

## *Humanistic Neuropsychology*

### The Implications of Neurophenomenology for Psychology

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For many, the notion of a humanistic neuroscience may seem to be an oxymoron. Neuroscience and physiological psychology emerged during the 18th century within the climate of a staunch materialistic worldview, which aimed to reduce all subjective qualities to objective qualities. Humanistic psychology, on the other hand, has always been grounded within a phenomenological worldview, in which the assumptions of empiricism, including the dichotomy of a subject versus an object, are questioned radically and in which experience is given priority in the investigation of reality (Bugental, 1964; Giorgi, 2005; Rogers, 1964). At first glance, these projects seem opposed. However, alongside reductionistic and mechanistic approaches to neuroscience, there have always existed alternative, nonreductive and holistic approaches to biology, which have sought to preserve the integrity of experience.

Rather than standing in opposition to biology, humanistic psychology, from the beginning, was strongly influenced by thinkers who were attempting to develop holistic approaches to biology and the mind—for example, Johann Wolfgang von Goethe, William James, John Dewey, Jakob Von Uexkull, Kurt Goldstein, and Maurice Merleau-Ponty, among others. Today, an integration and culmination of these approaches can be identified as neurophenomenology, which we identify as the basis for a genuinely humanistic neuroscience.

In his 1996 paper, “Neurophenomenology: A Methodological Remedy for the Hard Problem,” Francisco Varela pioneered the link between cognitive neuroscience and phenomenology. The aim of this project was to address what David Chalmers (1995) identified as the “hard problem” of consciousness. Chalmers first identified the “easy problems” of consciousness, such as how the brain can discriminate, categorize, and react to stimuli in the environment; integrate information within a cognitive system; report mental states; access its own internal states; focus attention; control behavior deliberately; and distinguish between wakefulness and sleep. Chalmers thought that it would only be a matter of time before

neuroscience answers these questions. The truly “hard problems” of consciousness, in contrast, have to do with why we experience anything in the first place. Hard-problem questions include the following: Why are some organisms subjects of experience? Why does awareness of sensory information exist at all? Why do qualia (i.e., a general property, such as “redness”) exist? Why is there a subjective component to experience? Note that these hard questions refuse to merely explain away consciousness by reducing it to simple mechanistic problems. The hard problem demands that consciousness be addressed on its own terms.

Consciousness itself is a problem that cannot be solved by explaining it away. Consciousness is in need of a functional explanation for why it exists in the first place. Neurophenomenology, as a science of experience grounded in phenomenological philosophy, is uniquely equipped to handle this very problem that neuroscience alone seems incapable of contending with. To this extent, neurophenomenology represents, today, the most well-developed philosophy for a humanistic neuroscience.

### NEUROSCIENCE AND THE EXPERIENTIAL REVOLUTION IN PSYCHOLOGY

At least since Galileo (1623/2008) made the distinction between the primary and secondary characteristics of objects, Western culture has had a tendency to conflate reality (what is ontologically and epistemologically valid) with mind independence (properties of objects believed to exist apart from a perceiver) (Robbins, 2006). Thus, the so-called primary characteristics of objects, such as the presumed qualities of extension and movement, have remained the domain of the sciences, whereas, the secondary characteristics, which are dependent on the observer,

such as color and value, have been understood to acquire scientific interest only to the extent that such qualities can be reduced to primary qualities, such as physiological events in the brain. A reduction of the psychological to biology and biology to chemistry and physics is the inevitable consequence of the Galilean worldview, which came to its fruition most explicitly in the philosophy of Locke (Zaw, 1976). This reductionism of psychology to biology and biology to chemistry and physics is, however, untenable.

When it comes to the problem of consciousness, reductionism is an inappropriate, internally incoherent strategy of resolution. The problem is a rather simple one. When we reduce consciousness to biology and then biology to chemistry and then physics, the explanation in terms of the primary qualities of physiological extension and movement in anatomical space still presupposes the existence of consciousness. Biology, chemistry and physics, and even the science of psychology and other social sciences, always already presuppose an individual and a collective consciousness within which knowledge and motivation for the study of physiology have meaning and being (Robbins, 2013; Thompson, 2007). Rather than arriving at given facts that are mind independent, science produces social artifacts that, over time, inspire our confidence because they have intersubjective validity. In other words, we ourselves and other people within the community can report over time that discoveries can be predicted and repeated through systematic methodological approaches to clearly stated and empirical questions. But without conscious individuals living within scientific communities, such discoveries would not be possible. Therefore, consciousness has ontological primacy within philosophy and science as the always already presupposed appearance of a world that matters and for which we have care and concern. A completely indifferent science alien to human

concerns would never get started. Therefore, a science that rejects the ontological primacy of consciousness will consequently undermine its own foundation—its very reason for being. Clearly, this is a major problem for biological reductionism within neuroscience.

Phenomenology within the tradition of Edmund Husserl, Martin Heidegger, Maurice Merleau-Ponty, and others provides a potential answer to the problem of consciousness and is a possible antidote to the quagmire of reductionism in the sciences. Phenomenology introduces an approach to philosophy and to human science that is able to articulate, in ways impossible to the conventional empirical sciences, the ontological ground on which science operates. Doing so, phenomenology is able to preserve both consciousness and science. Neurophenomenology is the integration of phenomenology and neuroscience in such a way that the science of the brain can help clarify questions about consciousness and experience without reducing consciousness or experience to the brain or the living organism to mere (cause and effect) mechanical causation. The upshot is a neuroscience, within the context of phenomenology, that attempts to transcend the faulty subject/object, fact/value, and feeling/thinking dichotomies that have plagued philosophy and the sciences for centuries. This is an ambitious project, and so humility is important. These problems have not been solved, but new kinds of questions provide the hope of better answers to them.

Psychology has much to benefit from this conception of neurophenomenology. Psychology has notoriously been subject to criticism for its failure to live up to the rigors of the so-called STEM (i.e., science, technology, engineering, and mathematics) disciplines. On the other hand, psychology identifies itself as a science to distinguish itself from philosophy and other humanities, and for this reason, it places a strong emphasis on empirical research as a central and defining

activity of the field. Neurophenomenology and phenomenology, more generally, hold a promise of clarifying psychology's relationship to philosophy and the STEM disciplines. Psychology, within this perspective, would be distinguished from the transcendental phenomenology that is central to phenomenological philosophy, because psychology's activity in contrast would be empirical. However, neither would psychology be capable of being reduced to biology, because psychology's domain is human consciousness—experience, thinking, and feeling—which must be described, understood, and explained empirically on its own terms prior to any question of biological correlation to these events of consciousness. Psychology, therefore, would be preserved as the descriptive and empirical examination of human experience and correlated behavior. This articulation of psychology would be the fruition of an experiential revolution in psychology, which does not stop at cognition and emotion as the domain of psychology but understands cognition and emotion to have their ontological basis within human experience (Robbins, 2013). The language of thinking and emotion has its roots in human experience, from which our language has emerged. By returning to the everyday consciousness within which everyday language about thinking, emotion, and experience has meaning, psychology may clarify its identity as a science in its own right, as clearly distinguished from yet integrally related to philosophy and biology.

## HISTORICAL ROOTS OF NEUROPHENOMENOLOGY

### *Goethean Science Versus Newtonian-Galilean Science*

While the dawning Galilean-Newtonian “scientistic” worldview painted a picture of a universe devoid of qualities other than

extension and movement, and while, as John Keats lamented, this new science reduced the rainbow and other awe-inspiring spectacles of nature to objects within a “dull catalog” of common things, Johann Wolfgang von Goethe was hard at work developing a serious alternative scientific worldview. Goethe, who is now primarily remembered as a poet, dramatist, and novelist, fancied his primary occupation to be that of a scientist; yet as a critic of the cultural hero Newton, he was seen mainly as a failed scientist during his own time. Living in the age of post-Newtonian physics, we can return to Goethe and recognize that he was actually a man ahead of his time, who anticipated the problems of reductionism and had already developed methods for a more holistic alternative (Robbins, 2006).

Goethe’s “delicate empiricism,” as he called it, was a participatory, morally responsive, holistic, and dynamic approach to understanding the natural world (Robbins, 2006), and these are qualities shared with neurophenomenology (Robbins, 2005; Thompson, 2007). Like the phenomenological approach that Goethe would inspire in Husserl (see Simms, 2005), the scientist is meant to absorb himself or herself into a careful, open, and empathic engagement with the phenomenon of interest, whether that be a plant, animal, person, or land formation. For example, Goethe and those scientists inspired by him spent many hours sitting with and drawing a creature by hand, with the intent to become intimately familiar with the form of the organism not only as it appears in one moment but also as it transforms over time. To bask in the “exact sensorial imagination” of the organism in its natural environment, argued Goethe, was a necessary step toward identifying the essential structure of the organism—its most primal meaning or “Ur-phenomenon” (Amrine & Zucker, 1987).

Goethe’s participatory science, quite similar to phenomenology, has four phases:

(1) exact sense perception, (2) exact sensorial imagination, (3) seeing is beholding, and (4) being one with the object (Brook, 1998). At first, the scientist attempts to bracket out presuppositions that would impose themselves on the phenomenon, and then the imagination is utilized to catch site of the morphology of the organism as it unfolds over time and across profiles or adumbrations. At a certain point, the scientist has a sense of having saturated all the given profiles of the organism, and beholding this holistic vision within the imagination, the scientist arrives at the primal or archetypal form or essence of the organism’s being. This kind of sensitivity to living organisms is morally responsive because it is thinking *with* the organism rather than merely thinking *about* the organism (Robbins, 2006; Shotter, 2000). In a sense, it is to witness the organism as an end in itself rather than merely as a means to our own end—and in that Kantian deontological sense, it is an ethical kind of relatedness to creatures and the natural world.

As an ethical stance in relation to the natural world and as a nonreductive approach that retains within its sensorial perception the value of the being that is encountered, Goethean science is holistic. Neither subject and object nor fact and value are seen to be ultimately distinguishable, but rather, they are viewed as being integrally related (Robbins, 2006). Values appear in perception, according to this view, as following a “law of requiredness,” which can be understood as a directionality by which the phenomenon moves in our perception toward a fulfillment of meaning (Fuller, 1990). This movement of the organism was identified by Goethe as the organism’s morphology—a description of the unfolding of the organism developmentally over time and within its context. Humanistic psychologists would later identify this process as “self-actualization,” inspired by Kurt Goldstein’s (1939) appropriation of this Goethean tradition of holistic natural science

(see below). Neurophenomenology as well as humanistic psychology both share a vision of science that is Goethean in spirit: participatory, morally responsive or ethical, holistic, and dynamic.

### *William James, John Dewey, and Functionalism*

The pragmatists, including William James and John Dewey, also anticipated neurophenomenology, each in his own way (Taylor, 2010, 2013). James and Dewey were both critical of the structuralist paradigm of psychology that Titchener and others imported from Wilhelm Wundt's laboratory in Germany. In contrast to a static view of consciousness and the organism, James's functionalism saw the organism as integrally related to the environment, such that aspects of the organism were to be understood, in the Darwinian sense, as serving survival-related, adaptive functions. James (1890b) famously described consciousness as having a streamlike quality that was ever changing rather than static, and thereby inherently resistant to reductionist explanations. Yet, as with Goethean science and phenomenology, he also adhered to the view that consciousness is deeply rooted in the body, to the extent that he viewed emotions as felt embodied tendencies toward actions in the world, which are only labeled after the fact as an "emotion" by the intellect (James, 1884). For James, consciousness was clearly embodied, but embodied in a way that is lived from a first-person perspective of a being (Taylor, 1981, 1996).

Dewey, also a functionalist after James, leaned in the direction of a holistic view of the organism. For example, in his now famous article, "The Reflex Arc Concept in Psychology," Dewey (1896) refuted the standard view that the reflex arc was thought to involve stimulus, sensation, and response related to one another in a linear, cause-and-

effect chain of events. In contrast, Dewey interpreted the reflex arc as occurring holistically, such that the circuit must be understood as a unit that is responsive to situations rather than merely as a reaction to decontextualized stimuli.

Both neurophenomenology and humanistic psychology share with functionalism a concern for the dynamic unfolding of perception and embodied being-in-the-world understood holistically. Like functionalism, neurophenomenology and humanistic psychology also share an interest in the practical applications of these ideas for real-world problems, such as in education, medicine, and psychotherapy.

### *Jakob Von Uexkull*

Jakob Von Uexkull was a German biologist in the early 20th century who, inspired by Goethe's holistic approach to science, developed a more humane approach to the study of life. Anticipating humanistic psychology's critique of mechanistic and reductionist approaches to life, Von Uexkull emphasized the place of "meaning" or "significance" in all forms of life. In his book *The Theory of Meaning*, he argued that "life can only be understood when one has acknowledged the importance of meaning" (cited in Buchanan, 2008, p. 12).

In the tradition of Kant, Von Uexkull emphasized methods of inquiry into subjectivity, not only of human beings but of all living organisms. He understood living beings to share qualities of being self-developmental and autonomous (Buchanan, 2008). As described by Goethe as well as Von Uexkull, the plant and the animal are morphological, dynamic organisms that unfold according to an inner logic quite unlike the nonliving machine, which operates according to a linear cause-and-effect chain of events. Each organism, in this sense, has self-governing laws that give it a sense of directionality in perception,

by which value comes into being. In fact, Von Uexkull went so far as to argue that it was not the metaphysics of a mechanistic, Newtonian universe within which we live—he saw this as a fiction—but, rather, that “we must abandon our fond belief in an absolute, material world, with its eternal natural laws, and admit that it is the laws of our subject” that constitute the world as meaningful (cited in Buchanan, 2008, p. 15).

Within Von Uexkull’s ontology, his understanding of life opens up possibilities that are closed off to a reductive and mechanistic biology. The aim of his work becomes not one of breaking down objective organisms into component parts but rather of viewing each organism as a subject “whose essential activity consists of perceiving and acting” (Buchanan, 2008, p. 2). To understand the subjectivity of the organism meant to study the *Merkwelt*, or perceptual world, as well as the *Wirkwelt*, or active world, of the organism, and taken together, these interactive perceptual and active worlds constitute the *Umwelt*, the lived world of the animal. It is this very same *Umwelt* that is the subject both of neurophenomenology and of humanistic psychology.

### ***Kurt Goldstein***

Holistic, nonreductive biology was directly applied to human beings in the neuroscientific theory of Kurt Goldstein. His book *The Organism* (1939) provided the foundation for what would later culminate into “dynamic systems theory.” He also coined the term *self-actualization*, which would be incorporated by the third force to describe the autonomous, self-directed movement of human existence (Kriz, 2007). In a line of argument similar to Dewey’s theory of the reflex arc, Goldstein argued that external stimuli do not affect the organism in a simple chain of cause-and-effect reactions between stimuli and response. Rather, external forces create perturbances in

the complex system of an organism, which reacts in a holistic and nondetermined way to lifeworld encounters with others and things (cf. Dubos, 1959; Eblen, 1994; Lust, 2006). This view of the organism is consistent with the views of humanistic psychology and contemporary neurophenomenology.

### ***Maurice Merleau-Ponty***

Maurice Merleau-Ponty is best known for his phenomenological work on the body. However, his first major text, his dissertation, was on the development of a holistic and naturalistic approach to understanding life and the emergence of human consciousness from more primitive life-forms. In his book *The Structure of Behavior*, Merleau-Ponty (1947/1983) was also critical of mechanistic and reductionistic approaches to life, which by reducing meaning to linear cause-and-effects chains of events create what he called an “explanatory gap” between our experience of consciousness and our conceptions of the natural world.

To bridge the explanatory gap between consciousness and the natural world, Merleau-Ponty developed the concept of behavior as a form of comportment. By this, he meant that behavior has a certain structure in which the parts of the organism emerge together in a system of relations in which the whole is greater than the sum of those parts. To break down these structures into more simple parts would mean to lose the structure and therefore to fundamentally mistake the part for the whole. Instead, Merleau-Ponty held that the parts and the whole are mutually determined dialectically. Thus, when an outside event has an impact on the organism, this does not set off a predictable set of events but is better conceived as an occasion upon which the whole organism responds to a meaningful environmental situation.

Merleau-Ponty thought that ontologically the universe was stratified into three levels

of order or structure: (1) the physical order, (2) the vital order, and (3) the human order. Within the physical order, structures such as a soap bubble represent units of form that maintain their structure through a kind of circular causality, which holds them together across time and space. Within the vital order, we see the first instances of life, such as the living cell, which maintains its own form through various chemical processes, interacts constantly with its environment, and, in relation to those environments, sets up certain “norms” by which it seeks optimal conditions to meet its ongoing need for survival. Within the human order, argued Merleau-Ponty, we see the first examples of a truly symbolic order, where one thing, for example, can represent a variety of meanings. The emergence into symbolic existence with the dawn of human beings creates the potential for multiple stabilities of meaning and, most exemplary of this, language.

### *Denial of Death in Modern Medicine*

While nonreductive, holistic, and humanistic approaches to nature and embodied consciousness have been readily available and are waiting in the wings to replace the outdated and highly flawed Newtonian, Galilean, and Cartesian worldview, one has to wonder why the more attractive humanistic alternative worldview—shared by neurophenomenology—has often failed to gain the upper hand. According to one line of research by Robbins (2012; Robbins, Tomaka, Innus, Patterson, & Styn, 2009), mechanistic approaches to the body and nature may serve as a defense mechanism to protect scientists and physicians from their encounter with existential death.

In a qualitative study of medical students working with cadavers in a gross human anatomy course, students described intense anxiety as they anticipated dissection of the body of the cadaver (Robbins et al., 2009). As

would be predicted by Ernest Becker (1973) and terror management theory (Greenberg et al., 1990; Rosenblatt, Greenberg, Solomon, Psyszczynski, & Lyon, 1989), the encounter resulted in a psychological confrontation with their own mortality in ways many students had never before experienced and which was felt as threatening. The body was perceived as an ambiguous body that could be approached either as a fascinating machine for dissection—in other words a typical cadaver—or as a memorial body that housed memories of a former life with loved ones still alive and mourning the person's death. The great majority of students could not cope with this ambiguity. As a result, either they resorted to outright denial of the personhood of the body or they actively repressed the personhood of the cadaver to carry on with the task of dissection. Those students who engaged in active denial or repression seemed more prone to reductive approaches to the body, and they may go on to approach their patients in a similar, mechanistic way. Arguably, such an approach to the body might help budding physicians temporarily cope with their own anxiety about death, but at what cost? Fortunately, there were a minority of students—just a few—who were able to carry on an integrated relationship with the body. They dissected the body and explored the materiality of the body, but while doing so, they never lost sight of the fact that this body they were examining was also a person and was a memorial to that person's life. Such an integrated, holistic approach to the body seemed to be a less defensive and more authentic encounter with the body. Indeed, Abraham Maslow (1966) noted similar problems with his instructor's distancing himself from death during his early medical training.

Based on the above research, it may be said that physicians and biologists need more formal training to develop less defensive and more integrated and holistic approaches to

embodiment, which promise to aid these students by helping them to more authentically encounter their own mortality. The denial of the personhood of a cadaver is a distortion of reality and threatens to fixate the researcher on a reductive, mechanistic view of the body as a way of avoiding the obvious quality of the body as a memorial of a person who is deceased. Yet a more integrated and holistic view of the body permits body and soul to be viewed together and allows one to encounter death and loss in a more direct, authentic, and existentially healthy manner. The upside of this encounter may be a more vibrant and centered experience of living in one's own body and also the development of less inhibited and more humane ways of relating to others, including patients. This possibility seems to require revisiting what is at stake in the encounter with death: the self.

### THE NEUROPHENOMENOLOGICAL SELF

What is self: psyche, soul, mind, consciousness? Self is closely tied to embodied existence and yet transcends it. Embodiment is the bodily aspects of human openness to the world, the presence of our flesh as a necessary precondition for the experience of emotion, language, thought, and social interaction. It is our kinesthetic awareness of the body as the vehicle through which we experience the sensory-motor, perceptual, and nonconceptual lived world. This is not a cognitive understanding of the self in the world but a proprioceptive, nonconceptual awareness that is tacit, prereflective, and intersubjective. Questions concerning the existential status of the self ranging from the phenomenological to the metaphysical are based on a long history of theoretical inquiry about human nature and the nature of the self across a number of disciplines, including philosophy, psychology, psychiatry, and neuroscience. This

discussion of the neurophenomenological self follows from the work of Francisco Varela and colleagues on enactive cognition and the embodied mind in neurophenomenology, which has fostered renewed interest in rethinking mind–body dualism; Buddhist conceptions of no-self, which have raised questions about whether the self actually exists; and existential-humanistic theories on human growth and development. What is the neurophenomenological self, and what are its implications for humanistic psychology?

From 1940 to 1970, humanistic psychology pioneered the emergence of a person-centered, growth-oriented existential psychology of the whole person. Figures such as William James, Abraham Maslow, Carl Rogers, Rollo May, Gordon Allport, Lois and Gardner Murphy, Paul Tillich, Karen Horney, Erik Erickson, Carl Jung, Erich Fromm, Jean-Paul Sartre, Martin Buber, Charlotte Bühler, Viktor Frankl, and others focused their writings on the self that is directly experienced, on the actualization of potential, on the striving toward health as intrinsic to human motivation, and on existential themes inherent to interior exploration and self-realization. Their vision went beyond the measurement of behavior to embrace a wider view of personality than mainstream trait theories because they acknowledged a growth-oriented dimension of the person or what is referred to as the *neurophenomenological self*. This construct depicts an embodied “sense of self” rather than a mental representation. Human subjectivity, embodied as felt sense or consciousness of self, can be described as a multidimensional stream of thoughts, perceptions, imaginations, representations, memories, and emotions associated with autopoietic or self-produced global states within the brain and body that are based on the perception of the observer and his or her ability to find meaning and significance in experience (Gordon, 2009, in press-b).

This growth-oriented dimension of the person or the neurophenomenological self is

articulated in the works of the humanistic psychologists Bühler, Maslow, and Jung (Gordon, 2013). Bühler (1968) posited that healthy personalities were active mediators of their own existence, motivated to maintain homeostasis—that is, change and growth to fulfill biological and psycho-emotional needs and spiritual values. Maslow (1967/1971) posited that metamotivation and the value life (spiritual, religious, philosophical, transcendent, and axiological) are rooted in the biological nature of the species. In self-actualizing people, this embodied, psychological self becomes larger than its biological entity through identification with the higher self, the highest values, the no-self, and nature. Likewise, Jung (1946/1971) portrayed the adult as an eternal child who is always becoming, never complete, whose conscious realization or self-actualization through individuation is the aim of human development in the second half of life. The process of individuation through active exploration of the unconscious uncovered and facilitated the person's potential wholeness. If the unconscious can be recognized as a codetermining quantity with the conscious, the center of gravity of the personality shifts from the ego and becomes located in a hypothetical point between the conscious and the unconscious called the self.

### *The Self*

In reaction to psychoanalytic conceptions of the disembodied ego and cognitive-behavioral conceptions of the self as a social construct (i.e., a self-concept), the founders of the humanistic movement reenvisioned “the self” as a pure subject or “I” (Bugental, 1965), an actualizing tendency (Rogers, 1986), and a process of becoming (Allport, 1955). The work of William James in the late 1800s and early 1900s speaks to the core of this vision of the self as experiential.

James (1892/1961) saw the mind and body as a fluid, integrated whole prior to the subject/object dichotomy and the self being

constituted through their interaction at the level of lived experience. He divided the self into an objectively known empirical ego—the *me*, which he further divided into its material, social, and spiritual aspects, and the subjective knower, pure ego, or the *I*. The spiritual *me* was “composed of the more active feeling states of consciousness; the core and nucleus of our self, a direct revelation of the living substance of the soul” (p. 43), while the *I* was “the agent, soul, transcendental ego, spirit; or thinker behind the passing state of consciousness lending unity to the passing of thought” (p. 63). According to James, the identity found by the “I” in its “me” was only a loosely construed thing or an identity “on the whole” (p. 72) that was divided into mutations of the self based on alterations of memory. For James, experience had no inner duplicity between subject and object. Thought was itself the thinker.

James described consciousness as a stream: a field with a focus and a margin (James, 1890b), a plurality of waking and subliminal states (James, 1902), and pure experience embodied in feeling and sensation (James, 1912). The underlying nature of consciousness or the self, he believed, is a unified field of pure experience with no content other than itself, where the processes of representation are fluctuations or qualified states of this underlying field (James, 1912). His conception of pure experience was as a feeling or sensation. Its “purity” was relative to the amount of un verbalized sensation that it still embodied (James, 1884, p. 94). In “The Hidden Self,” James (1890a) spoke about the existence of buried fragments of consciousness that solidify into a secondary or subconscious self to form subordinate selves. He believed that a comparative study of trance and subconscious states was of central importance to the comprehension of human nature (p. 373). Myers (1892, 1903/2001), likewise, proposed the concept of a *subliminal self* in which consciousness

is a spectrum of states ranging from the psychopathic to the transcendent, the waking rational state being only one among many. The subconscious or subliminal region was the doorway to transforming experience as it opened the entire range of states beyond the margin (Taylor, 1996).

Recent compendiums on the self by neurophenomenologists (Gallagher, 2011; Gallagher & Shear, 1999; Metzinger, 2003; Zahavi, 2005) include interdisciplinary research on conceptualizations of the self (e.g., minimal, hermeneutical, real, not real, existing, illusory, reduced, irreducible, embodied) and methodological approaches (e.g., introspection, phenomenology, linguistic analysis, empirical cognitive neuroscience, and developmental, ethical, social, and political analyses). The complexity of the self has been widely debated by theorists who represent the positions of analytic philosophy of the mind, phenomenology, psychiatry, pragmatism, neuroscience, feminism, Buddhism, and postmodernism. Topics range from bodily selves to the phenomenology and metaphysics of the self, personal identity, narrative, self knowledge, the moral dimensions of the self, self pathologies, and the social construction of the self.

In contrast, Siderits, Thompson, and Zahavi (2011) discuss the doctrine of the no-self or *anātman*, which is a rejection of the atman or enduring self as a type of self-reference, self-illumination, or “sense of self.” The no-self theorists (Joel Krueger, Miri Albahari, Georges Dreyfus, and Jonardon Ganeri) do not infer from the sense of self that the self really exists because they claim that it is not ontologically grounded but arises from the stream of consciousness. They believe instead that the “self is a useful fiction that helps to maintain the sense of agency and mobilize action-guided emotions” (p. 137). However, the self theorists (Dan Zahavi, Evan Thompson, Wolfgang Fasching, and Ram Prasad Chaturvedi)

speak of the self as the mode of givenness or the essential structure of consciousness that is prereflective, subjective, and self-revealed. They argue that a correspondence between conception and reality is required only if the sense of self is an epistemic state, which takes the self as its objective content. However, the self cannot be an object of itself. This is an important distinction. The self theorists offer no counterargument that defeats the Buddhist doctrine. Their characterization of the sense of self as “self-illuminating” captures this feature, which preconditions the sense of self that the no-self theorists focus on. Self-illumination is at the core of the neurophenomenological self.

### *The Sense of Self*

To revisit the origins of neurophenomenology and the enactive approach to cognition, in the early 1970s, biologists argued that the living cell, when conceptualized as an autopoietic or self-producing system, is the continual creation of itself. Varela (1979) defined the unity of autopoietic systems as organized networks of the processes of transformation and destruction through which the system continuously regenerates and realizes the processes or relations that produced it. Maturana and Varela (1980, 1987/1998; Maturana, Varela, & Uribe, 1974) adapted principles from cybernetics and dynamic systems theory to explain how structural change within a biological system defines its unity, identity, stability, and internal coherence. Autopoiesis sparked a new way of thinking about both the structural determinism of biological systems and the roots of human understanding.

The theory of autopoiesis called into question hypotheses regarding the unity of consciousness, atomism, empiricism, and representationalism that were of concern to philosophers of the classical modern era such as Rene Descartes, Leibniz, Immanuel Kant,

David Hume, Franz Condorcet Brentano, William James, and Charles Sanders Peirce. For example, the question for Kant (1781/2003) was determining the form that cognition should take to make the experience of the world possible. He found pure knowledge in a priori theoretical and deductive categories, and he claimed that only through representation could we know something as an object (phenomena), given that the law of causality, founded on mathematics, has its a priori basis in human understanding. In contrast, James (1890a) believed that a thing could not be known through its representation but must be directly experienced. The ground itself does not need to be structured before the mind splits experience into subject/object and other categories of interpreted experience (James, 1885).

With regard to representationalism, the central concern of the enactive approach has remained in contradistinction to the received view that perception is the truthful reconstruction of the physical world through a registering of environmental information. Knowledge is itself enacted. Varela, Thompson, and Rosch (1991) approached the problem of knowledge from a Buddhist perspective, arguing that there is no independent, fixed, or unitary self within the world of pure experience. There is, instead, a selflessness or egolessness, and a shifting stream of momentary mental occurrences that include the perceiver and the perceived (i.e., the Buddhists' five aggregates constitute a psychophysical complex comprising the person and each moment of his or her experience). They argued that while the self, as an emergent property or a process of these aggregates, is empty of self, it is full of experience. Meaning is not located in cognitive symbols or representations but is instead a function of the global state of the system's complex pattern of activity emerging from the interactions of its many constituents.

*Selfless Selves.* Given his enactive view of human knowledge, Varela (1992) called for a science of the "sense of self." He argued that biological cognition was not a representation of the world "out there" but, rather, an ongoing bringing forth of a world through the process of living itself. Thus, his theory of autopoiesis attempted to define the uniqueness of the emergence that produced life in its fundamental cellular form: That is, biochemical pathways of the cell and its membranes continuously regenerate through the internal production of substratum components, and biochemical states of the organism transform the state of activity of neural networks by acting on the neuron's membrane receptors. With no fixed point of reference, human beings, as autopoietic systems, regenerate, re-creating themselves by their own mutual interactions.

Varela's position remained situated in the context of what he saw as the irreducible nature of conscious experience. He studied phenomenal experience or embodiment as lived from the point of view of the subject's first-person experience associated with cognitive and mental events (attention, present-time consciousness, body image, volition, perceptual filling in, fringe, center, and emotion), which he posited represent an irreducible ontological level that retains its quality of immediacy because it plays a role in the organism's structural coherence. To Varela, consciousness was a distributed phenomenon of the whole active organism, not just the brain embedded in its environment. Rejecting the computational, logical views of the mind in favor of the embodied lived description of its processes, Varela (1992) saw the mind as a *selfless* or a virtual self—"a coherent whole that is nowhere to be found, and yet can provide an occasion for the coordinated activity of neural ensembles" (p. 60).

The concept of a sense of self composed of the nervous system's ensemble of synapses, whose efficacies are the legacy of genetic

endowment and life experiences that are emergent, embodied, embedded, and imprinted in synaptic patterns, is also found in the work of contemporary affective and behavioral neuroscientists who may be considered part of the larger humanistic lineage: for example, Oliver Sacks (2010), his Romantic predecessor A. R. Luria (2005; Goldberg, 1990, 2009; Vygotsky, 1925), Antonio Damasio (1999), the psychoanalyst Daniel Stern (1985), and the interpersonal neurobiologist Daniel Siegel (1999). Like the neurophenomenologists, their approach to neuropsychology and clinical assessment combine first-person case studies with third-person experimental research. Their common vision of the sense of self is an integrated holistic unity of affect, perception, and action rooted in the brain as it interacts with the external world, the body, and the mind, which regulates the flow of energy and information within the brain toward the developmental emergence of the self.

Varela derived his concept of “self” and “no-self” from immunology as well as Buddhist philosophy. Vaz and Varela (1978) provided an autopoietic framework for understanding the genetic induction and cellular interactions of the immune system and drew parallels between the nervous and lymphoid systems with regard to ontogenetic development and plasticity. At variance with the assumptions of the times, their picture of the immune system stressed the cooperative nature of events typical of lymphoid cells as a network of interactions that defined the organism’s macromolecular individuality (p. 255).

How did Varela view the self in relation to the mind? Varela (1999) described the mind as phenomenology in action. Viewed from both the first- and third-person perspectives, he situated behavior in a specific cycle of operations where the mind emerged through a distributed process. He considered the mind to be an aspect of a pattern in flux in which our biophysical being lives. As embodied selves in dynamic equilibrium,

we continually emerge within interactions of constituents and interactions of interactions. Varela and Cohen (1989) viewed the body as the locus where the corporal ego emerges, such that the ego gives rise to a sense of self in which this *selfless self* takes on a form so that it looks like our experience inside. Experience continuously shapes this dynamic core at all levels of reciprocal causality through the organizational complementarity of its nervous, hormonal, and mechanical pathways. Varela et al. (1991) conceptualized the organism’s identity as a meshwork of selfless selves:

Thus we need to deal with a multiplicity of regional selves, all of them having some mode of self-constitution, and in their overall assemblage giving rise to an organism. Accordingly, I want to invoke here the following “regional” selves: 1) a minimal or cellular unity, 2) a bodily self in its immunological foundations, 3) a cognitive perceptuo-motor self associated to animal behavior, 4) a socio-linguistic “I” of subjectivity, and 5) the collective social multi-individual totality. In all these regions we are dealing with levels and processes where an identity comes about—not as substance, but as movement—and whose fabric of articulation *is* the organism. To efface the multiplicity of this meshwork is a source of confusion. (p. 80)

Varela et al. (1991) argued that cognitive science does not distinguish between the idea or representation of the self and the actual basis of that representation, which is the individual’s grasping after an ego-self, nor does it take seriously its own finding of the lack of self, which is rooted in not having a disciplined method for examining human experience, which he later developed into neurophenomenology (Varela, 1996). He clearly believed that human beings, as dynamic systems, are characterized by a high degree of self-organizing autonomy and are therefore not reducible to

the more basic mental and physical events that constitute them.

As Thompson (2007) further clarifies, the emergent process of self-making is grounded in the fundamentally recursive processes that characterize lived experience: autopoiesis at the biological level, temporalization and self-reference at the level of conscious experience, and conceptual and narrative construction at the level of intersubjectivity. While the self may be dependently originated and empty, it is nevertheless real. The Buddhist-enactive conception of the self thus provides a middle path in which the stream of experience becomes self-referential through the structure of time consciousness. Thus, the embodied being is prereflectively aware of itself in and through its active, striving body. While the self may be emergent and constructed, it is not virtual. The self is an active, embodied, embedded, self-organizing process. Reality is not a given. It is perceiver dependent.

*The Psycho-Neuro-Intracrine System.* This complex system (Gordon, 2007, 2013, in press-a, in press-b) describes the perceiver-dependent, embodied sense of self in which the autonomic, neurointracrine, and limbic systems, as autopoietic networks or aggregates of neuronal ensembles, reveal a pattern of activity that is altered by experience—the phenomenological lifeworld, intentionality, and attention through a process of becoming that is conditioned by its past. Self knowledge is thus the result of ongoing subjective interpretations that emerge from our capacities of understanding rooted in the structures of our biological embodiment.

The construct *psycho-neuro-intracrinology* describes a complex system that is psychological (refers to the psyche, self, soul, mind, and consciousness), neurological (refers to the composition and reactions within the nervous system), and intracrinological (refers to the intracellular biosynthesis of steroids—the binding of receptors and the formation

of enzymes that catalyze the creation of hormones within the cell). Steroids are catalysts of microscopic concentration that stimulate the rate of biochemical reactions, which support and sustain the evolution of human cells. It is their autopoietic capacity to transduce and transform that is the locus of an individual's energetic balance. Within this system, the hypothalamic-pituitary-gonadal and adrenal axes, which govern the reactive and anticipatory response to stress, integrate pre-reflective, autonomic, and subliminal experiences in the development of meaning and the emergence of the self. The self has neural correlates in the hypothalamic-pituitary-gonadal and adrenal axes, which are responsible for enactive engagement through their connections to the higher-order functions of the brain. This system reveals the existential-phenomenological state, the sense of self, and the growth-oriented dimension of the person, or the neurophenomenological self.

## SUMMARY

In many respects, neurophenomenology represents the culmination and integration of a long line of alternative, nonreductive, and holistic approaches to biology and cognitive neuroscience. This alternative stands in contrast to the standard view of neuroscience and biology as inherently reductive in nature, with an aim to reduce subjective experiences to objective properties of physics, such as extension and movement. Neurophenomenology directly confronts the hard problem of consciousness rather than avoiding it. By conceptualizing the self within the perspective of neurophenomenology, the self can be identified as ontologically real and valid without succumbing to the problems of dualism, in which self and body are reified as distinct substances.

Humanistic psychology has played an important role in the development of a

nonreductive neuroscience, and the integration of concepts from neurophenomenology allows humanistic neuroscience to benefit from some of the most important advances in this line of research. Moreover, a holistic and humanistic neuroscience promises a more integrated view

of the body and dying, which may assist medicine with an approach to the body that is less defensive and more existentially authentic. An existentially grounded view of the body may afford more humane, empathically engaged, and authentic work with patients.

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