

For *Extended Epistemology*
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EXTENDED EPISTEMOLOGY: AN INTRODUCTION

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Abstract: First, we provide a theoretical background to the volume's topic, *extended epistemology*, by outlining briefly its cross-disciplinary theoretical lineage and some key themes. In particular, it is shown how and why the emergence of recent and more egalitarian thinking about the nature of human cognizing and its bounds has important and interesting ramifications in epistemology. Second, we provide an overview of the papers included in the volume. The 16 contributions are divided (broadly) into two categories: those which engage with foundational issues to do with extended epistemology, and those which pursue applications of extended epistemology to new areas of research.

1. EXTENDED EPISTEMOLOGY: A BACKGROUND

The very idea of 'extended epistemology' is a relatively new one on the philosophical scene. Prior to the late 1990s¹, at any rate, there was little cause to suppose that paradigmatic objects of epistemological inquiry, such as processes of belief formation, took place anywhere other than *within* the skull and skin of the agent. Granted, the institution of *content externalism* by (among others) Tyler Burge (1986) and Hilary Putnam (1975) sufficed to establish one interesting—though metaphysically benign—sense in which our mental lives are partly external to the agent's organism, by showing that the *content* of beliefs is partly individuated by the agent's physical and

¹ In particular, in the wake of Clark and Chalmers' (1998) classic paper 'The Extended Mind'.

social-linguistic environments². Importantly, though, Putnam-Burge externalism—viz, externalism about meaning and mental *content*³—is a thesis that is entirely compatible with accepting traditional, ‘intracranial’ thinking about the *material realisers* of cognition—that what drives cognition *itself* are processes which take place within our biological brains.

By the early 1990s⁴, though, cognitive scientists and philosophers of mind⁵ as well as roboticists⁶ began to push externalism about the mental much further than Putnam and Burge had, in the form of *embodied cognition*—the thesis that aspects of the agent’s body beyond the brain can, and often do, play a physically constitutive role in cognitive processing. Embodied cognition was, at its inception, the most substantial departure yet from the old Cartesian picture of mental operations⁷. Proponents of embodied cognition insist that, under certain circumstances where the agent’s brain and body are heavily interdependent, our bodies are parts of our minds⁸.

It was not until Clark and Chalmers (1998), however, that mainstream philosophers of mind began to take seriously the idea that our mental life is bound by *neither* brain *nor* body---and that it might include extra-organismic artifacts we interact with, such as notebooks, iPhones, laptops, and the like⁹.

There are two principal ways to think about what this idea involves, which line up with the *extended cognition thesis* and the *extended mind thesis*. To best appreciate the thrust of these views, and how they can potentially come apart, consider Clark and Chalmers’ own illustrative case of Otto:

Otto: Otto suffers from Alzheimer’s disease, and like many Alzheimer patients, he relies on information in the environment to help structure his life. Otto carries a notebook around with him everywhere he goes. When he learns new information, he writes it down. When he needs some old information, he looks it up. For Otto, his notebook plays the role usually played by a biological memory.

² See Carter, Kallestrup, Pritchard and Palermos (2014) for a recent overview of varieties of externalism in the philosophy of mind and epistemology, and how they relate to one another.

³ Lau and Deutsch (2014) provide a comprehensive review of this position.

⁴ For some historical antecedents to the embodied cognition thesis, see Wilson and Foglia (2016, §2).

⁵ For example, Varela, Thompson, and Rosch (1991); Clark (1997).

⁶ See especially Brooks (1991; 1995).

⁷ In some respects, embodied cognition can be seen as a subversion of Ryle’s (1949) critique of the Cartesian picture of the mental. Whereas Ryle took bodily behavior to be an explanatory replacement for the mental, embodied cognition *extrudes* the mental outward so as to include bodily behaviour.

⁸ Cf., Carter and Palermos (2016, §2) for a recent summary of this development.

⁹ For a more recent and sustained defence of this position, see Clark (2008).

It's hard to deny that Otto is using his notebook in a way that it is on a 'functional par' with the way ordinary agents rely on a working biological memory, *vis-à-vis* information storage and retrieval. Nonetheless, the notebook is located *outside* Otto's skull and skin, and it's constituted by paper, lead and ink rather than brain matter. Obviously, if the material constitution and location of the realisers of cognition should be what primarily guides our theorising about what is, and is not, part of a cognitive process (e.g., such as memory), then we will be led to draw no metaphysically interesting conclusions from cases like Otto's.

However, as Clark and Chalmers see it, what should really matter for whether something is part of a cognitive process is the functional role that it plays, *regardless* of material constitution and location. Our theorising about what sorts of things can feature in cognitive processes should, accordingly, be guided by what they call the *parity principle*:

Parity Principle: If, as we confront some task, a part of the world functions as a process which, were it to go on in the head, we would have no hesitation in accepting as part of the cognitive process, then that part of the world is part of the cognitive process. (Clark & Chalmers 1998, 8)

By reference to the parity principle, Clark & Chalmers insist that if an ordinary agent relies on her biological memory and we count her biological memory as an element of the cognitive process she employs, then so must we count Otto's notebook as a (literal) part of the cognitive process that he employs—as a kind of 'extended memory'. Furthermore, we should make the analogous judgments in more 'high-tech' cases, involving iPhones, laptops and other gadgets to which we outsource our memory.

Abstracting now away from the case of Otto, the *extended cognition thesis* is the thesis that cognitive processes (such as memory) can, and sometimes do, criss-cross the boundaries of brain, body and world. For those who regard the parity principle to be a plausible guide for theorising about the mental, then the extended cognition thesis will likely look plausible as well¹⁰.

The *extended mind thesis* is slightly stronger. According to the extended mind thesis, some mental states, such as beliefs, can supervene on extra-organismic elements of the world. While the lesson drawn from the Otto case by the proponent of the extended *cognition* thesis is that

¹⁰ The extended cognition thesis might also be attractive to philosophers who aren't swayed by the kind of common-sense functionalism (c.f., Braddon-Mitchell and Jackson 2006) which underlies the parity principle. For example, in a series of papers, Orestis Palermos (2011; 2014; 2013) has argued that the extended cognition thesis can be motivated on the basis of dynamical systems theory (e.g., Beer (1995)) and regardless of whether one is swayed by functionalist arguments.

Otto's memorial process—a cognitive process—includes an extra-cranial element of the world, his notebook, the proponent of the extended *mind* thesis draws an even more provocative lesson from the case of Otto: that some of Otto's *beliefs* are located outside of his head, in the notebook. These are, specifically, dispositional beliefs, which Otto counts as having in virtue of their being stored in memory, much as we attribute to ourselves (in ordinary circumstances) dispositional beliefs in virtue of what is stored in biological memory.

Some philosophers, including Clark and Chalmers themselves, have been happy to run the two theses together, or, to assume that embracing one of the theses is tantamount to embracing the other¹¹. However, there is theoretical space to opt for extended cognition *without* embracing the extended mind thesis, simply by teasing apart their associated supervenience claims¹². Whereas the extended cognition thesis tells us that cognitive *processes* can partly supervene on extra-organismic elements of the world, the extended mind thesis tells us that mental *states* can partly supervene on extra-organismic elements of the world.

This brings us to extended *epistemology*¹³. Epistemologists, concerned with *epistemic evaluations*—i.e., evaluations from the point of view where what matters (in short) is attaining truth and avoiding error¹⁴—can (for better or worse) afford to remain theoretically neutral on a wide range of theses in the philosophy of mind¹⁵. Take, for example, the hard problem of consciousness (e.g., Chalmers 1995)—e.g., the problem of explaining why some physical processes, such as brain processes, are accompanied by qualitative experiences (e.g., events or states with phenomenal qualities), when they are. It's hard to see how, for example, standard debates in epistemology such as the Gettier problem, lottery problems, problems of epistemic rationality, Bayesian epistemology, closure principles and the like would need to be committed

¹¹ One theoretical explanation for why Clark has not viewed the theses as interestingly different is that, premised upon a dynamic model for beliefs, they are not. The extended cognition thesis trivially entails the extended mind thesis against a background acceptance of the view that beliefs are dynamic processes. However, for those who embrace the more standard, static model of beliefs, the extended mind thesis is optional against a background acceptance of extended cognition.

¹² See Carter et al. (2014, §3).

¹³ For an overview of the literature at the intersection of epistemology and active forms of externalism in the philosophy of mind and cognitive science, see Carter and Palermos (2015).

¹⁴ See, for example, Pritchard (2014) and Goldman (1999) for explicit statements of this position. Not all epistemologists agree that truth, as such, is the fundamental epistemic good (e.g., see Riggs 2008; 2009), however, something very like the above statement distinguishes evaluations as *epistemic* as opposed to, for instance, epistemic, moral, etc. For a discussion of this specific point, see Alston (2005, 28).

¹⁵ One notable outlier here is Williamson's (2000) 'knowledge-first' project, for which the thesis that knowledge is a mental state is foundational in his epistemology and also carries with it a range of substantive commitments in the philosophy of mind.

one way or the other to the hard problem of consciousness. Put another way, if *ex hypothesi*, the hard problem of consciousness were settled one way or the other, it's hard to see how some of these traditional debates in epistemology would be inclined to take on interestingly different shapes.

The extended cognition and extended mind theses, however, are plausibly very different in this respect. Consider that *if* these theses about the nature of cognition are correct (or, indeed, if either is correct) then this will have some straightforward import in *epistemology*, including (i) ramifications for what first-order epistemic evaluations we should make; and, perhaps also, more interestingly, (ii) ramifications for what shapes our epistemological theories should take.

Consider first how, with these theses in the background, our first-order epistemic evaluations must shift. Take Otto, from the above example, as a reference point. Just suppose that Otto has written some piece of information, *I*, in his notebook, where *I* is not stored in his biological brain. Does Otto *know I*? Traditionally within epistemology, Otto is a candidate for knowing *I* only if Otto *believes I*¹⁶. And, against the familiar background of the received intracranial picture of cognition, Otto (clearly) does *not* believe *I*. Thus, what follows is that Otto does not qualify as a candidate for knowing *I*.

If the extended mind thesis is true, however, this withholding of knowledge to Otto might well be mistaken. After all, against the background of the extended mind thesis, Otto doesn't fail to know *I* simply by failing to believe *I*. Likewise, with respect to extended cognition: suppose Otto consults his notebook and (unlike in the previous case) forms the occurrent belief that *I*. If *ex hypothesi* Otto knows *I*, is what issues from his consulting his notebook *memory* knowledge or merely perceptual knowledge? Against the background of the traditional view of cognition, memory knowledge is ruled out in light of the fact that Otto's Alzheimer's disease has prevented him from storing the information in biological memory. However, if extended cognition is correct, we should be open to regarding what Otto attains as *bona fide* memory knowledge.

The foregoing are just some very simple and straightforward ways of thinking about how, if cognition itself is extended, then epistemologists should be prepared to revise certain kinds of

¹⁶ This is an artifact of the traditional 'JTB' analysis of knowledge (see, for example, Ichikawa and Steup 2014). However, there are two notable, albeit outlying, lines of resistance on this point. In recent work, Myers-Schulz and Schwitzgebel (2013) have proposed some considerations against the general thesis that knowledge requires belief. Kati Farkas, by contrast, has argued that the belief requirement on knowledge is relaxed in the special case of extended knowers. On Farkas's view, an individual can know information stored in her iPhone, for instance, even without believing that information.

first-order epistemic evaluations—viz., evaluations about whether individuals count as knowing, justifiably believing, etc., and correspondingly to update our evaluations of first-order epistemic *sources* (e.g., our evaluations about what count as the relevant bases of, and faculties supporting, various beliefs).

Extended human cognising might however have deeper theoretical ramifications in epistemology. In one sense, this should not be surprising: if the truth of a thesis affects our patterns of attributing epistemic standings, then we'll need to at least recalibrate to some extent our epistemological theories in light of the new attribution patterns¹⁷. Some of the specific *ways* in which epistemological positions might stand in need of revision in light of extended cognition and/or the extended mind map on to a range of important research questions for extended epistemologists to engage with.

One subset of such questions are *compatibility* questions. For example, it is natural to ask whether and to what extent extended cognitive processes and extended beliefs can be reconciled with *internalist* positions in epistemology¹⁸, according to which epistemic justification is (in short) a matter of what lies internal to an agent's mental life¹⁹. For instance, is extended cognition and/or the extended mind thesis compatible with our having reflective access to factors that justify our beliefs (as is demanded by accessibilist forms of internalism)? Furthermore, is extended cognition and/or the extended mind thesis compatible with: (i) Williamson's knowledge-first dictum that *knowledge* is a mental state²⁰; (ii) the view that self-knowledge, as such, is distinctively privileged²¹; (iii) *a priori* knowledge (e.g., is extended *a priori* knowledge possible?); (iv) are standard views about the nature of knowledge-conducive cognitive processes—such as those offered by virtue epistemology—compatible with the idea that these cognitive processes are themselves extended?

Another subset of questions concerns the matter of what the extended cognition and/or extended mind theses *entail* in epistemology²². The most natural such question on this score is whether either of these 'active externalist' theses entail epistemic externalism in epistemology,

¹⁷ For some discussion on this point of methodology, in the context of meta-epistemology, see Pritchard (2012).

¹⁸ For a detailed recent discussion of this question, see Carter and Palermos (2014). Cf., Smithies (this volume).

¹⁹ This question can be appreciated as a repositioning of the more familiar entailment question of whether content externalism à la Putnam and Burge entails epistemic externalism. For a recent intervention in this debate, see Carter and Palermos (Forthcoming).

²⁰ See Kallestrup and Pritchard (Forthcoming) for a discussion of how the giving up of epistemic individualism interfaces with both epistemic internalism and the knowledge-first thesis that knowledge is a mental state.

²¹ For an investigation into the prospects of extended self-knowledge, see Carter and Pritchard (Forthcoming).

²² Some philosophers have opted for negative answers to this question; see for instance, Jarvis (2015).

and if so, what specific forms of epistemic externalism²³? Relatedly, does embracing an extended cognition entail the possibility of *distributed* cognition²⁴, according to which cognitive processes and/or mental states or epistemic standings can be distributed across multiple individuals?

Finally, and more generally, the possibility of extending cognition raises a swathe of new research *questions* in epistemology—questions that have now become relevant for epistemologists to answer, whereas not prior to relaxing the bounds of cognition. For example: (i) what kind of cognitive *responsibility* is involved in extended epistemology, and to what extent can epistemologists countenance extended epistemic virtues²⁵? (ii) Does extended epistemology have implications for debates about epistemic *value*? In particular, is extended epistemology compatible with the idea that knowledge has a *distinctive* value²⁶? (iii) Do our evaluations of knowledge-undermining luck track extended and non-extended cases analogously²⁷? (iv) How does the epistemology of extended memory cases interface with traditional dividing lines in the epistemology of memory?²⁸ (v) To the extent that we enjoy entitlements to believe the deliverances of basic epistemic sources (e.g., perception, memory), might we also enjoy *extended* entitlements, viz., entitlements to believe the deliverances of extended perception and extended memory²⁹? (vi) If knowledge can be extended, via active forms of externalism, what other related epistemic standings might also be extended?³⁰ (vii) What are the connections between the notions of extended cognition and extended knowledge as pursued in the Western intellectual tradition and related notions as approached from within Eastern (e.g., Chinese) thinking?

The foregoing are only a representative sample of the many new research questions which active externalist approaches to the mind raise for epistemology. Contributors to the present volume engage with these as well as many other related themes. We are of the view that extended epistemology is far from a passing fad, and we expect instead that it will emerge as an

²³ An overview of this issue is explored in Carter et al. (2014).

²⁴ Paradigmatic examples of distributed cognition are scientific research teams. See, for example, Hutchins (1995) for a notable defence.

²⁵ The first attempt to answer this question is put forward in Pritchard (2010). Relatedly, see (among others) Kelp (2013), Vaesen (2011) and Palermos (2013; 2015a; 2015b) for discussions of whether and how knowledge attained via extended abilities can be subsumed within the virtue epistemology framework (e.g., Greco 2010; 2012; Sosa 2009; 2015).

²⁶ For an overview of the value problem for knowledge, see Pritchard and Turri (2014). Cf., Pritchard (2007; 2008) and Carter, Jarvis, and Rubin (2013).

²⁷ See Carter (2013).

²⁸ Carter and Kallestrup (2014).

²⁹ See Carter and Pritchard (Forthcoming).

³⁰ See Toon (2015) for a recent discussion of extended understanding. Cf., Lynch (2016). See also Carter and Czarnecki (2015) for an argument for extending *knowledge-how*, construed along anti-intellectualist lines.

increasingly important sub-discipline in epistemology and the philosophy of mind, and the research questions investigated by extended epistemology only become more pressing as technology affords us increasing possibilities for offloading the kind of tasks traditionally done in the head.

2. EXTENDED EPISTEMOLOGY: THE VOLUME

In what follows, we offer brief overviews of each specific chapter in *Extended Epistemology*, 16 in total. Given that extended epistemology, as a research programme, is still at the frontiers, it is natural that the contributions afford different subthemes special focus. Nonetheless, we submit that the contributions fall generally within two broad categories: (i) foundational issues with extended epistemology (including elaborations on, defences of and criticisms of core aspects of extended epistemology), and (ii) *applications* and new directions, where themes in extended epistemology are connected with other areas of research. The papers featuring in the first half of the volume cluster around the former theme, and the second half the latter.

2.1 Foundational Issues

In the volume's opening chapter, 'Access Internalism and the Extended Mind', Declan Smithies engages with a key question about the compatibility of extended cognition with traditional thinking in epistemology. Accessibilist internalism is the view that an agent can determine by reflection alone the factors that would make her beliefs epistemically justified³¹. If cognising can occur partly outside the biological agent, then can one just by reflection determine what justifies her beliefs? The position Smithies ultimately embraces is that accessibilist internalism is incompatible with the extended mind.

J. Adam Carter and Jesper Kallestrup, in their chapter 'Extended Circularity: A New Puzzle for Extended Cognition' by contrast, focus on the implications for extended cognitive processes (rather than extended mental states) for epistemic justification and knowledge. First,

³¹ An associated 'negative' accessibilist commitment is that agents do not diverge in the extent to which their beliefs are justified if they do not diverge in what is accessible to them by reflection alone. For some representative expressions of accessibilism, see Chisholm (1977) and Bonjour (1985, Ch. 2).

Carter and Kallestrup highlight what they take to be a condition of epistemological adequacy that should be accepted by proponents of extended cognition. Then, they generate a puzzle. Attempts to satisfy this condition of adequacy seem to lead to a (novel form of) epistemic circularity. They conclude by assessing some potential responses to the puzzle.

Kenneth Aizawa, in his contribution ‘Extended Cognition, Trust and Glue, and Knowledge’ takes a critical perspective on the very prospects of extended knowledge. His first aim is clarificatory, which is to overview how Andy Clark’s (2010, 46) ‘glue and trust’ conditions have featured in discussions of the implications of extended cognition in epistemology. Aizawa, against this background, suggests that such discussions are flawed in a crucial respect, which is that glue-and-trust conditions, on closer inspection, fail to provide a plausible account of when cognitive processes extend³².

Like Aizawa, Fred Adams is critical of the prospects of extended epistemology. Adams’ guiding question in his paper ‘Extended Knowledge’ is: what would it *take* for knowledge to extend? In developing an answer to this question, he offers conditions for extended knowledge which he regards as unsatisfied in cases of extended cognition and the extended mind, and only potentially satisfied in ‘we’ mode cases³³.

Duncan Pritchard, in his contribution to the volume, asks a specific version of the question which had engaged Adams: what does it take to convert an instance of an extended cognitive process into knowledge (i.e., extended knowledge)? Unlike Adams, though, Pritchard thinks the specification of conditions in response to this question are ones which can and are satisfied. Pritchard’s own answer is situated in the context of a particular approach to theorizing about knowledge, known as *anti-luck virtue epistemology*³⁴ (e.g., Pritchard 2012a). Within this framework, he argues that what is key to extended cognitive processes is how they are cognitively integrated within the cognitive character of the agent. With this point in mind, anti-luck virtue epistemology is shown to be comfortably able to accommodate cases of extended knowledge.

In his contribution, ‘Taking iPhone Seriously’ Boaz Miller, like Aizawa, engages with Clark’s (2010a) ‘trust and glue’ conditions, and the implications for extended knowledge in light

³² For earlier notable critiques of active externalist projects by Aizawa, in collaboration with Fred Adams, see Adams and Aizawa (2001; 2008)

³³ See, for example, Tuomela and Miller (1985); Tuomela (2005).

³⁴ For a recent refinement of this position, in terms of risk rather than luck, see Pritchard (Forthcoming).

of this criterion for extended cognition. In particular, Miller argues that the trust and glue criteria enumerated by Clark and Chalmers (1998) are incompatible with plausible epistemic responsibilities and the practices of trust needed to discharge them. The upshot, he thinks, to this epistemic objection to the trust element of the glue-and-trust conditions motivates a reevaluation of the extended mind thesis.

Finally, Michael Wheeler, in his paper ‘Knowledge, Credit and the Extended Mind, or what Calvisius Sabinus got Right’, approaches the issue of extended knowledge through the lens of cognitive ownership. Taking as a starting point for discussion the case of Calvisius Sabinus, who attempted to impress others by forcing his slaves to recite memorised epic or lyric poetry (for which Calvisius took the credit), Wheeler outlines and defends an account of cognitive ownership according to which the sort of functional integration suffices for cognitive ownership of the sort that can ground the kind of credit that is, within a virtue-epistemological paradigm, necessary for knowledge.

2.2. Applications and New Directions

Zoe Drayson, in her contribution ‘Extended Minds and Prime Mental Conditions: Probing the Parallels’, juxtaposes two topically different strands of argument: Williamson’s (2000) argument for the indispensability of externalist propositional attitudes and Clark and Chalmers (1998) argument for the indispensability of externally-realized mental states. Drayson contends that, in light of structural parallels between the two argument types, if one regards the former line of argument to be compelling, then one should be persuaded in equal measure by the latter seemingly more radical line (and vice-versa).

Chienkuo Mi and Shane Ryan, in ‘Reflective Knowledge: Extended Knowledge’, connect extended knowledge, in the Western tradition, with Confucian parallels in the Eastern tradition, in particular, with Confucianism. Their primary objective is to defend that reflective knowledge is necessary for extended knowledge, and this is an argument which draws from Confucianism and dual-process theory. The resulting picture, they argue, can overcome objections which face other accounts of extended knowledge.

In his paper, ‘Extended Knowledge and Confucian Tradition’, Eric Hutton also, like Mi and Ryan, connects extended knowledge to Confucianist thought. Hutton argues that the Confucian thinker Xunzi raises a potential problem for theorists of extended knowledge, and in particular, a problem for specifying conditions which must be satisfied for extended knowing. Hutton does not purport to solve the problem, but rather aims to highlight that the Xunzi-inspired issues for extended knowledge are ones which Western thinkers should grapple with alongside more traditional sorts of worries.

Heather Battaly, in her contribution ‘Extending Epistemic Virtue: Extended Cognition Meets Virtue-Responsibilism’ brings extended cognition into contact with a form of virtue epistemology—virtue *responsibilism*³⁵—which has been discussed in the context of extended epistemology less so than its virtue-reliabilist cousin. Battaly aims to rectify this oversight. In doing so, she argues, firstly, that extended cognition and virtue responsibilism are not incompatible, and secondly, she argues that each might fruitfully contribute to the other.

Ben Kotzee, in his paper ‘Cyborgs, Knowledge and Credit for Learning’ situates extended knowledge within research questions in the philosophy of education³⁶. Kotzee’s central question is how to assess the relationship between aided and unaided knowledge in education. For example, should we prefer that students be able to perform, using their biological brains exclusively, certain intellectual tasks which could potentially be offloaded to technology? Kotzee approaches this question by considering a range of factors that are relevant to how we should answer it, including whether we should consider many human knowers today to be cyborgs, and what is required for a piece of technology to become regarded as part of one’s mind and what knowledge people should get credit for in their interaction with technology.

Mark Alfano and Gus Skorburg, in their contribution ‘Extended Knowledge, the Recognition Heuristic, and Epistemic Injustice’, put extended knowledge in contact with two important themes in social epistemology: the epistemology of socially driven cognitive biases and epistemic injustice³⁷. Alfano and Skorburg outline how components of the recognition heuristic are largely external to the control of the epistemic agent, and connect this point to recent work on the hypotheses of embedded, extended, and scaffolded cognition, arguing that the recognition

³⁵ For a classic defences of this view, see Montmarquet (1993). See also Battaly (2008). For a helpful discussion of the differences between virtue reliable and virtue responsibilism, see Axtell (2000, Introduction).

³⁶ See Carter and Kotzee (2015) for an overview of literature at the intersection of epistemology and the philosophy of education.

³⁷ For the classic presentation of this topic, see Fricker (2007).

heuristic is best understood as an instance of scaffolded cognition. Against this background, they suggest that certain kinds of erroneous inferences can be to some extent avoided by shifting the burden of embodying the virtue of epistemic justice from the hearer or consumer of media to the media themselves.

In his chapter ‘Emerging Digital Technologies: Implications for Extended Conceptions of Cognition and Knowledge’ Paul Smart investigates cognitive and epistemic implications of emerging digital technologies, as assessed from the perspective of both active externalism and virtue reliabilism. As Smart argues, there is a special value to focusing on emerging digital technologies (rather than more mundane technological examples) in so far as they reveal issues that might not otherwise have come to light. Further, Smart suggests, features of emerging digital technologies seem often times make these technologies more viable candidates for cognitive incorporation than the kinds of artifacts which are generally used in discussions of extended cognition and extended knowledge.

Richard Menary in ‘Tracking in Encultured Cognitive Systems’, ‘Tracking in Encultured Cognitive Systems’ argues firstly that the development of artefacts and systems of representation lead humans to develop what he calls ‘enculturated’ cognitive mechanisms in ontogeny. Secondly, Menary explores the truth-tracking function of extended cultural systems, in relation to recent work on extended cognition and epistemology.

Finally, J. Adam Carter, Andy Clark and Orestis Palermos, in ‘New Humans: Ethics, Trust and the Extended Mind’, investigate the question of epistemic responsibility in connection with extended mind/ cyborg technology, and suggest how extended knowing—properly understood—generates a range of important new ethical as well as legal questions and challenges.

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