

## **The Extended Mind Hypothesis**

### ***An Objection and a Defense***

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#### **Introduction**

In “The Extended Mind”, Andy Clark and David Chalmers (1998) present a claim that mind extends beyond brain and body into the physical world via coupling of organism and external resources in order to hold mental states (such as beliefs) “constituted partly by features of the environment” (12, 18). One strong criticism of the hypothesis comes from Ken Aizawa and Fred Adams (2001), who argue in “Defending the Bounds of Cognition” that Chalmers and Clark commit a fallacy by confusing the *causal* relationship between the brain and external objects with a *constitutive* relationship (2). They further maintain that such objects cannot make up cognition as they lack the “nature” of “what constitutes the cognitive” (2001, 3). In the sections that follow, I will explicate this objection and then present counter-arguments that a proponent of the extended mind hypothesis may use to overcome it.

#### **The Objection**

Adams and Aizawa (also referred to herein as A&A) argue that Chalmers and Clark (also referred to herein as C&C) confuse causal and constitutive relationship between concepts. At this point it is helpful to briefly define “causal” and “constitutive” relations (something A&A do not do in their argument): in general, causal relations occur via ordering and/or

organization of events (e.g., “Incident A happened in circumstance C due to events 1, 2, and 3 and their spacio-temporal organization”), whereas constitutive relations are generally relations consisting of properties and organization of parts in composition (e.g., “System A is like this because of component parts 1, 2 and 3 and their properties P and organization O”); for a further discussion, see Ylikoski (2013). The distinction comes up if you strike a match and light a candle, causing it to burn; by performing this operation, you and the match do not become part of the constitutive properties of the candle (which we imagine include a wick in wax)—you instead enter into a causal relationship with its activity, burning. While operation “striking match” may be coupled to the event “candle burning”, it is erroneous to say that this makes the match a *part* of the candle. An object or operation may be coupled to another object causally, but this does not make it part of that object. Along this line, Adams and Aizawa argue that external objects in the physical environment act upon cognition via cause and effect, but this does not mean that they *constitute* (make up a part of) cognition or allow cognition to “extend”.

### *Problems in Cyber Land*

Critics arguing along the line above would do well to carefully examine the three cases of human problem solving presented by Clark and Chalmers (1998) in which a human accomplishes rotation of an object by three different means: (1) via mental rotation in the imagination, (2) by clicking a button so that a computer generates an animation of the rotation, and (3) by accessing a chip embedded in their brain, which rotates the object for them (p. 7). Clark and Chalmers maintain without explanation that case (3) is “on par” with case (1), and then since (2) and (3) are computationally equivalent, that we then must

admit that (1) and (2) are also on par with one another. In their intuition that (1) and (3) are “clearly...on par”, Chalmers and Clark seem to imply that the location of the chip obviously makes it a part of the constitution of the brain and thus the mind of the human, yet critically the entire point of the chip is that no *mental* rotation is performed, which makes it more on par with watching the animation in (2) than the mental activity in (1). We see that critics may easily maintain that whereas in (2) and (3) the computer activity is *causally* connected with cognition, there is no resulting *constitutive* relationship between computer and cognition and thus no extension of mind. Aizawa and Adams might further argue that the chip lacks “nature” of cognition or the “mark of the cognitive” as they maintain that cognition is a causal process that must contain “non-derived content” (a concept beyond the scope of this paper but for discussion, see Adams and Aizawa, 2001; Aizawa, 2005).

### *Otto's Notebook*

We next can tackle C&C's discussion of Inga and Otto. Inga and Otto separately navigate to the museum—Inga by memory, and a forgetful Otto by reference to a notebook containing directions to the museum. Chalmers and Clark maintain that so long as use of the notebook is substituting for events that if occurring in the head would be considered part of cognition, then that operation of using the notebook itself is part of cognition (1998, 8). But does the notebook really function as a process that would occur in the head? The notebook informs Otto of certain realities, but presumably Otto or some other cognitive agent wrote down the items in Otto's notebook, and the cognitive task of reading the notebook and the notebook's writing causing cognitive events to happen in Otto is not the

same thing as the notebook performing cognitive operations or participating constitutively in Otto's cognition. An objector may thus assert that the notebook is not in and of itself cognitive.

### **The Defense**

Recall that Adams and Aizawa argue that while external objects and physical surroundings may act upon cognition via cause and effect, they do not *make up* cognition, as they lack the "nature" of "what constitutes the cognitive" (2001, 3). One possible line of defense against A&A's accusation of fallacy is to reply that their accusation itself is partly fallacious as a matter of direction: to say that B is not composed of A is not to disprove that A is composed of B! By saying components which may constitute a concept are not themselves composed of that concept is *not* to say that the concept is not composed of those components. Critically, being cognitive in nature or acting as a cognitive agent is not the same as constituting a part of a cognitive thinking system. As mentioned previously, a good deal of A&A's "Defending" is spent arguing that an object (such as the notebook or pencil discussed by Clark and Chalmers) is not *itself* cognitive or performing cognitive activity, in order to reason that they cannot be *constitutive* of cognitive activity. Yet it is spurious to maintain that objects must be constituted of components individually instantiating the system they constitute, just as it is specious to say melted wax, a cotton rope, or melted crayons must individually exhibit "candle-ish-ness" because they may constitute part of a candle.

In a reply to Adams and Aizawa, Clark responds that a clump of neurons is no more “cognitive in nature” than a notebook (2001, 35); neither the notebook nor cluster of neurons is doing anything cognitive considered alone. If a clump of neurons can participate in cognitive systems without being cognitive “in nature”, why not pencils or notebooks? Critics may respond that the neuron clump is arguably an *intrinsic* part of the cognitive agent and that the notebook is not, but proponents may respond (a) that cognition may not be limited to the agent, and/or (b) that the notebook has become “part of the agent’s cognitive routines” (Clark, 2001, 5).

### *Constituting Process*

Here we return to the accusation that C&C confuse causal and constitutive relationships by suggesting that causally impacting a cognitive process constitutes a part of a cognitive process. Notably, in defining cognition, A&A themselves describe it as “a species of causal processing...” and thus we are immediately inclined to admit that cognition is at least in part composed of causal chains of step by step events per common definition of “process”. (Indeed, a process may be composed of several sub-processes; see process “checking the mail” which typically involves the subprocess “walk to the mailbox”). Now, if a *causal* relation of steps may in and of itself *constitute* a process, we are forced to admit a distinct boundary between causal and constitutive relations has already broken down. (This breakdown actually happens quite frequently in sciences, as described in 2010 by Don Ross and James Ladyman.) So critics may be forced to admit cognition is constituted in part of causal chains—fine, we’ll allow for that—but we now return to the operation of striking a match causing the process “candle burning” and critically recall that simply existing in step

by step *processual motion* with a secondary process does not make the two processes a *single* process or one process a constitutive part of the other. Nevertheless, it is possible to argue that objects in the extended world (such as Otto's notebook) may partake as constitutive *sub-processes* of the process of cognition.

### *Guns and Notebooks*

For an unpleasant but useful analogue, consider the concept "murder". The expression "murder" is associated with a heinous act of grave moral turpitude committed freely by a morally knowledgeable and cognitively capable agent a.k.a. a murderer. But the process of murder almost invariably contains the subprocess "use of weapon", e.g., "firing of gun". No rational agent would argue that a gun is independently capable of murder or that a gun used in murder is a murderer. Nevertheless, anyone would vouch that a gun may be both a causal and constitutive part of the process "murder", and some would further argue that without access to a gun, some individuals would not have been primed by its very presence to fire it. (In other words, a gun *affords* shooting in the phenomenological sense.) Now let us return to Otto's notebook. If the notebook *enables* and *affords* Otto to have thoughts that he would not have without it (or that he would find very difficult without it), just as the gun *enables* and *affords* actions not possible (or much more difficult) without it, what makes the notebook less a part of his thinking process than the gun is part of a violent action?

### *Constituting Mind*

If a cognitive task is completed with seamless integration of external inputs, it becomes difficult to argue that the external inputs are not in some way part and parcel of the cognitive task. Still, even conceding the notebook participates in a cognitive routine via

cause and effect or even as a constitutive part, a critic might argue that these extended systems do not constitute “mind” or extension thereof. They could easily argue that mind is roughly equivalent to the boundaries of a cognitive agent, and thus that mind and agent is separate from tools used to improve cognitive function. Proponents of an extended mind could reply that mind itself is equivalent to an organization of cognitive processes performed by an acting agent and extended systems, or that the agent *itself* is extended by coupling with external objects (Clark and Chalmers, 1998, 18).

In their argument, Clark and Chalmers focus on carefully defined types of couplings involving aspects that “were it done in the head, we would have no hesitation in accepting it as part of the cognitive process” (1998, 8). Extending this argument, if Otto’s beliefs are part of his identity of self, and the beliefs happen to be constituted in notebook rather than his mental memory of his beliefs, the notebook is an actual part of Otto’s self (Clark and Chalmers actually argue this, see 1998, 14,18). Depending on the beliefs or memories the notebook contains, this line of reasoning becomes more compelling; if Otto has dementia and only remembers the name of his adult son and deceased wife via the notebook, is there a way to argue that the notebook is not a key constituent part of Otto’s self or sense of self? While in a reply to A&A, Clark mentions the potential for critics to fear “devaluation” of “the cognitive core” (27), but when the external becomes a part of identity, devaluation of cognitive systems may be just as frightening.

It might be interesting to mention at this point a side argument that without input from and coupling to the environment more generally, *mind may not be able to exist at all*. Although the mind performs operations distinct from outer events (such as dreams), it is almost impossible to imagine mind or dream completely *in nihilo*. Just as animals cannot

live without oxygen used internally but sourced externally, without input from the external environment of some kind or another, mind or thought might cease. While *dependence on* the external is not equivalent to *constitution by* the external, an emerging view that mind is embedded in the external and vice versa becomes rationally compelling, and thus the concept of “extension in the external” less challenging.

### *Return to Cyber Land*

Now we return to the problems brought up by Clark and Chalmers of the humans performing operations in mental and cyber space. What can we say about Method (2) at this point? If a human being pushes a button and watches an animation of an object rotating in space, is the human performing a cognitive activity simply by watching it happen? At this point, we could consider the computer animation as part of a larger cognitive system and maintain that the animation is seamlessly filling in for a process that could be done more slowly via the imagination (or as C&C put it “in the head”) but still constitutes a crucial part of a cognitive operation. This interpretation puts (2) essentially on par with both (3) and (1).<sup>1</sup>

### **Conclusion**

We see that one strong criticism of the extended mind hypothesis is challenged by similar problems to those of the extended mind hypothesis itself, and that it is possible to rescue the hypothesis from criticism given some work. As a note upon departure, I suggest that careful

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<sup>1</sup> While this may have strange repercussions for teachers trying to vouch to students that googling answers with a smart phone is not “thinking”, this concern is beyond the scope of my paper!



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definition of “constitutive” vs “causal” and further inquiry into definition of the boundaries, constitution and causal framework of processes vs objects may serve both critics and proponents of the extended mind hypothesis.

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