, in the realms of text-based virtual communities, two- and three-dimensional chats and immersive virtual reality.

Screen-based multimedia often assumes the user is in a fixed position, capable of interaction on a limited basis. Thus, there is little or no need to represent the user — he or she is simply a point-of-view, able to interact through a simple representation of a mouse or cursor. In computer-mediated multi-participant worlds, which range from text-based MOOs,[4] graphical and three-dimensional chats to immersive VR, the user must generally choose an avatar to define and distinguish herself as a discreet entity. Thus, avatars are the very site where a user brings, modifies, problematizes and constructs a sense of self as distinct from others. Yet, the avatar is a representation, a simultaneous "I" and "not I," through which human agency is projected and reflected back to influence the user's subjectivity. Avatars, broadly defined, range from textual representations to graphic, or less often, audio representations.

The role of the avatar in these computer-mediated realms is constructed and defined by the participant, but also by the nature of the virtual community and its participants, and by constraints imposed by the specific technological medium. Avatars in MUDs, for example, function differently from avatars in immersive VR. Further, avatars contribute to or impede a sense of immersion and degree of participation within the virtual world, a sense of bodily connection and a sense of self.

Finally, any discussion of subjectivity in relation to technology must take into account the larger cultural milieu within which it resides and operates. This ranges from the ways in which avatars function and are understood as particular instantiations of technological intervention in subjectivity, to the culturally constructed presuppositions and perceptions of the participant. The act of viewing and participating in virtual domains, as well as the articulation of that experience, raises questions about the nature of culturally conditioned perception and conceptualizations of technology as it relates to the body and to the self.

4 MOOs, MUSHes, MUSEs and MUCKs, among others, are variants of MUDs (Multi-User Domains). These text-based, on-line virtual environments allow participants to interact in "real-time," or synchronously, as they type. The environment itself is described, responding to the participant, as he or she travels through it. Thus, if the participant types "enter elevator, go to ninth floor," the participant will then see text appear which describes the elevator ride and the appearance of the ninth floor. Likewise, "objects" may also respond to the user.

The following examination of subjectivity in relation to avatars will account for three types of virtual environments: widely accessible text-based MUDs, emerging two- and three-dimensional chats and the celebrated but relatively inaccessible immersive VR.

Text-based virtual communities

In text-based MUDs, participants may communicate with others by typing responses in "real-time," much like a textual version of a telephone conference call *(figure 1)*. Others may look up attributes of that character in a different part of the screen, even as they interact. Those who log on to the MUD but who do not directly participate are referred to as lurkers. During their voyeuristic time, lurkers do not define themselves as a particular character or role, but may often appear in a sub-screen, whose presence is thus knowable by all users. Although it is generally assumed that each avatar corresponds to an individual, several avatars operated by a single user may be simultaneously participating. Further, agents or BOTs — programmed units which function independent of a user, and which may be preliminarily indistinguishable from avatars connected to "real" participants — may be present and active. While seemingly a fanciful enterprise to non-users, thousands participate in these realms — for purposes social, entertaining, professional and educational — to a degree that merits consideration as a social and cultural phenomenon. In this textual symbolic realm, the avatar allows a participant to enter into and co-create the participatory virtual world, often exploring subjectivity in ways not possible in other realms. In *Life on the Screen: Identity in the Age of the Internet,* Sherry Turkle examines the effects on identity of participation in MUDs. Here, according to Turkle, participants project, express and explore multiple and parallel aspects of

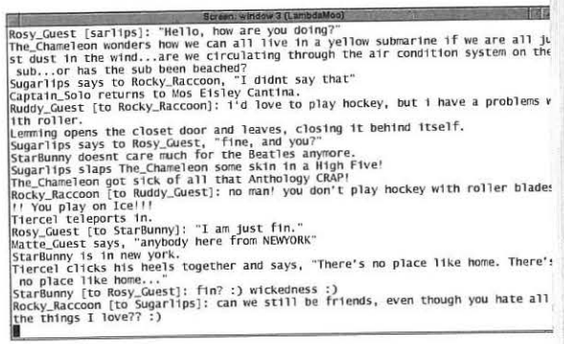

Figure 1. LambdaMOO is among the oldest and most populated text-based virtual communities. Thousands of participants regularly log in, choose avatars, and communicate through text. Words appear in "real-time," or nearly simultaneously, as participants type.

themselves. Because there is an on-going permeability between virtual and real worlds, and because the self is constituted through interaction with and through machines, Turkle argues that MUDs are unlike the theater, where one steps into and out of a role.[5] This allows us to conceive of the self as fluid, multiple and distributed, and represents a fundamental shift in the way we experience human identity. This in turn affects our ideas of mind, body, self and machines. Boundaries between real and virtual worlds are eroded, along with boundaries between animate and inanimate, human and machine, mind and body.

The boundaries between mind and body are among the most widely discussed. Discourses surrounding text-based virtual communities such as MUDs reveal the problematic conceptualizations of the body and its relations to technology and subjectivity. In the context of an avatar in a MUD, either the body itself is understood to not be present, though clearly (unless the avatar is a BOT), a body is operating the keyboard or the computer is viewed as a prosthesis, a technological extension of the mind and body whose boundaries are increasingly indistinct. The tendency to think of the mind and body as separate are further problematized by the widespread use of the term "disembodiment," used in VR to describe transcendent sensations and experiences, and by science fiction, which popularizes liberatory dreams of "downloading pure consciousness," leaving the problematic and expendable "meat" behind. Foregrounding these conceptions is the assumption that technology and subjectivity are distinct, which forecloses the consideration of technology and subjectivity as mutually constitutive, each intervening in the creation of the other. Two instances will serve this point further: the use of emoticons and the case of the Rape in Cyberspace.

Participants' avatars in MUDs may bear extensive textual descriptions, but the medium does not allow for certain aspects of an unmediated presence of the participant. Thus gestures, facial expressions, vocal intonations and other indications which serve to clarify and condition communication are represented, in MUDs, as text: emoticons[6] express emotion and gesture, the use of capital letters indicates yelling or screaming and numerous acronyms define specific conditions. This type of inscription, read by other participants, and in an interaction unmediated by technology, may provoke or produce bodily responses. This is most evident in "virtual sex," where the connections among the participants' body, mind, avatar and textual

5 The assumption underlying Turkle's argument relies in a certain conceptualization of the theater as a particular, situated cultural form, rather than broader notions of performance and performativity in the sense employed by Herbert Marcuse, Jean Francois Lyotard or other cultural theorists. For discussions of the wider conceptualization of performativity and technology, see Jon McKenzie, 1994. "Virtual Reality: Performance, Immersion, and the Thaw." *The Drama Review* 38:4, 83-106. See also Brenda Laurel, 1991. **Computers as Theatre**. Reading, Massachusetts: Addison Wesley.

communication become seamless. Likewise, an effective flame — an aggressive and unsolicited action — will produce a response affecting the mind, the emotions, the heart-rate and the blood pressure of the recipient.

The case of the Rape in Cyberspace often serves to illustrate the permeability of virtual and "real life" (RL), and to elucidate the limits of thinking in terms of mind/body and biological/symbolic dualisms. In LambdaMOO, the malicious Mr. Bungle used a voodoo doll to gain control of two participants' avatars and brutally forced them to perform sexual acts on him. When ejected from the room, Mr. Bungle continued his sexual assaults on others until he was finally "toaded" or ejected from the system and denied re-entry privileges (or what amounts to a virtual death of an avatar). One of the victims called for both "civility" and for Mr. Bungle's "virtual castration," a curious amalgam of "murderous rage and eyeball-rolling annoyance"[7] that indicates the complicated nature of the victim's simultaneous virtual and real life experience. Journalist Julian Dibbell recounts:

Where virtual reality and its conventions would have us believe that legba and Starsinger were brutally raped in their own living room, here was the victim legba scolding Mr. Bungle for a breach of 'civility.' Where real life, on the other hand, insists the incident was only . . . confined to the realm of the symbolic and at no point threatening any players' life, limb, or material well-being, here now was the player legba issuing aggrieved and heartfelt calls for Mr. Bungle's dismemberment. Ludicrously excessive by RL's lights, woefully understated by VR's, the tone of legba's response made sense only in the buzzing, dissonant gap between them.[8]

While those unfamiliar with MUDs might easily dismiss this incident, and the sometimes profound degree to which participants experience a sense of self through their avatars in the symbolic realm of MUDs, it is useful to consider other aspects of life which illuminate the transcursion between the "real" and the symbolic. The forging of a signature, for instance, or defamation of character which may occur in the media, also affect the social, political and economic reality of the victim. Or, in another example, a patient signed over all rights to the diseased tissue of a segment of his pancreas. This tissue was removed by doctors, who subsequently developed a patent and profited from his genetic material.

Mary Douglas, an anthropologist, examined the relationship of the biological and symbolic realms in order to understand the way bodies are culturally constructed, regulated

6 Emoticons are textual shorthand for emotions and gestures. Read sideways, the punctuation becomes pictorial. :) expresses happiness or a smile, :(expresses sadness, ;) represents a wink, and >:P depicts a tongue stuck out in anger.

7 Dibbell, Julian. 1993. "A Rape in Cyberspace or How an Evil Clown, A Haitian Trickster Spirit, Two Wizards, and a Cast of Dozens turned a Database Into a Society." **The Village Voice**, 21 December, 38.

8 Dibbel, "A Rape in Cyberspace..."

and understood. She argues that how a body acquires meaning and is able to signify involves a process of symbolic construction and change. "The social body constrains the way the physical body is perceived. The physical experience of the body, always modified by the social categories through which it is known, sustains a particular view of society. There is a continual exchange of meanings between the two kinds of bodily experience so that each reinforces the categories of the other."[9] Technology is necessarily implicated in the inextricability of the ways in which the social subject and physical body co-constitute each other, as illustrated in the examples just discussed.

While Turkle discusses how boundaries such as these are eroded through computer-mediated communications, she stops short of also describing how the very erosion of boundaries may also serve to concretize, maintain and reify those very boundaries, even as they fall. To define falling boundaries, post-structuralist thinking suggests, is also to continually keep them erect. The figure of the cyborg defined by Donna Haraway offers a potentially liberatory way out of this feedback loop. Haraway's cyborg is both a matter of fiction and a matter of lived, embodied material experience; a site for continually reorganizing boundaries; a figure that disrupts ideological constructions that are still regarded as incontestably natural. The subjectivity enjoyed by this cyborg is already always partial and contingent; it both finds pleasure in boundary confusion, but also takes responsibility for their re/de/construction.[10] Thus, the cyborg is understood as a perpetually emitting collection of material-semiotic vectors, simultaneously biological and symbolic, always residing within specific regimes of power and knowledge which embody and normalize social subjects, but always also capable of disturbing and contributing to their continual reinscription.

9 Douglas, Mary. 1982. **Natural Symbols: Explorations in Cosmology**. New York: Pantheon Books,

10 Haraway, Donna J. 1991. **Simians, Cyborgs, and Women: The Reinvention of Nature.** London:

Immersive virtual reality

Graphical, two-dimensional chats allow users to choose or create avatars with particular attributes in visual form. Most often these are human depictions, but because the environment can be fictive, avatars may range from animals and god-like figures to anthropomorphized inanimate objects, or elements like wind. Participants communicate through their avatars by moving them within the graphic environment with the mouse, by choosing the avatars' gestures and through inscribing conversational text which appears in a subscreen or in a cartoon-like balloon. Some three-dimensional chats, like V-

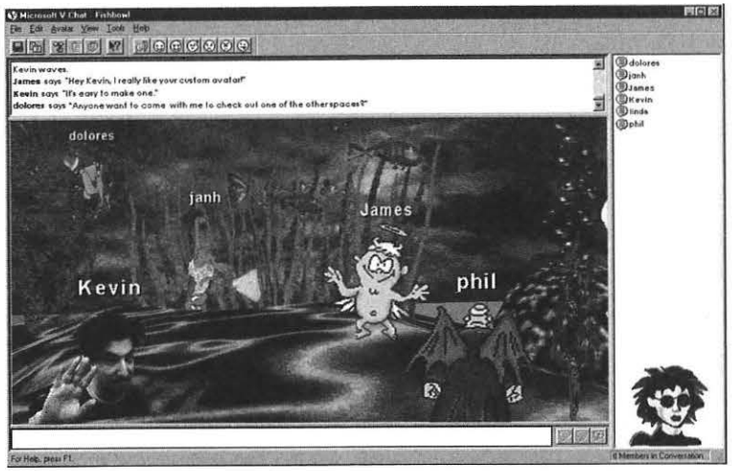

Figure 2. V-Chat is one of several emerging three-dimensional, online virtual worlds. Participants choose or create their avatars, which have several variants available through the gesture toolbar. These gestures are termed wave, smile, shrug, flirt and silly, along with be sad and get angry. Typed, real-time dialogue appears above the scene, augmented by "think, say, emote" indications. All participants are listed in the vertical window; they individually navigate their avatars through the three-dimensional space via mouse movements.

Chat (*figure 2*), allow users to construct their own avatars, mapped with a limited library of pictorial or photographic facial expressions and bodily gestures. Users' views of themselves as avatars becomes complex. More than one window is provided to show the avatar from a first-person point-of-view; another window allows the participant to zoom out as a camera might, showing the avatar from an angle behind and above, from the approximated perspective of others or from a more synoptic bird's-eye-view. Thus, the user is able to both see himself as if he were embodied in the avatar, and by "stepping out" of that avatar's form, may simultaneously view his avatar as other participants do.

Although participants in these virtual communities may choose or create, define and name their graphical avatars, the specificity of a more visually descriptive environment functions to both limit and possibly enhance the participants' sense of relation to their avatar. In a low-bandwidth medium like text-based MUDs, it is argued, much of the experience necessarily occurs within the participant's imagination and may thus more readily provide the participant with a sense of immersion.[11] As one student who participates in both textual and graphic environments put it, "it is like the difference between reading a novel and seeing the film adaptation." The sense of immersion within these fictive realms depends on the creator's abilities, but also upon the specificities of the medium, which in

11 Allucquere Rosanne Stone. 1992. "Virtual Systems." *Zone*, 615. Stone specifically refers to the low-bandwidth medium of phone sex in this publication, but relates it to text-based media in others. See 1995. **The War of Desire and Technology, at the Close of the Mechanical Age**, Cambridge, Massachusetts: MIT Press.

part influence how the reader or viewer understands and relates to it. In addition, the relative verbal, visual, and spatial skills or proclivities of the participant is a contributing factor in the construction, experience of and sense of relation to the avatar and to the environment. Participants who create photographic avatars of themselves often report an odd sensation of looking at themselves "in the mirror."[12] This phenomenon, along with the multiple points of view offered by some three-dimensional chats, seem to lead participants to experience their avatars as puppets at a remove, rather than as bodily extensions of themselves. However, habituation to these strategies of interaction and medium specificities often serve to reduce the sense of distance users report in relation to their sense of selves as avatars.

If our subjectivity is constituted by and through language, we must also account for both the textual and visual aspects of that language, particularly in graphical and three-dimensional chats. This necessarily assumes the socially constructed nature of perception,[13] which influences how the participant comes to knowledge and a sense of self through relating their avatars in specific ways. It also necessarily extends to other participants and how their communications are created and structured, as well as to the designers of these two- and three-dimensional chats.

Many of these designers are computer scientists, who create the virtual environments, including the systems that operate them, structure the methods of and possibilities for interaction and direct the artists employed to render their visual aspects. These computer scientists bring the particular biases of their discipline, which include aspects of the social sciences, but which are dominated by the assumptions inherent in scientific positivism. This can be most easily seen in their literature related to virtual chats, which belie a reliance upon existing, specifically western stereotypes, objective and measurable outcomes and standardizations of avatars. The literature rarely, if ever, takes into account the language, age, gender, ethnicity, sexual preference or class of participants, and does not acknowledge the ways in which the technology may profoundly affect the nature of this specific type of social discourse. The literature is prescriptive, rearticulating conservative, masculine myths and biases, particularly with relation to gender.

12 N. Katherine Hayles, describes a second mirror stage, the Mirror of the Cyborg, which accounts for a subjectivity not reliant upon physical boundaries. See N. Katherine Hayles, 1993. "The Seductions of Cyberspace," in **Rethinking Technologies**, Conley, Verena Andermatt, editor. Minneapolis: University of Minnesota Press, 186-188.

13 Burnett, Ron. 1995. **Cultures of Vision: Images, Media, and the Imaginary**. Bloomington, Indianapolis: Indiana University Press. Crary, Jonathan. 1992. **Techniques of the Observer: On Vision and Modernity in the Nineteenth Century**. Cambridge, Massachusetts: MITPress. Jay, Martin. 1994. **Downcast Eyes: The Denigration of Vision in Twentieth-century French Thought.**. Berkeley, California: University of California Press. Levin, David Michael, editor. 1993. **Modernity and the Hegemony of Vision**. Berkeley, California: University of California Press. Mitchell, W.T.J. 1994. **Picture Theory: Essays on Verbal and Visual Representation.** Chicago, Illinois: The University of Chicago Press.

The first instantiations of two- and three-dimensional chats[14] in particular reinscribes gender stereotypes, both in their form and effect. Although genderswapping is popular and celebrated as liberatory, for example, it relies upon avatars stereotypically gendered male or female. Participants describe the liberatory aspects of gender as more akin to changing clothes, without recognizing the way in which gender deeply structures the use of language, behavior and subjectivity. It is commonly understood that if the participant desires attention, he or she should assume a female avatar, whether because of or in spite of their smaller numbers on-line. To be taken seriously, however, the choice of a male avatar is necessary. While such gender-swapping may indeed offer opportunities for social and self-exploration, feminists point out that it is limited: a man using a female avatar can, at any time, simply log off. While the experience may be permeable from the virtual to the real world, and while he may enjoy the pleasurable aspects of being gendered female, it elides the experience of the more oppressive and disempowering aspects that are also part of this gender construction.[15]

In contrast to text-based and two- and three-dimensional virtual communities, the users' bodies are more directly implicated in immersive VR, and are capable of more types and ranges of interaction, extending to those not ordinarily possible in the physical realm, like "flying." The user's body is generally attached to a computer by trackers, which enables the virtual environments to respond to the user's ever changing position in the simulation, real-time movement and methods of interaction. In addition, the user's interaction within the simulation extends from simple navigation through it, such as walking through Virtual Venice, to complex interactions with responsive objects or characters. Further, because the possible interactions of users is complex, extending from the visual and auditory to the kinesthetic and haptic, their representation becomes a crucial aspect in their perception of cause-and-effect — how they apprehend the language of interaction strategies, particularly through their bodies — as well as navigational abilities, cognitive approaches and a sense of self.

14 Particularly the two-dimensional Habitat, and the three-dimensional AlphaWorld.

15 Allucquere Rosanne Stone. "Sex and death among the disembodied: VR, cyberspace, and the nature of academic discourse." In **The Cultures of Computing**. 1995. Susan Leigh Star, editor. Oxford: Blackwell Publishers, 254.

Two- and three-dimensional virtual communities

Immersive virtual environments currently require expensive computing equipment, and therefore are not widely available. A few of these environments are accessible as entertainment: "rides" allow groups to simultaneously experience and influence the simulation, but not as individual users. Most environments are limited to one or two participants, who spend no more than fifteen minutes in the simulation. Because each user in the simulation requires significant computation, multi-user environments are only now emerging. In early immersive virtual environments, the singular immersant did not choose an avatar, but experienced the simulation from a first-person point-of-view *(figure 3)*. Many of the early and familiar virtual environments of this type depended on navigational strategies through a head-mounted display (HMD) and a dataglove. Trackers attached to the HMD account for where the immersant looks and thus what she sees in the simulation. The dataglove, attached to the immersant's hand, appears as a graphic, disembodied hand in the simulation. The immersant is able to move forward by pointing an extended hand, stop by making a fist, and turn by pointing in the desired direction.[16]

Just as in text-based and two- and three-dimensional chats, it is necessary in emerging multi-participant VR for immersants to choose an avatar to define themselves as distinct from others. However, the nature of this medium offers opportunities to affect the immersants perceptions of themselves and of the simulation. In GreenSpace,[17] two immersants in Seattle met, within the simulation, with two immersants in Tokyo. Each was defined by an avatar comprised of a series of head-and-shoulder videograbs and a ping-pong like paddle, operated by a simplified dataglove. Each could speak with their voices spatially localized near his or her avatar. Unlike a three-dimensional chat, the simulation appeared differently to immersants in Seattle and Tokyo. All immersants viewed the same table, paddles and videograbs; however, the immersants in Seattle viewed these as situated within a traditional Japanese house with Mt. Fuji in view, while the immersants in Tokyo saw the surroundings as a log cabin with Mt. Rainier in view. Thus, some elements appeared common, while other elements of the simulation were unique.

In Brenda Laurel and Rachel Strickland's PlaceHolder, the very point-of-view of each immersant may function differently, altered according to the character chosen.

16 Other types of related environments which do not depend on attaching sensors to the user's body include "augmented reality" and "artificial reality." Here the user is inserted in the simulation through video compositing. Refer to Patti Maes, Artificial Life Interactive Video Environments, http://casr.www.media.mit.edu/groups/casr/maes.html; and Myron Krueger, 1991. **Artificial Reality II**, Reading, Massachusetts: Addison-Wesley.

17 GreenSpace was developed at the Human Inter Interface Technology Lab.

Figure 3. Osmose is an immersive virtual environment created by a team led by Char Davies. In this VR, a singular user is not represented in the simulation, but experiences it from a first-person point-of-view. The unique interface depends on the breath and balance of the immersant, a method derived from the scuba diving practice of buoyancy control. According to Davies, this allows the user to explore the self's subjective experience of "being-in-the-world," as embodied consciousness in an enveloping space where boundaries between inner/outer, and mind/body dissolve.
(1995 © Char Davies, Soft Image.)

If one chooses the snake, for example, that immersant's vision is changed to an anthropomorphized, "as-if infrared," physical actions are limited to ground movement, and voice synthesized. Likewise, if the Crow is selected, the user is able to "fly," and experience the concomitant vision and movement of a bird, with a different quality of synthesized voice. In both GreenSpace and PlaceHolder, the immersants' experience both vary and are shared within the shared and multi-participant simulation, affecting immersants' subjectivities, as experienced through their avatars.

Immersive VR in particular problematizes boundaries between mind and body, and between the biological and the symbolic. The common articulation of the transcendent state of sensation experienced in VR as "disembodiment" belies its most outstanding characteristic: the profound experiential dimension that seems to resist description and conceptualization, and which confound binary oppositions of mind/body and self/other. This is because more of the immersants'

bodily senses are very directly involved in the simulation, providing a multiplicity of sensorial feedback and cause-and-effect. This is particularly true of the proprioceptive sense of "being in the body." Because the immersant is simultaneously experiencing dissonant sensations from the simulation (flying) and from RL (gravity), users often describe what has been termed sim-sickness (or simulation sickness). Lag times in how the simulation appears to respond to the immersant add to a dissonance of experience. Sim-sickness reveals a simultaneity of experience, involving the difficulty of adapting to the conjoined experiences, resulting initially in dizziness and nausea. However, the immersant most often habituates or adapts to these dissonant inputs after a few minutes. The experience is multiple and simultaneous, only partially shared, not reducible to the VR world or the "real" world, yet necessarily implicated in both. Just where is the self and the body in relation to this disconcerting and simultaneous experience of being in and not in the virtual world, and how do they constitute each other?

The experiential dimensions of VR further provoke confusion in the relationship between bodily experience and subjectivity in the symbolic realm.[18] A fluid subjectivity can seem in some way to bodily inhabit or occupy the symbolic realm of VR. Because the technologically enhanced body or human sensorium is "joined in a sensory feedback loop with the simulacrum that lives in RAM, it is impossible to locate an originary source for experience and sensation."[19] Thus, the body, experienced as more viscerally "present" than it is in other fictive realms, is therefore seen to somehow circumvent our subjective relation to the symbolic. According to Jaron Lanier, for example, VR abrogates the process of entry into the symbolic realm, what he terms "postsymbolic communication."[20] Such resulting attempts to conceptualize experience in VR and to describe this VR experience as "disembodiment," however, only serve to reify the Cartesian mind/body split — a simultaneity of experience is denied — adaptation to simultaneous experiences of subjectivity in relation to the body and virtual and unmediated realities is disavowed.

Subjectivity then, mediated, constituted and reconfigured through experience in immersive VR and the larger cultural domain within which it resides and operates, is problematized: the experience is irreducible to subject/object, inside/outside, mind/body and VR/"real" world oppositions.

18 Gromala, Diane. 1996. "Pain and Subjectivity in VR." **Clicking In: Hot Links to a Digital Culture**. Seattle, Washington: Bay Press.

19 Hayles, N. Katherine. 1993. "The Seductions of Cyberspace." **Rethinking Technologies**. Conley, Verena Andermatt, editor. Minneapolis: University of Minnesota Press, 174.

20 As Katherine Hayles reminds us, Jaron Lanier's view that VR will supplant language denies the underlying assembly language of VR computation, as well as the formation of our sensibilities through language. Because our sensibilities are formed through language, Hayles continues, language pervades even nonlinguistic domains.

21 The French term "jouissance" may be translated as "extreme pleasure" and generally is connected to the pre-linguistic infant (that is, before it differentiates itself from others and the world). Also considered an experience which defies representation, sometimes associated with sexual pleasure, it is found in psychoanalytical discourses of D.W. Winnicott, Jacques Lacan, Julia Kristeva and Luce Irigaray.

22 Ronell, Avital. 1993. "Our Narcotic Modernity." **Rethinking Technologies**, Conley, Verena Andermatt, editor. Minneapolis: University of Minnesota Press, 59-73.

23 Deleuze, Gilles and Felix Guatarri. 1987. **A Thousand Plateaus.** Brian Massumi, translator. Minneapolis: University of Minnesota Press.

24 Merleau-Ponty,Maurice. 1995. **Phenomenology of Perception.** Colin Smith, translator. London: Routledge. First published in Great Britian by Routledge & Kegan Paul, 1962.

However, strategies for thinking within the contingent interstices between binary oppositions, and which serve to disturb them, reside in examinations of the conditions of jouissance,[21] Avital Ronell's notion of drugs,[22] and Julia Kristeva's exploration of the abject (I/not I). In addition, a schizophrenic subjectivity as described by Gilles Delueze and Felix Guattari[23] might rather provide an alternative to these dualisms by its nomadic embrace of shifting and contingent experiences. Finally, the phenomenology of Maurice Merleau-Ponty,[24] with its focus on the radical semiosis of the polymorphous lived-body, points toward alternative ways to conceive of subjectivity and the simultaneity of experience which take into account the material and symbolic, both existential acts and perceptions, and especially, prereflective experience. Merleau-Ponty's work in particular allows for a rigorous method to examine the sometimes phatic apects of immersive VR.

Cultural domains

The sharable and otherworldly places of multi-participant virtual realms are sites where humans extend and project their agency — the ability to act upon, within and through the world — through their avatars, and in turn, are sites where subjectivity is problematized. At the same time, this subjectivity functions within the larger cultural domains within which the subject constructs a sense of self and sociability, and understands and relates to technology. Although it is impossible to specifically define users in this cultural milieu, the majority of them and the technologies themselves are dominantly western, and particularly, it may be argued, American and postmodern. The hyper-real and postmodern context as described by Baudrillard, Deleuze and Guattari, Jameson, Lyotard and Virilio, among others, is profoundly influenced by technology. The hyper-real, postmodern context is typified by a fluid and indeterminant subjectivity, disconcerting shifts in the time/space continuum, contentious and shifting power relations and free-floating signifiers — symbols which no longer maintain a referent, or are preferred over the thing they originally represented — on the level of the everyday. Technology is seen as a specific instance of power/knowledge which embodies and normalizes social subjects, yet it is not to be regarded as distinctly separate from or quite fully part of the human subject. Technology, power and subjectivity are understood to be dialogically and mutually consitutive.

While technology is understood to be powerful, defining instances of instrumental forces of domination, those very structures may be simultaneously disrupted through emerging contingent and hybrid subjectivities, such as those precipitated in virtual communities. Likewise, an unquestioning acceptance of the common rhetoric which demonizes technology — renders it in utopian terms — which reifies mind/body or biologocial/symbolic dualisms — works at the level of ideology and allows hegemonic forces of domination to work, influencing subjectivity at the level of "common sense." Rather than adhering to a demonization of technology or reacting to it by developing another, oppositional and totalizing theory, theorists like Haraway enjoin us to consider and embrace "the skillful task of reconstructing the boundaries of daily life, in partial connection to others, in communication with all of our parts."[25]

25 Haraway, Donna J. 1991. **Simians, Cyborgs, and Women: The Reinvention of Nature**. London: Routledge, 181.

Conclusion

In the virtual realms of multi-participant MUDs, two- and three-dimensional chats and immersive virtual reality, an avatar functions as the site through which human agency is projected and reflected back to the user, influencing that user's sense of self. Through avatars, users experience both the reification and disruption of boundaries between the "real" and "virtual" worlds, between the mind and body and between the biological and symbolic. Understood as a particular instantiation of technological intervention in subjectivity, the ways in which an avatar functions necessarily include the culturally constructed presuppositions and perceptions that participants bring to bear in virtual domains. These operate both on the level of individual experience, and the level of the cultural domain within which it resides and operates, thereby creating a profound shift in the way we understand and perceive the complex interrelations among the self, body and technology.

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