The Relationship Between Aphantasia and Embodied Cognition

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What is Embodied Cognition?

- The overarching theory depicts that it is the interaction between mind, body, and environment, although there are many different ‘flavors’ of EC proposed by several researchers in Psychology and Cognitive Science
    - Tibbets, Wilson, and Anderson

Tibbets' Theory

- From Tibbets' point of view, embodied cognition is 'online,' or sensory-based, and they also back up claim that embodied cognition as a whole is unified by the extended mind-thesis.
- The extended mind thesis entails cognitive systems reaching beyond the individual and into our physical and social environments (through use of cognitive artifacts, etc.)

Wilson's Theory

- There are six views of embodied cognition that are intrinsic to understanding the theory of EC.
- These include things like how cognition is situated, how the environment is part of the cognitive system, and how the environment receives information that is offloaded from the cognitive system.

Anderson's Theory

- One notable, and less widely mentioned facet of EC discussed by Anderson is that the evolutionary history of a cognitive agent is important to understanding the functions of the theory.
- He argued that if we didn't have evolution or take it into account, we would not have reason – and reason is the pinnacle of embodied cognition.

But what about Cognitivism?

We shouldn't discount cognitivism as a relevant theory...

Because of the many helpful contributions that cognitivism has given to cognitive science. However, in the context of embodied cognition, many people believe that cognitivism is its rival, and the two cannot coexist.

Embodied cognition and cognitivism should instead...

Coexist as both important theories for the field of cognitive science, because they have both contributed meaningful and insightful literature regarding our cognition. This is especially so in the context of mental imagery!

Mental imagery? How is that related to embodied cognition?!

1. There have been several notable studies which provide empirical evidence for the effect embodied cognition has on our mental imagery.

    a. Schendan and Ganis (2012), Gibbs and Berg (2002), and more explicitly defined a relationship in which mental imagery relies upon our usage of embodied cognition in order to supply us with the faculties we need to complete tasks using our imagination.

    b. “People have the phenomenological experience of having a mental image whenever a schema that is not directly relevant to the exploration of the present environment momentarily takes control of the body's exploratory apparatus”

Implications of Embodied Cognition

If we accept the theory of embodied cognition, what else do we need to know and thus accept?

1. The brain/mind is not the only source of our cognitive states.
    a. Cognition instead arises from the interaction of the mind, body, and environment to directly influence our cognitive states. This is in direct contrast to the cognitivist belief that the mind is the sole influencer of cognition.
2. Although there are discrepancies between the different ‘flavors’ of embodied cognition, we can use the general theory to understand our cognitive states.
    a. There has been a noted difference between ‘mainstream’ EC and ‘radical’ EC, where the former emphasizes sensorimotor experiences, while the latter is focused on perception and action-dynamics.
    b. Different interpretations will affect the specific viewpoints held within the broad umbrella of EC, and can help prove points about more niche topics related to cognition.

What is Aphantasia?

- Aphantasia is a condition that affects the ability to experience mental imagery through vividness
- It exists as an extreme end on the scale of mental imagery vividness (little to no imagery)
- There are different theories that will be discussed that attempt to classify the '*cause*' of aphantasia
    - Blomkvist, Zeman

Theories of Aphantasia's *potential causes**

*These researchers are not necessarily implying causation, but rather giving a hypothesis of what makes it come about from our mental states, as most of the population does not experience aphantasia.

Blomkvist

- Aphantasia may be caused by an episodic memory deficiency
- When we are trying to recall episodic memories, people with aphantasia may have deficiencies which cause mental imagery to not be registered/stored within the memories.

Aphantasic people can also have involuntary imagery, but the inability to mentally visualize is typically only considered and tested on our voluntary imagery abilities.

Zeman, et al.

- Aphantasia is just a variance in our neuropsychological functioning as humans
  - This means that the condition is comparable to similar variants, such as synaesthesia
- Instead of being a deficiency or disorder, Zeman et al. argued that aphantasic individuals just have a different psychological functioning than the general population.

How do Aphantasic people complete tasks though?

Similar to the general population, just using alternative strategies than utilizing our voluntary mental imagery.

- Wilson, Jacobs, et al., Dawes et al., Ganczarek et al., and Dance et al. all laid out that people with aphantasia tend to use different mental faculties than non-aphantasic individuals (because of the inability to use mental imagery!) for tasks such as mental rotation, etc.
- It's also important to note that aphantasia does not solely affect the visual senses, but is inherently multi-modal in the sensory mental imagery it can affect.
    - Most studies use the VVIQ (Vividness of Visual Imagery Questionnaire), but there are questionnaires that can take into account multi-sensory imagery!

How are Aphantasia and Embodied Cognition related?

- Because of the intricate connection between mental imagery and EC, we can extend this relation to aphantasia...
- Would it be that aphantasics are unable/less able to ground their mental images into the environment through an offloading process?
- Or, would it mean that the ‘off-line’ aspects of our cognition are distorted in our retrieval of mental imagery for the mind’s use?

The ‘off-line’ aspects of cognition may be distorted

My argument for the relationship between aphantasia and embodied cognition is that the ‘off-line’ aspects of our cognition are distorted in our retrieval of mental imagery for the mind’s use.

- Palermio et al. argued that when we process our sensory information, we may be synthesizing mental imagery from that information
  - Thus, when retrieve this sensory information from our embodied cognition (brain, body, environment interaction), it may be distorted.
  - If the information becomes distorted during the sensory processing, it would drastically affect our capacity for voluntary mental imagery, which may lead to aphantasia!

In summary...

Embodied Cognition

- Embodied cognition is derived from the inherent communication between brain, body, and environment.
- We have evidence for many different ‘flavors’ of embodied cognition, which vary in how separate they are from the traditional cognitivist theory of cognition.

EC + Mental Imagery

- Embodied cognition and mental imagery are intricately related.
- Empirical evidence shows that embodied cognition can be derived from and have an effect on our mental imagery.
- The interaction between the neural mechanisms and our biological faculties with the environment leads to our mental imagery

EC + Aphantasia

- Embodied cognition and aphantasia are thus related because of the relationship between mental imagery and EC.
- We can infer that embodied cognition’s “off-line” aspects are distorted when we are processing sensory information from our cognitive states, which thus affects our mental imagery vividness – leading to aphantasia.

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