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From cognition's location to the epistemology of its nature

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Matthew J. Barker

Department of Philosophy, Mount Allison University, New Brunswick, Canada

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Abstract

One of the liveliest debates about cognition concerns whether our cognition sometimes extends beyond our brains and bodies. One party says Yes, another No. This paper shows that debate between these parties has been epistemologically confused and requires reorienting. Both parties frequently appeal to *empirical considerations* and to extra-empirical *theoretical virtues* to support claims about where cognition is. These things should constrain their claims, but cannot do all the work hoped. This is because of the overlooked fact, uncovered in this paper, that we *could never* distinguish the rival views empirically or by typical theoretical virtues. I show this by drawing on recent work on testing, predictive accuracy, and theoretical virtues. The recommendation to emerge is that we step back from debate about *where* cognition is, to the epistemology of *what* cognition is.

Keywords: Extended cognition; Situated cognition; Extended mind; Empirical test; Theoretical virtue; Individuation

1. Introduction

Sometimes, possibilities escape us. Until Richard Dawkins (1982) showed at book length that phenotypes can extend beyond the organisms they belong to, most of us had not conceived this possibility. Clark and Chalmers' 1998 paper "The Extended Mind" had a similar effect. Until then, only a few had seriously entertained the possibility that cognition extends beyond the brain.

But we are well beyond that now. Even the harshest critics of Clark and Chalmers concede it is possible, even nomologically possible, that cognitive processes extend beyond the brain (e.g., Adams & Aizawa 2001; Adams & Aizawa, 2008). But *does* cognition extend? Debate on this issue, stemming from the Clark and Chalmers' paper, has led to a battle between advocates of two views. Shortly I will precisely characterize these views, but we can start with loose descriptions. Proponents of the *Thesis of Extended Cognition* (TEX) hold that some cognitive processes grow and shrink frequently, protruding outside of, and then retracting back into, the skull as needed.[1] On this view cognition is *based* within the skull, but as an octopus confined to a cage, with its legs lashing out between the bars, then back in again. Several scientists carry out their research under a TEX banner.[2] To make TEX seem less radical, philosophers have compared extended cognitive processes to processes in other domains that extend beyond the bounds of their bearers. This has seemed especially plausible for feedback processes, where an agent's intracranial cognition shapes extracranial interactions, the products of which are then fed back into and influence other intracranial cognition. Many fish use similarly extended feedback loops to swim, as do turbo engines to drive vehicles.

E-mail address: mbarker@mta.ca

[1] Philosophical proponents of TEX include Clark (1997, 2007, 2008), Clark and Chalmers (1998), Rowlands (1999), Wilson (1995, 2004) and Wilson and Clark (2009).

[2] See Glenberg (1997), Glenberg and Kaschak (2002), Hutchins (1995), Kirsh (2009), McNeill (2005) and Sawyer and Greeno (2009).

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Opposing this view are advocates of the *Thesis of Embedded Cognition* (TEM), who attempt to capture the importance of features external to the brain without taking the final TEX step of claiming those features are constitutive of cognition. For TEM authors, external features are causally crucial for cognition, and many of our explanations should appeal to them, but cognition is contingently brain-bound.[3]

To keep clear in mind which view goes with which acronym, remember that the acronym that reminds you of the relatively big state of Texas refers to the view that cognition is "bigger" (it extends beyond the brain and body) than most of us have thought. The other acronym refers to the view that keeps cognition within the skull.

Leading authors on either side of the TEX-vs.-TEM debate frequently appeal to empirical considerations and theoretical virtues to evidentially favor their preferred view, rather than merely to sway intuitions. They attempt to show, for example, that their preferred view has superior "empirical power" (Rupert, 2004, p. 407).[4] My chief contribution is to show that this is an epistemological mistake and that we need to reorient the debate accordingly. Specifically, I argue for a strong modal thesis. It is not just that TEX and TEM are presently at an empirical stalemate, one that we could resolve, or one we could reasonably live with in virtue of favoring TEX or TEM via extra-empirical theoretical virtues. Rather, I draw on recent work on testing and predictive accuracy to uncover the fact that we *could never* distinguish TEX and TEM empirically (Section 3) *or* by theoretical virtues (Section 4).[5]

As we will see, my thesis leaves open that disagreement between proponents of TEX and advocates of TEM is reasonable; my thesis does *not* imply that the disagreement is merely verbal, for example. My thesis also leaves open that the disagreement is important; for instance, TEX and TEM may motivate distinct methodologies despite being indistinguishable in the respects I discuss. Indeed, on the assumptions that disagreement about TEX and TEM is both reasonable and important, my thesis motivates us to reorient debate between TEX and TEM. We should steer some attention from empirical considerations and theoretical virtues, to the prior task of determining what methods we could and should use to successfully favor one view over the other. In closing (Section 5), I suggest we do this by turning from trendy questions about where cognition is, to urgent epistemological and methodological questions about what it is. This is to confront the epistemology of individuation. To start though, let me clarify TEX and TEM.

2. Theses of extended and embedded cognition

To formulate TEX and TEM precisely, let *brain features* refer only to matter, activity, interactions, states, structures, etc., of the brain or wholly realized or implemented by the brain. Let *external features* refer only to matter, activity, interactions, states, structures, etc., external to the brain or at least partially realized or implemented outside the brain. In these terms, some TEXers carefully imply that external features are proper parts of the *minimal supervenience base* of cognitive processes, rather than simply proper parts of cognitive processes, and that they *physically* constitute cognitive process, rather than simply constitute those processes. But we can conveniently and harmlessly recognize these qualifications implicitly, and define TEX as follows[6]:

> *TEX*: External features often help produce and explain cognitive phenomena, and in some of these cases the external features are partly constitutive of cognition.

Exactly when external features play this role, let us say they *constitutively shape* cognitive processes that help produce and explain cognitive phenomena. Next:

> *TEM*: External features often help produce and explain cognitive phenomena, but they in fact never partially constitute cognition, and brain features in fact always exhaustively constitute cognition.

According to TEM, precisely when external features help produce and explain cognitive phenomena, they do so by virtue of their relations to the cognitive parts of the processes that produce those phenomena. Let us say that when external features do this, they *causally shape* cognitive processes.[7]

We can now clarify how TEX and TEM relate to what Rupert (2004) calls the hypothesis of extended cognition (HEC) and the hypothesis of embedded cognition (HEMC), respectively. My TEX roughly corresponds with his HEC, and my TEM roughly corresponds with his HEMC. Rupert initially characterizes the two views he discusses as follows:

[3] TEX and TEM roughly correspond, respectively, to the views that Rupert (2004, pp. 389, 393) calls the Hypothesis of Extended Cognition (HEC) and the Hypothesis of Embedded Cognition (HEMC). Shortly I clarify the correspondence and make TEX and TEM more precise than the HEC and HEMC counterparts.

[4] Guilty TEM advocates include Rupert (2004) and Adams and Aizawa (e.g., 2001, 2008); on the TEX side there is Clark and Chalmers (1998) and Wilson and Clark (2009).

[5] I have benefited from quite divided responses to this thesis while circulating drafts of the paper. Some readers have said that they are not at all surprised to hear that we cannot distinguish TEX and TEM empirically or by theoretical virtues; I am happy that they agree with me. Others have been surprised by my thesis, and convinced there must be something wrong with my argument for it; I am also happy with this response, because it helps show that the argument is important.

[6] You might think the qualifications would be misleading anyway, because you are an identity theorist about cognition. But if you are, the debate about extended cognition remains open. It will be a debate about whether some of the parts of the physical features with which cognition is identical are outside the brain. All my claims in this paper could be translated into this context without loss.

[7] In the next note I distinguish two ways of understanding this claim.