Digital Parasites: Reassessing Notions of Autonomy and Agency in Posthuman Subjectivity

Abstract

This article offers a composite of the concepts of the parasite from Michel Serres's work The Parasite, *and of the digital subject of N. Katherine Hayles's* My Mother Was a Computer *in order to provide a model for better understanding the operation of autonomy and agency in the formation of posthuman subjectivity. For Serres, interactions between subjects are always instigated and mediated by a third party, a parasitical noise that both interrupts and orders communication. Serres's subject as parasite resembles the digital subject postulated by Hayles, in that the digital subject also depends on fragmentation for its complexity and growth. However, Hayles's subject offers a possibility for agency that is not possible with Serres's analog model. The composite I propose, the digital parasite, enables an autopoietic process that reassesses the autonomy and agency of the subject. The article seeks to explore and understand how re-conceptions of autonomy and agency within this autopoietic process can be applied to theorizing the posthuman as an extension of, rather than a departure from, the humanist subject.*

KEYWORDS: Subjectivity; Autonomy; Agency; Posthuman; Transhuman

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> Theorem: noise gives rise to a new system, an order that is more complex than the simple chain. This parasite interrupts at first glance, consolidates when you look again.[1]

Even as theories of posthumanism appear more and more frequently in the field of humanities scholarship, the term "posthuman" persists in eliciting conjectures on what remains or arises after the dissolution of the liberal humanist subject, whether from the perspective of animalism or that of transhumanist theory. These perspectives tend to view the posthuman as a subject lacking the features of autonomy and agency central to the Enlightenment notion of the humanist subject, in other words, mastery over the self and mastery over the environment. Posthumanism, under these conditions, marks a radical departure from liberal humanism and the notion of the posthuman subject emerges to replace the defunct concept of the human subject, for good or ill. However, some theorists contend that the posthuman subject stands rather as a redefinition of the human subject, not a departure from humanity but an evolution in our understanding of what it is to be human. This step forward entails a reassessment of how autonomy and agency operate in the definition of the human subject.

Autonomy, as envisioned by Enlightenment thought, entails a discrete subject entirely distinct from its surroundings and from other subjects. For the posthuman subject, however, autonomy can no longer be viewed as self-containment or self-ownership but instead as a process of self-making; in other words, as an ongoing practice of self-definition and re-definition through various relations to the subject's environment. Social cognitive theory, as explicated by Albert Bandura, provides one possible example of such a reconception, arguing that "[h]uman

functioning is rooted in social systems."[2] However, social cognitive theory does not share the postmodern view that subjects are entirely determined by external conditions or forces, such as Althusserian Ideological State Apparatuses or Foucauldian structures of power. Bandura observes: "Although the self is socially constituted, by exercising self-influence human agents operate generatively and proactively, not just reactively, to shape the character of their social systems. In these agentic transactions, people are producers as well as products of social systems."[3] A self-reflective element is key to this notion of autonomy. "Through reflective self-consciousness," Bandura explains, "people evaluate their motivation, values, and the meaning of their life pursuits."[4] This practice of continual self-evaluation suggests that the boundaries of the subject are mutable and permeable, that the subject changes and adapts in relation to its social environment.

As suggested above, agency continues to be an essential feature of this alternative view of autonomy. However, agency appears no longer as domination of the environment but as engagement and reciprocal exchange with the environment. For the posthuman subject, agency entails various interfaces and exchanges with technologies that increasingly comprise the social environment. As Bandura observes, "Growth of knowledge is increasingly enhancing human power to control, transform, and create environments of increasing complexity and consequence. We build physical technologies that drastically alter how we live our daily lives."[5] But, even as these technologies alter our lives, "These new social realities provide vast opportunities for people to bring their influence to bear on their personal development and to shape their social future."[6] Agency, then, amounts to an ongoing exchange in which we shape the technologized environment that, in turn, shapes our social lives. We do not fully dominate our environment, but we are also not fully determined by it.

Bandura concedes that "the mechanisms linking sociostructural factors to action in this macroanalytic approach are left largely unexplained."[7] I would like to suggest that by refiguring notions of human relations, both with one another and with our technologized environments, we might begin to understand how these mechanisms operate. Specifically, a composite of the concepts of the human as parasite, as presented in Michel Serres's work *The Parasite*, and of the digital subject of N. Katherine Hayles's *My Mother Was a Computer*, might provide a model for better understanding, if not for explaining, these mechanisms. Furthermore, through a combination of elements of these two works in systems theory and posthumanity, this essay seeks to present a model to aid in understanding how re-conceptions of autonomy and agency can be applied to theorizing the posthuman as an extension of, rather than a departure from, the human subject.

In popular culture, the posthuman is frequently characterized as a being, usually a machine or computer of some sort, which consumes or subsumes the human. We are presented with images something akin to Ray Kurzweil's transhuman vision of the machine that emulates, exceeds, and then replaces the human, not only physically through prostheses, but cognitively through information and communication technologies. Kurzweil, in fact, predicts that "within several decades information-based technologies will encompass all human knowledge and proficiency, ultimately including the pattern-recognition powers, problem-solving skills, and emotional and moral intelligence of the human brain itself."[8] Guiseppe O. Longo proposes the emergence of "a new species, homo technologicus, a symbiotic creature in which biology and technology intimately interact."[9] This new species, according to Longo, "is not simply 'homo sapiens plus technology,' but rather 'homo sapiens transformed by technology'; it is a new evolutionary unit, undergoing a new kind of evolution in a new environment."[10] While Kurzweil and other proponents of transhumanism view these changes as positive steps forward, critics such as Francis Fukuyama and Bill Joy worry over the potential abuses of new technologies and the negative effects they may have on humans.[11]

Though expressing contrary positions regarding the benefits or dangers of new technologies, both Kurzweil and Joy invoke a section of Theodore Kaczynski's *Unabomber Manifesto*, which warns of two potential outcomes of recent technological advances: either a small group of technocrats will retain control over the technology and its applications in society, or "machines might be permitted to make all of their own decisions without human oversight."[12] Both scenarios threaten human autonomy and agency as understood under liberal humanism. In the first, power is held by a "tiny elite,"[13] leaving most of humanity subject to the agency of very few. The majority of

humanity exercises neither self-mastery nor mastery over the environment. In the second, technology is given mastery over humanity: "Eventually, a stage may be reached at which the decisions necessary to keep the system running will be so complex that human beings will be incapable of making them intelligently. At that stage the machines will be in effective control."[14] In both cases, as Kaczynski warns, "human work will no longer be necessary [and] the masses will be superfluous, a useless burden on the system"[15]. Joy is quick to point out that, despite the source and his obvious Luddism, these reservations should not be dismissed outright: "Kaczynski's dystopian vision describes unintended consequences, a well-known problem with the design and use of technology."[16] Even well-intended advances in technology can lead to unforeseen and, possibly catastrophic, consequences. Indeed, Kaczynski's fears seem to be in line with the popular imagination, with his concerns reflected in much recent science fiction such as *The Matrix* film franchise (1999 and 2003) and the 2009 film *Surrogates*, films that imagine futures wherein humanity has been overwhelmed and dominated by technologies of its own creation.

One might question where the anxiety reflected in recent popular media comes from. After all, advances in technology have always been part of the human experience and have, at times, had profound influence on human society. Recently, however, the relationship between humanity and technology has undergone a recognizable change, as emerging technologies challenge the integrity of the body and its role as the center of human identity. Certainly, philosophical movements in poststructuralism and deconstructionism have raised such issues in the past; but these perspectives proved too abstract to find wide acceptance in mainstream culture, i.e. outside of academia or some highly specialized professions. Public awareness of, and anxiety about, issues of identity and agency seem to have been brought on largely through confronting the implications of new technologies. Tomás Maldonado attributes this shift in awareness to "the very high degree of artificialization that the body is achieving in our time."[17] Writing on the impact of technology on our notions of body and identity, Longo observes, "Electronics, robotics, and spintronics invade and transform the body and, as a consequence of this, the body becomes an object and loses its remaining personal characteristics, those characteristics that might make us consider it as the sacred guardian of our identity."[18] Anxieties arise as people sense the possibility of self-definition, and therefore self-control, slipping away. People feel threatened with something akin to the condition of the Foucauldian subject, to be determined and controlled by powers they cannot overcome or even understand. And, as Bandura notes, "Unless people believe they can produce desired outcomes and forestall undesired ones by their actions they have little incentive to act or persevere in the face of difficulties."[19]

Furthermore, "this separation of the body from its primitive functions and this weakening or negation of presence induced by technology imply pain."[20] The transhuman conversion into technological beings becomes associated with the pain of loss, an amputation of traces of humanity from out of the machine rather than an interface of the two. This notion has been popularly represented in the *RoboCop* film and television franchise (1987-1995) as well as in *Star Trek*'s Borg race, and the issue is central to the storylines of recent popular video games *Deus Ex: Human Revolution* (2011) and the *Mass Effect* series (2007-2012). Such representations reinforce the characterization of technological alterations of the body as dehumanizing. Autonomy becomes particularly threatened if human identity is to be replaced by external computer programs or subsumed into a collective consciousness.

These examples are extreme to be sure. But, justified or not, such nightmarish visions reflect mainstream society's fears of posthumanity as a disconnection from human subjectivity, as the subject is subsumed by technology. No doubt, this vision of the posthuman follows from the dis-ease generated by the lingering specter of the postmodern subject: that subject stripped of autonomy and agency and subjected to the machinery of societal power structures. Longo observes: "Everyday life is increasingly regulated by complex technologies that most people neither understand nor believe they can do much to influence. The very technologies they create to control their life environment paradoxically can become a constraining force that, in turn, controls how they think and behave."[21] And John Zerzan connects this dread more specifically with posthumanism in his assertion that "[t]he postmodern subject, what is presumably left of subject-hood, seems to be mainly the personality constructed by and for technological capital."[22] The posthuman, in this view, is an inevitable outcome of postmodernity's disintegration of the subject: the human subject reduced to merely another piece of the larger machinery.

However, some theorists have recognized the potential of posthumanism to offer us an alternative to this bleak condition. Hayles, for example, insists that the posthuman is not a divergence from the human, not a break from humanity, but a movement forward in our understanding of humanity. "If the human has been mechanical all along," she argues, "anyone who represents it as 'contaminated' by the mechanical mistakes his own process of discovery for the hybridization that was always already there."[23] For Hayles and others—notably, Cary Wolfe—the technology that many fear will eventually overwhelm us is actually an extension of ourselves, and has always been a feature of our evolution as humans. According to Wolfe, the human "is fundamentally a prosthetic creature that has coevolved with various forms of technicity and materiality, forms that are radically 'not-human' and yet have nevertheless made the human what it is."[24] These theorists owe much of their notions of the posthuman to a perception of human subjectivity offered by Michel Serres: that of the human as parasite.

Serres's 1980 work *The Parasite* has far reaching implications for many fields of inquiry and lays the groundwork for later theorization that all communication emerges out of an underlying chaos of noise.[25] This essay's examination of Serres's notion of the parasite focuses on its implications for human subjectivity and human relations with one another and with technology. As such, the essay draws significantly on Wolfe's interpretation of *The Parasite* as a posthumanist text. However, while Wolfe maintains that "Serres's work asserts…that we have never been human,"[26] I want to suggest, instead, that Serres offers a model for reassessing and redefining human subjectivity, often thought to be irreparably complicated and compromised by poststructuralist and deconstructionist thought.

For Serres, all human subjects are parasites; and all human interactions constitute systems in which participants parasite one another: "Man is a louse for other men. Thus man is a host for other men."[27] Furthermore, humans "live amidst parasites," which means that parasites are not merely the other humans with which we interact but "they constitute our environment."[28] Steven D. Brown and Paul Stenner note that, for Serres: "Things are always-already in the midst of other things and this means fundamentally mediated by other things."[29] Significantly, Serres represents this environment of parasites as a system constructed of "the flow of messages passing through the lines."[30] Necessarily, this environment is technologized and "includes the telephone, the telegraph, television, the highway system, maritime pathways and shipping lanes, the orbits of satellites, the circulation of messages and of raw materials, of language and foodstuffs, money and philosophical theory;"[31] essentially, any pathway by which information can be transmitted and received. In this sense, parasitism amounts to a form of communication in which the host transmits and the guest/parasite receives.

The relationships between Serres's subjects run in one direction, the host feeding the guest/parasite and that guest feeding off of the hospitality of the host. Serres explains, "The flow goes one way never the other. I call this semiconduction, this valve, this single arrow, this relation without reversal of direction, 'parasitic'."[32] This relationship represents only one of three definitions of parasite that Serres employs, in this case, that of the "biological parasite."[33] The host becomes defined within the system as it acts upon the need of the guest, deriving an identity as server to and feeder of the guest. The guest is defined as a parasite that feeds from the hospitality of the host. Brown and Stenner explain: "The parasite takes without giving. It makes an unequal exchange which moves the chain away from any form of equilibrium."[34] This exploitative scenario characterizes the most common conceptualization of parasitic relationships. However, Serres's notion of parasitism adds a recursive movement. Moving in only one direction, the relationship eventually feeds back upon itself and the two subjects are always defined in relation to one another, both feeding off of the function of the other.

Though the direction of the relationship between host and guest cannot be reversed, Serres redefines the roles of the two participants by applying the second definition of the "social parasite."[35] For Serres, "[t]he parasitic relation is intersubjective,"[36] the result of a social in addition to biological exchange. The social exchange offers a sort of payment for the hospitality of the host, though this "exchange appears after everything was freely given."[37] Serres explains: "[The parasite] obtains energy and pays for it in information. He obtains the roast and pays for it with stories."[38] Again, the exchange must move in one direction. Therefore, the flow of information between host and parasite does not reverse direction but instead closes a loop of exchanged information, biological and social

respectively. There is no longer a simple relationship of exploiter and exploited, both participants take on both roles. The guest and host both parasite one another in a recursive loop.

The information loop created amounts to a feedback loop between the host/parasite and guest/parasite: "The relation is the function of the parasite, in a circular causality, in feedback loops."[39] The interchange creates a feedback loop between the two subjects who function as both host and parasite, simultaneously consuming and nourishing one another. This relation generates "negative" feedback, described by Derek J. Smith as a "classic 'closed loop' control system" in which feedback is used "to reduce, or 'damp', the amount of an error."[40] Such a system promotes homogeny and abnegates agency. The two subjects, host and guest, are subsumed within the machinery of the system, always interdependent, always feeding and consuming one another, never changing or growing. The description follows that of the autopoietic systems theorized by Humberto Maturana and Francisco Varela. As Wolfe notes, autopoietic systems "use their own outputs as inputs in an ongoing process of 'self-making' or 'self-production,' and they constantly (re)produce the elements that in turn produce them."[41] Though "self-making," at this level, is really only re-making, or maintaining, the same self again and again. Autonomy, in this case, is not so much a matter of self-creation as of shoring up the boundary between what is the system and what is not the system. A rather hollow self-determination, wherein the elements of the autopoietic system are helpless to impact the system into which they have been incorporated, merely repeating the same patterns endlessly, feeding back upon and parasiting themselves.

Outlining Maturana's and Varela's theory of autopoiesis, Hayles explains: "In the autopoietic view, no information crosses the boundary separating the system from its environment. We do not see a world 'out there' that exists apart from us. Rather, we see only what our systemic organization allows us to see."[42] In other words, the system is closed and its constituents are confined within its boundaries, moving in an endlessly recursive and parasitic loop. This system, moving always through the same routines, lacks the ability to significantly react and adapt to its environment. Maturana and Varela address the issue of complexity through a process called "structural coupling," a process by which disturbances resulting from interactions with the environment or with other systems trigger changes within the system. However, in referencing the work of Keith Ansell Pearson, Patricia Ticineto Clough and Jean O'Malley Halley, argue, "Autopoiesis, as Pearson sees it, does not offer enough in the way of elaborating the potential for the coevolution of organism and environment because autopoiesis takes disturbances to the organism's equilibrium and homeostasis as destructive."[43] Furthermore, the boundaries of the system continue to divide and distinguish it from the environment that impacts upon it. Certainly, a sort of autonomy is established as these systems "maintain their boundaries and integrity through a process of self-referential closure";[44] but agency is again sacrificed. The environment impacts upon the system, but the system does not impact upon its environment, it only reacts to the disturbances brought about by contact with the environment. As Hayles indicates, "the environment is indeed merely a trigger for processes that close on themselves and leave the world outside."[45] She recognizes that to retrieve agency, an autopoietic system must be modified to "a fast, responsive, flexible, and self-organizing system capable of constantly reinventing itself, sometimes in new and surprising ways."[46] And Serres offers just such a modification.

The parasitic relationship, under both the biological and social definitions, will remain in a state of deathlike harmony unless a third party is included, the third definition of parasite: the noise, the interrupter, the disruptor. As Serres notes, "Here we have a trivalent logic where we expected only a bivalent one."[47] Relationships between subjects, for him, are always instigated and mediated by a third party, a parasitical noise that simultaneously interrupts and reorders communication between subjects: "Noise is not simply a threat to order: it is the basis from which order might emerge. It is simultaneously destructive and productive."[48] This third party represents Serres's third definition of the parasite as "static or interference."[49] The addition of the third player in the parasitic system creates a different kind of feedback loop. Smith describes this "positive" feedback as that which "magnifies the displacement instead of diminishing it."[50] A balance must be struck between the disorder created by the third parasite and the stasis in which the first two are trapped. Serres writes, "Noise destroys and horrifies. But order and flat repetition are in the vicinity of death. Noise nourishes a new order."[51] Dissonance must disrupt harmony, chaos must interrupt order, for the system to evolve and for its parasites to thrive.

In this triumvirate, the positions of the parasite subjects are not fixed, each party can be interchanged not only as host or guest, but can also function as the third, the noisemaker. The relationship, therefore, includes reciprocal exchange rather than amounting exclusively to unidirectional exploitation. As Serres insists, "The three positions are equivalent. Each is in a line with the others, and each can play the third."[52] The possibility of agency emerges as the subjects interrupt the flow of information, acting upon and changing the environment and its structures even as they are contained by it. Thus, the parasitic relations between the three parties give rise to the very systems through which these subjects define and are defined by one another. In Serres's words, "The parasitic relation is intersubjective."[53] The autonomy of the subject depends upon its interrelations with other subjects, its ability to constantly redefine its function within the system. This transitive autonomy is quite different from the notion of immanent autonomy attached to the liberal humanist subject. As stated above, this is an autonomy based on self-making rather than self-containment, and the subject is always in process, never totalized. This subject is not self-contained but extends into its environment, interacting and engaging with elements of the environment including other subjects as a necessary condition of self-making. As Brown and Stenner assert, for Serres "there is nothing without a constitutive environment."[54] Agency and autonomy, therefore, become inextricably bound together, as agency is a necessary feature of self-making and thus autonomy.

Here, then, is the redefinition of the subject from the self-contained, self-determined, humanist subject to the decentered posthuman subject: a subject created and re-created through interactions and interfaces with and within systems of information flow. As Hayles observes, "the more profound change is from form to process, from preexisting bodies to embodied materialities that are linked to one another by complex combinations of processes."[55] Hayles is careful to point out that this change "from form to process" does not imply the dematerialization or dissolution of the subject. On the contrary, "for information to exist, it must always be instantiated in a medium."[56] Though the subject may no longer be enclosed, it is still embodied. "In contrast to the body," Hayles explains, "embodiment is contextual, enmeshed within the specifics of place, time, physiology, and culture."[57] The subject as an "embodied materiality" shifts self-perception from Maturana and Varela's "self-referential closure" to "a posthuman collectivity, an 'I' transformed into the 'we' of autonomous agents operating together to make a self."[58] Hayles's "embodied materialities," like Serres's parasites, are thus defined and redefined by their interrelations with one another and with their environments.

Serres's cybernetic parasites, in fact, closely resemble the hybrid analog/digital subjects postulated by Hayles. For her, as noted above, "the human has been mechanical all along."[59] In other words, the human subject has always developed through its interactions with technologies. And the emergence of digital technologies, with which most humans now interact in some way even if only remotely, brings with it the emergence of the digital subject. Referencing Mark Poster, Hayles marks a distinction between the natures of analog and digital subjects. In analog subjects, complexity derives from levels of relations based on resemblance. The elements at the deepest levels—"the most meaningful part of the self," according to Hayles[60]—must resemble those closest to the surface, closest to the boundaries of the subject. This emphasis on internal coherence, on self-similarity, implies the totalized and enclosed subject of liberal humanism, the very sort of totalization of identity belied by poststructuralist and deconstructionist thought. Furthermore, "Analogical relations require that the integrity of the units taken to resemble one another be preserved; otherwise the correspondence is lost and the relation broken."[61] For the subject to undergo change, each unit must change in order to preserve resemblance. Thus, the capacity for change within the analog subject is limited. Change must be gradual and must occur symmetrically throughout the system.

In this way, analogical relations bear similarity to what Brown and Stenner termed the parasitical cascade in Serres's work. They explain that the continuing existence of a system depends upon "converting the 'primal' noise of its inheritance into a temporary form of order."[62] The parasitical cascade reflects the process in which, by "systematising noise, emergent systems become fertile ground to be parasitised by new systems" creating a cascade effect.[63] Complexity is generated as each emergent system strives for equilibrium, for a balance between the chaos of noise and the stasis of order. To this end, each succeeding level of the cascade "functions as a rectifier, in particular, as a rectifier of noise."[64] As with analogical relations, "[e]ach system level…would depend upon those situated 'upstream' from it."[65] In fact, Brown and Stenner point out, a new system "is always the old system in a new

circumstance."[66] Complexity in a parasitical cascade, as in analogical relations, must be achieved in stages between which resemblance must be maintained.

Maria L. Assad recognizes a problem with Serres's cascade (a problem which, according to Assad, Serres himself addresses in his subsequent work, *Genesis* (1982)). For Assad, this process represents one "by which the excluded third insinuates him/it-self into a given system only to become, in turn, the system per se… the excluded/now-included is exposed to or threatened by a larger and mightier parasite who will repeat exactly the same steps."[67] There can be no reciprocal exchange between systems, exploitative or otherwise. One system will always be exploited by the next emerging system which, in turn, will be exploited by the next. "[A]s a model, the parasite tends to be exploited at higher and higher levels of complexity" Assad explains, "but is incapable of representing a different level."[68] If Serres's parasitical noise seeks to truly interrupt the host/guest binary, and to avoid the sacrifice of agency characteristic of Maturana and Varela's model, a new model needs to be found.

The complexity of Hayles's digital subject does not depend on a model of internal resemblance but instead on hierarchical levels of code in which the codes at the deepest levels bear little if any resemblance to those at the surface. In this way, "the structures governing the relation of surface to interior differ dramatically from the analog subject."[69] A useful analogy is that of the technique of pointillism in art (similar methods are used for image creation by some printers and televisions). From a distance, these works of art appear as coherent images; but the closer the viewer gets to the painting, the more it breaks down into more chaotic collections of colored dots. In a similar manner, the coherence of the digital subject emerges from deep levels of code that are "less intuitive" and "more obscure."[70]

Hayles further defines the digital subject as one which "instantiates hierarchical coding levels that operate through a dynamic of fragmentation and recombination."[71] Such coding that is not reliant on a model of internal resemblance is free to engage in more radical fragmentation and, thus, more substantial change. This definition recalls Serres's description of the parasite-as-noise: "The noise is a joker. It has at least two values, like the third man: a value of destruction and a value of construction."[72] However, in the case of the digital subject, the goal of restructuring is not to return to a previous state of equilibrium but to establish a unique system, in Assad's terms, "a different level." This alternative outcome opens the digital subject to more significant interaction with its environment. Clough and Halley observe, "This move away from privileging homeostasis to thinking evolution in terms of information, complexity, and open systems under far-from-equilibrium conditions of metastability undoes the opposition between the organism and the environment, as well as the opposition between the organic and the nonorganic."[73] As oppositions and binary divisions breakdown, greater possibilities for reciprocal influence and exchange emerge.

The digital subject thus adds a further dimension to the potential for agency within its technologized environment. Hayles explains, "Unlike analog subjectivity, where morphological resemblance imposes constraints on how much the relevant units can be broken up, the digital subject allows for and indeed demands more drastic fragmentation."[74] The more the elements of the digital subject can be fragmented, the more possible permutations of reordering can be achieved. And, as Longo observes, "We are immersed in a world with which we interact, and such interactions modify both the structure of the world and ourselves."[75] The digital subject can, thus, exercise greater influence on its environment through more effectively adapting itself to changes in the environment.

Recall that Serres's notion of parasitism amounts to a form of communication, a reciprocal exchange of information between subjects or between a subject and its environment. Not only are interactions with digital technologies increasingly prevalent in the lives of many human subjects, but communications between humans are increasingly mediated through digital technologies. Consider that the text of this article was created and edited on a computer using word processing software (not to mention transmitted to editors and formatted for print using digital means). While, on the surface, this printed text may very closely resemble the analog texts of the past, at its deepest levels it is code. This article is itself a digital technology, perhaps even being read on the screen of a computer. And this is only one of the myriad ways in which human subjects interact with and through digital technologies.

Finding ourselves in relation to such digital technologies, and the social systems that emerge from them, we parasites must adapt. Hayles argues, "When we inscribe ourselves as actors in these distributed cognitive environments, we become neither the interiorized analog subject of print culture nor the binary code of the digital subject; rather, we become a hybrid entity whose distinctive properties emerge through our interactions with other cognizers within the environment."[76] This hybrid of the analog and the digital subject amounts to a digital parasite: a subject that combines the parasite's ability to shift functions within social and biological systems with the digital subject's increased capacity for drastic fragmentation and recombination. The digital parasite makes for a more ideal subject for an environment in which rapid technological advances necessitate a capacity for equally rapid adaptation and, at times, radical change.

Much of the anxiety surrounding the state of subjectivity in the last two or three decades arises from the fear that humans will not be able to adapt quickly enough to advances in technology and that eventually humans will lose control, will be run by the technologies we create. Certainly, the environment formed by digital technologies impacts and changes the human subject and will continue to do so; but the subject as digital parasite is no helpless victim of its technologized environment. As humans interact, as they shift parasitical functions within the environment, they create noise and interrupt the flow of information. In disrupting the order of the system, digital parasites create the very fragmentation that presumably puts the contemporary subject in jeopardy.

However, this fragmentation is essential to the subjectivity of digital parasites. Like Serres's parasite, the digital subject depends on the fragmentation of order for its complexity and growth: "In fact," according to Hayles, "emergence depends on such fragmentation, for it is only when the programs are broken into small pieces and recombined that unexpected adaptive behaviors arise."[77] Or, as Serres writes, "The bit of noise, the small random element, transforms one system or one order into another. To reduce this otherness to contradiction is to reduce everything to violence and war."[78] Fragmentation, then, allows the subject to engage with, to interface with, its environment—be it in the form of technology or of another subject mediated by technology—rather than to divide from and conflict with the environment.

The fragmentations enacted by the digital parasite introduce alterity into the larger social system in the form of noise. And this noise creates the possibility of difference and of self-determination. "The noise, through its presence and absence, the intermittence of the signal, produces the new system, that is to say, oscillation."[79] Fragmentation initiates change from within by disrupting the subject to the point at which it collapses into a new configuration. For both Hayles and Serres, this noisemaking, digital parasite enables an alternative autopoiesis to that theorized by Maturana and Varela. Autopoiesis is no longer based on disturbances initiated through the "structural coupling" of divided and self-enclosed subjects/systems, but instead on exchanges of information and of noise through the interfacing of subjects/systems capable of great adaptability and flexibility. In this conception of autopoiesis, "Boundaries are both permeable and meaningful; humans are distinct from intelligent machines even while the two are become increasingly intertwined."[80] Through processes of constant reintegration and reconfiguration, the subjects that comprise the social system, and that live and interact within the technologized environment, avoid both the death of stasis and that of disintegration.

The disintegration of the human subject in postmodernity presupposes a divide between humanity and its technologized environment, a divide which places human subjects in conflict with technologies that threaten to eventually dominate and transform humanity. Many fear that, as Kurzweil predicts, in the future "the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed."[81] However, this transformation need not be a question of subsumption, and the relationship between humans and the technologized environment need not be one of conflict. The interrelations and interactions of humans and technology may be an important element in human evolution; and, in fact, may have always been so. The concepts of Serres and Hayles offer a way to reintegrate the presumably disintegrated postmodern subject by interfacing with and parasiting the technologies that comprise the contemporary social landscape. The relationship becomes, not one of conflict and division, but of reciprocal exchange.

The human subject can be re-imagined in terms of the digital parasite. Not a self-contained entity merely exploiting or being exploited by other parasites and by its environment, but a decentered and hybrid being capable of embracing and even influencing its own transformations. Kenneth Gergen observes: "Certainty of self operates as a rigidifying influence, the sense of an autonomous center denies the forms of interdependence that render 'being' possible. […] It is when one moves in a state of ambiguous multiplicity that realization of relational being is most fully realized."[82] And Serres echoes the need such for multiplicity and permutation, writing, "If I had to tell it again, the doubles and oppositions would disappear in favor of the plural and transformations."[83] Likewise, theorists such as Hayles and Wolfe recognize that the decentering of the human subject does not entail its complete disintegration or its subordination, but allows new possibilities for human agency and autonomy in a world of rapid and continual change. Wolfe reminds us that "the very thing that separates us from the world connects us to the world."[84] This connection to the technologized environment that our world has become requires a new model that allows us to reassess the roles of autonomy and agency in posthuman subjectivity. Through its composite of concepts drawn from Michel Serres and N. Katherine Hayles, the digital parasite might provide such a model.

Endnotes

[1] Michel Serres, *The Parasite*, trans. Lawrence R. Schehr (Minneapolis: University of Minnesota Press, 2007), 14.

[2] Albert Bandura, "Social Cognitive Theory: An Agentic Perspective," *Annual Review of Psychology* 52 (2001): 14.

[3] Ibid., 15.

[4] Ibid., 10.

[5] Ibid., 22.

[6] Ibid. 17.

[7] Ibid., 5.

[8] Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology,* (New York: Viking, 2005), 8

[9] Guiseppe O. Longo, "Body and Technology: Continuity or Discontinuity?," *Mediating the Human Body: Technology, Communication, and Fashion*, eds. Leopoldina Fortunati, James E. Katz, and Raimonda Riccini (New Jersey: Lawrence Erlbaum Associates, Publishers, 2003), 23.

[10] Ibid., 23.

[11] See, for example, Fukuyama's *Our Posthuman Future: Consequences of the Biotechnology Revolution* and Joy's "Why the Future Doesn't Need Us."

[12] Theodore Kaczynski qtd. in Bill Joy, "Why the Future Doesn't Need Us," *Wired* 8:4 (April 2000): par. 7, accessed 6 June 2011, http://www.wired.com/wired/archive/8.04/joy_pr.html.

[13] Ibid., par. 9.

[14] Ibid., par. 8.

[15] Ibid., par. 9.

[16] Joy, "Why the Future Doesn't Need Us," par. 12.

[17] Tomás Maldonado, "The Body: Artificialization andTransparency," *Mediating the Human Body: Technology, Communication, and Fashion*, eds. Leopoldina Fortunati, James E. Katz, and Raimonda Riccini (New Jersey: Lawrence Erlbaum Associates, Publishers, 2003), 16.

[18] Longo, "Body and Technology," 25.

[19] Albert Bandura, Growing Primacy of Human Agency in Adaptation and Change in the Electronic Era, *European Psychologist* 7:1 (March 2002): 3.

[20] Longo, "Body and Technology," 26.

[21] Ibid., 17.

[22] Zerzan, "The Catastrophe of Postmodernism," *Primitivism.com* (March 1994), par. 19, accessed 2 April 2009, http://www.primitivism.com/postmodernism.htm.

[23] N. Katherine Hayles, *My Mother Was a Computer: Digital Subjects and Literary Texts* (Chicago: University of Chicago Press, 2005), 175.

[24] Cary Wolfe, "Bring the Noise: *The Parasite* and the Multiple Genealogies of Posthumanism," *The Parasite* (Minneapolis: University of Minnesota Press, 2007), xxv.

[25] See Maria L. Assad's *Reading with Michel Serres: An Encounter with Time* for detailed discussion of the influence of the concept of the parasite on Serres's subsequent works, particularly *Genesis*.

[26] Wolfe, "Bring the Noise," xi.

[27] Serres, *The Parasite*, 5.

[28] Ibid., 10.

[29] Steven D. Brown and Paul Stenner, *Psychology Without Foundations: History, Philosophy and Psychosocial Theory* (Los Angeles: Sage, 2009), 38.

[30] Serres, *The Parasite*, 11.

[31] Ibid., 11.

[32] Ibid., 5.

[33] Wolfe, "Bring the Noise," xiii. It should be noted that the three definitions do not represent stages in the development of parasitic relations, rather all three are always, and simultaneously, present in parasitic relations.

[34] Brown and Stenner, *Psychology Without Foundation*, 48.

[35] Wolfe, "Bring the Noise," xiii.

[36] Serres, *The Parasite*, 8.

[37] Ibid., 30.

[38] Ibid., 36.

[39] Ibid., 63.

[40] Derek J. Smith, "Negative vs. Positive Feedback," *Basics of Cybernetics* (March 28, 2003), par. 9, accessed January 2, 2008, http://www.smithsrisca.demon.co.uk/cybernetics.html.

[41] Cay Wolfe, *What Is Posthumanism?* (Minneapolis: University of Minnesota Press, 2010), 111.

[42] N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics* (Chicago: The University of Chicago Press, 1999), 10-11.

[43] Clough and Halley, *The Affective Turn*, 11.

[44] Wolfe, *What Is Posthumanism*, 111.

[45] Hayles, *How We Became Posthuman*, 148.

[46] Ibid., 158.

[47] Serres, *The Parasite*, 23.

[48] Brown and Stenner, *Psychology Without Foundation*, 49.

[49] Wolfe, "Bring the Noise," xiii.

[50] Smith, "Negative vs. Positive Feedback," par. 9.

[51] Serres, *The Parasite*, 127.

[52] Ibid., 19.

[53] Ibid., 8.

[54] Brown and Stenner, *Psychology Without Foundation*, 38.

[55] Hayles, *My Mother Was a Computer*, 211.

[56] Hayles, *How We Became Posthuman*, 13.

[57] Ibid., 196.

[58] Ibid., 6.

[59] Hayles, *My Mother Was a Computer*, 175.

[60] Ibid., 201.

[61] Ibid., 201.

[62] Brown and Stenner, *Psychology Without Foundation*, 50.

[63] Ibid., 50.

[64] Serres qtd. In Brown and Stenner, *Psychology Without Foundation*, 51.

[65] Brown and Stenner, *Psychology Without Foundation*, 52.

[66] Ibid., 50.

[67] Maria L. Assad, *Reading with Michel Serres: An Encounter with Time* (Albany: State University of New York Press, 1999), 21.

[68] Ibid., 20.

[69] Hayles, *My Mother Was a Computer*, 203.

[70] Ibid., 203.

[71] Ibid., 203.

[72] Serres, *The Parasite*, 67.

[73] Patricia Ticineto Clough and Jean O'Malley Halley, eds., *The Affective Turn: Theorizing the Social*. (Durham: Duke University Press, 2007), 12.

[74] Hayles, *My Mother Was a Computer*, 203.

[75] Longo, "Body and Technology," 26.

[76] Hayles, *My Mother Was a Computer*, 211.

[77] Ibid., 203.

[78] Serres, *The Parasite*, 21.

[79] Ibid., 52.

[80] Hayles, *My Mother Was a Computer*, 242.

[81] Kurzweil, *The Singularity Is Near,* 7.

[82] Kenneth J. Gergen, "Postmodern Culture and the Revisioning of Alienation," *Alienation, Ethnicity, and Postmodernism*, ed. Felix Geyer (Westport, Connecticut: Greenwood Press, 1996), 124.

[83] Serres, *The Parasite*, 21.

[84] Wolfe, "Bring the Noise," xxi

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