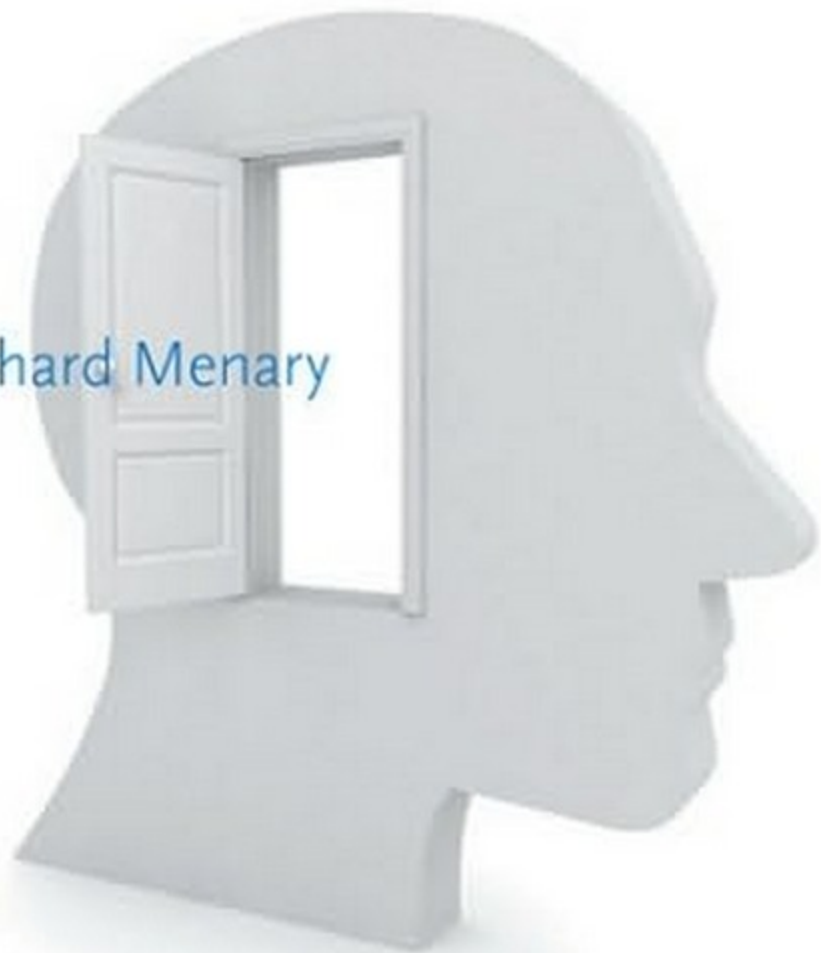


# The Extended Mind

edited by Richard Menary



## The Extended Mind

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**edited by Richard Menary**

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For my parents with thanks  
*Ab imo pectore*



# Contents

- 1 Introduction: The Extended Mind in Focus 1**  
Richard Menary
- 2 The Extended Mind 27**  
Andy Clark and David J. Chalmers
- 3 *Memento's* Revenge: The Extended Mind, Extended 43**  
Andy Clark
- 4 Defending the Bounds of Cognition 67**  
Fred Adams and Ken Aizawa
- 5 Coupling, Constitution, and the Cognitive Kind: A Reply to Adams and Aizawa 81**  
Andy Clark
- 6 The Varieties of Externalism 101**  
Susan Hurley
- 7 The Alleged Coupling-Constitution Fallacy and the Mature Sciences 155**  
Don Ross and James Ladyman
- 8 Meaning Making and the Mind of the Externalist 167**  
Robert A. Wilson
- 9 Exograms and Interdisciplinarity: History, the Extended Mind, and the Civilizing Process 189**  
John Sutton
- 10 Cognitive Integration and the Extended Mind 227**  
Richard Menary
- 11 In Defense of Extended Functionalism 245**  
Michael Wheeler



- 12 Consciousness, Broadly Construed 271**  
Mark Rowlands
- 13 The Extended Infant: Utterance-Activity and Distributed Cognition 295**  
David Spurrett and Stephen Cowley
- 14 Representation in Extended Cognitive Systems: Does the Scaffolding of Language Extend the Mind? 325**  
Robert D. Rupert
- 15 The Extended Mind, the Concept of Belief, and Epistemic Credit 355**  
John Preston
- Contributors 371  
Index 373

# 1 Introduction: The Extended Mind in Focus

Richard Menary

One of the most dangerous ideas for a philosopher is, oddly enough, that we think with or in our heads. The idea of thinking as a process in the head, in a completely enclosed space, gives him something occult.

—Wittgenstein, *Zettel*

In 1998, *Analysis* published an essay by Andy Clark and David Chalmers<sup>1</sup> which has excited vigorous debate about the nature and study of mind and cognition. This volume presents the best critical and reflective responses to the bold vision of mind and cognition set out in that essay. Before turning to the details of this debate, I want to briefly summarize the main proposals and arguments as laid out in the 1998 essay and highlight the main features that are criticized or developed by the essays in this volume. In this way we will be in a better position to understand the focus of the arguments and developments to be found in the essays presented here.

## 1 Active Externalism

The extended mind begins with the question “where does the mind stop and the rest of the world begin?” In answer to this question, C&C present an *active externalism*, which should be distinguished from the more traditional meaning externalism familiar from the writings of Putnam (1975) and Burge (1986). Active externalism is distinguished from traditional forms of externalism because it concerns *the active role of the environment in driving cognitive processes* (Clark and Chalmers 1998, this volume, p. 27). This statement of active externalism is ambiguous between two interpretations, and we must be careful about which is implied. First, there is a rather trivial reading of active externalism, where some causally active

features of the environment influence cognitive processing in the brain. Second, there is the more robustly externalist reading, where some cognitive processing is *constituted* by active features of the environment. For example, C&C define an epistemic action as altering “the world so as to aid and augment cognitive processes such as recognition and search” (this volume, p. 28). I doubt that internalists will have any problem with actions that *aid* cognitive processes, just so long as those actions themselves are not constitutive of cognitive processes.

However, C&C explicitly endorse the constitutive version of active externalism: “In these cases, the human organism is linked with an external entity in a two-way interaction, creating a *coupled system* that can be seen as a cognitive system in its own right” (p. 29). The coupled system constitutes a cognitive system. It is not simply that the external features, to which the organism is interactively linked, have a causal influence on the cognitive processing of the organism; rather, the interactive link *is* the cognitive processing. Therefore, active externalism is a constitutive thesis, not a merely causal one, as encapsulated by the slogan “cognitive processes ain’t (all) in the head” (p. 29). We should be aware that active externalism as a robustly constitutive thesis has been challenged by critics (Adams and Aizawa, this volume; Rupert 2004, this volume), who are inclined to think that the less robust causal version of the thesis is all that we are likely to get. I shall outline the reasons for this below.

Before turning to the nature of coupling we should attempt to understand the difference between active externalism and *passive* forms of externalism.

When I believe that water is wet and my twin believes that twin water is wet, the external features responsible for the difference in our beliefs are distal and historical, at the end of a lengthy causal chain. Features of the *present* are not relevant: if I happen to be surrounded by XYZ right now (maybe I have teleported to twin earth), my beliefs still concern standard water, because of my history. In these cases, the relevant external features are *passive*. Because of their distal nature, they play no role in driving the cognitive processes in the here-and-now. This is reflected by the fact that the actions performed by me and my twin are physically indistinguishable, despite our external differences. (C&C, p. 29)

Active externalism is to be distinguished from an externalism where the contents of beliefs are dependent on my history. The external features are distal, not having a synchronic effect on the organism. This opens up an important question about the role of content in extended cognitive processes, a question addressed in the essays by Adams and Aizawa and

Wilson. By contrast, active externalism focuses on active features of the environment in the here-and-now.

The active nature of this externalism is explicated in terms of the notion of causal coupling. Since the issue of coupling relations is a focal point for criticism of the extended mind (EM) in this volume and elsewhere (Adams and Aizawa 2001), we should be very clear about what it entails.

## 2 Causal Coupling

C&C define a coupled system in the following way: “In these cases, the human organism is linked with an external entity in a two-way interaction, creating a *coupled system* that can be seen as a cognitive system in its own right” (p. 29). C&C give something by way of criteria for this constitutive thesis (p. 29):

1. All the components in the system play an active causal role.
2. They jointly govern behavior in the same sort of way that cognition usually does.
3. If we remove the external component, the system’s behavioral competence will drop, just as it would if we removed part of its brain.
4. Therefore, this sort of coupled process counts equally well as a cognitive process, whether or not it is wholly in the head.

The active features of the environment have an influence over us in the here-and-now. If we maintained the internal structure but varied the nature of the environment then our behaviors and competences might alter radically. Crucially, C&C claim that “the external features here are just as causally relevant as typical internal features of the brain” (p. 30).

There are two possible interpretations of causal coupling here, and it is important to be clear about which one is implied by C&C.

A. Asymmetric influence: environmental features have a causal influence over inner processes. It may still be the case that we can change the external environment and that affects competence and behavior of the subject. If you take my diary away from me I won’t be able to remember all my engagements. The diary prompts my recall of memories, but there is no need to go further and say that because the diary has a causal influence on me that it is thereby part of my memory, or the cognitive processes that allow me to remember. It would be a mistake to make this claim simply on the basis of a causal connection.

B. Symmetric influence: the inner and outer features have a mutually constraining causal influence on one another that unfolds over time. It is not simply that the diary prompts or causes, as input, various cognitive processes to unfold in my brain; rather, the external process of retrieving the information from the diary and the concurrent processes in my brain jointly govern my future behavior. This is what Menary calls *cognitive integration* (2006, 2007, this volume).

This distinction is important because, critics of EM, such as Adams and Aizawa (2001, this volume) are working with interpretation A, but Clark is working with B. Hence there is a misunderstanding between exponents of EM and their critics. The critics may wish to claim that although EM is supposed to endorse B, very often A is what is endorsed, and A is not a constitutive thesis. Exponents of EM must be careful to indicate when and why they are using interpretation B.

C&C do not give an explicit example of a coupled process, nor do they explain how the internal and external features jointly govern behavior. However, in some of Clark's other work he does make the notion more explicit. In chapter 8 of *Being There*, Clark outlines the notion of continuous reciprocal causation, "the presence of continuous mutually modulatory influences linking brain, body and world" (Clark 1997, p. 163).<sup>2</sup>

Continuous reciprocal causation (CRC) occurs when some system S is both continuously affecting and simultaneously being affected by, activity in some other system O. Internally, we may well confront such causal complexity in the brain since many neural areas are linked by both feedback and feedforward pathways (e.g., Van Essen and Gallant 1994). On a larger canvass, we often find processes of CRC that criss-cross brain, body and local environment. Think of a dancer, whose bodily orientation is continuously affecting and being affected by her neural states, and whose movements are also influencing those of her partner, to whom she is continuously responding! (Clark 2008, p. 24)

Although we can identify the relevant components, and factorize them into internal and external components, the nature of reciprocal coupling makes it difficult to study the components as separate systems because they are continuously influencing and responding to one another. They are coordinating with one another to produce behavior. Insofar as brain, body, and world can be shown to be reciprocally coupled in this way, we can consider them to be a coupled system. However, we are still not in a position to definitively say when a coupled system is a cognitive system, because there might be coupled systems that are noncognitive. The parity principle is supposed to help us make such judgments.

### 3 The Parity Principle

The parity principle is stated in the following way:

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* (so we claim) part of the cognitive process. (C&C, p. 29)

The parity principle (henceforth PP) should not be taken independently of active externalism and causal coupling. It is not the main pillar in support of the conclusion that cognitive and mental processes are extended. The PP has two roles in the argument. First, it is an intuition pump; it asks us to reconsider our Cartesian prejudices<sup>3</sup>. The location of a process should not, by itself, discount a process from being cognitive. Second, it introduces the functionalist credentials of EM. As long as a process has a cognitive *function* then it does not matter where it is located. If it plays the right sort of role and is causally integrated with other cognitive processes, then it is part of the system of processes that constitute a person's completion of a cognitive task. The functionalist credentials of EM will be evident again in section 6 below.

It is important to note that the parity principle has become the focus for some of the main criticisms leveled at EM. Some critics (e.g., Adams and Aizawa 2001, this volume) take the PP to have specific implications, which EM theorists have been at some pains to resist (Clark 2005, this volume; Menary 2006; Sutton, this volume). Some friends of EM even deny that the PP is a useful motivational tool and claim that it is apt to confuse rather than enlighten (see Menary 2006, this volume; Wilson, this volume; and see Sutton, this volume and Wheeler, this volume, for a qualified defense of the PP).

Problems arise because C&C's formulation of the PP does not rule out the misleading interpretation of the extended mind as "the externalizing of internal processes." Nor does it rule out identifying external processes/vehicles as cognitive because of the relevant similarity of the external with the internal.

My strategy is to focus on a specific kind of cognitive state, memory, and here the thrust of the discussion is twofold: I argue that the external portions of extended "memory" states (processes) differ so greatly from internal memories (the process of remembering) that they should be treated as distinct kinds; this quells any temptation to argue for HEC [hypothesis of extended cognition] from brute analogy (namely, extended cognitive states are like wholly internal ones; therefore,

they are of the same explanatory cognitive kind; therefore there are extended cognitive states). (Rupert 2004, p. 407)

Clark and Chalmers' 1998 article leans heavily on the *parity argument*, which says that if a process counts as cognitive when it is performed in the head, it should also count as cognitive when it is performed in the world. (Dartnall 2005, pp. 135–136)

They [C&C] contend that the active causal processes that extend into the environment *are just like the ones found in intracranial cognition*. (Adams and Aizawa 2001, p. 56)

These critics think that the main argument for the extended mind is simply the claim that if external processes are sufficiently similar to internal ones, then they are cognitive. Is this really the argument for EM? I believe that the critics have reached this conclusion by misinterpreting the PP. It would have been better if C&C had made it clear that it is functionality and not location that matters when determining whether or not a process is cognitive. If a coupled process has the relevant functionality—for example, it meets the criteria set out in the previous section—then it doesn't matter whether that process is partly, or indeed, mostly external. Focus on the function, not the location, is the purpose of the PP.<sup>4</sup> It is not a simple comparative exercise; if external process *X* is sufficiently similar to internal process *Y*, then *X* is cognitive.<sup>5</sup>

This would be a bad way to argue for EM because external processes are often very different from internal ones. Internal process *X* may have properties *a*, *b*, and *c* and external process *Y* may have properties *d*, *e*, and *f*. They may differ radically in their physical properties; it is not the physical properties that matter to EM, however, but the functionality of the process. Internalist critics think that a knock-down argument against EM is available because it is easy enough to highlight these differences. Internal and external memories are so different, as Rupert argues, that they should not be counted as being members of the same cognitive kind. This would quell the temptation to argue for EM on the basis of similarity; but the argument for EM is not that external memories must be like internal memories for them to be counted as cognitive, *pace* Rupert and Adams and Aizawa.

This is an important point, because Rupert and Adams and Aizawa think that EM can be shown to be implausible because external processes are not susceptible to the same cognitive explanations as internal processes, and that, therefore, they cannot be considered to be members of the same cognitive kind. For example, biological memory, to use a less

prejudicial term, is subject to a variety of effects such as recency, interference, and chunking. Nonbiological memories stored in notebooks, PDAs, and so on do not share these same effects; worse, they are not subsumable under the laws that apply to biological memories. Even if we don't argue for EM through explicit similarity of processes, the difference in explanatory approach to biological and nonbiological memories should tell us that there is a problem for EM.

Or is there? Theorists such as Sutton (this volume), Rowlands (1999), Wilson (2004), and Menary (2007) argue for a hybrid science of memory (and by extension cognition and mind) where the unit of study is the entire cognitive unit, including both bodily internal and bodily external processes. There is no assumption that the internal and external must be alike. Following Merlin Donald's work, the virtue of external memories is that they have different properties from internal ones; they allow us to do things that we cannot achieve with internal memory alone.<sup>6</sup> However, it is clear that internal and external memories complement one another and coordinate in completing cognitive tasks.

#### 4 Portability, Reliability, and the Linguistic Surround

C&C raise a potential objection to EM that some commentators have picked up on, and that it is the issue of portability and reliability (Adams and Aizawa 2001, this volume). The brain and body constitute a package of cognitive capacities that are *portable* in that they can always be brought to bear on a cognitive task; they form the constant cognitive core of an individual. The coupling of these core cognitive resources to the local environment is *too* contingent: the cognitive core can be too easily decoupled from its environment. Two conclusions can be drawn from this observation. First, it is the core cognitive resources that are of real interest to cognitive scientists, who are largely interested in the cognitive processes to be found in the brain. Second, the contingency<sup>7</sup> of coupled cognitive resources shows that they are not really part of the reliable and portable cognitive resources that agents bring to bear on the world.

C&C respond with the idea that coupled cognitive systems can be both portable and reliable; it is reliable coupling that is important. If the resources in the environment are reliably available to me, then they can be reliably coupled to me. "In effect they are part of the basic package of cognitive resources that I bring to bear on the everyday world" (C&C, p. 31). The brain is subject to the dangers of damage and malfunction and even loss



of specific capacities through intoxication or stress, so this cannot be a sufficient reason for rejecting externally coupled systems.

C&C go further by claiming that external coupling is part of our core cognitive resources because “the biological brain has in fact evolved and matured in ways which factor in the reliable presence of a manipulable external environment” (C&C, p. 31). For example, the visual system exploits various features of the external environment and bodily motion (Ullman and Richards 1984; Blake and Yuille 1992).

Another central example of reliable coupling with the surrounding environment is language.<sup>8</sup> We are surrounded by spoken and written language in our everyday lives; we develop ideas and plans in groups, we write down lists, we consult diaries, we look up train timetables. The capacity to produce the linguistic surround and manipulate and exploit it for our own cognitive ends is something we gain through a process of learning and psychological development (this is what Menary 2007 calls the *transformation thesis*):

In such cases the brain develops in a way that complements the external structures, and learns to play its role in a unified, densely coupled system. Once we recognize the crucial role of the environment in constraining the evolution and development of cognition, we see that extended cognition is a core cognitive process, not an add-on extra. (C&C, p. 32)

The surrounding linguistic environment contains reliable structures, speech and text, that are available as cognitive resources to be coupled with. Our ability to reliably couple with this ever-present environment constitutes human cognition and thought.

## 5 From Cognition to Mind

The argument so far has focused on the extended nature of cognitive processes, but what of the mind? C&C provide an audacious argument to the conclusion “that *beliefs* can be constituted partly by features of the environment, when those features play the right sort of role in driving cognitive processes. If so the mind extends into the world” (C&C, p. 33). They argue to this conclusion largely through the use of an example, the case of Otto and his extended memory system.

Inga hears that there is a cool Rothko exhibition on at the Museum of Modern Art, and she decides to go to it. Inga recalls the location of the Museum of Modern Art from biological memory, which causes her to go to 53rd street. Thus, Inga makes use of a long-standing biological memory

that MoMA is on 53rd street. Consider Otto: he has Alzheimer's and depends on a notebook for the retrieval of information. He has all sorts of useful information about places and people, addresses and names, and so on. Otto takes his notebook with him wherever he goes and refers to it frequently. Upon being told of the same exhibition as Inga he decides to go, but Otto retrieves information from his notebook concerning the location of MoMA. This causes him to go to 53rd street.

As such, the physical implementation of the causal role is irrelevant to the functional level of description—Otto's use of his notebook and Inga's pattern of activation in her brain. The two cases are on a par. "For Otto, his notebook plays the role usually played by a biological memory" (C&C, p. 33). This is the case only if Otto's notebook plays the same role for Otto that biological memory plays for Inga. We might be inclined to agree with C&C that the information in Otto's notebook is reliably available to him and guides his actions in just the sort of way that beliefs are usually supposed to. The information is available and functions just like the information that constitutes non-occurrent beliefs; the only difference is the location of the information. C&C's argument calls on their commitment to functionalism: as long as information plays the relevant role it is a belief, regardless of location. Hence, the mind extends into the world. However, we should note that we are identifying the functional role of belief at a level quite abstracted from the details of physical implementation. It is certainly debatable as to whether Otto and his notebook display the same causal profile as Inga and her biological memory—once again raising the problematic nature of the argument to EM from functional parity. As we shall see in the next section, Clark does not think that the Otto case is problematic in the way that I have described here. I shall now turn to the criticisms of EM concentrating on those formulated in Adams and Aizawa's, Rupert's, and Preston's essays for this volume.

## 6 Criticisms of the Extended Mind and Responses

### Extended Beliefs

In "*Memento's* Revenge: the Extended Mind Extended," Andy Clark responds to various criticisms that have been leveled at EM, bringing out clearly the central commitment to functionalism of EM, the challenge it poses to setting the boundary of the mind at the skin, and further refinement of the notion of a coupled system.

Clark reaffirms that the conclusion of EM is that "mental states, including states of believing, could be grounded in physical traces that remained

firmly outside the head" (this volume, p. 43). Some of Otto's dispositional beliefs are stored in his notebook, because the information in Otto's notebook has the same functional poise as that stored in Inga's biological memory for the control of subsequent behavior; Otto and Inga's memories are on a par. An obvious objection to this claim is what Clark calls the "Otto two-step": "all Otto actually believes (in advance) is that the address is in the notebook. That's the belief (step 1) that leads to the looking (step 2) that then leads to the (new) belief about the actual street address" (ibid., p. 46).

Clark doesn't think that this objection works, because the notebook acts as transparent equipment for Otto as Inga's memory does for her. The Otto two-step introduces needless complexity into the account of Otto's memory system. However, this response does not really take into account what is potentially damaging about the objection. The point is that we don't normally have to remember that we remember something; Otto has to remember that the relevant information is in his notebook before looking it up. Inga, by contrast, just remembers where the address is. Thus, Otto and Inga do not appear to be on a par when considered in this way.

John Preston takes the criticism further in his essay (chapter 15) by addressing the issue of first-person authority. Beliefs are the kind of mental states over which we can be said to have first-person authority<sup>9</sup> "in utterance" (this volume, p. 359). One can *say* what one's beliefs are without fear of contradiction by others. We do not have a similar authority over "external" resources such as notebooks and diaries. Otto is not, according to Preston, an authority about the content of his notebook before he has consulted it. Otto has to find out what he believes, and such finding out is not included in the ordinary concept of belief.

Preston locates the problem with identifying Otto's notebook as being the location of his belief in the distinction between subpersonal cognitive systems and personal beliefs, avowals, intentions, and other mental states. We normally say that a person (such as Clark or Preston) remembers or believes something, and furthermore it is they who cognitively achieve things; Clark sees the subway entrance, Preston calculates that the \$34 entrance fee to MoMA subtracted from his \$50 bill leaves him with \$16 for lunch. Say Clark wears strong eyeglasses to be able to see the signs in the subway station; is it Clark plus the prosthetic enhancement of the eyeglasses that sees? Preston uses a calculator to subtract 34 from 50; is it Preston plus calculator that achieves the calculation? If it is the subpersonal cognitive system that includes both Preston and calculator (reliably coupled, etc.) that makes the calculation, then, according to EM,

epistemic credit for the cognitive achievement is spread across the system, which includes Preston's brain, body, and the calculator. Preston denies, though, that we attribute such achievements and therefore epistemic achievement to systems; he claims we do so only to persons—"Preston made the calculation using a calculator" would be the natural thing to say in this instance.

The Otto case may, though, be clouding the issue,<sup>10</sup> for, as Preston himself suggests, we often do remember what we think about an issue by making reference to an external record of our thoughts. In these cases it looks fair to say that the contents of our beliefs are stored externally, in books, notebooks, diaries, computer files, on beer mats, and so on, allowing for their easy retrieval when required—when we are asked to make an avowal of what we think about a subject, for example.<sup>11</sup> Therefore, although we don't say that our beliefs are in the notebooks, and so on, we do retrieve the contents of our beliefs to be able to make accurate and authoritative avowals about what we are committed to. There is a clear sense in which the vehicles and their contents stored in the notebook and our accessing those vehicles for a cognitive purpose are part of our completion of a cognitive task: they enable the cognitive achievement (see Menary and Hurley's essays in this volume for further discussion).

### **The Coupling-Constitution Fallacy (Fallacy)**

Adams and Aizawa's primary criticism of the extended mind (chapter 4) is based on an alleged fallacy that the argument for the extended mind perpetrates, namely, the coupling-constitution fallacy. The fallacy is summed up in the following way:<sup>12</sup>

When Clark makes an object cognitive when it is connected to a cognitive agent, he is committing an instance of a "coupling-constitution fallacy." This is the most common mistake the extended mind theorists make. (Adams and Aizawa, this volume, pp. 67–68)

When some object or process is coupled to a cognitive agent in some way, Adams and Aizawa claim that the extended mind theorist slides to the conclusion that the object or process constitutes part of the agent's cognitive apparatus. The fallacy is based in the distinction between causal relations and constitutive relations and "the fact that object or process *X* is coupled to object or process *Y* does not entail that *X* is part of *Y*" (ibid., p. 68).

This alleged fallacy is the first line of attack in their strategy to draw the boundaries of cognition at the skin of the "individual." Schematically

the strategy is as above: just because  $X$  is causally related to  $Y$ , it does not follow that  $X$  is a part of  $Y$ . The second line of attack is closely allied to the first: because we need to ask which processes are candidates for inclusion in the “kind” cognitive. Schematically the argument strategy runs like this:<sup>13</sup> neuronal (and therefore cognitive) processes have property  $X$ ; non-neuronal processes do not have property  $X$ ; therefore nonneuronal properties are not cognitive. This form of argument looks dangerously close to the fallacy of denying the antecedent: if a process has property  $X$ , then it is cognitive; this process does not have property  $X$ ; therefore it is not cognitive. Let us focus on the first line of attack here.

Friends of the extended mind have begun to respond to the charge of committing the causal coupling fallacy (Menary 2006; Clark, this volume; Hurley, this volume; Ross and Ladyman, this volume). Menary’s response is to deny the picture of causal coupling as presented by Adams and Aizawa. Rather than the picture of a cognitive agent causally related to an object, such as a notebook, the picture ought to be one that is integrated. Schematically:  $X$  is the manipulation of the notebook reciprocally coupled to  $Y$ —bodily processes, including neuronal ones—which together constitute  $Z$ , the process of remembering. Once we have this picture, it is easy to see that Adams and Aizawa have distorted the aim of the extended mind. The aim is not to show that artifacts get to be part of cognition just because they are causally coupled to a preexisting cognitive agent, but to explain why  $X$  and  $Y$  are so coordinated that they together function as  $Z$ , which causes further behavior. Take this analogous example: the input layer of units in a feed-forward neural network is coupled to the hidden layer of units, but nobody thinks that this makes the input layer part of the hidden layer. However, the coupling of the input units to the hidden layer units does make them part of a larger system, that is, the neural network.

Clark takes a similar line in his response to Adams and Aizawa in chapter 5 of this volume. The point of coupling isn’t to make the notebook cognitive; “rather it is intended to make some object, that in and of itself is not usefully (perhaps not even intelligibly thought of as *either cognitive or non-cognitive*, into a *proper part of some cognitive system*, such as a human agent” (Clark, this volume, p. 83). The question that Clark proposes as the object of the extended mind theorist’s inquiries is “when is some physical object or process part of a larger system?”—rather than the “murkier” question that Adams and Aizawa think the extended mind theorist is pursuing, “when should we say, of some such candidate part, that it is *itself* cognitive?” (ibid., p. 84). Therefore, the extended mind theorist needs to clarify the kind of coupling that allows for incorporation into a single

system rather than use by that system. This is also the point of Menary's cognitive integration: we need to understand how bodily processes and the manipulation of external vehicles are coordinated in such a way that they jointly cause further behavior (see Menary 2006, 2007, this volume).

If Adams and Aizawa's answer to this were that the putative part of a cognitive system cannot be a candidate because it does not exhibit the mark of the cognitive (representations with nonderived content), then they may, as Clark points out, be subject to the fallacy of composition—assuming that the parts of a system must have the same properties as the whole. We do not, for example, expect the subsystems that support conscious thought to themselves be conscious.

Hurley (chapter 6) and Ross and Ladyman (chapter 7) are concerned about the very nature of the alleged fallacy. Hurley complains that philosophers employ the causal–constitutive distinction, on which the causal coupling fallacy trades, without motivating or explaining the distinction in detail. Ross and Ladyman argue that the distinction itself is not used in mature sciences such as economics and physics. Furthermore, the distinction is based on a metaphor ubiquitous in analytic metaphysics, that of “containment”: “On this doctrine, the world is a kind of container bearing objects that change location and properties over time. These objects cause things to happen by interacting directly with one another” (Ross and Ladyman, this volume, p. 159). These objects are themselves containers, and their properties and causal dispositions are explained by the properties and dispositions of the objects they contain. The notion of composition in the sciences is different from that of the containment picture, they argue. For example, water is composed of oxygen and hydrogen in polymeric forms such as  $(\text{H}_2\text{O})_2$ ,  $(\text{H}_2\text{O})_3$ , and so on, that are constantly forming, dissipating, and reforming over short time periods. As such, the properties of the macroscopic kind water, such as wetness, are emergent features of a complex dynamical system.

Therefore, the containment metaphor and the causal–constitutive distinction have no place in the mature sciences. Since mature sciences such as physics and economics have no need for the distinction, cognitive science should feel under no similar stricture.<sup>14</sup>

### **Fleeting versus Persistent Cognitive Systems**

A related worry is explored by Rupert (chapter 14): “We want to understand how and why the capacities and abilities of individual persisting systems change over time, eventually taking a stable form” (Rupert, this volume, p. 330). The worry is that we cannot explain the developmental

differences between a child of two and one of five if there are only “ephemeral” coupled systems. There would be nothing stable and persisting, the individual, to study. The problem is generated by the supposition that coupled systems are fleeting; Otto, for example, is not constantly coupled to his notebook, but only fleetingly so. However, Rupert looks to be working with a picture of extended systems similar to the problematical one endorsed by Adams and Aizawa above. If cognition depends on factor *X* in an especially strong or clear way, then *X* is part of the thinker’s cognitive system (see also Preston, this volume). Rupert takes this to be an unreliable form of dependence reasoning, but it is the kind of reasoning that has been used in work on supervenience for decades. Mental properties are dependent on neuronal properties in an especially clear way; therefore the brain instantiates mental properties.<sup>15</sup> Does it turn out for Rupert, Adams and Aizawa, and others that mind–brain supervenience is based on an unreliable form of inference? That would be a surprising and interesting result.

Perhaps the unreliability of the dependence inference should be applied only to cases where the factor in question is bodily external. If my capacity to walk is clearly dependent on a walking stick, then it does not follow that the walking stick is part of my “walking system.” This conclusion does not always follow in the biological world; spiders are clearly dependent on their spider webs to catch prey—the spider’s prey-catching system consists of both spider and web (and spider’s webs are fleeting systems if anything is). The organismic process extends beyond the boundary of the body of the organism in this case. Similarly, the caddis fly larva collects small stones and shell fragments from the riverbed and binds them together with a kind of secreted cement (Dawkins 1982). The caddis fly larva then lives in and carries this new home around with it on the riverbed for its larval period. Humans with their linguistic surround, speech and writing, are in a similar situation. They must create and maintain delicate and intricate linguistic webs as part of their cognitive processing.

However that may be, Rupert still finds a fundamental difficulty in the extended approach: “First, consider that the persisting nature of the capacities investigated by cognitive science cannot be squared with the often fleeting nature of extended systems comprised of human organisms and external linguistic resources (Wilson 2002, pp. 630–631); the latter do not have the longevity or integrity to support the capacities of interest in cognitive science, for example, the capacity to use or to respond to language systematically across a wide variety of contexts” (Rupert, this volume,

p. 325). This opens up an interesting question about the notion of capacity at work here. Rupert rejects extended cognitive systems because they have cognitive capacities only for as long as the “fleeting” extended system is coupled. It would then appear to follow that we lose our cognitive capacities when the extended cognitive system is decoupled. Otto has the capacity to remember only when he is coupled to his notebook and not when he is decoupled from it. Let’s apply the same inference to an analogous case: the spider has a capacity to catch prey when it is coupled to its web; it loses this capacity when it is decoupled from its web. I suspect that no one would want to endorse this inference, because it is clear that the spider has a long-standing capacity to create, maintain, and manipulate its webs, and therefore it does not lose its capacity to catch prey.

Perhaps, then, the answer to Rupert’s worry is to distinguish between long-standing dispositional capacities and the exercising of those capacities<sup>16</sup> on various occasions. To exercise its prey-catching capacity the spider must have a web in place and be able to maintain and manipulate that web—it is able to do so because it has a long-standing capacity to create webs. Similarly, humans have a long-standing capacity to create linguistic surrounds and then to maintain and manipulate them: Otto’s cognitive “web” is created and maintained in his notebook, where he manipulates and exploits the written sentences for cognitive ends. The exercising of the capacity is, of course, fleeting, although the long-standing disposition is not.

### **Derived and Underived Content, or The Mark of the Cognitive**

Adams and Aizawa (2001, this volume) base their second criticism of the extended mind on the need for a mark of the cognitive/mental. They propose, “A first essential condition on the cognitive is that cognitive states must involve intrinsic, non-derived content” (2001, p. 48). Cognition just is causal processing involving nonderived content.<sup>17</sup> They do, however, draw a fundamental distinction between vehicles with conventionally determined (derived) content and vehicles with naturalistically determined (nonderived) content. Adams and Aizawa further clarify the condition as follows: “Clearly, we mean that if you have a process that involves no intrinsic content, then the condition rules that the process is noncognitive” (Adams and Aizawa, this volume, p. 70).

Clark’s initial response to this condition<sup>18</sup> is to provide an example of an image of a set of overlapping Venn diagrams. He suggests that the meaning of the overlaps of two Venn diagrams is determined by convention, but



that we would not, consequently, wish to deny that the image could be a part of a cognitive process. The example is supposed to lead us to the conclusion that some mental and cognitive states have contents with conventional content.

Adams and Aizawa do not find this response convincing, because they think that there is an *important* difference between the way artifacts get their meanings determined and the way that mental representations get their meanings determined. Artifacts, such as “words, stop signs, warning lights and gas gauges mean what they do through some sort of social convention” (Adams and Aizawa, this volume, p. 70)—whereas mental representations of natural objects, “such as trees, rocks, birds, and grass mean what they do in virtue of satisfying some naturalistic conditions on meaning” (ibid.). Adams and Aizawa think that Clark has not noticed this difference; they accept that Venn diagrams on paper get their meanings determined by social convention, but images of Venn diagrams get their meanings determined by some naturalistic conditions.

The next move is to reject the *derivation* of the content of the image from the external Venn diagram, the social convention governing the intersection of Venn diagrams is “not a fact about the constitution of the content of a mental image of the intersections of [Venn diagrams]” (ibid., p. 72). The content of the image of the Venn diagram is *dependent* on the Venn diagram on the page in the same sense that an image of a car is dependent on there being cars that are contrived into existence (i.e., artifacts that do not occur naturally).

Finally, Adams and Aizawa reject the notion that cognitive content could be conventionally determined. They do this because agreement on what an artifact means is dependent on the artifact being publically accessible; for example, we can make “bad” or “cool” into positive adjectives by agreement. However, we cannot do this with neuronal states; we cannot agree that a group of neurons will mean something by agreement. This, Adams and Aizawa claim, gives us reason “to believe that cognitive content is not normally derived via any sort of social convention” (ibid., p. 73).

Before looking at Clark’s response, it is worth noting that there are several puzzling features to the underived content condition as Adams and Aizawa set it up.<sup>19</sup> First, Adams and Aizawa make a great deal of the difference between conventional determination of meaning and naturalistic determination of meaning; but in the case Clark considers, this had better not make the meaning of the image different from the meaning of the overlapping Venn diagrams. Adams and Aizawa may be right that, strictly speaking, the content of an image of a car or a stop sign is directly caused

by visual processing that has no access to conventional content. However, if all cognitive content were like the images in this case, then it would be unclear how we could deploy the content in inferences and related cognitive processing. Why? Because the image, naturalistically construed, does not constitute the concept of a Venn diagram, stop sign, or a car. Such concepts are derived from the conventions that determine what a Venn diagram, stop sign, or a car is and what they can be used for, how they can be acted on, and other useful information. Perhaps our concepts do have imagistic content of a naturalistically determined sort, but they also have content of a conventionally determined sort—at least in cases like these. If Adams and Aizawa restrict cognitive content to naturally determined contents and not conventionally determined ones then cognitive explanations will lose much of their explanatory power. If my concept of a stop sign does not contain any conventional content, then how will I know when to stop?

Clark responds<sup>20</sup> by drawing attention to the nature of Adams and Aizawa's proposed condition. They appear to claim that only processes that involve no intrinsic content can be considered cognitive (see above). However, on closer analysis Clark thinks that:

Adams and Aizawa are committed to the usefulness of pressing a question that, to us, looks pretty clearly to be among the very reddest of possible herrings. That is the question whether Otto's notebook (to put the matter bluntly), is "cognitive." Since what is at issue is (to repeat) whether the notebook might now be part of the local supervenience base for some of Otto's dispositional beliefs (a putative systems-level fact if ever there was one) the status of the notebook itself, as "cognitive" or "noncognitive," is (to whatever extent that idea is even intelligible) simply irrelevant. By contrast, the *precise nature* of the coupling between the notebook and the rest of the Otto system seems absolutely crucial to how one then conceives of the overall situation. (Clark, this volume, p. 90)

Thus the question is being asked at the wrong level. It is not whether Otto's notebook, on its own, is cognitive or noncognitive, but whether Otto and his notebook, appropriately coupled, constitute a cognitive system. This leads Clark to reject the condition because "from the requirement (if it is a requirement) that every cognitive agent trade in intrinsic contents, it cannot follow that every proper part of such an agent must trade, and trade at all times, in such contents" (ibid., pp. 89–90).

If Clark is right about this, then Adams and Aizawa's question becomes: "do the parts of a system of type *X* have to share the essential properties that make it a system of that type?" Do all the parts of a cognitive system have to involve intrinsic content, for them to be parts of that system? It may turn out that this is not the right kind of question to ask, as Clark

argues. Instead, it may be that there are more fine-grained questions concerning the roles that states and processes have to play in a cognitive system for them to be parts of that system, and how those states and processes are integrated as parts of the same system, even though some of them are not always spatially and temporally present as parts of the system.<sup>21</sup> Presumably it is incumbent upon extended mind theorists to provide empirical examples of such states and processes, rather than relying on imagined examples (as useful as they may be to begin articulating the position). This leads us to the next problem for the extended mind.

### Scientific Kinds

Adams and Aizawa stipulate that “the cognitive must be discriminated on the basis of underlying causal processes” (Adams and Aizawa 2001, p. 52). The causal processes studied by psychology give rise to certain laws and regularities that are not found in other processes. Therefore, the scientific kind “cognitive” is discriminated on the basis of these causal processes. It turns out, as a matter of empirical fact, that the only lawlike regularities that psychology has so far offered are ones that apply to intracranial processes and not intercranial ones (see also Rupert 2004, this volume).

The critics claim that the natural kind “cognitive” is structured by a set of causal regularities that apply to processes of only one type. Hence effects such as recency and chunking in memory apply only to processes found in the brain. The critics are impressed by the differences between processes found in the head and those found in the surrounding environment, such that “the external portions of extended ‘memory’ states (processes) differ so greatly from internal memories (the process of remembering) that they should be treated as distinct kinds” (Rupert 2004, p. 407).

Clark (this volume), Sutton (this volume), and Menary (this volume, 2006, 2007) hold that this difference is irrelevant as long as external processes and internal processes exhibit a sufficient degree of complementarity and integration. Will this move satisfy the critics? Not unless complementarity and integration provide genuine cases of lawlike regularity—the test being that the move to extend cognition beyond the brain must yield genuine advances in scientific explanations. This is a reasonable request, but conclusions should not be too hastily drawn; the science of extended thought is, as yet, in its theoretical and empirical infancy—but a fair amount of empirical work has been done.

Clark also suggests another alternative (this volume, p. 93), which “to paraphrase Dennett, is that cognition is as cognition does. That is to say, we should individuate the cognitive by its characteristic effects, not by its

characteristic causes." Hence, we should not look for a distinctly unified set of similar causal properties that give rise to causal regularities, but instead expect to see a "motley" crew of internal and external resources that produce regular effects because of a looser coordination "poised" in such a way that characteristically cognitive behavior is produced (cf. Otto and his notebook).

An alternative approach to Clark's conclusion can be found in Susan Hurley's remarkable essay in this volume. She presents a taxonomy of the varieties of externalism allowing us to see the relationships between more traditional versions of externalism and more radical ones such as the extended mind. She distinguishes between "what" and "how" varieties of externalism. "What" explanations explain mental states in terms of their personal-level content types or phenomenal quality types. "How" explanations explain the workings of the processes and mechanisms that enable mental states (that are of a content or quality type). "What" versions of externalism are familiar as the standard content externalism of Putnam and Burge, although less so in the "what" phenomenal sense. However, "how" externalism is the newer and more radical version of externalism, in that it is committed to enabling mechanisms, processes, and vehicles being external. In one obvious sense the extended mind falls within the "how" externalist camp, because it identifies external processes and vehicles as enabling cognitive processes and mental states.

Hurley's essay is split into two sections. In the first she gives a detailed account of "what" externalism in both its content and "quality" forms. In the second part she turns to "how" or enabling externalism. She makes the distinction between cultural and noncultural cases of extension (cf. Menary's taxonomy of different kinds of manipulation). In the cultural cases, an external artifact enables mental states or cognitive processes (Otto's notebook being the test case for C&C), whereas in noncultural cases extended sensorimotor dynamics extend enabling processes. This goes some way to answering Adams and Aizawa's charge that the extended mind creates an unscientific motley.

The remaining essays in the volume provide a variety of ways in which the extended mind project can be pursued.

## **7 The Second Wave of Extended Mind Arguments**

Chapters 8 through 13 begin the process of looking at the different directions in which the extended mind project might be taken. Wilson's, Sutton's, and Menary's essays (chapters 8, 9, and 10) all point to the need

for an approach that focuses on cognitive activity and practice. Rowlands's essay focuses in on the extended conception of consciousness. Wheeler's essay argues for a functionalist interpretation of the extended mind project. Spurrett and Cowley's essay indicates ways in which empirical research on child development fits very happily into an extended mind framework.

Wilson identifies intentionality as not being the problem of specifying essentialist criteria for mental representations—we should instead move from the essences of things to the specification of certain activities as cognitive:

The shift is one from a focus on “things,” such as representations, to a concern with “activities,” such as the act of representing. Such activities are often bodily, and are often world-involving in their nature. A version of the problem of intentionality formulated so as to apply to them—“In virtue of what is activity A the representation of C?”—seems hardly pressing at all. Rather, what cries out for discussion is the question of just what forms these activities take, and just how they bring about the effects they do. (Wilson, this volume, p. 183)

This defuses the coupling constitution error and the problem of underived content of Adams and Aizawa and discussed by Hurley. Instead Wilson echoes Sutton's call (this volume) for a more interdisciplinary approach to the study of cognitive practices.

The task is to understand a variety of representational practices, and wherein they are representational. The means we employ in doing so will be various: historical analysis of their emergence, sociological analysis of the conditions under which they operate, experimental psychological analysis of representational gaps and gluts, anthropological analysis of practices of symbolization, evolutionary analysis of social environments and our sensitivity to them. (Wilson, this volume, p. 183)

Sutton helpfully distinguishes between a first wave of arguments for the extended mind and a second wave. The first wave is based on the parity principle, where external processes “function in the same way as do unquestionably cognitive processes in the head” (this volume, p. 193). The second wave is based on what Sutton calls the complementarity principle, where external processes and vehicles can be radically unlike internal ones. Exograms (external memories) can have different properties and play different roles from engrams (internal memories); but nevertheless engrams and exograms can make complementary contributions to cognitive processes (this is what Menary calls *integration*).

Sutton indicates that in the move from parity-based to complementarity approaches there are yet some problems to be superseded. Menary

(chapter 10) also attempts to begin this process, by specifying different cognitive activities, one of which, cognitive practices, is defined in terms of the normative practice of manipulating external representations to complete cognitive tasks. He indicates (in a similar way to Hurley) that there are two ways in which extension, or integration, can happen: one involves integration through sensorimotor activity, the other through the manipulation of external representations. What Menary adds to the discussion is the importance of normativity for any account of extension/integration, whether it is primarily biological or biocultural.

Wheeler (chapter 11) argues that the extended mind is a kind of extended functionalism. Wheeler points out that the extended mind is not simply a weak claim about the causal dependence of some cognition on external factors (cf. Adams and Aizawa's coupling-constitution fallacy). It is a stronger claim involving the constitution of cognition, at least in part, by external factors. Therefore, the extended mind is not simply an embodied-embedded thesis that treats external props and tools as causally relevant features of the environment. It is a thesis that takes the bodily manipulation of external vehicles as constitutive of cognitive processes. Wheeler argues that this commits us to a functionalist account of cognition, where cognitive processes and vehicles are multiply realizable, insofar as the stuff in which the processes are realized allows for the function to be discharged. Wheeler argues that such multiple realization of functions is often found in nature, in which case, contra Adams and Aizawa, extended functionalist minds may turn out to be actual. He then goes on to argue that certain objections to the extended mind can be dealt with by providing a high-level liberal grain of functional analysis—such as that raised by Rupert (2004) and Sprevak (forthcoming).

Wheeler's extended functionalism complements the arguments of Clark (chapters 3 and 5) in giving a functionalist reading of the parity principle and showing that the extended mind is the next logical step in the development of a functionalist theory of mind. This emphasis on the functionalist credentials of the extended mind differs from the focus on activity found in the essays of Wilson, Sutton, Menary, and Rowlands (see below), who all take a more enactive approach to the extended mind, focusing on how the manipulation of environmental vehicles constitutes cognitive processes. It may turn out that a liberal functionalist account of cognition will provide a way of determining which manipulations are part of cognition and which are not, in which case there may not be any great tension between the enactive and functionalist approaches to the extended mind.

However, the details of this proposed rapprochement are yet to be worked out in any depth.

Rowlands (chapter 12) provides a way of thinking about consciousness as extended and therefore connects up with Hurley's quality-enabling externalism. He argues for an extended account of conscious states that are intentional. He argues that conscious experiences that are intentionally directed are a form of revealing or disclosing activity and that such an activity "typically straddles neural processes, bodily processes and things we do to and in the world" (this volume, p. 271). Rowlands begins this process by considering two interpretations of Frege's conception of sense: the first is sense as an intentional object, and the second is sense as determining reference. The first is Frege's claim that a sense, or thought, can be apprehended in an act of consciousness and that the act of consciousness is aimed at the sense or thought. Rowlands claims that this is analogous to the way that physical objects can be the objects of mental acts; for example, they can be perceived. However, it is the second conception of sense that is primary for Rowlands, the picking out of a referent, and it is this role of sense that can only be *shown* and not *said*—in this role, sense is not an object of apprehension. From this position Rowlands goes on to show that "what it is like to have an experience does not supervene on what is going on inside the head of a conscious subject" (this volume, p. 274). He does this by showing that there is a parallel between Fregean sense as an object of apprehension and as a determinant of reference and the mode of presentation of an intentional object<sup>22</sup> and a mode of presentation that enables aspects of an object to be presented. Just as the role of sense as a determinant of reference cannot itself be an object of apprehension, so the enabling role of a mode of presentation cannot itself be an aspect of experience for a subject.

The noneliminable core of intentional experience, according to Rowlands, consists in a *disclosure* or *revelation* of the world. Intentional acts disclose or reveal aspects of intentional objects at which they are directed, and it follows that this form of disclosing activity does not supervene exclusively on what is inside the head. Rowlands goes on to argue that it follows from this that consciousness is extended into the world via disclosing and revealing activities that are intentional acts.

The focus of Wilson, Menary, and Sutton on cognition as an activity, on cognitive practices, finds its corollary in Rowlands's extended account of the intentional directedness of conscious experience.

Cowley and Spurrett give an embodied account of language in terms of what they dub *utterance-activity*. Rather than think of language as a formal

system of arbitrary symbols, we should think of language as developing out of utterance-activity, which is “the full range of kinetic, vocal and prosodic features of the behavior of interacting humans” (this volume, pp. 295–296). Cowley and Spurrett develop an account of how we come to be symbol-using creatures through the kind of “robust real-time embodied responsiveness” (this volume, p. 303) that the extended mind affords.

In providing some detailed examples of developmental research, they conclude that infant–caregiver dyads are examples of extended cognition at work. The caregiver provides the linguistic scaffolding for the infant in the cases that Cowley and Spurrett describe: “The types of embodied coordination noted above thus permit a particular type of extended mind, in which infant’s cognitive powers are augmented by those people with whom they interact” (this volume, p. 316). Cowley and Spurrett’s arguments can be usefully contrasted with Rupert’s arguments that language does not extend cognition.

The essays collected together in this book present a comprehensive analysis of the hypothesis of the extended mind. Many of them provide the most recent criticisms of the position, and others move the debate in new and exciting directions. They provide reference points for a debate that is sure to continue for many years to come.

## Notes

1. Henceforth, C&C. Unless otherwise noted, all page references are to the essay as reprinted in this volume.
2. See also Wheeler, this volume.
3. A clearer statement of the intuition is as follows: “But if an inner mechanism with this functionality would intuitively count as cognitive, then (skin-based prejudices aside) why not an external one?” (Clark 2005, p. 7).
4. Michael Wheeler makes this clear in his chapter in this volume, he thinks that there is longevity in the PP *only* as an articulation of EM’s functionalist credentials.
5. Clark denies that this is the point of the PP in this volume, pp. 44–45.
6. See Sutton’s essay in this volume for an especially clear statement of this point.
7. Or to coin an uglier word: the *decouplability*.
8. Rupert is a strong critic of the view that language extends cognition; see his essay in this volume.



9. Preston admits that the extent of this authority is a matter of debate.
10. Because Otto has Alzheimer's and has impaired biological memory, whereas Preston has a normal biological memory but still manipulates diaries and lists to remember things properly.
11. I'm inclined to think that we don't just store passive chunks of text in this way; we also construct narratives, which are retrieved as embodied enactments. Memory and belief may have narrative and embodied (or felt) structuring elements and therefore may be very different from the classical image of passive chunks of data that are stored away in memory registers to be retrieved or accessed at a later date.
12. Rupert sees the problem as involving a form of 'dependence reasoning' that is unreliable. See his essay, this volume, for further discussion and below.
13. This argument strategy is also being run by Ron Chrisley (in preparation) as a phenomenological objection to the extended mind: neuronal properties are not directly available to consciousness; nonneuronal processes are directly available to consciousness; therefore nonneuronal processes are not cognitive.
14. Ross and Ladyman note that the metaphor of the mind extending, or pushing out into the world, is similarly subject to the same metaphorical problem.
15. Noticeably, Clark takes Otto's notebook to be part of his supervenience base for beliefs because of a special form of dependence (see his essays in this volume); so if this form of dependence reasoning is unreliable, then so is the reasoning behind mind-brain supervenience.
16. A distinction that goes all the way back to Aristotle.
17. Adams and Aizawa are cagey about the extent to which a cognitive process must involve nonderived, or as they sometimes refer to it, *intrinsic* content. They do not, therefore, make the claim that cognitive processes involve only nonderived content, just that there must be some.
18. In "*Memento's Revenge*," this volume.
19. See Menary 2006 for further discussion.
20. In "*Coupling, Constitution, and the Cognitive Kind: A Reply to Adams and Aizawa*," this volume.
21. This alone is reason for suspicion, argue some critics (see Rupert, this volume, and discussion above): if parts of a system are fleeting, how can they be considered as genuine parts? Won't the system be unstable and liable to break down when these parts are not present?
22. Where a mode of presentation presents an aspect of an object, such as the redness of a tomato.

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