Believe and Be Live: Entangled Experience in *Halo*

Tom Hehir

Introduction

You owe him everything, your freedom, your life, your future. The space is somber, which is fitting, as it is as much a memorial as it is an historical monument. We are surrounded by the tools of war as our guide steps into the room. He is an aged veteran, the weather lines scrawled across his face trace the despair he must have felt confronted with a dwindling supply of ammunition, no reinforcements, and no hope. His voice cracks with emotion as he assures us that despite these insurmountable odds there was always hope because the Chief was still in the fight. In a show of great humility, another veteran, burned, scarred, and blind in one eye, proclaims that no soldier should be honored for doing what is expected of him. It was that overwhelming sense of service, of duty and self-sacrifice, which allowed these Marines to prevail against all odds. We are confronted with the stark reality of our freedom; the astonishing number of lives sacrificed to protect. As the backdrop of the museum fades away, we are left to contemplate its significance. It is the first of its kind. Unlike its predecessors, this museum, the Museum of Humanity, commemorates the enduring survival of a species, the human species. It commemorates the man who gave humanity faith, who gave us back our future, Petty Officer John 117, Master Chief. And as quickly as we were drawn in, we snap back to a shocking reality. This is an advertisement for a videogame. It is a game that asks for our faith, and in return promises us meaning, and a context for greatness. It allows us to play out the history of the future of humanity. As the advertisement concludes we are asked, or commanded, or maybe even obligated to believe.

The advertisement described above was one in a series used to advertise the release of the Halo 3 videogame (link 1, link 2, link 3). Dubbed the "Believe" campaign, this series of advertisements never aired on television, but was strategically released online, where it quickly disseminated virally. As a videogame, Halo 3 is an incredibly popular, albeit unremarkable piece of fiction, clearly distinct from "real" life. Like all games, Halo 3 allows players to escape from reality (Huizinga 1950), and momentarily project themselves into a "temporary sphere of activity with the disposition all of its own" (Huizinga 1950:8). In that temporary suspension of real life, Halo 3 allows players to control a digital figure, called an avatar. Avatars do not simply represent or stand-in for the videogame player's physical body, but rather they expresses aspects of the player's identity by freeing the player from the representation of their physical body, and allowing the player access to different modes of acting out their identity. Despite the many interesting turns of expression the avatar may take, it is never fully free from the player's need for their body. The avatar cannot exist without the embodied form of the player. The avatar's dependence on the physical individual establishes a hierarchy of representation, the body is always more significant than the avatar because the body is not dependant on the avatar. The avatars in Halo 3 are no different; they are simply digital expressions of real bodies.

However, the "Believe" campaign advertisements represent characters from the videogame with living actors. In other words, the physical bodies of living actors are subordinated and serve as representations for avatars from the game. For me, this inversion of representational hierarchies that allows human bodies to stand in for game characters serves as a metaphor for the interrelation of the physical and the digital that today comprises lived experience and informs the creation of culture. I argue that this form of representation, in which living actors stand in for game avatars, is demonstrative of a cultural renegotiation of the boundary between game and life, of played-experience and lived-experience, and ultimately of human and machine.

Player experience is anthropologically interesting because it is heavily intertwined with, and no less important than what we might label as real experience. However, player experience is unquestionably a different form of experience for which there is no historical precedent. I argue that these commercials are part of a historically new form of technologically enabled narrative that makes up the player experience of Halo, compressing the player's sense of space and time, and changing the nature of social relations. I will explore the anthropological impact of this narrative form, placing particular emphasis on Halo's technologically enabled narrative as both a site for innovative expression, and threat to the possibility of authentic culture.

Method

To assess the "Believe" campaign commercials I interviewed 21 individuals who self-identified as avid players of the Halo videogame series, or "Halo players." All 21 respondents were men, had racially and ethnically diverse backgrounds, and fell between the ages of 18 and 29. Having respondents self-identify as avid Halo players was very important to the success of the study, and far more meaningful than having them meet a cutoff of hours played per week or other quantitative metric. I assumed that respondents who self-identified as avid players had staked a claim in associating themselves with the game series. A respondent's willingness to align himself or herself with the game indicates that the Halo series figures significantly into the respondent's identity.

Narratives and the "Narrative Machine"

For the overwhelming majority of respondents, their relationship with the game was strongly tethered to their experience with the game's narrative. For many of the respondents, Halo was the first game in the first-person shooter genre to have successfully incorporated a strong narrative component. "It was really the first game I played that incorporated the very involved plot, and that there was a lot of emotion between the characters. You become emotionally invested as you are going through."[1] Halo's narrative emerged as a prevailing building block providing the grounds for a more complex investment with the game. Described as feeling "authentic" and "emotional," respondents expressed feeling they had become a part of the narrative, as opposed to simply observing what was happening.

Before further explicating the respondents' relationships with Halo's narrative, I would like to briefly develop an argument about the nature of narrative. When the

---

[1] Interview Subject I, age 28, Interviewed May 7, 2011

respondents spoke of narrative they were referencing what we might label the plot of the game, or the advancement of story. Although plot and story play a massive role in the player's understanding of their own interaction with the game, this limited conception of narrative only captures the extent of the player's conscious interaction with the game as narrative. Narrative is not simply the telling of stories, but is an interpretive mechanism that engenders social and individual understanding and meaning making. Following Paul Ricoeur, I suggest that narrative discourse is implicit in both historical and fictional realizations, and that both registers of narrative share common features and produce social effects. Ricoeur argues that all narrative is comprised of interconnection of two different levels: the level of *sense*, and the level of *reference* (Ricoeur and Thompson 1981:274). The *sense* of narrative corresponds to the common structural qualities that orders narrative discourse, and is shared by all forms of narrative. The structure of all narrative can be understood as synthesis of heterogeneity, in which the flow or durée of experience is organized into a more tellable form that enables the production of understanding and creation of meaning. As a synthesis, narrative contains both chronological and non-chronological time. Chronological time corresponds to the episodic dimension of narrative that produces a contingent progression of discrete events. The non-chronological dimension exists as a configurational dimension of understanding that, extracted from the narrative totality, creates meaning (Ricoeur and Thompson 1981:278-279). This *sense* of narrative, which understands narrative to be a created or produced thing, is consistent across all types of narrative.

In Ricoeur's argument, narrative is differentiated on the basis of *reference,* or more specifically, how *reference* is sourced, being where it comes from. Reference is understood as the orientation of the position of the narrative. This notion must be differentiated from classifications of *sense* such as plot, genre, or topic, as *reference* only concerns the analytical relation of the narrative as a product of a certain social and historical condition. From Ricoeur's analytic perspective, both history and fiction are narratives that cross reference the same features of individual and social existence (Ricoeur and Thompson 1981:274). However, they should not be construed as one and the same. History produces its reference by indirectly tracing a narrative through a collection of documents, archives, or even oral customs. Fiction develops narrative with a spilt reference, because fiction is produced in a specific social and historical condition, and yet simultaneously engages in an active suspension of the "ordinary linguistic reference" of the conditions of its making (Ricoeur and Thompson 1981:293).

The game's narrative provided more than just simple entertainment or suspension from reality for these respondents. In describing his reason for playing the game, one respondent reported, "I guess it was just to discover the narrative and sort of to discover the sense of progress. With the narrative, you're actually achieving something beyond the superficial, like numbers of kills."[2] Seen as such, the narrative helped the respondents makes sense of the game they were playing, contextualize their moments of gameplay in a larger and seemingly more significant context. Most notably the advancement of the narrative provided them with a sense of accomplishment in that they were not simply playing, but rather were doing or accomplishing. This notion of progress gave them a reason to engage with the game by validating their enjoyment.

---

[2] Interview Subject F, age 18, Interviewed March 29, 2011

Although these findings regarding the importance of narrative are incredibly important for understanding why these players engage with Halo, they do not provide an incredibly insightful or historically new perspective that can sensibly extrapolated to other aspects of the social world. The findings regarding the importance of plot and the narrative's ability to simulate reality in Halo can be comprehended through a larger more general understanding of narrative (Ricoeur and Thompson 1981). This said, respondents did reveal a historically new conception of narrative in speaking of the "shape" of Halo's narrative, a concept they use to qualify the progression of narrative in videogames generally. "In Halo there are not what you would call branching paths. Its shape is a very linear kind of experience. … Other games…are nonlinear, and you can make different paths to achieve the same end. …In Halo, I know that eventually I'm going to reach the end, and that it's going to be a good ride no matter what. So I don't really technically shape anything, it's just the number of goals that I have to get through to get to the end."[3] What respondents accomplish in describing the shape of the narrative is mapping the possible routes that a particular "reader" or player of the game can take to advance through the narrative. The idea of narrative shape indicates a differentiated relationship that videogame players bring to the narrative presented in video games, and demonstrates that the relationship between readers and narrative has changed in a way that is historically new and technologically enabled.

In addition to narrative shape, respondents describe the interactive or reactive capacity of videogame technology as incredibly important in forming their relationship with the imagined world presented by Halo. Much like narrative shape, this sense of interactivity is relatively historically new, and stems from the respondent's appreciation of the technological capacity of the videogame system to create responsive gameplay. "In Halo, the enemies have a rudimentary artificial intelligence. So while you may be playing the same level over again, and facing the same enemy, the enemy will act differently according to how you act. …You are fighting something that actually has intelligence. Because of that intelligence the Halo enemies have, it gives a more personal feel to each of the fights. It makes you more invested."[4] The responsive quality of the game allows respondents to feel agency within the game, confirming the player's desire for significance in a way that is almost social, and allowing them to more fully suspend reality. Although the respondents were very aware of the machine's capacity to respond to their actions, they lack appreciation for the significant contribution this reactive quality adds to the narrative experience of the game.

The narrative moments presented by Halo allows for suspension from reality, or living within the text, that is somehow more extensive, more comprehensive, and more enduring than other works of fiction. To characterize this difference in a meaningful way, I suggest we think of Halo as a machine that produces narrative. The digital technologies that render the game world visible and playable are obviously nonhuman, but precisely where does the machine begin and the role of the player end? To address this question, I look to Paul Virilio's theory of the vision machine (Virilio 1994), and think of Halo as a machinic ensemble that produces narrative as a *narrative machine*. Virilio departs from a

---

[3] Interview Subject K, age 20, Interviewed May 11, 2011

[4] Interview Subject H, age 21, Interviewed April 5, 2011

typified relation of subject and object, by introducing the possibility of "sightless vision" (Virilio 1994:59). Virilio argues the vision machine is a machine capable of interpreting the visual field, recognizing and distinguishing objects based upon their general geometric form. For Virilio, the vision machine is not simply capable of interpreting the visual world, but is able to produce complex visual representations as well. The vision machine "automates perception" by simultaneously interpreting and staging complex visual representations, entangling human perception in a system of virtual images with no base in reality.

Emphasizing the machinic qualities of Halo's narrative production calls attention to the players' loss of agency to shape perception, association, and meaning in relation to the game. By thinking the machine, we reveal a relation to movement and moving parts through which the machine produces an unprecedented relationship with its "reader," which grants the machine the capacity to change the contours of the text, a text that is uniquely in flux in both its function and representation. Albeit the fluctuations in Halo's narrative are incredibly minimal, the variable quality engendered by the narrative machine is identified by many players as enabling them to deeply suspend their relation with reality and meaningfully engage in the virtual world in which representations are never set down and reified.

The narrative production of the narrative machine conflates the sources of reference as described by Ricoeur. This is to say that the narrative machine sources its reference through *both* trace, and split reference, rendering a narrative that is both fantastic and historical. This unique sourcing is only possible in the narrative machine, which coordinates both human and machinic actors in a process of interactive and contingent production of narrative. As an act of fiction, Halo split-sources its reference, engaging in an active suspension of the "ordinary linguistic reference" of the conditions of its making (Ricœur and Thompson 1981:293). However, Halo takes on the unique formation of the narrative machine as it also sources its reference through an historical trace. Halo does this with the game controller, which sources an historical trace by perfectly codifying human gesture. The game controller builds a history not through documents or archives, but from the player's physical and embodied reactions. Although the time period between the player's movement, and its rendition into narrative is incredibly short, it is nonetheless historical.

At its most fundamental level, the narrative machine can be understood as an automated narration that produces representations of the world, while also interpreting the world through a process of codified exchange. What is interesting about the narrative machine, and what fundamentally differentiates it from the human creation of narrative, is that the narrative machine creates narration without a corollary experience. The narrative machine interacts with the world through a process of quantified literal transcription as opposed to relativistic perception.

The narrative machine's perspective and interpretation of meaning is one that is entirely over-determined by the automation of narration, a process in which complex mapping associations are reduced to a simple construction of experience based upon the linear progression of stimulus and response. The linear progression of the narrative machine is enabled through major processes of simplification or radical abbreviation of

narrative into highly simplified tropes, and in the case of Halo, a generic and consistent narrative. The result is an entirely typified experience across players. The narrative machine destroys specificity precisely because it must simplify processes of meaning making into easily recognizable schemes.

My concern with implementing the concept of the narrative machine within Halo and other games of its genre is that it produces a narrative that is essentially the same across all individuals. There is very little differentiation within the experience related to the individual engaging with the narrative machine, while the interactive capacity of the machine facilitates a deceptive belief that the meaning of the narration is somehow unique. Despite the fact that those interviewed felt their experience to be unique, the respondents' all shared a shockingly consistent experience with the game. The machine produces the capacity to formulate a system of experience and reflection upon that experience as meaning that is undifferentiated across individuals because the automation of narration has no base outside of the machine. Any individual interacting with the same machine likely has the same base of experience. In other words this over-determining of perspective causes the potential to have an over-determination of subjectivity.

Reiteration and Hyperreality

Although narrative was an incredibly important element brought up by the respondents with regard to their engagement with Halo, it was by no means the only element they described as helping them engage more fully with the world presented by the game. Another particularly unique quality of the videogame the respondents mentioned as being important for them when it came to deeply investing themselves in the narrative was a quality they identified and labeled as "reiteration." This idea encompasses two important elements: the first is simply that the game can be played exhaustively, and the second being that the narrative introduced in the videogame has been proliferated in a number of other forms of media in addition to the game itself. In the experience of the respondents, the combination of these two qualities imbues Halo with a sense of development, historical time, and adaptability. "If I'm going to play Halo and write an academic paper about it, I don't directly contribute anything to the plot of Halo. That iteration of Halo is done. But am I contributing to the understanding of other people that read my article and play Halo? Absolutely. And that is going to change the way that they view Halo."[5] Halo is not static for them, existing outside of time, but rather is responsive and part of an evolutionary process of understanding.

This notion of iteration can be attributed to the players understanding of the videogame medium, and the way that the structural capabilities and limitations of the videogame medium ultimately shape the communicative capacity of Halo. "Videogaming is computer science and computer science is iteration, algorithms are various iterations of various commands you string together, and entire game engines are used to build other games."[6] The discipline of computer science is built upon Claude Shannon's (1948) foundational theory of information that allows for transmission without reference to meaning, disconnecting concept from linguistic materiality without impacting

---

[5] Interview Subject A, age 18, Interviewed February 2, 2011
[6] Interview Subject J, age 19, Interviewed May 10, 2011

significance. Defined only as patterned, information becomes a universal form of representation that makes for a much more fluid or democratic flow of knowledge, language, and significance (Bowker 1993). "I think of iteration as one instance of something that is repeated many times. You can't say that there could not be a Leviathan two, three, and four, but not only are aspects of Halo in many different games, but those aspects carryover into successive versions of Halo. Indeed they can spawn entirely new genre of Halo."[7] For the respondent, any continuation of Hobbes' Leviathan would be discrete from the original because the original work is written and constrained by language. Contrastingly, the respondent uses the concept of universality and information theory to imply that any continuation of the Halo series would be inextricably linked to the original, or iterative. The respondent's knowledge of computer science, information theory and the possibility of universal transmission form the crucial base of their thinking regarding reiteration.

The simple fact that the game can be played exhaustively contributes significantly to the respondent's engagement and sense of immersion regarding Halo. All of the players I spoke with engaged in exhaustive play, returning to Halo's narrative campaign mode multiple times. "I go back and play the single player on the game quite a bit. I guess it's sort of the romantic ideals that I have with it."[8] This respondent's romantic ideals include feeling part of a larger, more significant context that is almost mythical in nature. "[Halo] has the feel to it, like grandeur, where I can use it as sort of escapism and [am] told a really awesome story at the same time. I actually feel like I'm part of a bigger thing when I'm playing."[9] This is all encompassed by the fact that these moments can be revisited frequently, although never reproduced in their exact specificity. Unlike reality, players can return to moments, alter their decisions, and ultimately alter outcomes. After many reiterations, the small differences created by the reactive nature of the game imbue the player's experience with a sense of texture and depth. Nevertheless, the idea of exhaustive play is implicitly contradictory to the reality that there is a limit to the game. The sense of accomplishment players get from investigating every proverbial inch of a game relates to a sense of total mastery. "In that respect [exhaustive play] allows for the game to give you every single piece of narrative information and because you can play it exhaustively you can also yourself seek out every piece of information."[10] This notion of "finding everything" is essential to the notion of exhaustive play, and tremendously important to why players are not necessarily as investigative in the real world. They appreciate that the real world is not in fact wholly knowable and intimidating in its complexity, limiting their capacity for mastery and sense of accomplishment. Although the game offers an alternative to engaging with reality, it is always still a game, a place of play, and the goal is winning mastery over the domain of the game (Huizinga 1950:10).

In addition to exhaustive play, respondents indicated the importance of having a common narrative carried across an array of media as a significant contributor to their idea of reiteration. All of the individuals interviewed engaged with some variety of these reiterative medial forms of the game. This trans-medial narration sheds new insights on

---

[7] Interview Subject J, age 19, Interviewed May 10, 2011

[8] Interview Subject G, age 23, Interviewed April 5, 2011

[9] Interview Subject C, age 21, Interviewed March 1, 2011

[10] Interview Subject K, age 20, Interviewed May 11, 2011

the concept of a "Halo Universe" previously discussed by one respondent. Predicated on the idea of the universality of information, transmedial narration proliferates the narrative introduced in the videogame experience of Halo to a variety of additional media. "[The additional media regarding Halo] expand Halo in the same way the novels do. By giving you more background on the things that are taking place in the game, even though they are not in the game. These other types of media can influence the core media, which is the game, and make it seem more fleshed out and real."[11] The Halo universe emerges as a descriptor encapsulating the nebulous collection of media that contribute to the macro-narratives inspired initially by the videogame Halo. Furthermore, respondents indicate how this contributes to the immersive potential of the narrative because it reflects the transmedial coverage of important events in the real world. This supplementary information reflects back on the game and influences the understanding and meaning respondents take from the game. "The game does a good job at telling you what everyone is doing, but the books give more of a background [as] to why this is such a desperate struggle."[12] The transmedial distribution of Halo's narrative increasingly resembles its players' perception of reality by adding context and meaning through reiteration.

The transmedial distribution of Halo's narrative is further exemplified by increasingly decentralized or distributed authorship. Distributed authorship has enabled Halo's narrative to develop in a seemingly autopoetic process in which those consuming the narrative are often the same individuals (re)producing it transmedially. "People write fan fiction too, and people read additional stories to games that have not occurred, and that also influences the way you view the characters in the game."[13] The authority of these distributed authors is judged not on the basis of their formal institutional allegiances, but on their ability to introduce new storylines while maintaining a sense of consistency with the original narrative.

The reiterative quality of the respondents' interaction with Halo challenges the boundaries between played experience and lived experience by compressing time and space. Concepts of space and time are not objective measures, but are defined by material processes, including the production of goods and speed of travel (Harvey 1990: 204). The new ways in which players can materially interact with the narrative of Halo has altered their perception of space and time. With Halo, the reiterative way narrative is produced and distributed has moved player experience into the temporal domain of reality. Respondents more closely associate the reiterative narrative of Halo with the media coverage of important events in reality, not the fantasized events of imagination. The tremendous speed at which Halo's narrative reiterates itself into a prolific history of the future destroys any spatial or temporal "distance" between the player and the game, and as the game moves into a temporal domain consistent with reality, it becomes equitable to reality. Played experience and lived experience collapse into an imbricated relation such that the constructs begin to mirror each other, creating the possibility for experience unbeholden to reality. Reality enters into a cyclical or teleological relation with fiction, such that fiction becomes lived as reality (Baudrillard 1994).

---

[11] Interview Subject B, age 25, Interviewed February 25, 2011
[12] Interview Subject F, age 18, Interviewed March 29, 2011
[13] Interview Subject D, age 19, Interviewed March 2, 2011

Conclusion

The "Believe" campaign commercials demonstrate fluidity between played experience and lived experience that is enabled by a historically new form of narrative, and a compressed experience of space and time. In these commercials, the physical bodies of living actors are subordinated and serve as representations for avatars from the game in a way that demonstrates how the time and space of played experience is becoming increasingly indistinct from the time and space of lived experience. The old anthropological questions of the possibility and limits of authentic culture are made new again. For Jacques Lacan, the key element of ego formation is the senses' ability to mediate between the self and others, establishing the self as subject (Lacan and Fink 2006: 75-81). At its very inception, identity is dependent on media, and media dependent on identity. The media theorist Marshall McLuhan writes, "[M]en at once become fascinated by any extension of themselves in any material other than themselves" (McLuhan et al. 2003:41). This contradiction provides the basis for McLuhan's theory of technological amputation, a process by which the self is externalized and separated from the body by way of technological mediation. Media technologies generate a unique tension of identity that seems inherent to the relation of self and media. McLuhan forces an examination into how the mediated figurations of the self relate to identity, and whether or not the mediated self can be unified with identity. The important distinction is not so much how media technology impacts identity, but rather that media technology and identity have always been codependent, constantly evolving and changing in relation to each other. However, something has changed. Played experience creates the possibility for experience unbeholden to reality. The body provides centrality to the multiple figurations of identity that emerge from the technologically enabled expanded field of identity. The body implies a connection of all figurations of identity, but is unable to contain them; identity develops in excess of the body. Technology presents the possibility for the self to emerge as a multitude, a mass of utterly discrete selves unified on the basis of their difference that can never again be reduced to a single identity (Hardt and Negri 2004). Narrative, and not the body, is capable of providing the connective thread to unite the multiple figurations of identity making up the exploded view of the self. The body emerges as a metaphor for the self as narrative, uniting the progression of multiple identities into an absolute figuration of self. The body is not the definitive figuration of self, but rather a medium that connects the multiple figurations of identity. These figurations of identity can no longer be traced back to the body, but are nonetheless wholly dependent upon it. This is the grounds for a new kind of culture, but does not destroy the old. In it, there is both the possibility of threat, and of newfound potential.

Games

Halo: Combat Evolved. Bungee, Xbox, 2001
Halo 2. Bungee, Xbox, 2004
Halo 3. Bungee, Xbox 360, 2007

References

Apter, E. (2008). *Technics of the Subject: The Avatar-Drive*. Postmodern Culture 18(2):1-1.

Apter, E. (1999). *Continental Drift : From National Characters to Virtual Subjects*. Chicago: University of Chicago Press.

Baudrillard, J. (1995). *The Gulf War did Not Take Place*. Bloomington: Indiana University Press.

Baudrillard, J. (1994). *Simulacra and Simulation*. Ann Arbor: University of Michigan Press.

Bowker, G. (1993). *How to be Universal: Some Cybernetic Strategies, 1943-70*. Social Studies of Science, Vol. 23 (1993):107-27.

Deleuze, G. & Guattari, F. (1987) *A Thousand Plateaus : Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press.

Grossman, L. (2007). *The Man in the Mask*. Time 170(11):81-83.

Hansen, M. (2009). *Living (with) Technical Time: From Media Surrogacy to Distributed Cognition*. Theory, Culture & Society 26(2):294-315.

Hansen, M. (2004). *Digitizing the Racialized Body Or the Politics of Universal Address*. SubStance 33(2, Issue 104: Special Section: Contemporary Novelist Lydie Salvayre):107-133.

Hansen, M. (2003). *Affect as Medium, Or the `Digital-Facial-Image'*. Journal of Visual Culture 2(2):205.

Hardt, M & Negri, A. (2004). *Multitude : War and Democracy in the Age of Empire*. New York: Penguin Press.

Harvey, D. (1990). *The Condition of Postmodernity : An Enquiry into the Origins of Cultural Change*. Oxford, England ;New York, NY, USA: Blackwell.

Huizinga, J. (1950). *Homo Ludens: A Study of the Play Element in Culture*. New York: Roy Publishers.

Kittler, F. (1999). *Gramophone, Film, Typewriter*. Stanford, Calif.: Stanford University Press.

Lacan, J. & Fink, B. (2006). *Ecrits : The First Complete Edition in English*. New York: W.W. Norton & Co.

McLuhan, M. McLuhan, S. & Staines, D. (2003). *Understanding Media: Lectures and Interviews*. Cambridge, Mass.: MIT Press.

Mirowski, P. (2002). *Machine Dreams : Economics Becomes a Cyborg Science*. New York: Cambridge University Press.

Pickering, A. (2010). *The Cybernetic Brain : Sketches of Another Future*. Chicago: University of Chicago Press.

Ricœur, P & Thompson, J. (1981). *Hermeneutics and the Human Sciences: Essays on Language, Action, and Interpretation*. Cambridge Eng. ;New York :Paris: Cambridge University Press ;Editions de la Maison des sciences de l'homme.

Shannon, C. E. (1948). *A Mathematical Theory of Communication*. Bell System Technical Journal, vol. 27, pp. 379-423 and 623-656, July and October.

Virilio, P. (1994) *The Vision Machine*. Bloomington: Indiana University Press.

Wingfield, N. & Guth, R. (2007). *Microsoft's Halo 3 Busts Games Record*. Wall Street Journal - Eastern Edition 250(74):B3.