Supersizing the Mind

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Cognitivism holds that minds are disembodied, representational symbol processing input/output devices located entirely within our heads. Clark and Chalmers (1998) suggested a radical alternative—the "Hypothesis of Extended Cognition" (HEC). An external object may be part of (the vehicles of) an agent's cognitive processes if it fulfills the following "Parity Principle": "If, as we confront some task, a part of the world functions as a process which, were it done in the head, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world is … part of the cognitive process" (Clark and Chalmers, 1998, p. 8). Since some external objects fulfill this requirement, they argued, some of our cognitive processes transcend the boundaries of skin and skull. HEC has been amply criticized by defenders of a "brainbound" or "organismbound" approach to cognition. Andy Clark's Supersizing the Mind is its most recent and most thorough defense. Clark's book is an elaboration of the original hypothesis, a response to critics, and a continuation of Clark's conceptual work on embodied, embedded and situated cognitive science.

Supersizing the Mind has ten chapters. Part I reviews a vast collection of empirical studies (from robotics to cognitive psychology), showing how much the execution of cognitive skills actually depends upon the agent's body and environment (chs. 1–3), and argues that the body, by incorporating rather than merely using external tools, can extend beyond the organism's boundary. Chs. 2–4 introduce HEC by arguing that the idea of incorporation rather than mere use

also applies to cognition. Part II (chs. 5–7) responds to some objections, including Fred Adams and Ken Aizawa's charges that Clark has no proper account of the cognitive and is committing a "coupling-constitution fallacy", and Robert Rupert's claim that there is no sensible reason to move from mere tool use to incorporation. Part III (chs. 8–10) contrasts Clark's position with "radical embodiment" approaches (e.g., Alva Noë and Kevin O'Regan's sensory-motor approach which ties perceptual experience to a specific kind of embodiment). Here Clark continues his endeavor of reconciling traditional cognitivism with alternative approaches. Despite his critique of purely representational approaches Clark does not want to break entirely with the cognitivist heritage. HEC, he claims, is "fully continuous with computational, representational and (broadly speaking) information-theoretic approaches to understanding mind and cognition" (p. 198; see also pp. 152–156).

Philosophically most interesting are chapters 5 and 6 in which Clark tries to defuse some objections against HEC. Here the reader finally gets to understand Clark's rationale for embracing HEC: a thoroughly commonsense functionalist approach to the cognitive which individuates mental states by the roles commonsense psychology assigns to them.

Adams and Aizawa identified two fundamental problems for HEC: (1.) the lack of an adequate account of cognition, a "mark of the cognitive", which would show that cognitive processes actually are extended; (2.) the "coupling-constitution fallacy" according to which an agent's intimate causal coupling with an external object does not entail that this object is constitutive in any substantial sense of the agent's cognitive processes. Clark's response to the first problem is that asking what makes an external object cognitive is asking the wrong question because the "appeal to coupling is not intended to make any external object cognitive … [but] to make some object, which is in and of itself not usefully (perhaps not even intelligibly) thought of

as either cognitive or noncognitive, into a proper part of some cognitive routine" (p. 87). That, however, does not dispel Adams and Aizawa's point, because to provide a mark of the cognitive just is to provide a criterion for what makes an object a proper part of some cognitive routine that can be fulfilled by external objects. Adams and Aizawa's own suggestion is that nothing can be a cognitive process unless it involves non-derived representations and is implemented by certain kinds of mechanisms, both of which are found in human brains only. Clark rejects this as a kind of "anthropocentrism and neurocentrism" and instead defends a functionalistic mark of the cognitive: "it is the coarse … functional role that … displays what is essential to the mental state in question" (p. 89).

We will come back to the issue of functionalism below. For now, let us note that it seems unwise to ask for (or provide) an a priori mark of the cognitive. Most sciences invoke central concepts—"gene" or "species" in biology, say, or "computation" in cognitive science—the meaning of which is fixed depending upon the theoretical and empirical pay-offs one hopes to thereby achieve: if attaching a certain meaning to a term significantly enhances our knowledge, then scientists will, ceteris paribus, accept it. The same should hold for the cognitive: if it is empirically and theoretically fertile to treat a process spanning brain, body, and environment as a cognitive process, then so be it. As a consequence, what counts as a cognitive process is not so much a theoretical issue as a matter of scientific practice.

Apart from his attempt to provide a functionalist mark of the cognitive, Clark's functionalist inclinations are also evident in his response to Adams and Aizawa's second objection. According to their "coupling-constitution argument", adherents of HEC use the causal coupling between an agent and an extraorganismal tool as evidence that the latter is a constitutive part of the agent's cognitive routines—an inference that is obviously fallacious.

Clark pleads not guilty. “In terms of the form of the argument,” he says, the original argument “is not even close to the commission of a coupling-constitution fallacy” (p. 88). It is not the coupling that matters “but the effect of the coupling—the way it poises … information for a certain kind of use within a specific kind of problem-solving routine” (p. 87). What matters is the “achieved functional poise” (p. 88), and coupling is important only insofar as without coupling an external object could not exhibit the right “functional poise”.

Clark’s argument for HEC is thus not a coupling-constitution argument. Neither is it, contrary to what Clark and Chalmers (1998) strongly suggested, the Parity Principle. Although Clark does not explicitly say so, the Parity Principle cannot, all by itself, support HEC because it is silent about the exact conditions under which we would grant that a part of the world functions as a process which, were it done in the head, would be called “cognitive” and about whether these conditions are ever fulfilled. What fills the gap for Clark is, again, an a priori commitment to functionalism. We call a process cognitive if it achieves the right “functional poise”, and at least some extraorganismal objects contribute to the commonsense functional roles distinctive of ordinary cognitive states. Clark is not very explicit about these issues and mostly leaves it to the reader to figure out the details of the argument. However, at one point he admits that the original argument for HEC is best “viewed as a simple argumentative extension … of what Braddon-Mitchell and Jackson … describe, and endorse, as ‘commonsense functionalism’ concerning mental states” according to which “normal human agents already command a rich (albeit largely implicit) theory of the coarse functional roles distinctive of various familiar mental states” (p. 88).

Clark’s deep commitment to functionalism also surfaces in his response to Rupert’s question why one should endorse HEC and not instead a considerably weaker thesis—the

"Hypothesis of Embodied Cognition" (HEMC)—according to which cognitive processes depend heavily, but only causally, upon external features. Why move from mere tool use to outright incorporation? According to Rupert, HEC has no advantages over HEMC, but a couple of disadvantages. For instance, whereas research on internal processes can rely on well-established laws and regularities, it remains doubtful whether there can ever be a systematic science of extended cognitive processes. Eventually, Rupert fears (in Clark's words), we might be "losing our practical and theoretical grip on the very minds … that we hoped better to understand" (p. 111) because they are no longer "a suite of integrated, persisting, organismically grounded capacities" (p. 113).

In ch. 6 Clark argues that it is actually HEMC that "threatens to obscure much that is of value" (p. 138) so that in the end HEC is preferable to HEMC. Alas, the exact nature of his argument is, as so often, obscure and continues to elude us. According to Clark, HEC reminds us that, first, "the neural goings-on are not blessed with some intrinsic property that makes them alone suitable to act as the circuitry of mind and intelligence", and, second, "there is no single, all-powerful, hidden agent inside the brain whose job is to do all the real thinking" (p. 136). Ultimately, we think, it can, again, only be functionalism that is driving him to these judgments. If the nature of cognitive processes is functional, and if the functional role of a cognitive processes is filled by some extraorganismal object, then that object is indeed incorporated into the cognitive process, and not just used as a handy tool.

Clark does next to nothing to justify his commitment to commonsense functionalism (CSF). Given the pivotal role CSF plays within his overall argumentative scheme, both explicitly and implicitly, this is a pity. The pros and cons of CSF have been discussed intensively in philosophy, and the debate about HEC might obviously benefit from recognizing the

philosophical discussion. For instance, Block's (1978) Homunculi-Head and Chinese-Nation examples were already designed to show that CSF is too liberal because it attributes mental states to things which, intuitively, have no mental life—which is exactly the kind of criticism often leveled against, e.g., the example of Otto's notebook appealed to in Clark and Chalmers (1998). Moreover, Block quarreled with CSF's attempt to define mental states in terms of folk psychological platitudes. He argued that: (1.) a brain in a vat would continue to have a mind although it would exhibit none of the usual platitudinous connections between behavior and clusters of inputs and mental states; (2.) two mental states that are intuitively different might be folk psychologically indistinguishable; (3.) many of the widely held platitudes may turn out to be false. Obviously, all three objections are pertinent to the debate concerning HEC. Consider, say, the CSF conception of memory as a simple storage mechanism where memories are waiting for retrieval, which accords well with pro-HEC examples like Otto's notebook, but turns out to be wrong on a scientific functional analysis of memory. The point is not that objections like this are insurmountable, but that a thorough defense of HEC at least ought to address them. Alas, Clark remains silent on this issue.

Throughout the book one finds an ongoing and implicit appeal to personal and subjective experiences. Clark points out that while learning and adaptation can render tool use transparent and fluid so that the agent does not experience the tool as a tool anymore, an agent who struggles with a novel tool might "feel quite alienated" (p. 74) from it and not consider as a part of her cognitive routine. Another reason to prefer HEC over HEMC would be thus phenomenological: If the coupling between an agent and an external tool becomes intimate enough, the agent may no longer feel as though she is using a tool, but instead experience the (former) tool as part of herself. However, Clark explicitly downplays the role of phenomenology: "I do not mean, here

or elsewhere, to advance any arguments of the form 'it seems to us as if we are/are not cognitively extended; therefore we are/are not cognitively extended'!" (p. 238, n. 8). In our eyes, this is unfortunate since first person phenomenology certainly is essential for work in embodied, embedded and situated cognitive science. A task for future research will be to disentangle first person arguments and third person arguments for HEC and to assess their quality independently (although it is debatable whether one can make a convincing phenomenological argument for HEC).

To sum up, the evidential situation vis-à-vis HEC and HEMC seems rather embarrassing. They are clearly distinct hypotheses, but we cannot (yet) see any principled reason to prefer one over the other. We remain unconvinced by attacks on HEC, but there does not seem to be any knockdown argument in favor of HEC either. As indicated above, we suspect that ultimately the issue cannot be settled philosophically. We may have to ask empirical scientists whether HEC has any significant theoretical or explanatory advantage in their everyday business.

The main vice, and at the same time the main virtue, of Supersizing the Mind is that—even though it is written by one of the most innovative and imaginative contributors to the philosophy of mind and cognition—it is not a philosophical book. It is an invaluable source of empirical examples, inspiring, and a breathtaking ride through current cognitive science, but it is not a meticulously argued book that defends its conclusion at a deliberate pace, step by step, dotting the i's and crossing the t's. From a philosophical point of view, this is disappointing. At the same time, however, we are fortunate that Clark has written the book he has written. It is groundbreaking and of interest to an audience much broader than merely philosophers. For scientists interested in the theoretical underpinnings and consequences of some of the most

fascinating work in recent cognitive science, the book is invaluable. Nevertheless, the philosophical book on HEC ought to be written, too; and it ought to be written soon.

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