

Perception under Heideggerian Phenomenology

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Abstract:

Heideggerian phenomenology challenges traditional Western metaphysics and cognitive science's mechanistic view by proposing a dynamic, contextually embedded understanding of human perception and cognition. This paper critiques the traditional cognitivist perspective, particularly its modularity thesis, and argues for a radical top-down (RTD) processing model rooted in Heideggerian insights. It explores how perception, understood through Heidegger's notion of readiness-to-hand and embedded in the Background Conditions (Taylor, 2006) of human existence (Da-sein), involves a holistic engagement with the world rather than a passive reception of sensory data. Drawing on contemporary cognitive theories such as 4EA (embodied-enactive-extended-embedded-affective) cognition, DST (dynamic system theory), and PPT (predictive processing theory), this paper proposes a dynamic and interactive approach to perception that eschews static representations and embraces the embodied, cultural, and contextual dimensions of human experience on the ground established by Heideggerian phenomenology.

Keywords: Heideggerian phenomenology, perception, Kant, Husserl, modular theories of perception, top-down processing, background conditions, 4ea cognition, dynamic system theory, predictive processing, etc.

Introduction:

Heideggerian phenomenology marks a revolt against the traditional Western metaphysics which is primarily concerned with the ontic inquiry and believes in a gulf between the subject and the world, which the former needs to bridge using some representations and rules. Kantian philosophy is also no exception from this metaphysical view against

whom Heidegger contests. Kant, under his "Copernican Revolution," placed limits on metaphysical speculation by arguing that we can only know phenomena (appearances) and not 'things in themselves' (noumena) (Kant, 1781). However, Heidegger saw it as overly restrictive since Kantian metaphysics confines itself to a static, pre-determined realm of phenomena, and prevents a deeper investigation into the nature of reality and Being in its dynamic, emergent character. Kant's approach is static because it relies on fixed categories of Understanding and Forms of Sensibility that structure our experience. Under this approach, certain a priori categories of Understanding (like quantity, quality, relations like causation, and modality) act as conceptual tools that organize our thoughts about objects and their relations, while the Forms of Sensibility (like space, time) are the basic intuitions that organize our sensory experiences of objects in space and time. Together, these structures enable us to have a coherent and meaningful experience of the world. However, these a priori structures are pre-determined and remain constant, imposing a specific framework on how we perceive and understand the world, while Heidegger's approach is inherently dynamic, emphasizing the ongoing, evolving process of being-in-the-world (Dasein). Meaning emerges through active engagement with the world and is not pre-determined by fixed mental structures. This dynamic process reflects the fluid, ever-changing nature of existence and perception.

Further, Kantian philosophy doesn't include the role of human embodiment (and instrumentality of objects) in the emergence of meaning in the perception of the world. This embodiment also plays an *acausal* deterministic role in the sense-making of the world as discussed by Charles Taylor (2006) following Heidegger. This means that our understanding and perception are shaped by our lived experiences, bodily presence, and the context in which we exist, rather than by a causal sequence of mental operations. Our embodied existence provides a pre-reflective background that fundamentally influences how we

engage with and interpret the world. For example, an apparently mundane phenomenon of gaining physical changes in body, such as gaining muscles and strength through regular weight training, can significantly alter one's perception and meaning of the world, aligning with Heidegger's emphasis on embodiment and the dynamic nature of being-in-the-world. As a person becomes physically stronger, their sense of presence in the world shifts, often leading to increased confidence, capability, and assertiveness, which influences their interactions and navigation of various environments. The way others perceive and respond to the person may change, potentially leading to greater respect and different social expectations, which can affect the person's self-perception and social role. Increased physical strength also enables new activities and experiences, such as moving and climbing stairs more easily or engaging in demanding sports, broadening the person's understanding of their capabilities and reshaping their engagement with the world. This contrast highlights how Heidegger's phenomenology provides a more fluid, context-dependent, and embodied understanding of meaning, compared to Kant's more rigid, structured approach.

Heidegger also criticizes Kantian maintenance of subject-object dualism, where the subject (the knower) understands objects through the integration of a priori mental structures. In contrast, Heidegger shifts the focus from epistemology to ontology, criticizing Kant for neglecting the fundamental question of Being⁵⁴. Heidegger rejects the subject-object dualism and introduces the concept of being-in-the-world, where Dasein (human existence) is always already situated in a world, emphasizing practical engagement and lived experience over theoretical cognition. While for Kant, time exists as an abstract form of intuition structuring experiences sequentially, Heidegger reinterprets time *existentially*, seeing temporality as integral to Dasein's existence and the

⁵⁴ Being with capital 'B' and not 'being' in the reading of Dreyfus (1991). While the former represents 'what does it mean to be' in an existential sense, the later represents the existence of an ontic entity as an object or a fact.

interconnectedness of past, present, and future in shaping our understanding. Thus, in such manners, Heidegger criticized Kant's transcendental idealism which posits that the structure of our experience is determined by the categories of the Understanding and the intuitions of Sensibility, in an absolute and static manner (Heidegger, 1929).

Heidegger further argued that Kant's focus on the subject as the source of knowledge and meaning ignored the fundamental question of the nature of Being itself, where by Being he meant not the ontic being but 'what does it mean to be' as part of his 'ontological' inquiry in contrast to the 'ontic' one (Dreyfus, 1991). Heidegger's philosophy distinguishes between "Being" (with a capital 'B') and "being" (with a lowercase 'b'). "Being" refers to the existential sense of existence, focusing on the fundamental question, "What does it mean to be?" (Heidegger, 1927/1962). This concept is dynamic and process-oriented, influenced by cultural and historical contexts, temporality, and pragmatic, embodied interactions with the world (Dreyfus, 1991). Heidegger contrasts this with "being," which refers to the ontic existence of specific entities or facts within the world. "Being" is concerned with the deeper, ontological nature of existence, while "being" deals with the concrete, static reality of individual entities. Heidegger critiques traditional metaphysics for focusing too much on 'beings' and neglecting the question of "Being," asserting that understanding existence requires exploring the underlying nature of "Being" (Heidegger, 1927/1962). In this vein, Heidegger finds Kant to be too anthropocentric for neglecting the question of the meaning of Being and reducing Being to a mere concept.

Heidegger also criticized Husserl's "pure" phenomenology – of "pure" idealized abstract structures severed from the naturalistic experiences of the world, which sought to describe consciousness and its intentional acts without presupposing the existence of the external world. Husserl's approach emphasized the transcendental ego and the reduction of experience to pure consciousness, aiming to uncover the essential structures of consciousness through phenomenological reduction

(Husserl, 1913). Heidegger, however, criticized Husserl for starting with a presupposed consciousness divorced from the world, arguing that consciousness is always already engaged with the world as "Being-in-the-world" (Da-sein) (Heidegger, 1962). Heidegger's concept of Da-sein embodies a radical departure from Husserl's transcendental subjectivity by emphasizing the embodied and situated nature of human existence (Heidegger, 1962). Da-sein is not a detached observer but a being that "cares" (Sorge) about its existence and its world, inherently entangled in a web of practical engagements and relationships (Heidegger, 1962).

Modular Theories vs. Enactive Perspective on Perception:

Under the computational cognitive science of vision, Raftopoulos (2014) claims that nonconceptual content (NCC) in the "early-vision" is cognitively impenetrable (CI) or "encapsulated" by higher cognition (or affective elements). What is early-vision? Broadly, it refers to the initial stages of visual processing that occur in the early layers of the visual system, primarily in the retina and the primary visual cortex (V1). These early stages involve low-level processes such as edge detection, colour processing, motion detection, and other basic visual feature extraction. Early vision is thus characterized by its bottom-up processing, where visual information is received from the environment and processed in a relatively automatic and pre-attentive manner. It is considered to be more sensory-driven and less influenced by higher-level cognitive factors such as attention, memory, or expectation (Raftopoulos, 2014). This claim is, however, highly contested by various studies showing that even early vision is intruded by top-down higher cognitive and affective factors (Cecchi et al., 2014; Macpherson, 2012; Davidson, 2012).

However, I reject the very relevance of this distinction since, except for some emergencies (like being in a war situation), in routine life, we perceive a "full" object - we don't just stop at "early" vision. I propose that the relevant cognitive process accomplishes this under thoroughgoing Heideggerian "background" conditions. Furthermore, I

propose that this involves not merely top-down but a "radical top-down" (RTD) process. RTD is coined to sensitize the cognitive science community that perception doesn't merely involve standard top-down processing under the conscious situation one enters into (e.g., perceiving and identifying things in the conscious situation of being inside a school or a church or junkyard, and the cognizance of relevant objects one may expect to find there, or the appreciation of the appropriate behaviors in those spaces), or somewhat conscious biases one already has for a specific situation (like someone carrying a bias against women being bad in mathematics or car-driving). Rather, RTD recognizes that one is always already situated in a pragmatic context, or in an intersubjectively shared worldview shaped by the culture and history of the region, inescapably, being a *Da-sein*, while perceiving or making sense of the mundane objects and events in the world, say, for a cup, door, table, or while understanding the difference between a marriage ceremony and a mourning gathering (Heidegger, 1962).

Further, even if we accept the 'impenetration of early vision' as these scholars claim, this doesn't achieve much in favor of modularity of vision or visual perception. Perception is a complex cognitive process involving different stages even in the view of proponents of the modularity thesis (Raftopoulos, 2014; Pylyshyn, 1999) when they accept the distinctions of early vision and late vision. Pylyshyn's acceptance of cognitive penetration in late vision is actually a defeat of the modularity thesis of vision since what we are concerned with is not the success of a *part* of the cognitive process about vision, i.e., early vision. Rather, our concern is with the overall cognitive process and its final outcome - the final perceptual content/object one sees or the final perceptual experience of the object one sees finally. It simply doesn't matter if a small early part of this process is shown to be impenetrable. One makes decisions or acts in accordance with what one achieves as the final perceptual object/perceptual experience, e.g., no one decides to use a shorter ladder to fix a bulb on a distant electric pole which apparently seems to be

shorter, or worries if one's friend has gotten shorter when seen from a distance.

Under the enactive or interactionist perspective, we find perception as a result of the interaction of a living organism trying to act successfully in its environment, learning from previous experiences involving the integration of changes in sensory information with the movement towards (or around) the object (e.g., in Bach-y-Rita's experiments⁵⁵ (1969, 2003), Held and Hein's kitten experiments⁵⁶ (1963)), and actively anticipating and expecting from the environment to make sense of the incoming sensory stimuli. In no way is the final perceptual product or the final representation a passive representation of naive reality out there. The active and interactive enactive mind completes the impoverished data with the nearest meaningful gestalt (e.g., CQT is perceived as COT, when the lower portion of O is occluded in CQT, or perceives the tent as a wild bear when one already expects and anticipates it while crossing through a forest at twilight⁵⁷).

The perception of the **Muller-Lyer illusion** is one big example of such an interactive process, which Fodor tried to use in favour of the encapsulated modular theory of perception.

⁵⁵ Bach-y-Rita's pioneering research demonstrated that the brain could adapt to sensory substitution, where information from one sensory modality can be processed by another. In his experiments, Bach-y-Rita developed devices that allowed blind individuals to "see" through tactile or auditory inputs, showing that the brain could reorganize itself to process visual information through different sensory channels (Bach-y-Rita et al., 2003).

⁵⁶ In 1963, Richard Held and Alan Hein conducted experiments using kittens to explore the role of self-produced movement in the development of visual perception. In their study, one kitten in a pair was allowed to move freely while the other was passively carried in a gondola, ensuring both had the same visual experiences. The results demonstrated that only the actively moving kittens developed normal visual coordination, highlighting the importance of active engagement with the environment for perceptual development (Held & Hein, 1963).

⁵⁷ I will come to its explanation a bit later, on page 14.

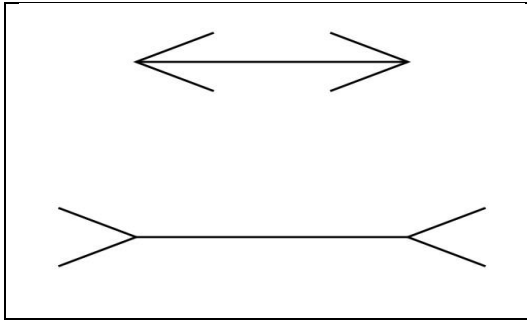


Figure 1. Müller-Lyer illusion

However, contrary to Fodor's account (1983), the Müller-Lyer illusion can be understood in the context of the environment in which people live. People susceptible to this illusion are inhabitants of "rectangular" carpentered houses – i.e., houses having rectangular cross-sections, with four walls and four edges inside and four edges outside. If one looks at an inner (vertical) edge, one can see that the corners of the top and bottom ends are the joints with the roof and the floor of the room, respectively. This situation contextualizes the edge or a bar between two arrowheads pointing inwards. For 'size constancy', we tend to mentally elongate the length that only *appears* to be smaller for being placed away from the person. When such an arrangement is placed alongside another bar with arrowheads pointing outwards, the first one appears to be longer due to the mind's action on it. Thus, the illusion results from a person's adaptation to their environment (Segall, Campbell, & Herskovits, 1966).

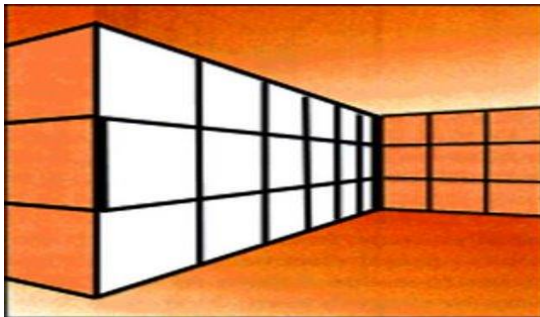


Figure 2

One psychological explanation for this phenomenon describes it as the result of an interaction between two factors: our mental elongation of the visual image of an object when it is seen from a distance (to maintain size constancy) and our adaptation to living in rectangular homes (i.e., ones with rectangular cross-sectioned rooms). The orientation of the arrows contextualizes the location of the two lines. The line with arrow points directed inward (the second line) is interpreted as the inside corner of a rectangular room extending away from us, and the line with arrow points directed outward (the first line) is viewed as the relatively close corner of a rectangular object, such as the building corner in Figure 2. Our previous experience with distance cues leads us to assume that the outside corner is closer than the inside corner and that the inside corner must therefore be longer. Empirical evidence supporting this explanation comes from the case of the Zulu tribe, where people are raised in circular homes with cylindrical walls. These people are much less susceptible to the illusion than those who grow up in environments where most structures are built using right angles and rectangles (Segall, Campbell, & Herskovits, 1966).

In Heideggerian philosophy, all these observations make perfect sense but not in Fodor's paradigm due to the latter's limited and rather distorted metaphysical worldview, under which the world is seen as a totality of discrete entities/objects that draw their meaning through external, abstract rules, not inherent to the objects themselves. For Heidegger, objects are not discrete entities connected to each other through some external abstract rules for their sense-making; rather, the pragmatic need to act or successfully adapt, under the "ready-to-hand" condition (which is present from the beginning when one starts dealing with them or when they "care" for them), plays the causal or constitutive role in perception. This inherent pragmatic connection or possibility to act in specific manners infuses meaning or sense into them. Gibson goes one step further and ascribes action possibilities or affordances as part of their meaning, even when one merely sees or perceives them. A hammer,

when perceived as lying on the table, is intended for the hand to use it, say, to drive nails into walls or break objects. In modern terms, we may say that the enactive need is present from the beginning when one encounters an object like a hammer. This phenomenon is not just confined to man-made tools but to any object, natural or artificial, that one can think of to be subjected to some use. That use is part of the meaning of the entity inherently, not by an external rule (Gibson, 1979; Heidegger, 1962).

The failure of this illusion among the Zulu tribe (and many other tribes) who don't live in carpentered rectangular houses supports the case against the modular theory and in favor of the interactive, feedforward-feedback theory of perception, heavily influenced by the confluence of top-down and bottom-up processes. Studies show that people living in round or curvilinear (or non-carpentered, non-rectangular) houses, e.g., in the Zulu tribe (Segall, Campbell, & Herskovits, 1966) and the Navajo tribe (Pedersen & Wheeler, 1982), are less susceptible to the Müller-Lyer illusion. Studies by Segall, Campbell, and Herskovits (1966) demonstrate the influence of culture on visual perception. It is the final perception that matters as the result of a complex process of perception. Hence, the claims of modularists don't stand for the encapsulation of visual perception.

In Fodor's view, a theory-neutral observation is possible, which can permit the constitution of a reliable perception of the external world. But this seems to be a mischaracterization of the situation. Cultural factors are not merely a theory; they are a background condition. In Heideggerian perspective, this aspect is well received as part of human existence, conceived as being-in-the-world, as one aspect of the Heideggerian background conditions (Taylor, 2006). We understand the body (and the orientation of objects with respect to the body), the instrumental-pragmatic relation of objects in how they play a teleological, purposeful, or pragmatic role in our routine activities, culture, history, or what Wittgenstein (1954) calls "forms of life," as all

part of the background condition in shaping sense-making or meaning-making of the world.

Thus, the proposal of the notion of "**radical top-down**" (RTD) to describe the complex interplay between various factors in perception, including unconscious and pre-reflective processes under the influence of embodiment, culturality, historicity, and other contextual elements, might be an insightful way to convey the complexity involved in the perceptual experience. By emphasizing the dynamic emergence of meaning and the ongoing interplay between the perceiver and the world, the proposed notion of RTD aligns well with Heidegger's phenomenological insights. Human beings are not isolated thinkers but are actively engaged in the world. Our understanding and perception of objects and situations emerge from our interactions with them, which goes beyond the notion of passive mental representations. The concept of representation has often been associated with Cartesian dualism which separates the mind from the body and the external world. Scholars who reject representation tend to favor approaches that challenge this dualism in favor of a more integrated and holistic view of cognition, where the subject and the world co-define and co-constitute each other.

Heideggerian Background Conditions and Perception:

I find Heideggerian phenomenology as a "grounding" account for perceptual processes for routine activities which enables one to be well-adjusted to one's world with an appropriate understanding of the world as he finds himself in (Dreyfus, 1991; Merleau-Ponty, 1945). Phenomenologists like Hubert Dreyfus, following Heidegger and Merleau-Ponty, explain the perceptual process as part of "maximal grip" and not the result of explicit rule-following, to attain an optimal functional grip on the world (Dreyfus, 1991). One doesn't perceive the world in a neutral manner but as part of one's skillful activities to cope with the contingencies of the world (Merleau-Ponty, 1945). Under this, more and more refined skills are acquired by the person under a feedback

loop between him and the perceptual world (Dreyfus, 1991). This loop is called an "intentional arc" which makes one learn from the past experiences and also projects certain anticipations and expectations into the future, and thus this arc "...projects round about us - our past, our future and our human setting" or the situation we are in (Merleau-Ponty, 1945). This feedback structure is called by Merleau-Ponty as a "dialectical" or "circular causality" and not a "linear causality" between the person and his/her milieu, under which one makes perception of an object or event, as part of Maximal Grip on the world and not mere passive application of some abstract rules (Merleau-Ponty, 1945). We can reserve the latter process as the account of the functioning of an AI-driven robot, but not for the living human mind and its intentionality for whom the world and his wellbeing matters and who "cares" for the world as a 'being-in-the-world' and not an inert AI system (Dreyfus, 1991).

Heidegger's concept of readiness-to-hand (*Zuhanden*) suggests that our engagement with the world is not merely passive reception of sensory data but an active involvement with meaningful entities in our environment (Heidegger, 1962). Objects are not perceived as isolated entities to be understood through innate rules or modules but as tools with affordances that emerge in the context of our practical interactions (Heidegger, 1962). Moreover, Heidegger's notion of "Being-in-the-world" implies that perception is always situated within a specific context, influenced by our cultural, historical, and personal background (Heidegger, 1962). This contextualized understanding challenges the abstract, modular view of perception by emphasizing the dynamic interplay between our situatedness and the world. Heidegger's view of perception, thus, involves a dynamic interaction between the perceiver and the world. It's not a one-way flow of information or a linear-causal mode, from concepts to perception (as in top-down processing) but a reciprocal relationship wherein our engagement with the world shapes our understanding and vice versa. In light of these aspects of Heidegger's philosophy, it would be an oversimplification to reduce meaningful

perception to just top-down processes. Meaningful perception emerges from our existential engagement with the world, where the subject is not merely a lone individual but it involves the body, the world, and the situation one is in.

This requires some elaboration. The body here figures in as a background condition for the objects we see in the world for which objects are far, near, up, down, to left or right, on front or back, etc. and we make sense of the world in terms of these spatial concepts afforded by the kind of body we all share (Taylor, 2006). These are, however, not a causal kind of relationship where we expect one body impacting another with an external causal force. This is an acausal account since nothing from the body is reaching out and colliding or exerting some force on the objects around; the objects just stand in a spatial perspective for the kind of body we have - elongated and upright (and not spherical), having eyes in front (and not all over, not at the back), our usual moving on the front side (where we have eyes). If we had a spherical body with eyes all over, then many of these spatial concepts would not have existed. Next, the objects in the world are not neutral objects for us; they are there to be acted upon by us to meet some practical purpose according to our bodily capacities, like some can be picked, some can be grasped and thrown, some can be lifted and overturned, and so on, and accordingly a meaning or sense is constituted for them in a pragmatic-instrumental relation, not in a prior absolute, universal and static manner. Thus, the meaning of a table and a door are different for us, but not for a woodpecker owing to the different kinds of pragmatic relation they have for the former but not for the latter. Then, the situation one is in plays a role in the constitution of perception, e.g. in a tragic event a tourist tent was perceived to be a wild bear by a person. This man had read news about a wild bear roaming in the woods and having killed some people. Thus, under the belief and expectation of encountering that bear while crossing through the woods at dusk, he anticipated the tent to be that bear (and shot at it, killing two people inside). Similarly, the meaning of the word "water!" uttered in different

situations is perceived differently, e.g. when it is uttered to one's boss entering the office, or to the peon entering the same office even if it is uttered with the same tone and loudness (Wittgenstein, 1953).

Thus, perception is a complex and multifaceted phenomenon that cannot be neatly categorized as solely top-down or bottom-up (Taylor, 2006). One gets pre-conceived ideas or concepts from his cultural, historical background. If our mind makes sense of the world in a pre-reflective manner under the background conditions, this rather makes a stronger case of top-down processing in contrast to the bottom-up processing which advocates perception of an object merely in terms of integration of individual features of an object. In the top-down processing, the perception involves a prior understanding of context in the backdrop of which the raw sensory data is organized into a meaningful perceptual object. Why confine the meaning of such a context only in terms of a conscious concept, and a personal situation? Why not call the shared cultural, historical situation or background as also part of the context operating beneath the conscious awareness and pre-reflectively? Such expectations, beliefs and concepts under the traditional framework need not be conscious, rather for the most of the time, they are actually unconscious. The person (or Dasein) simply operates under them without even being aware that he/she possesses them. Further, since the Heideggerian account is holistic, it makes the case for a stronger sense of top-down processing in perception or sense-making in general. Rather, the perception is thoroughly Top-down processing in extended top-down sense, and the early-perception of Pylyshyn or Raftopoulos doesn't make sense since the product of early-perception is not the final product of the complex perceptual process.

4EA Cognition, DST, PPT in Alignment with Heideggerian Theory

It is not just cognitivism but also the general traditional Western metaphysics against which Heidegger fights, and his philosophy makes the basis for the second – eneration cognitive science called embodied

cognition or embodied - enactive – extended – embedded - affective (4EA) cognition, dynamic system theory (DST), predictive processing theory (PPT). Heidegger's critique extends beyond traditional cognitivism to challenge the broader framework of Western metaphysics, which has historically emphasized a dualistic separation between mind and body, subject and object. Heidegger's philosophy provides a foundational basis for second-generation cognitive science, which includes 4EA cognition, and it aligns well with other approaches in modern cognitive science like dynamic systems theory (DST) and predictive processing theory (PPT), all of which resonate with Heidegger's insights on human existence and perception.

Embodied cognition posits that cognitive processes are deeply rooted in the body's interactions with the world, challenging the notion of the mind as an abstract, disembodied entity. This perspective aligns with Heidegger's concept of *Dasein* (being-there), which emphasizes that human existence is always situated in a physical and social context. According to Heidegger, perception is not a mere passive reception of sensory data but an active engagement with the world, informed by our bodily capacities and activities (Dreyfus, 1991). Thus, the body is not just a vessel for the mind but integral to the process of understanding and interacting with the world. Although Heidegger has not explicitly talked much about the role of body, but his emphasis on the 'readiness-to-hand' implicitly involves the role of the body in sense-making, say, of the hammer in hammering. Hammering can't happen without a hand. Enactive cognition develops the idea explicitly that cognition arises through a dynamic interaction between an organism and its environment. This view mirrors Heidegger's notion of "being-in-the-world," where the subject and the world are interdependent and mutually constitutive. In enactive cognition, perception is understood as an activity of sense-making that involves the whole organism, rather than a mere computational process of data input and output (Varela, Thompson, & Rosch, 1991). Heidegger's phenomenological approach underscores that

our understanding of the world is shaped by our practical engagements and the contexts in which we find ourselves.

Extended cognition proposes that cognitive processes can extend beyond the brain to include the body and even external tools and environments. This aligns with Heidegger's view that tools and equipment are not merely external objects but integral to our being and actions in the world, and their meaning is not personal but is shared in the intersubjectively shared use of them in routine life (Heidegger, 1962). Embedded cognition, which emphasizes that cognitive processes are deeply embedded in a specific environment, also resonates with Heidegger's understanding that our being is always situated within a specific context that shapes our experiences and actions. Affective cognition emphasizes the role of emotions and affective states in shaping cognitive processes. Heidegger's concept of *Befindlichkeit*, often translated as "disposedness" (Kisiel, 2002) or "situatedness" - "finding oneself in a situation", or "attunement", as an a priori transcendental condition for, and shows up in, the everyday phenomenon of "mood" (*Stimmung*). Moods are not merely internal states but are ways in which the world is disclosed to us, influencing how we perceive and engage with our surroundings (Heidegger, 1962). It highlights that our understanding of the world is always colored by our emotional and affective states. This aligns with the *affective* dimension of 4EA cognition, which recognizes that emotions are integral to cognitive processes and not just ancillary to rational thought.

Heidegger's philosophy emphasizes that human existence, or *Dasein* (being-there), is always situated in a physical and social context, challenging the disembodied view of the mind. Perception, according to Heidegger, is not a mere passive reception of sensory data but an active engagement with the world, informed by our bodily capacities and activities (Dreyfus, 1991). This view aligns with embodied cognition, which posits that cognitive processes are deeply rooted in the body's interactions with the world.

Enactive cognition further develops the idea that cognition arises through a dynamic interaction between an organism and its environment. This mirrors Heidegger's notion of being-in-the-world, where the subject and the world are interdependent and mutually constitutive. In enactive cognition, perception is understood as an activity of sense-making that involves the whole organism, rather than a mere computational process of data input and output (Varela, Thompson, & Rosch, 1991). This perspective underscores that our understanding of the world is shaped by our practical engagements and the contexts in which we find ourselves.

Extended cognition proposes that cognitive processes can extend beyond the brain to include the body and even external tools and environments. Heidegger's view that tools and equipment are integral to our being and actions in the world aligns with this notion. For Heidegger, tools have a "readiness-to-hand" (*Zuhandenheit*) that is revealed through their use, rather than being perceived as detached objects (Heidegger, 1962). Embedded cognition, which emphasizes that cognitive processes are deeply embedded in a specific environment, also resonates with Heidegger's understanding that our being is always situated within a specific context that shapes our experiences and actions.

Dynamic systems theory (DST) views cognitive processes as emergent from the dynamic interactions within the system of the organism and its environment, rejecting linear causality in favor of complex, nonlinear interactions (Thelen & Smith, 1994). This resonates with Heidegger's idea of "circular causality" or the intentional arc, where perception and action are part of a continuous feedback loop involving the body and the world (Merleau-Ponty, 1962). Predictive processing theory (PPT) suggests that the brain constantly generates predictions about sensory input and updates these predictions based on incoming data. This theory aligns with Heidegger's notion that perception is not a passive reception of data but an active, anticipatory process grounded in our practical engagement with the world (Clark, 2013).

In summary, Heidegger's philosophy provides a robust foundation for 4EA cognition, DST, and PPT, emphasizing the inseparability of mind and body, the importance of practical engagement with the world, and the dynamic, anticipatory nature of perception. This alignment underscores the shift from viewing cognition as a detached, computational process to understanding it as an embodied, enactive, and situated activity deeply rooted in our being-in-the-world.

Conclusion

Heideggerian phenomenology provides a philosophical foundation for critiquing traditional cognitive science's reductionist view of perception. By emphasizing RTD (radical top-down) processing rooted in the background conditions of human existence, this paper proposes a dynamic and contextually embedded model of perception. Drawing on insights from enactive cognition and predictive processing theory, it argues for a holistic understanding of perception that eschews static representations in favor of dynamic meaning-making processes. This approach aligns with Heidegger's vision of human existence as fundamentally relational and engaged with the world, challenging traditional dichotomies between mind and body, subject and object, and representation and reality.

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