Can Embodied Cognition Deny Representation and Still Account for Intentionality?

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Abstract: With its historical roots in the phenomenological perspective of philosophers such as Edmund Husserl and Maurice Merleau-Ponty, embodied cognition has been able to address classically problematic issues in cognitive science. In this paper I examine the model of visual consciousness put forth by Alva Noë and J. Kevin O'Regan, and the model of learning and skill acquisition put forth by Hubert Dreyfus. In each case the authors attempt to explain aspects of cognition and consciousness without recourse to mental representations. These accounts, and others, have been embraced by many philosophers of mind. I charge that while they provide a better explanation of aspects of cognition, they fail to address fundamental questions to do with the intentionality of our mental states towards the world. In rejecting representation, they keep pushing the fundamental question of intentionality further and further back.

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Introduction

With its historical roots in the phenomenological perspective of philosophers such as Edmund Husserl and Maurice Merleau-Ponty, embodied cognition has recently been able to address classically problematic issues in cognitive science to do with perception, learning and skill acquisition. Embodied cognition has been so successful that rather than defend the general principles, most writings in the field jump right into the issues, focusing instead on in what ways, and to what degree, cognition is embodied (Morris 232). While many of these empirical findings have been embraced by philosophers of mind, to date, work in embodied cognition has yet to show how these embodied explanations of perception and learning can account for consciousness and subjective experience. I argue that a complete rejection of representationalism leaves us unable to explain the aboutness of our mental processes towards the world. An acknowledgment of certain phenomenological considerations, by those in embodied cognition, sheds light on these problematic aspects of the current state of embodied cognition research.

Cognitive science developed out of an acknowledgment of the need for an interdisciplinary approach to addressing issues of mind and cognition. While having gained significant popularity, the field of cognitive science has had a difficult time though of trying to account for fundamental aspects of cognition such as learning, skill acquisition, error detection and error guided behavior. And there are deeper conceptual problems the field is riddled with as well; such as 'the binding problem', the 'explanatory gap', and the 'hard problem of consciousness' (Chalmers 206). If we reject dualism, how are we to account for mental phenomena that are somehow rooted in a biological organ containing a collection of electrochemical processes, none of which are themselves conscious? Our mental states are in some way "about" the world, they "represent" chairs and cups, dogs and cats, smells and sounds,

desires and emotions. How brain processes could create internal mental representations of the external world is a disputed topic, and a theory of how these mental representations arise has thus far evaded us.

Embodied Cognition

Embodied cognition programs within cognitive science seek to put the focus on the holisitic nature of cognition as a process the entire body engages in, as part of a larger interactive process with the environment. Over and above the brain, it is the morphology, dynamics and temporality of the body and its interactions with the environment that shape our perceiving, learning, remembering and conceptualizing. This research program has allowed for many important breakthroughs in understanding many aspects of human cognition and action, including perception, learning, skill acquisition and other types of intelligent behavior. If this wasn't enough, many working with embodied cognition claim to have solved the problem of accounting for mental representations…by denying they exist. According to this line of reasoning, once the embodied cognition thesis is accepted, and shown to provide a stronger explanation of cognition, we see that mental representations are simply not needed to account for experience. Experience is not a passive process of representations created in the brain, but rather a way of acting in the world. The world serves as its own best representation (O'Regan and Noë 939).

I will discuss two examples of the kinds of advances embodied cognition has been able to make in understanding cognition; these being perception and skill acquisition. In both cases embodied cognition approaches are able to account for these phenomena better than other research programs in cognitive science, not only without a recourse to mental representations, but even denying that mental representations could in principle account for these sorts of things.

Perception Without Representation

Historically both philosophy and cognitive science have viewed perception as some sort of passive process of signals in the environment interacting with our eyes, and through a complicated brain process, those signals are said to correspond to a mental representation inside our heads. Thus we all supposedly have some sort of 'mental image' which emerges from patterns of neuronal firing which have been transduced from the electromagnetic waves that hit our retinas. Neurons are just cells sending electrochemical signals back and forth though, and there is certainly no a priori reason why any amount of neuronal firing, no matter where it is located in the brain, and how it was causally initiated, should allow visual experience to arise. O'Regan and Noë propose an alternate model of visual consciousness, one in which seeing is a way of acting, a particular way of exploring the environment (943).

O'Regan and Noë view the brain/body as a dynamic sensorimotor coupled system, which itself is in a constant state of interaction with the environment. There are certain rules that govern the types of interactions we can have with the sensory signals in our environments if we want to successfully navigate the world. We take advantage of the affordances provided by the relevant sensorimotor contingencies through exploratory activities in the environment, and the experience of seeing is the label we put on this process. Thus seeing is not passively representing pregiven features of the outside world, but is the body's attunement to the changes that would occur as a consequence of an action on the part of the perceiver, it is the exercise of the mastery of the relevant sensorimotor contingencies.

This future action oriented account of perception accounts for all sorts of classically problematic aspects of visual consciousness. One such example is the fact that the visual signal that hits the retina is very impoverished, but that our visual experience feels very rich to us. Other examples have to do with our blind spot, our blinking, other perturbations caused by eye movements and many others. Only on classic accounts of representation do these phenomena present a problem for visual experience. But if

visual experience emerges in anticipations of future actions based off the input the system receives, then these impoverishments don't have any necessary effect on that anticipation, as long as the structure of the system is such that it can interact properly given those inputs. This richness of detail of our visual experience, this sense of "presence" of all the details in our visual world is not an internal image of the outside world, but rather, the knowledge that you could access all this information if you engaged with and manipulated the environment in particular ways. Whether it is moving your eyes around, moving your head, moving your body or manipulating an object with your hands, O'Regan and Noë argue that it is the knowledge of how things would change if you took advantage of these affordances, from which your experience arises from. This view further seems to negate the 'binding problem' of how different features of the visual signal are all brought together to produce an 'image' of what we see. There simply is no need for a single binding location or explanation of how binding occurs, because there is no picture, there is only the method of exploring the world based on the sensorimotor contingencies. The solution to the puzzle of understanding how visual consciousness arises in the brain, according to O'Regan and Noë, is to realize that it doesn't. It is not a special kind of brain state, but something we do.

Learning and Skill Acquisition without Representation

Hubert Dreyfus defends the notion that two of the classic staples of intelligent behavior, learning and skillful action, can be described and explained without any recourse to mental representations (367). He develops on a phenomenological account first put forth by Merleau-Ponty, which involves explicating the idea of an 'intentional arc', where, as the body acquires skills, they aren't stored as representations, but manifest themselves as dispositions to respond to certain stimuli and situations in the environment, in certain ways. 'Maximal grip' is the further notion that refers to the

body's tendency to refine its responses so as to bring the current situation to some sort of optimal gestalt.

Dreyfus takes the reader through a phenomenological account of skill acquisition from novice up to expert. This involves the novice learning rules for determining actions based on features in the environment; for instance, shift the car to second gear when the speedometer is at 12mph or when the rpm is 3000. Next, on the basis of experience the advanced beginner starts noticing meaningful correlations where earlier there was only rule following, i.e. - this type of engine noise is associated with this particular speed when in this gear, so shift when at this particular speed, or this particular rpm, OR when the engine is making that particular noise. Soon the agent begins to realize that the number of potentially relevant elements is overwhelming and must devise plans and new procedures for action, so taking a turn off the freeway the driver has to consider the speed they are going at and the road conditions, the angle of turn and the traffic situation, etc…and decide whether to take their foot of the gas, or break or stay the same speed. Eventually the agent becomes more emotionally involved in the tasks she is performing; successfully navigating the turn causes positive feelings and relief, while going into a skid is accompanied by feelings of terror.

This is to be desired though, as this engaged, emotional involvement allows further learning to occur. When events are experienced with this sort of involvement it results in positive and negative experiences that further strengthen successful responses or inhibit unsuccessful ones. Rules and principles soon become replaced by situational discriminations which are accompanied by associated responses; intuitive behavior replaces the former reasoned response. Rather than calculating or plotting or planning what needs to be done, the agent simply sees what needs to be achieved, though she may not immediately see how to achieve it. The driver simply sees or senses that they are going too fast into a turn. Actions are still chosen deliberatively though, so the driver still has to decide how best to account

for their dangerous speed through a deliberative process. But through further experience this deliberative process is itself intuitively engaged in. Immersed in this skillful activity the agent sees what needs to be done, and simply does it. The importance of this story, according to Dreyfus, is that at any given level of skillful action, the behavior that the agent engages in, in the present moment, stems from certain dispositions. Dreyfus argues that what has been learned appears in the way the world shows up. The past learning is not represented in the mind, and added to the current experience through some sort of information processing going on in the brain, but is simply presented to the agent as a more and more finely discriminated situation, which itself solicits a more and more finely grained response.

The Problem of Association

In opposition to classical accounts, the agent doesn't passively receive information that is then processed, rather, the agent is always engaged with her environment, already disposed to respond appropriately based on the input. The agent already sees things from a given perspective as affording certain actions, and what those affordances are depends on past experience. The important point is that for Merleau-Ponty, Dreyfus, and those working within embodied cognition, there is no need to create a recourse to mental representations of past experiences to somehow compare to the current experience.

Getting rid of any type of association between past experiences and current experiences seems to cause a bit of a problem on the surface. How is that we generalize a current situation as being similar to a past situation (so we can learn from or act appropriately in the current situation), if we don't do this comparison? The answer is that this comparison is simply not necessary for making a generalization, and that positing generalizations as involving mental representations actually has its own set of conceptual problems (Dreyfus 373). How is that we know which memory or past experience is relevant to compare to the current one? For us to be able to do that, we would already have to have a representation of what we want to compare it to, to make the comparison. Merleau-Ponty, though, would say that we

don't see the current situation as similar to a past situation; we simply see the current input as being impoverished in some particular way, as a deviation from some sort of prototypical input. Given our past experiences, our body is already disposed to interact with particular inputs in certain ways. The interaction of the structure of our bodies and the structure of the world is the only way to make sense of our dispositions towards the world, since it is in possible active manipulations that affordances present themselves. The way the world appears to us, and what we can do in it, are intimately connected.

Goal States without Representation

This brings us to an issue of how to talk about goal states and satisfaction conditions. To eschew representation, we are also forced to deny that there is a representation of the goal states or satisfaction conditions contained within any action. But how can we talk about success or failure without a representation of what that success or failure would look like before hand? This is where the notion of "maximal grip" discussed above becomes important. In the same way that problems of generalization discussed above depended on the notion of a current input simply being an impoverished version of a prototypical input based on the disposition of the agent, similarly, while engaging in skillful activity, there is a sense of deviation from the optimal body/environment relationship. Dreyfus argues that the agent does not need to be able to express or even know what this optimum is, the steady flow of activity takes the agent either closer to or further away from this optimum, and it is this 'sense', in the moment, that serves to direct the agent to the goal state. An expert tennis player does not need to represent what their final body position would have to be, what position the racket would be in, what angle the racket would be in, and how much force the ball will need to be hit with and where it should be placed on the racket, to successfully return a serve. The tennis player engages in the skillful action

and if it feels as if it's deviating from the optimal gestalt, she intuitively adjusts to better bring the current situation in line with this optimal one.

The Problems of Embodied Cognition

But there is still a problem with these anti-representationalist accounts. What these accounts do well is provide, at one level, an explanation of much of human cognition that other research programs in cognitive science fail to do, but in themselves provide no holistic explanation of what many in the field would really like to understand, consciousness and subjective experience. Nothing about these accounts provides an explanation of why certain causal interactive processes in the universe allow consciousness or arise, whether those processes happen to be distributed through a body or not, and whether we take into account the interactive relationship the system has with its environment or not.

The purpose here is not to deny the import of embodied cognition accounts of cognition, and it is not to deny the power of their arguments against classic notions of representation as a passive "re-presentation" of pregiven objects in the world. Rather, the purpose is to point out that embodied cognition has misguidedly rejected the entire notion of mental representation, as it leaves the field unable to account for the most important thing that representational accounts are invoked for; explain consciousness. How is it that some types of interactive processes lead to the emergence of normativity and aboutness, the intentionality of our mental states towards the world?

How Phenomenology Can Help

O'Regan and Noë are correct in their criticisms of classic accounts of representation. And they are correct in focusing on the active exploration of the agent. What tends to be ignored is that our experience is to some degree a constructive process. We don't experience what is "out there." We experiences illusions and hallucinations. And more importantly, organisms with different sensorimotor

capacities will have different affordances, and would thus have different experiences of the world. To say that our experience is directed towards future anticipations given the sensory input we interact with, while simultaneously saying that the world serves as its own best representation, is contradictory. As these theories point out so well, our experience of the world does not correspond to the world itself. It emerges from the dynamic interactions between our body and the world, constructed in the way it is because of the particular features of the biological system doing the interacting. How to account for this construction, and the normativity inherent in it, is not something that just falls out of the embodied cognition explanations. In fact, what makes consciousness and thought even relevant at all in the O'Regan and Noë account? Why should mental contemplation ever occur? How could it? An account of how biological systems can interact with their environment so as to "perceive" or "learn" has no immediate need for the added burden of consciousness at all.

Yet, we are conscious. We think, we choose, we imagine, we feel. In fleshing out vision not as a passive representation of the outside world, but as a process of constructing anticipations about the world given the interactive opportunities provided by sensory input , we forget to focus on the fact that there is "something it's like" to see. In fleshing out the learning process and skill acquisition as a process of acting in the moment based on the dispositions of the system, we forget that there is an intentional experience that always accompanies this behavior. Yes, I can hit that tennis ball with the correct amount of force, with the racket in the correct location with the correct angle, and with my body in the correct position, without thinking about each movement, each part of the process, and without needing to represent, remember, or think about the history of how this was all able to occur. But in that moment I *am* thinking about how I want to hit that ball. My attention, my awareness, my intentionality is focused on this action I am engaged in. I may not represent this future state of affairs linguistically or even pictorially, but my interaction is goal directed, distinct from that of an automaton. I could, if pressed, explicate that goal state visually or linguistically. Dreyfus spoke of "sensing" the current situation was a

deviation from some sort of optimal one, and already inherent in using that sort of terminology, we must accept that the explanation provided of skill acquisition fails to account for the intentionality with which we engage in that action, and the intentionality that was present throughout the whole learning process itself. Dreyfus has to presuppose consciousness and intentionality to execute his argument. And while his argument explains why the world shows up in the way it does for the agent, it doesn't address why there is a world that shows up at all.

Conclusion

This is why further phenomenological considerations are needed here. Arguably the most important aspect of Husserl's philosophy was his notion of intentionality (Husserl 33), that consciousness is always "consciousness of" something; consciousness of our thoughts, consciousness of our actions, consciousness of our perception. Our intentional activity is always in a dynamic relationship with the objects of that intentional activity; without intentionality there is no world (for us). This is a key aspect of experience for Husserl. Experience is not something that is free floating in the universe, but it something that is for me, I am an experiencer.

The importance of this notion is worth stressing, but also must be tempered. The fact of intentionality on its own is not going to solve all the riddles of conscious experience. But its existence in the universe must be accounted for. By focusing on embodiment, cognitive science has been able to put aside many naïve notions from the work of earlier decades, but it has thrown the baby out with the bathwater. To say that the world serves as its own best representation, and that experience is a way of acting, simply sidesteps the riddle of the intentionality of our mental processes towards the world. As these embodied accounts continue to make advances in accounting for aspects of our cognitive processes, they presuppose the intentionality with which we engage in that cognitive process, and thus keep pushing the fundamental question of how intentionality arises further and further back. Husserl

didn't have an answer for how intentionality itself arises in biological organisms, but he would've been thunderstruck by the idea that its importance in consciousness studies could be put by the wayside.

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