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The Posthuman as Complex Dynamical Personhood: A Reply to Hyun-Shik Jun

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In his article on "Posthuman Subjectivity and Singularity in the Nature-Culture Continuum" (2020), Hyun-Shik Jun examines Rosi Braidotti's posthuman subjectivity through the post-structuralist and philosophical perspectives of Jacques Derrida and Giorgio Agamben. Whereas the technocratic paradigm seems to have eradicated the subject, Braidotti attempts to reinscribe the subject in current posthuman cultural, political and social landscapes. Jun is sympathetic to Braidotti's work and aims to illuminate posthuman subjectivity as a dialectical and transversal phenomenon.

Braidotti "holds the nature-culture continuum as the starting point for her theory, seeking to distance herself from the social constructivist approach which, she claims, is constrained by a dualistic understanding of the world and hence an opposition between nature and culture" (Jun 2020, 1). Jun thinks that Braidotti's posthuman nature-culture continuum is in the right direction but lacks a sufficient dialectic in understanding subjectivity more coherently. Hence he looks to the Hegelian trajectory, one which does not see a dialectical reconciliation of opposites but a dialectical paradox, a sublation of contradictions between similarity and difference, yielding to an open-ended process of being without origin or closure.

Relying on Derrida's notion of différance and Agamben's *signator*, Jun states that "the posthuman subject should be understood as the deferred subject" (3); that is, the subject who never arrives at final subjectivity because engagement between nature and culture is a constant, indefinite and dialectical movement. Hence the posthuman subject is "neither the centered self-conscious being nor the decentered unconscious automaton of modernity. The posthuman subject emerges with a sort of ontological fold or gap wherein nature and culture meet" (4).

I am sympathetic to Jun's efforts to frame the posthuman in a conceptual dialectical metaphysics but I am not convinced by his approach to the posthuman, specifically because he strives to redefine subjectivity rather than reconceive personhood. The persistent tension between the posthuman and subjectivity impels me to look in a new direction. Rather than addressing the question of the posthuman from a postmodern philosophical perspective, I would like to examine the concept through the lens of complex dynamical systems. I think insights from science can alleviate the tension of the posthuman "subject" by reframing personhood as an emergent process of complex relationships.

Insights from Science

A discussion on personhood that begins with culture may easily dismiss the larger reality, that personhood is the outflow of evolution. The human person rises from evolution and, in turn, can reflect on evolution, a knowledge that redounds on the very processes that make knowledge possible. Knowledge is a function of evolutionary emergence; not the structures of the human mind alone but the dynamic structures of evolution. Whereas the modern knower exists in a world of phenomena, in an evolutionary paradigm knower and known are integrally related in the process of evolution; the knowing process emerges from evolution and in turn affects evolution. To adequately understand the human person is to understand the emergence of personhood in evolution. For the sake of this brief response, I want to

highlight two important features of evolution that redound on the discussion of personhood, namely, complex dynamical systems and the emergence of consciousness.

The discoveries of early 20th century physics, in particular, Einstein's theory of special relativity, showed that matter and energy are interconvertible. At fundamental levels of reality, matter exists in superimposed energy states marked by wave-particle duality. Interacting particles separated at a distance are seen to affect one another, a phenomenon known as quantum entanglement (Rosenblum and Knutter 2011, 3-11; Barad 2007, 247-53). Nature is not a machine, as Newton thought, but an undivided wholeness. Although the mechanisms of quantum mechanics are still hotly debated among scientists, there is a holism in nature that baffles scientists. Philosopher Jonathan Schaffer claims that the fundamental layer of reality is not made of particles or strings but the universe itself; a single, entangled quantum state, an entangled whole. Carl Friedrich von Weizsäcker states that quantum mechanics predicts a unique, single quantum reality (Päs 2019).

A relational holism was brought to light in the twentieth century through the work of David Bohm and Karl Pribam (among others) who speculated on wholeness in nature. They each developed theories to explain wholeness as a function of consciousness. Bohm recognized that the new features of quantum theory require that the entire universe be considered as an unbroken whole, with each element in that whole demonstrating properties that depend on the overall environment. Bohm (1980) wrote: "Thus, if all actions are in the form of discrete quanta, the interactions between the different entities (e.g. electrons) constitute a single structure of indivisible links, so that the entire universe has to be thought of as an unbroken whole" (175). He called this unbroken wholeness "implicate order" meaning that enfolding takes place in the movements of various universal fields, including electromagnetic fields, sound waves, and others (178).

Bohm's implicate order relates to another consequence of quantum physics, one that remains a controversial subject, namely, the relationship of mind and matter. Physicist Max Planck spoke of consciousness as fundamental to matter, that is, we cannot consider matter apart from consciousness. Erwin Schrödinger (2012), like Planck, thought that consciousness is integral to matter and always experienced in the singular; everything begins with consciousness (93-5). Astrophysicist James Jeans (1931) wrote: "The universe looks more like a great thought than a great machine. Mind no longer appears as an accident intruder into the realm of matter. . . . The quantum phenomena make it possible to propose that the background of the universe is mindlike" (138). These insights have led to what Gaylen Strawson (2016) calls, "the hard problem of matter," namely, we cannot talk about matter apart from consciousness. Since consciousness is fundamental to matter, everything seems to begin with consciousness. "Consciousness is not the fundamental mystery," Strawson writes, "matter is."

Complex Dynamical Systems

Quantum physics undergirds a second aspect of science that is relevant to the discussion of the posthuman, namely, the shift from closed systems to open systems. According to the second law of thermodynamics, there is a trend in physical phenomena from order disorder. Any isolated or "closed" physical system will proceed spontaneously in the direction of ever-increasing disorder (Capra 1997, 47). Since "closed" means "bounded," the entire world

machine should be running down and eventually grind to a halt. But evolution shows that the life is unfolding toward increasing unity and complexity. Ludwig von Bertalanffy took a bold step by saying that living organisms are open systems and feed on a continual flux of matter and energy from their environment: "The organism is not a static system closed to the outside and always containing the identical components; it is an open system … in which material continually enters from, and leaves into, the outside environment" (Capra 1997, 49). The discovery of open systems gave birth to complex dynamical systems and shed new light on relational nature. Boundaries between the system and its environment are porous, local and flexible so that a system's external relations are as critical to it as its internal ones.

Complexity refers to the quality of a thing based on the number of elements and the organization of the structures, which comprise it. Alicia Juarrero (2002) points out that autonomy and independence—the classical measures of identity—do not hold value in dynamical systems; "autonomy and independence are seen as values associated only with dead, isolated things" (98). Living organisms and their creations must instead be judged by their degree of resilience and thriving. Identity is integral to the system's potential to qualitatively evolve and self-organization is part of its ongoing identity (98). Robust resilience, which in large measure is a function of connectivity and interdependence, plays a significant role in the dynamic integrity and flourishing of systems. Interdependence replaces the emphasis on autonomy, which now comes to be equated with isolation; robust resilience replaces that of independence, which now comes to be associated with stasis and stagnation (98).

In complex dynamical systems survival is a function of resilience. Juarrero contends that the more interconnected a system is (both internally and externally), the more robust and resilient it will be. In this respect, the integrity and identity of a complex system is not based on its essence but is fundamentally related to its dynamical connectivity. The more numerous and diverse qualities a process displays, the more uniquely individuated it is; that is, the richer its internal and external relations, the more individuated is the system, and the more resilient and robust is the process (99).

Complex dynamical systems are environmentally robust when the system responds to the environment and the environment challenges the system. Cybernetics is the science of communication and control over an environment. It refers to a "circular causal" relationship whereby the systems' action generates some change in its environment, and the environmental change through feedback evokes a change in the system. Hence cybernetics approaches things not by asking what *a thing is* but "*what does it do?*" (Ashby 1956, 1-2). Complex Dynamical Systems therefore are opens systems in which feedback mechanisms of information undergird ongoing self-organization. In a sense, every self-organizing dynamical system generates a form of "life" adapted to its environment.

Nature is *Techne*

In his essay on "The Question Concerning Technology" (1993) Martin Heidegger described nature as a "standing reserve," the pluripotentiality of being itself. The prefix *techne* is the act [or art] of "bringing forth" from "nature" (383). Heidegger suggested that technology is a

"revealing that rules. . . a *challenging* which puts to nature the unreasonable demand that it supplies energy which can be extracted and stored as such" (383). This kind of unconcealment orders everything to stand by, to be ready at hand, to be rendered as a "standing-reserve." Nature does not exist as a "thing" but everything that exists is a standing-reserve to be set-upon. Techne is the intrinsic ability of "nature" to become "something" through connections that enhance informational flow. Techne undergirds nature's "plasticity" and speaks to the fact that nature is more flow than fixed and more dynamic than mechanistic.

Three aspects of nature lead me to suggest that what we call "artificial intelligence" is actually rooted in "nature," expressing the evolution of nature on a new level of mind:

1) information is part of "nature" on levels of physics, chemistry and biology;

2) mind is fundamental to matter, and

3) nature is porous, permeable and pluripotential.

The word information derives from the Latin i*nformare* (*in* + *formare*), which means "to give form, shape, or character to" something. Etymologically, it is understood to be the formative principle of something, or to imbue that something with a specific character or quality. Information can be generally defined as a code that undergirds "a correspondence between two independent worlds."

The biological world is replete with examples of information. The neurons in the brain, for example, are natural processors that work concurrently and without any centralized, global control. The immune system also operates as a highly evolved complex adaptive system that functions by means of highly distributed computations without any central control structure. Cell signaling works on elaborate pathways of information, as does the genetic code, which establishes a correspondence between DNA (the symbolic genes which store information) and proteins, the basic stuff of earth life. We can also think of animal communication mechanisms, such as the ant pheromone trails, and bird signals as information systems (Whitworth 2010). Information, therefore, is not a specifically human phenomenon but a physical phenomenon of nature.

Lynn Margulis, a renowned microbiologist who died in 2011, argued that the blurring of technology and biology isn't really all that new. She observed that the shells of clams and snails are a kind of technology dressed in biological clothing. Chip Waiter (2006) asks:

> Is there really that much difference between the vast skyscrapers we build or the malls in which we shop, even the cars we drive around, and the hull of a seed? Seeds and clam shells, which are not alive, hold in them a little bit of water and carbon and DNA, ready to replicate when the time is right, yet we don't distinguish them from the life they hold. Why should it be any different with office buildings, hospitals and space shuttles? Put another way, *we* may make a distinction between living things and the tools those things happen to create, but nature does not (https://www.kurzweilai.net/cyber-sapiens).

Nature does not distinguish between the clamshell and the clam, or the first flint knife and the human that made it. Rather nature is a social construct of multiple meanings so that neither the artifice (the knife) nor the organism (the human) alone is adequate by itself as a cultural root symbol. Rather, nature-culture is an informational matrix of relational wholeness. To distinguish them by placing boundaries around one or the other turns each one into an artifice.

From "Subjectivity" to "Dynamical Life System"

In his book, *The Lure of Machinic Life* (2008), John Johnston asks if the new biological-electronic hybridization of artificial intelligence or machinic life is an extension of "nature." He states, "our human capacity as toolmakers (*homo faber*) has also made us the vehicle and means of realization for new forms of machinic life" (12). His argument centers on the plasticity of nature as complex systems of information and cybernetics. He states that artificial intelligence is actually producing a new kind of entity or being which is at once technical object and simulated collective subject. He writes:

> Constituted of elements or agents that operate collectively as an emergent, self-organizing system, this new entity is not simply a prime instance of the theory of emergence, as its strictly scientific context suggests. It is also a form of artificial life that raises the possibility that terms like subject and object, physis and techne, the natural and the artificial, are now obsolete. What counts instead is the mechanism of emergence itself, whatever the provenance of its constitutive agents (13).

Katherine Hayles indicates that information, cybernetics and the rerouting of nature into new machinic life have given rise to the posthuman (Hayles 1999). If matter is a function of mind, and mind is a dimension of matter, then the extension of mind into new material substrates is also an extension of materiality into new levels of mind. Personal agency is reconfigured as distributed, interactive agential realism. Karen Barad uses the term "agential intra-action" indicating that what is pre-existing is relations from which relata (that which relates) emerge; that is, something does not first exist and then relate. Rather, relationships are formative of existence (Barad 2003, 815). Agential intra-action is expressive of complex dynamical systems. Machinic life as posthuman life means the distributed cognition of the emergent human correlates with the distributed cognitive system as a whole in which "thinking" is done by both human and nonhuman actors. Hence the subject's ability to conceptualize oneself as autonomous being exercising one's will through individual agency and choice gives way to "distributed" personhood where conscious agency is never fully in control.

The posthuman is a new type of relational person emerging in and through the embeddedness of mind in matter, whose boundaries undergo continuous construction and reconstruction. The body that "exists in space and time … defines the parameters within which the cogitating mind can arrive at 'certainties'" (Hayles 1999, 203). Embodied experience generates the deep and pervasive networks of metaphors and analogies by which we elaborate our understanding of the world. Hayles writes that within informatics "a

signifier on one level becomes a signified on the next-higher level" (31). Hence information technologies fundamentally alter the relation of signified to signifier, as Jun (2020) writes, "the human subject as a *signator* is located in the place of the signature" (4).

The complex dynamical system of embedded cognition undergirds the porous, fluidity of the posthuman. "When people begin using their bodies in significantly different ways, either because of technological innovations or other cultural shifts," Hayles states, "experiences of embodiment bubble up into language, affecting the metaphoric networks at play within culture" (206-07). Hence the posthuman means that conscious agency is vulnerable; openness, spontaneity and strange attractors may be better markers of personhood than agency. Barad speaks of "intra-action" and distinguishes it from "interaction." In Barad's (2003) view agency is not a center of action but a center of relationship; agency is not something one has but what one "is." Agency, therefore, is mutual, bilateral and thus consistent with the operations of complex dynamical systems (815).

Johnston (2003) suggests that the term "human" may come "to be understood less as the defining property of a species or individual and more as a value distributed throughout human-constructed environments, technologies, institutions and social collectivities" (7).

Theologian Paul Tillich (1963) described the human person as a multidimensional unity of life whereby the inorganic, organic and animal dimensions are integrated with conscious self-awareness, and the psychological and the spiritual dimensions (15). Similarly Philip Hefner (2000) offers a scientifically-nuanced understanding of personhood that calls for self-engagement: "To be a person is to engage in the struggle to center this vast array of conditioning material so as to form a coherent self, that is, the operational matrix of integrating processes of regulating, judging, perceiving, learning, remembering, thinking, planning and decision making" (73). Personhood is shaped by establishing or actualizing one's personhood in the world in which one exists, and world is established by the self-organization of personhood; world and person are two dimensions of the same reality.

To consider the human person as a complex dynamical system is to connote personhood as open, emergent and hybridizing, aspects of personhood that are subsumed or lost in the notion of "subject." Personhood is a constant engagement of a self-organizing (autopoietic) core of constitutive relationships, whereby the ongoing self-organization of relationships constitutes the dynamic ongoing process of "self" and "world." Personhood, therefore, is "the creative activity of life as it projects itself to the next instant" (Bruetau 2001, 142). To be a person is to be a creative dynamical center of world unfolding toward personalization.

A New Logic of Personhood

The posthuman is more than a transformation of the modern liberal subject into porous postmodern subjectivity. Rather it signals a new type of relational person emerging in and through the evolution of complex systems of consciousness and information. The metaphysical landscape has changed, and while Hegel's dialectic is attractive, a self-making dynamic wholeness may be more appropriate to describe the posthuman. A metaphysics of the whole does not annihilate the person; rather the person becomes person precisely in and through the whole; for the person *qua* person is the whole; in Derrida's (1988) words, "there is nothing outside text" (136).

Rather than speak of a nature-culture continuum it might be better to speak of a complexifying wholeness. As systems interact through computer technology, embodied mind becomes distributed across multiple terrains, yielding to hyperconnectivity and hyperpersonalization. The hyperconnectivity of the posthuman is hyerpersonalizing personhood. The difference of self is the union of self that makes difference possible. Personal identity is ongoing, constructive, intra-agential and self-organizing. Drawing on Barad's agential realism, knowing is a matter of intra-acting. The term "intra-acting" refers to acting reciprocally, a term consonant with cybernetic systems. Information forms an intra-acting process of personal formation and world formation; that is, person and world interact reciprocally. Shared information becomes an ontological performance of the world in its ongoing articulation and differential becoming. We are the world in its ongoing changes, reconfigurations, dynamics, production of meaning and entities (its ongoing intra-activity) and the world takes shape through our actions. Knowing and being, Barad (2007) claims, are mutually related: "We know because we are of the world. We are part of the world in its differential becoming" (76).

The posthuman is the person who *lives from the splice* or the interstitial spaces between what is and what is not, reciprocally related; in Derrida's view, the posthuman emerges in the space of différance. Melanie Swan describes a new logic of being in the middle, an idea proposed by Stéphane Lupasco in *The Principle of Antagonism and the Logic of Energy* (1951) and supported by Werner Heisenberg. Swan (2017) writes:

> It is a conceptual model that overcomes dualism and opens a frame that is complex and multi-dimensional, not merely one of binary elements and simple linear causality. We have now come to comprehend and address our world as one that is complex as opposed to basic, and formal tools that support this investigation are crucial … The Included Middle is a more robust model that has properties of both determinacy and indeterminacy, the universal and the particular, the part and the whole, and actuality and possibility. The Included Middle is a position of greater complexity and possibility for addressing any situation. Conceiving of a third space that holds two apparent contradictions of a problem is what the Included Middle might bring to contemporary challenges in consciousness, artificial intelligence, disease pathologies, and unified theories in physics and cosmology (https://www.edge.org/response-detail/27155).

To "live from the splice" reiterates Barad's notion that relata ontologize; we exist precisely in the spaces of what we are and what we are not, the spaces that draw us within and without to think, create, respond and imagine. The "what" of a person depends on the vitality of the splice.

The Triadic Logic of the Posthuman

Human personhood requires a new logic of relationships that provides a creative space of engagement. The logic of posthuman personhood is a logic of complexified relationships. As

Braidotti, Hayles and others point out, one lives not in a binary mode (*me* and *you*) but in the creative space of interrelatedness (me *and* you) so that relationships ontologize relata. One becomes a "self" within and beyond oneself, for the "self" is a complex dynamical system existing within a network of multiple complex dynamical systems. Hence the "self" is an ongoing construction, an open, autopoietic system, within the dynamic matrix of relationships. The self is both self-organizing and self-relating so that the center of consciousness (the "I") flows from constitutive relationships of shared existence; being is first a "we" before it is an "I." To be is to be in relationship, which is a presence of decentered being, that is, an ongoing process of dynamical life that exists in creative tension with present existence open to novelty. Persons are always emerging intrapersonally and co-constitutively. What is posited here is the appearance of becoming that is symbiotic, a hybridity of entities, a *tertium quid* that gives way to complexified being. Emmanuel Levinas employs triadic logic in his book *Otherwise Than Being* (1991) where he writes:

> It (triadic logic) is a relationship with a surplus always exterior to the totality, as though the objective totality did not fill out the true measure of being, as though another concept, the concept of infinity, were needed to express this transcendence with regard to the totality, non-encompassable within a totality and as primordial as totality (23).

In triadic logic a limit is where infinity overflows itself towards another and the limit must be included as part of the logic. Binary logic is a synchronized, totalized structure of relationality that cannot tolerate the ambiguity of the excluded middle. Triadic logic, however, is a progressive evolutionary process of learning—it is about *the narrative* of thinking. The limit in triadic logic is like a transcendental moment of *aufheben* in which a new particular pattern or thought is recognized as potentially iconic for a new general pattern or idea. The term Hegelian *aufheben*, which Jun alludes to, means "the process by which the conflict between two opposed or contrasting things or ideas is resolved by the emergence of a new idea, which both preserves and transcends them" (Rogers 2016).

In triadic logic, the intermediate complex mediates the relationship between the Same and the Other. The intermediate complex makes possible a process of return through which we can synchronize our interiorities and enter into mutuality. Through the intermediate complex, "I and other" become proximate. But this proximity is different from the relationship of contiguity that defines neighboring elements or "selves" in the classical worldview (ex. the 'tool model'); it is different from the (non) relationship that defines spatiality through the null point (binary logic.) This intermediate complex is not a synthesis but a mediating principle between the other two relational entities. Triadic logic posits that instead of paired opposites, we have the interplay of three energies that in turn creates a whole new realm of possibility.

Conclusion

The logic of the posthuman follows a different trajectory from the modern liberal subject because the parameters of the cognitive system it inhabits expands and is multidimensional. Personhood is an open system of distributed cognition whereby knowing and being known are ongoing negotiated terms. The human person is no longer the source from which emanates the mastery to dominate and control the environment but the co-creative

conscious constituent of open and dynamic complex wholeness. Our challenge is to recognize the transition from subjectivity to complex dynamical personhood, embedded personhood, and to realize, as Braidotti points out, that all systems must be renewed to accommodate the posthuman complexified whole.

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