

Hunter May

PHI 3323

4/24/2022

The Ecological Psychology Approach

The Computational-Representational Understanding of Mind (CRUM), being the domineering theory within cognitive science since its conception is apparent. Rooted in the ideas of Descartes but coming to fruition through the works of those working on artificial intelligence such as Turing; it's standard that this more orthodox idea become the more popularized. However, a multitude of other theories are progressively becoming more widely accepted by the field—theories of embodied cognition, ecological psychology, dynamical systems of mind among others are the head competitors of the traditional CRUM viewpoint. These theories offer a more monistic idea, in contrast to the dualist beliefs held with CRUM, wherein the mind and body are one complete entity, inseparable and whole; not only connected trivially but working in tandem throughout the entire process of the mind. The major criticism of the CRUM approach is its overreliance on representation and computation, and thusly, on inference. This creates major weak points in the aspect of perception-action; this factor leads me to believe that CRUM is insufficient for explaining the mind, and I believe a strong alternative explanation is the approach of ecological psychology.

Being an embodied-embedded theory, the ecological psychology approach asserts that both the mind and body are of equal importance, because they are one system. This approach rids itself of the dualities that are held by CRUM in favor of a more synergically combined idea of mind and body, perception and action, and organism and environment. This theory, offering its conception to Gibson, seeks to give a more concrete and worldly explanation of mind. The paper by Richardson and others gives an example analogy of geocentrism to the egocentric views

presented by computational explanations of mind; wherein, the idea that geocentrism allotted for explanation that were abstract and divine in nature—drawing comparison to the inferential resolutions offered by CRUM and its similar counterparts. Concepts that the paper mentions like the central executive, or the “loans of intelligence” are prime examples of the abstractions that computation and representation require to be incorporated into a theory of mind. The ecological psychology approach, on the other hand, prefers to deal with the physicality of a mind-body system, and more importantly, an organism-environment system. It denies the idea of mental activities being local processes in themselves, and posits that they are aspects of the organization of the organism-environment system. Additionally, it describes behavior, not as an interaction between the organism and the environment, but as the reorganization of the system. Also, unlike CRUM, it holds that perception and action as a unified, dual aspect; not as a linear event but a cyclic tandem event.

The abstraction created by the disembodied nature of CRUM allows for an easy way out, so to speak, when it comes to cognition. It grants cognitive scientists the possibility to isolate variables, that is, it detaches the computational procedures and mental representations from the material world; further permitting the use of abstract assumptions such as the central executive. From this a more “complete” explanation can be forged, which is more likely to be accepted in intellectual realms, specifically those focused more on the philosophical side of the argument rather than the scientific side. Also, being the traditional viewpoint, CRUM will be incredibly difficult to get past, as it is much easier to hold previously assumed correct beliefs. It is evident that Descartes and his mind-body dualism (and further Ibn Sina’s) had poisoned the well of knowledge that cognitive science had to begin with. In the paper Richardson uses the example of the observance of an organism A to explain the difference between the type of approach the

ecological psychology and CRUM uses. It shows the first observer, unaware or ignorant of E, this observer comes to a convoluted theory for the behavior R of the organism based on I—this is the viewpoint of someone accustomed to CRUM—ignoring the variable E leads to an elaborate attempt at explaining R through other means. Similar to how CRUM must resort to a central executive function or loans of intelligence to explain the more “abstract” workings of the mind. On the other hand, the second observer takes into account all information, including E, which, in turn, leads to a much simpler explanation for R, that isn’t utilizing some internal and unobservable concept. This observer is representative of the ecological perspective, where the entirety of the organism and the environment are taken as important aspects of a system. It should also be noted that CRUM often allows for semantics to get in the way of progress regarding theories; there is much argument over the exact definition of “representations” among other terms. This trouble is sought to be lessened through embodied cognition, which seeks to create concrete, definable terms that don’t vary between researchers.

A critical factor that puts the ecological approach above CRUM, is it’s descriptions of the environment that are pertinent to the organism as well. These descriptions include: substances, surfaces, places, objects, and events; each of which can have a multitude of variations, these having an effect on the organization of the organism-environment system. Also, the idea that what an environmental aspect is and what it means are in the same is brought up here, declaring that meaning, rather than being conjured up within the mind, is an objective reality of the environment and can be understood as such. This theory is much more charitable than that of CRUM’s representations of the separated environment, which requires a much more laborious explanation, that is reliant upon ideas like; logic, rules, and concepts, all of which aren’t sufficient enough to explicate viably how an organism navigates an environment, let alone all of

the smaller aspects that can be detected by an organism. CRUM prefers a more “search” heavy explanation that necessitates that the mind must search through a catalogue, so to speak, for a complete idea of what is occurring and to what. This task, then, boils down to an intractable problem, that which would take much too long to do. In no way does an organism require the amount of effort this would need, to determine its environmental state. Furthermore, the ecological approach offers a much more sound interpretation of behavior. The linearity of CRUM suffices for a more step-based description of action, this translates to behavior, wherein the behavior must originate from somewhere, typically explained as the central executive here. Opposed to this, the ecological perspective maintains that instead of originating from some specific entity, rather it emerges through the interaction within the organism-environment; be it between the mind, body, environment, etc. Richardson gives us an example of fingers, initially moving anti-phase, when the frequency increases, they begin to move in-phase; exemplifying the nonlinearity of the dynamics of behavior and proving the physicality that is apparent within perception-action. Moreover, this example of rhythmic coordination is evident in multiple other situations; for example, the coordination between two people rocking in chairs, which shows the connection with the external environmental aspect that an organism has, including with other organisms in the environment. The componential nature of CRUM isn’t sufficient to explain phenomena such as this, and it’s likely that if were to try to explain these, it would resort to an immaterial explanation. Additionally, the separation of perception and action, is not at all reminiscent of how perception-action seems to work. A linear track from stimulus to perception and intention to response, is almost never how an organism’s action pans out. Instead, perception and action tend to work in tandem and are continuously occurring, if it weren’t then there would

apparently be temporal spaces between actions and new perceptions, which would constantly be happening, which isn't evident in the world.

There are two types of argument that I'd expect to hear emanating from my own. One would be that of the traditionalists within cognitive science defending CRUM. The most likely argument would be toward the self-evidence of the organism and the environment's apparent separation, where the actions of oneself aren't completely dependent on the environment and often have no effect on it, and the clear disparity between one organism and another. However, this is easily combatted through that analogy to the geocentric theory that was discussed previously. From the perspective of an organism within an environment, it appears to one that the environment is separated from that organism, but if one were to be an onlooker, it would be evident that the environment is not only undoubtedly having an effect on the organism but is connected to the organism, and vice versa. As if one were a biologist studying the behavior of frogs, it would be impossible to not acknowledge the connection between the frogs and the environment. Similarly, the assumption that Earth is centered in the solar system was apparent, when we focused only on our own perspective, looking out from Earth it would seem that everything revolves around our planet—looking at the entire solar system, though, it is clear that the Earth, alongside the other planets, revolves around the Sun. Another argument that would be possible would be a position from another embodied approach, such as the dynamics, asserting that their theory would be a better alternative. However, I'd argue that the approach of ecological psychology, takes all of the best parts from the embodied-embedded approach and leaves the discrepancies. This is especially the case regarding a cognitive being within an environment, which is the standard situation in a real world example. Although, I do think it's possible that another theory could excel in another specific area, such as dynamics with speech perception.

Further, it appears some of the differences between theories are essentially trivial at best, and in the ecological approaches favor at worst.

It's evident that the CRUM approach, most of all, is insufficient in being able to explain the complexities and sometimes even the simplicities of perception-action. The ecological approach provides a much more concrete framework for the mind to operate within an environment, whereas CRUM prefers thought experiments that rid themselves of the environmental framework as a whole. From this they are able to forge a theory, however, this theory will never be able to hold within a system that isn't totally isolated—of such no system is ever found in nature, as for an organism to exist, so too does an environment. This very fact proves the superiority of ecological psychology's ability to explain the mind and its interactions between the world.