Edinburgh Research Explorer

Extended virtue epistemology

EXTENDED VIRTUE EPISTEMOLOGY

Duncan Pritchard

University of Edinburgh

ABSTRACT. What does it take to convert the deliverances of an extended cognitive process into knowledge (i.e., *extended knowledge*)? It is argued that virtue epistemology, at least of an epistemic externalist kind (*virtue reliabilism*, as it is known), offers the resources to satisfactorily answer this question, provided that one rids the view of its implicit (and sometimes explicit) commitment to *epistemic individualism*. Nonetheless, it is also claimed that while virtue reliabilism can accommodate extended cognition, there are limits to the extent to which virtuous epistemic standings can be extended. In particular, it is argued that it is in the nature of intellectual virtue to be directed at non-extended epistemic standings. This point has important implications for an extended virtue epistemology, as is illustrated by considering how this point plays out in the context of the contemporary debate regarding the epistemology of education.

KEYWORDS: Epistemology of education; Epistemology; Extended Cognition; Intellectual virtue; Virtue epistemology

1. EXTENDED COGNITION AND EXTENDED KNOWLEDGE

One of the most influential movements in contemporary cognitive science of recent years is the *extended cognition* research programme. This programme turns on the thesis that a subject's cognitive processes can extend beyond the brain and central nervous system of the subject; indeed, can extend beyond her skin and skull.[1] In particular, it is the thesis that features of the subject's cognitive environment, such as technology, can in the right conditions become genuine proper parts of the subject's cognitive processes.[2] So, for example, in the right conditions a subject's seamless use of their iPhone to recover information could be functionally equivalent to their use of biological

memory, to the extent that on this view we ought to treat it as an extended form of memorial cognitive processing. In this way, the subject's relationship to the technology ceases to one of merely subject and instrument, and instead the instrument becomes an integral part of an extended cognitive process.

For the purposes on this paper I will take it as given that extended cognition is not only a genuine possibility, but also that it is a phenomenon that is fairly commonly instantiated.[3] Our interest will rather be in the epistemological ramifications of this thesis, especially with regard to virtue epistemology. In particular, one question we might naturally raise in this regard is what, if anything, it takes to convert a cognitive success (i.e., in the normal case at least, a true belief) that is acquired via an extended cognitive process (we will focus on cases involving technology) into knowledge. In short, is *extended knowledge* possible and, if so, what is its nature?

Until recently, there had been next to no discussion of the epistemological ramifications of extended cognition (though this situation has changed quite dramatically in the last few years). This reflects the fact that mainstream epistemology has tended to be uncritically wedded—often implicitly, but sometimes explicitly—to *epistemological individualism*, whereby epistemic standings such as knowledge are always the result of cognitive processes that are internal to the biological subject. Here, for example, is Alvin Goldman:

> "One thing we do not want to do is invoke factors external to the cognizer's psychology. The sorts of processes we're discussing are purely internal processes." (Goldman 1986, 51)[4]

Similarly, virtue reliabilists, like Ernest Sosa (1991; 2007; 2009; 2015) and John Greco (e.g., 2009), have tended to understand knowledge in terms of the manifestation of cognitive abilities that have a physical basis in the subject. Sosa, for example, describes cognitive abilities in terms of what he calls 'competences', which he in turn characterizes as follows:

> "[*A*] competence is a disposition, one with its basis resident in the competent agent, one that would in appropriately normal conditions ensure (or make highly likely) the success of any relevant performance issued by it." (Sosa 2007, 29)

But, of course, if one takes epistemic individualism for granted, then it immediately follows that there cannot be extended knowledge, since even if there are genuinely extended cognitive processes, it will only be the non-extended, purely biological, cognitive processes that are knowledge-conducive.

But why would knowledge be so restricted, if cognitive processes are not similarly restricted in scope? Goldman's comment in this regard is particularly puzzling, since it seems to take it as given that factors external to the biological subject are thereby external to the 'cognizer's psychology'.[5] But isn't that just to presuppose that extended cognition is false? More generally, is there a rationale for epistemological individualism that does not presuppose the falsity of extended cognition?

One motivation for epistemological individualism that doesn't seem to presuppose the falsity of extended cognition is via appeal to *epistemic internalism* about knowledge. By this I mean the view that when one knows, one's true belief enjoys significant levels of rational support, where this rational support is in turn reflectively accessible.[6] We can see why epistemic internalism might seem to go hand-in-hand with epistemic individualism by considering how an epistemic internalist would be inclined to characterise a subject's use of an extended cognitive process. Consider a subject's use of their iPhone to recover information, for example, and let's suppose that it really is functionally on a par with their use of biological memory to be considered a genuine case of extended cognition. Even so, on this view in order for it to count as knowledge the subject needs to have significant levels of reflectively accessible rational support for their belief so formed. But wouldn't that mean, for example, having an independent rational basis for trusting the information on the iPhone, such as a track-record of verified success? If so, however, then it seems that although the cognitive process is extended, what is supporting the knowledge in this case is in fact something purely internal to the subject and which is not dependent upon the external device—i.e., the rational endorsement of the information displayed by the iPhone. Put another way, epistemic internalism about knowledge, while in principle compatible with extended cognition, seems to in effect demand that in order for such a process to generate knowledge it needs to be 'internalised', via the subject taking epistemic responsibility for the use of the external device. In doing so, it ensures that the agent's relationship to the technology is now inevitably one of subject and instrument, rather than the technology being an integral part of the cognitive process itself. No wonder, then, that epistemic internalists will tend to be epistemic individualists.

Even if we grant this point about epistemic internalism and epistemic individualism, however, it remains that many epistemologists—including the epistemologists cited above, like Sosa and Goldman—are epistemic *externalists*, and hence don't demand that knowledge should always enjoy reflectively accessible rational support. At most, then, the above argument only demonstrates

that when knowledge enjoys reflectively accessible rational support it is thereby non-extended knowledge. Knowledge more generally could be perfectly compatible with epistemic anti-individualism, and thus there could be—for all we've been told otherwise, anyway—extended knowledge.

This is a good juncture to bring virtue epistemology into the fray. While there are internalist versions of virtue epistemology available (often referred to as *virtue responsibilism*), there are also externalist renderings of the view too (*virtue reliabilism*, as it is sometimes known), with Sosa and Greco at the fore with regard to the latter.[7] What is interesting about the externalist renderings of virtue epistemology is that even though they eschew epistemic internalism, they nonetheless claim to be able to capture a robust version of epistemic responsibility, of the broad kind that epistemic internalism answers to. In particular, what proponents of virtue reliabilism claim is that when one knows, although one might not have reflectively accessible rational support, it will nonetheless be the case that one's cognitive success is the result of cognitive processes that are sufficiently integrated within one's cognitive character that this success is appropriately creditable to one's cognitive agency. In this way, one can account for how knowledge is a cognitive performance of mine, one that I can take epistemic responsibility for, even though it might not always involve meeting the requirements laid down by epistemic internalism.

Does accommodating epistemic responsibility in this fashion require virtue reliabilism to endorse epistemic individualism, and thereby eschew extended knowledge? I've argued elsewhere that it doesn't.[8] As noted above, what is key to cases of extended cognition is that they are functionally on a par with parallel cases of non-extended cognition, such that the subject's use of the technology is as seamless and fluid—which will often mean *unreflective*—as their use of the corresponding biological cognitive resource. Transplanted over to the case of knowledge, this means that we are interested in subjects who are cognitively successful by employing technology in ways that are functionally on a par with their use of their on-board cognitive faculties. If the latter is a route to knowledge, then it seems that so should be the former. In particular, whereas epistemic internalism accounted for epistemic responsibility by in effect intellectualising the cognition in play, and thereby diminishing its functionally equivalence to parallel cases of non-extended cognition, there is nothing in virtue reliabilism which demands this. Instead, what is key to virtue reliabilism is the weaker demand of *cognitive integration*—*viz.*, that a cognitive process must be sufficiently integrated within one's cognitive character as a whole if it is to be knowledge-conducive, where this

is itself understood functionally rather than in terms of the subject having reflectively accessible grounds.[9]

So, for example, one key aspect of cognitive integration as it is usually understood is the presence of co-operative feedback loops between the target cognitive process and other cognitive processes that form part of the cognitive system. For example, outputs of an integrated cognitive process are often inputs for further cognitive processing within the cognitive system. One's eyesight can generate information, which in turn stimulates memories, which in turn aids inquiry (and perhaps leads one to make further observations with one's eyes), and so on. Moreover, sometimes the information processing can in turn have a bearing on how the target cognitive process functions (and so the direction of information is not just one-way, but can be reciprocal). To take a simple case: one's visual perception can, in concert with information from other cognitive processes (such as one's memories), change where one subsequently looks. Another key feature of cognitive integration is that where the deliverances of an integrated cognitive process are in conflict with the deliverances of another cognitive process, then this will have consequences for the cognitive system. If one's eyesight is generating information which conflicts with one's memories, for example, then that will typically lead to some degree of cognitive adjustment—for instance, by accommodating the apparently conflicting information, by discounting some of the information, by putting the relevant task on hold until further evidence can be collected, and so on.

Crucially, however, once cognitive integration is understood in this epistemically externalist fashion—i.e., such that a cognitive process can be integrated within a subject's cognitive character without the subject thereby having any independent rational basis for employing this process—then there is nothing to prevent a subject's cognitive success, gained via an extended cognitive process, as being appropriately creditable to her cognitive character. In particular, so long as the extended cognitive process has been appropriately integrated within the subject's cognitive character, then it will be attributable to that subject, and hence a case of extended knowledge, even though factors outwith the skin and skull of the subject will be proper parts of the cognitive process that generated that knowledge. In such a case, the subject will be exhibiting an extended cognitive process that includes the technology as a proper part, rather than merely employing that technology as an instrument. The upshot is that one can understand epistemic responsibility along virtue reliabilist lines without thereby being forced to endorse epistemic individualism and hence exclude the possibility of extended knowledge.[10]

2. EXTENDED VIRTUE EPISTEMOLOGY AND THE INTELLECTUAL VIRTUES

One of the distinctive features of virtue reliabilism is that it allows knowledge to be the result of the appropriate functioning of one's cognitive abilities and faculties, even where the cognitive success in question is not supported by reflectively accessible rational grounds. Relatedly, virtue reliabilism can allow for a subject to be a knower even if that subject lacks *intellectual virtue*. By an intellectual virtue here I have in mind a much more sophisticated cognitive trait than a mere cognitive ability or faculty, such as the cognitive traits of being *intellectually conscientious*, *open-minded,* and so forth. There are a number of important differences between intellectual virtues and mere cognitive abilities.

To begin with, whereas cognitive abilities can be innate (this is especially true of one's cognitive faculties), or at least acquired in purely unreflective routes, intellectual virtues are essentially acquired cognitive traits, where their acquisition involves a conscious process of habituation.[11] Indeed, intellectual virtues, unlike mere cognitive abilities and faculties, are acquired, sustained and manifested in ways that essentially involve reflection. Relatedly, intellectual virtues involve characteristic motivational states⸺broadly speaking, the subject's love of, and hence desire for, the truth⸺while one can exhibit mere cognitive abilities or faculties without such motivational states.

A further distinction between intellectual virtues and cognitive abilities that is worth highlighting here concerns their specificity. Cognitive abilities tend to be narrowly understood, in that they are often abilities to reliably perform specific cognitive tasks (e.g., the cognitive ability to do simple arithmetic in one's head). Intellectual virtues, in contrast, are very broad cognitive traits of the agent, where this reflects the general regulative function that they perform within a subject's cognitive economy, in that they guide one's employment of one's cognitive abilities and faculties, rather than *vice versa*. So, for example, a conscientious scientist, recognising the need to double-check her data (because of her concern for the truth), will marshal her cognitive abilities in the service of this aim.

This last distinction between intellectual virtues and cognitive abilities reflects the fact that intellectual virtues are more closely tied to the notion of good inquiry, and hence are essentially *active* cognitive traits. Cognitive abilities, in contrast, can be essentially *passive* in their deliverances. I open my eyes and in virtue of the good functioning of my eyesight I am able to come to know all kinds of facts about my environment. But contrast perception here with the intellectual virtue of being observant. This latter cognitive trait is not passive at all. The observant subject will, rather,

investigate and interrogate her environment in discerning the features that are salient for her inquiries (to take an extreme case of this kind of intellectual virtue, think of how Sherlock Holmes might extract information from his surroundings).

This leads me to a final distinction between intellectual virtues and cognitive abilities that I think is relevant for our purposes, which is that the former has a special axiological status that the latter lacks. Whereas both kinds of traits are undoubtedly practically useful (with intellectual virtues tending to have a greater scope for practical utility), there is also a difference in kind in play here. As a number of commentators have noted, the intellectual virtues seem to play a constitutive part of a life of flourishing, such that they are plausible candidates for having final (i.e., non-instrumental) value). Cognitive abilities, in contrast, are at most necessary conditions for such a life, but unlikely candidates as constitutive parts. Indeed, they stand to intellectual virtues much as the ancients thought that skills stand to virtues more generally. Whereas a virtuous person might willingly give up one of her skills—if it ceased to be practically useful, for example, and the costs of maintaining it were high—she would never willingly lose a virtue because she recognises the special value that it has.[12]

The notion of cognitive integration employed by the virtue reliabilist, and which enables virtue reliabilism to accommodate extended knowledge, need involve no appeal to intellectual virtue. On this view, after all, cognitive integration can be brought about in ways that are completely unreflective. One upshot of this point is that a virtue reliabilism which embraces extended knowledge—i.e., an *extended virtue reliabilism*—will be in effect committed to there being extended cognitive abilities and faculties. That is, once an extended cognitive process has become sufficiently integrated within a subject's cognitive character, then it will count as part of the subject's cognitive abilities even though it involves factors that are outwith the skin and skull of the subject.

This raises the interesting question of whether the intellectual virtues can ever be extended in this fashion. For notice that while virtue reliabilism does not claim that the manifestation of intellectual virtue is required in order for one to gain knowledge, the view is meant to be consistent with the acquisition of knowledge via this means. Indeed, it is important that this is so, because a lot of mature human knowledge of the best sort—think, for example, of the knowledge gained through a well-conducted inquiry—will be acquired in this fashion. Is an extended virtue reliabilism committed to regarding knowledge so acquired as potentially also being the result of an extended cognitive process?

I think the answer is 'no', although understanding why will take some unpacking. The nub of the matter is that while we can make sense of the idea of an extended cognitive process becoming integrated within a subject's cognitive character in a purely epistemically externalist fashion—such that the extended cognitive process now counts as an extended cognitive ability—we cannot apply the same model to manifestations of intellectual virtue.

The overarching reason why this is so is that the very process by which a cognitive trait becomes an intellectual virtue cannot simply involve cognitive integration in the weak epistemic externalist sense set out above when we described virtue reliabilism. Instead, it needs to essentially involve conscious reflection on the part of the subject. This does not mean that the acquisition of intellectual virtues cannot be aided in lots of ways, such as via training delivered by others. But it does mean that one cannot simply passively acquire an intellectual virtue. Rather one must actively endorse the trait in question, where this includes exhibiting the motivational component of the virtue (i.e., a general love of the truth).

Imagine, for example, a parent trying to instil in a child the intellectual virtue of being intellectually conscientious. This might involve, for example, questioning them whenever they jump to conclusions in order to highlight the lack of grounds they have for their judgements, it might involve praising the intellectual conscientiousness of others, as a means of stimulating them to emulate their intellectual virtue, and so on. Ultimately, however, it is not enough that the child simply behaves *as if* she has the intellectual virtue, in that in practice she is careful not to rush to judgement, she acts as if she admires the open-mindedness of others, and so on. Rather, to truly possess, and thereby manifest, this intellectual virtue the child needs to consciously endorse this cognitive trait herself, where this also means having the motivational states that correspond to the manifestation of this trait. But once the subject has crossed these thresholds for the possession of an intellectual virtue, then even despite the assistance of the parent in the acquisition of this virtue, it will nonetheless be the case that her manifestation of it thereafter is primarily due to her (unextended) cognitive agency rather than to the extended cognitive agency that also involves the parent. In short, the subject will be, at least as far as the manifestation of this intellectual virtue is concerned, epistemically autonomous.

We can bring this point into sharper relief by considering a concrete case. Since our focus is on technologically extended cognition, rather than socially distributed cognition, imagine that the training in question is not done by another subject but is instead rather facilitated by an instrument. We can imagine, for example, that there is a device that the subject carries around with her which

questions her judgement when she displays signs of automatic unreflective responses to stimuli. In such cases she is called upon to further reflect on the grounds for her judgement, and to revise it if necessary. We can imagine that, over time, the use of this technology might become so seamless that it is functionally equivalent to how an analogous subject might use her on-board cognitive resources to improve judgements—i.e., that she becomes adept at spotting when she is rushing to judgement and so prompts herself to reflect further on the basis for her viewpoint. In this way, we have a picture of how a certain cognitive skill might be technologically extended by becoming suitably cognitively integrated within the subject's cognitive character such that it is functionally on a par with a corresponding non-extended cognitive process.

Crucially, however, while the example as it is described so far involves an extended cognitive ability, it does not yet involve the possession and manifestation of an intellectual virtue. After all, our subject might not have any of the motivational states that are essential to the manifestation of a virtue. Instead, this extended cognitive trait may simply represent a habit of thought—something that can be exhibited regardless of a subject's desire for the truth—rather than a *bona fide* intellectual virtue. Relatedly, if our subject has not taken reflective ownership of this trait—if she has not actively endorsed it—then that would also count against it counting as an intellectual virtue.

Notice, however, what happens to the cognitive trait once it crosses these thresholds and it becomes an intellectual virtue. The subject is now self-consciously employing the technology as part of her drive to gain the truth, and in doing so has formed a reasoned view about why the device in question will help her to serve this role. In doing so, however, she has ensured that her use of the device is now no longer on a functional par with corresponding non-extended cognitive processes. Rather than her employment of the device being as seamless and unreflective as these non-extended cognitive processes, the relationship that the agent now bears to that technology is now one of subject and instrument. That is, the agent employs the device precisely because she has assured herself that it serves her intellectual ends. This means that the explanatory load when it comes to accounting for her cognitive success when she employs this virtue will almost exclusively relate to her non-extended cognitive character, just as it would in normal cases where a subject merely employs an instrument.

The upshot of all this is that whereas cognitive abilities and faculties can be extended, and while the facilitation of intellectual virtue can involve such extended cognitive processes, the acquisition and manifestation of intellectual virtue is an essentially autonomous, and thus

nonextended, matter. As we will see, this has some important implications for extended virtue epistemology.

3. EXTENDED VIRTUE EPISTEMOLOGY, AND ITS LIMITS

The first point to note is that the non-extendedness of intellectual virtue is not as surprising a result once one remembers our earlier point about epistemic internalism. Intellectual virtues, after all, are closely related to epistemic internalism, in that it is hard to understand the manifestation of an intellectual virtue that doesn't involve the subject being able to adduce rational grounds in support of her beliefs so formed. Accordingly, in manifesting intellectual virtue, one thereby almost certainly meets the conditions for epistemic internalism. If that's right, however, then given our previous point about how epistemic internalism is naturally allied to epistemic individualism, then it's hardly surprising that intellectual virtues align with epistemic individualism also. In both cases the common thread is that the subject is required to take reflective cognitive responsibility for her beliefs so formed, and that this entails that there is not the kind of functional equivalence between extended and non-extended pairs of cognitive processes that is key to extended knowledge. Instead, there is, rather, the kind of relationship of subject to instrument that actively militates against extended knowledge.

A second reason to think that the non-extended nature of intellectual virtue ought to be unsurprising on closer reflection concerns the regulative role that it plays in one's cognitive character. As noted above, in mature human knowers it is the intellectual virtues that structure the subject's cognitive character, rather than *vice versa*. Even on virtue reliabilist views which allow for knowers to lack intellectual virtue, and more generally to be able to acquire instances of knowledge without manifesting intellectual virtue, it will still be the case that intellectual virtues, where they are present, will perform this regulative function. Indeed, whatever one's epistemic perspective, whether epistemic internalist or externalist, there is an overarching agreement in the special value of intellectual virtues, particularly in contrast to mere cognitive abilities and faculties. Moreover, this special value reflects the regulative function that intellectual virtues play, since it is only an intellectual life that is so regulated that can plausibly satisfy the cerebral component of the good life of flourishing. The virtuous subject does not merely passively know (though she will do a lot of this of course), but will also actively inquire, with her inquiries guided by her love of the truth and

informed by her body of knowledge. So even if one's epistemology allows for knowledge to be acquired in the absence of intellectual virtue, one still needs to find a privileged place for the intellectual virtues within one's epistemology.

Once one grants that the intellectual virtues occupy this privileged role, however, then this has important ramifications for an extended virtue epistemology. On the one hand, as we have seen, there is a straightforward case to be made for supposing that cognitive abilities can be extended, at least so long as one is willing to embrace the epistemic externalist conception of cognitive integration put forward by virtue reliabilism. On the other hand, however, we have also seen that there are limits to an extended virtue epistemology, in that there is an important domain within that view which does not admit of being extended. I want to close by further demonstrating the import of this point by considering how it plays out within the specific field of the epistemology of education.

Education has many goals, some of them social, some of them political, some of them practical, and so on. But one core goal of education is also surely epistemic, in that we want to enable students, through education, to attain certain epistemic goods. But which ones? A crude view—one not held by educationalists, though a mainstay of the popular media (at least in the UK at any rate)—is that education is simply about instilling facts into subjects. This is what we might (tendentiously) call the 'bucket' view of education. While there is obviously a place within good education practices ensuring that students know a body of useful facts, the idea that education is ultimately aimed at such an epistemic goal does not stand up to scrutiny. Merely reciting information, after all, is simply a demonstration of one aspect of one's (on-board) cognitive abilities—i.e., one's (biological) memory. And yet what we surely want to promote with our educational practices is not just this feature of the student but also her cognitive character more generally. This will include a range of cognitive abilities over and above her memorial skills. Indeed, it will arguably include the development of the kind of intellectual virtues that we have been discussing thus far.[13]

We can bring this point into sharper relief—and in the process highlight the importance of extended knowing to this debate—by noting how our children now learn in increasingly technologically-embedded ways.[14] In fact, in engaging with technology from the outset of their development, they come to use that technology in ways that are so seamless and natural that they are ripe for extended knowledge on a virtue reliabilist conception. Interestingly, however, the way in which this technology is developing is such as to enable completely easy access to facts. So, for

example, one way in which the technology is developing is via so-called 'wearable technology' that enables immediate and reliable access to a range of information whenever the subject desires.[15] Think, for instance, of Google glasses, and the (already patented) Google lenses, and then imagine the possibility of a neuromedia version (whereby we effectively have an 'internal' version of extended cognition, with the technology on the inside, though still external to one's brain and central nervous system), such that one need never even be aware that one is receiving information from an 'external' device.

Here is the crux. A student who is equipped with such a device and who is using this technology in a seamless fashion that is functionally equivalent to her on-board cognitive processes can count as having extended knowledge of a whole range of facts that she would not count as knowing hitherto (i.e., with just her on-board cognitive resources). So consider memory, for example. The technologically-enhanced student has extended knowledge of a much wider range of facts than her non-technologically-enhanced counterpart, and that's because unlike the latter she is no longer depending solely on her biological memory, but is also employing extended cognitive processes. And yet wouldn't we be concerned about a child having immediate access to this wealth of information but who had not been inculcated in the intellectual virtues? In particular, imagine a child who simply rehearses—and, indeed, knows, given the epistemic credibility of source in question—the information in question, but who has none of the intellectual virtues. She never questions the information she receives, she never employs it in directed inquiry, and so on, but merely passive receives it. Wouldn't we think that an education system that generated this epistemic result for this child was seriously deficient, even despite the fact that the child in question has access to a wealth of information that her forebears could only dream about (confined, as they were, to their on-board cognitive resources)?[16]

I think this highlights two important points about extended knowledge in the contemporary age. The first is that we are likely to see, in the coming years, the floodgates open in terms of the scope of this kind of knowing. But the second is that we should be wary about promoting extended knowledge where this doesn't go hand-in-hand with the development of intellectual virtue, a cognitive trait that is not extended. In the early modern period it was common to distinguish between *active* and *passive* knowers, where roughly the former were keen to find things out for themselves, while the latter were content to accept the received wisdom delivered by socially accepted authorities. I think a similar distinction is required in the modern age. While the expansion of extended knowledge is to be welcomed, and while this is something that can comfortably be

accommodated within a virtue-theoretical framework (at least of a broadly epistemically externalist variety), we also need to preserve a place for the essentially active intellectual virtues, and to recognise that they—unlike their passive cousins, the mere cognitive abilities and faculties—are not susceptible to being extended. In this way we can harness the epistemic goods offered to us by this technological revolution while also preserving our intellectual autonomy and the more general goods that go with a life of flourishing (of at least the intellectual variety).[17]

REFERENCES

Adams, F., & Aizawa, K. (2008). *The Bounds of Cognition*, Blackwell, Oxford.

Axtell, G. (1997). 'Recent Work in Virtue Epistemology', *American Philosophical Quarterly* 34, 410-30.

Baehr, J. (Ed.) (2015). *Intellectual Virtues and Education: Essays in Applied Virtue Epistemology*, London: Routledge.

—— (2011). *The Inquiring Mind: On Intellectual Virtues and Virtue Epistemology*, Oxford: Oxford University Press.

BonJour, L. (1985). *The Structure of Empirical Knowledge*, Cambridge, MA: Harvard University Press.

—— (2002). 'Internalism and Externalism', *Oxford Handbook of Epistemology*, (ed.) P. Moser, 234-64, Oxford: Oxford University Press.

Breyer, D., & Greco, J. (2008). 'Cognitive Integration and the Ownership of Belief: Response to Bernecker', *Philosophy and Phenomenological Research* 76, 173-84.

Carter, J. A., Kallestrup, J., Palermos, S. O., & Pritchard, D. H. (2014). 'Varieties of Externalism', *Philosophical Issues* 24, 63-109.

—— (Eds.), (*Forthcominga*). *Extended Epistemology*, Oxford: Oxford University Press.

—— (Eds.), (*Forthcomingb*). *Socially Extended Epistemology*, Oxford: Oxford University Press.

Carter, J. A., & Pritchard, D. H. (*Forthcoming*). 'Epistemic Situationism, Epistemic Dependence, and the Epistemology of Education', *Epistemic Situationism*, (eds.) M. Alfano & A. Fairweather, Oxford: Oxford University Press.

Chemero, T. (2009). *Radical Embodied Cognitive Science*, Cambridge, MA: MIT Press.

Chisholm, R. M. (1977). *Theory of Knowledge* (2nd Edn.), Englewood Cliffs, NJ: Prentice-Hall.

Code, L. (1987). *Epistemic Responsibility*, Hanover, NH: University Press of New England.

Clark, A., (2008). *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*, Oxford: Oxford University Press.

Clark, A., & Chalmers, D. (1998). 'The Extended Mind', *Analysis* 58, 7-19.

Conee, E., & Feldman, R. (2004). *Evidentialism*, Oxford: Oxford University Press.

Elgin, C. (1999*a*). 'Education and the Advancement of Understanding', *Proceedings of the Twentieth World Congress of Philosophy* 3, 131-140.

—— (1999*b*). 'Epistemology's Ends, Pedagogy's Prospects', *Facta Philosophica* 1, 39-54.

Goldman, A. (1979). 'What is Justified Belief?', *Justification and Knowledge*, (ed.) G. Pappas, 1-23. Dordrecht: Reidel.

—— (1986). *Epistemology and Cognition*, Cambridge, MA: Harvard University Press.

Greco, J. (2003). 'Further Thoughts on Agent Reliabilism', *Philosophy and Phenomenological Research* 6, 466-80.

—— (2009). *Achieving Knowledge*, Cambridge: Cambridge University Press.

Grimm, S. (2006). 'Is Understanding a Species of Knowledge?', *British Journal for the Philosophy of Science* 57, 515-35.

—— (2010). 'Understanding', *The Routledge Companion to Epistemology*, (eds.) S. Bernecker & D. H. Pritchard, 84-94, London: Routledge.

—— (2014). 'Understanding as Knowledge of Causes', *Virtue Scientia: Bridges Between Virtue Epistemology and Philosophy of Science*, (ed.) A. Fairweather, 329-45, Dordrecht, Holland: Springer.

Hookway, C. (2003). 'How to Be a Virtue Epistemologist', *Intellectual Virtue: Perspectives from Ethics and Epistemology*, (eds.) M. DePaul & L. Zagzebski, 183-202, Oxford: Oxford University Press.

Hutchins, E. (1995). *Cognition in the Wild*, Cambridge, MA: MIT Press.

Kallestrup, J., & Pritchard, D. H. (2012). 'Robust Virtue Epistemology and Epistemic Anti-Individualism', *Pacific Philosophical Quarterly* 93, 84-103.

—— (2013). 'Robust Virtue Epistemology and Epistemic Dependence', *Knowledge, Virtue and Action*, (eds.) T. Henning & D. Schweikard, ch. 11, London: Routledge.

—— (2014). 'Virtue Epistemology and Epistemic Twin Earth', *European Journal of Philosophy* 22, 335-57.

Kvanvig, J. (2003). *The Value of Knowledge and the Pursuit of Understanding*, Cambridge: Cambridge University Press.

—— (2010). 'Virtue Epistemology', *Routledge Companion to Epistemology*, (eds.) S. Bernecker & D. H. Pritchard, 199-207, London: Routledge.

Lynch, M. (2016). *The Internet of Us: Knowing More and Understanding Less in the Age of Big Data*, New York: W. W. Norton.

MacAllister, J. (2012). 'Virtue Epistemology and the Philosophy of Education', *Journal of Philosophy of Education* 46, 251-70.

Montmarquet, J. (1993). *Epistemic Virtue and Doxastic Responsibility*, Lanham, MD: Rowman & Littlefield.

Noë, A. (2004). *Action in Perception*, Cambridge, MA: MIT Press.

Palermos, S. O. (2014*a*). 'Knowledge and Cognitive Integration', *Synthese* 191, 1931-51.

—— (2014*b*). 'Loops, Constitution, and Cognitive Extension', *Cognitive Systems Research* 27, 25-41.

Palermos, S. O., & Pritchard, D. H. (*Forthcoming*). 'The Distribution of Epistemic Agency', *Social Epistemology and Epistemic Agency: De-Centralizing Epistemic Agency*, (ed.) P. Reider, Lanham, MD: Rowman & Littlefield.

Pappas, G. (2005). 'Internalist versus Externalist Conceptions of Epistemic Justification', *Stanford Encyclopaedia of Philosophy*, (ed.) E. Zalta, http://plato.stanford.edu/entries/justep-intext/.

Poston, T. (2008). 'Internalism and Externalism in Epistemology', *Internet Encyclopaedia of Philosophy*, (eds.) B. Dowden & J. Fieser, www.iep.utm.edu/int-ext/.

Pritchard, D. H. (2005). *Epistemic Luck*, Oxford: Oxford University Press.

—— (2007*a*). 'Anti-Luck Epistemology', *Synthese* 158, 277-97.

—— (2007*b*). 'Recent Work on Epistemic Value', *American Philosophical Quarterly* 44, 85-110.

—— (2009*a*). 'Apt Performance and Epistemic Value', *Philosophical Studies* 143, 407-16.

—— (2009*b*). 'Knowledge, Understanding and Epistemic Value', *Epistemology* (*Royal Institute of Philosophy Lectures*), (ed.) A. O'Hear, 19-43, Cambridge: Cambridge University Press.

—— (2010). 'Cognitive Ability and the Extended Cognition Thesis', *Synthese* 175, 133-51.

—— (2012). 'Anti-Luck Virtue Epistemology', *Journal of Philosophy* 109, 247-79.

—— (2013). 'Epistemic Virtue and the Epistemology of Education', *Journal of Philosophy of Education* 47, 236-47.

—— (2014*a*). 'Knowledge and Understanding', *Virtue Scientia: Bridges Between Virtue Epistemology and Philosophy of Science*, (ed.) A. Fairweather, 315-28, Dordrecht, Holland: Springer.

—— (2014*b*). 'Virtue Epistemology, Extended Cognition, and the Epistemology of Education', *Universitas: Monthly Review of Philosophy and Culture* 478 (2014), 47-66.

—— (2015). 'Anti-Luck Epistemology and the Gettier Problem', *Philosophical Studies* 172, 93-111.

—— (2016*a*). 'Epistemic Dependence', *Philosophical Perspectives* 30, 1-20.

—— (2016*b*). 'Intellectual Virtue, Extended Cognition, and the Epistemology of Education', *Intellectual Virtues and Education: Essays in Applied Virtue Epistemology*, (ed.) J. Baehr, 113-27, London: Routledge.

—— (2016*c*). 'Seeing It For Oneself: Perceptual Knowledge, Understanding, and Intellectual

Autonomy', *Episteme* 13, 29-42.

—— (*Forthcominga*). 'Epistemic Axiology', *Epistemic Reasons, Epistemic Norms, and Epistemic Goals*, (eds.) M. Grajner *&* P. Schmechtig, Berlin: DeGruyter.

—— (*Forthcomingb*). 'Extended Knowledge', *Extended Epistemology*, (eds.) J. A. Carter, A. Clark, J. Kallestrup, S. O. Palermos *&* D. H. Pritchard, Oxford: Oxford University Press.

—— (*Forthcomingc*). 'Epistemic Risk', *Journal of Philosophy*.

Pritchard, D. H., Millar, A., *&* Haddock, A. (2010). *The Nature and Value of Knowledge: Three Investigations,* Oxford: Oxford University Press.

Pritchard, D. H., *&* Turri, J. (2014). 'The Value of Knowledge', *Stanford Encyclopædia of Philosophy*, (ed.) E. Zalta, http://plato.stanford.edu/entries/knowledge-value/.

Pryor, J. (2001). 'Highlights of Recent Epistemology', *British Journal for the Philosophy of Science* 52, 95-124.

Roberts, R., *&* Wood, W. J. (2007). *Intellectual Virtues: An Essay in Regulative Epistemology*, Oxford: Oxford University Press.

Rowlands, M. (2009). *The Body in Mind*, New York: Cambridge University Press.

Rupert, R. D. (2009). *Cognitive Systems and the Extended Mind*, Oxford: Oxford University Press.

Shapiro, L. (2011). *Embodied Cognition*, New York: Routledge.

Sosa, E. (2007). *A Virtue Epistemology: Apt Belief and Reflective Knowledge,* Oxford: Clarendon Press.

—— (2009). *Reflective Knowledge: Apt Belief and Reflective Knowledge*, Oxford: Clarendon Press.

Steup, M. (1999). 'A Defense of Internalism', *The Theory of Knowledge: Classical and Contemporary Readings* (3rd Ed.), (ed.) L. Pojman, 310-21, Belmont, CA: Wadsworth.

Turri, J., *&* Pritchard, D. H. (2011). 'The Value of Knowledge', *Stanford Encyclopedia of Philosophy*, (ed.) E. Zalta, http://plato.stanford.edu/entries/knowledge-value/.

Zagzebski, L. (1996). *Virtues of the Mind: An Inquiry into the Nature of Virtue and the Ethical Foundations of Knowledge*, Cambridge: Cambridge University Press.

—— (1999). 'What is Knowledge?', *The Blackwell Guide to Epistemology*, (eds.) J. Greco *&* E. Sosa, 92-116, Oxford: Blackwell.

NOTES

[1] For the canonical defence of extended cognition, as part of a defence of the (arguably) bolder extended mind thesis, see Clark & Chalmers (1998). See also Clark (2008).

[2] Note that given how I have just characterized extended cognition, it isn't necessary for an extended cognitive process to take in features of the subject's cognitive environment. Instead, *embodied cognition*—whereby one's body (other than one's brain and central nervous system)—can also count as a kind of extended cognition. For the purposes of this article I will be setting embodied cognition to one side. For some recent discussion of this thesis, see Noë (2004), Chemero (2009), Rowlands (2009), and Shapiro (2011). Note that for the purposes of this article I will also be setting aside another kind of extended cognition—sometimes called *distributed cognition*—whereby the cognitive extension involves other agents. For one of the seminal works on distributed cognition, see Hutchins (1995). For specific discussion of the epistemological ramifications of distributed cognition, see Carter, Clark, Kallestrup, Palermos & Pritchard (*forthcoming*), and Palermos & Pritchard (*forthcoming*).

[3] For two prominent critiques of extended cognition—and also the related extended mind thesis (see endnote 1)—see Adams & Aizawa (2008) and Rupert (2009).

[4] See also Goldman (1979, §2).

[5] One might claim that Goldman's use of 'psychology' here opens up the possibility that he isn't limiting cognitive processes to the biological subject. But he has foreclosed this interpretive possibility in conversation.

[6] Although nothing depends on this here, this way of understanding epistemic internalism is explicitly along *accessibilist*, as opposed to *mentalist*, lines, where mentalism is the other dominant way of characterizing epistemic internalism in the contemporary literature. For two key defences of accessibilism, see Chisholm (1977) and Bonjour (1985, ch. 2). For the core defence of mentalism, see Conee & Feldman (2004). For some useful discussions of the debate between accessibilists and mentalists, see Steup (1999), Pryor (2001, §3), Bonjour (2002), Pappas (2005), and Poston (2008).

[7] For some of the key defences of virtue responsibilism, see Code (1987), Montmarquet (1993), Hookway (2003), Zagzebski (1996), and Roberts & Wood (2007).

[8] See especially Pritchard (2010; *forthcoming*).

[9] For more on the notion of cognitive integration, see Greco's (2003; 2009; cf. Breyer & Greco 2008) virtue reliabilist account, which approaches the problem from an essentially epistemological perspective, and also Palermos's (2014*a*; 2014*b*) intriguing use of dynamical systems theory.

[10] In earlier work on extended knowledge—see, especially Pritchard (2010)—I had thought that the notion of *epistemic dependence* was also very important to understanding how knowledge of this kind is possible, at least by virtue-theoretic lights. Very roughly, the basic idea behind epistemic dependence is that knowledge can be dependent in significant ways on factors outwith the subject's cognitive agency. This idea is rooted in an earlier critique that I've levelled against robust virtue epistemology, and my related defence of anti-luck virtue epistemology—see Pritchard (2009*a*; 2009*b*; 2012*a*) and Pritchard, Millar & Haddock (2010, chs. 2-4)— but I have since developed the idea independently—see especially Kallestrup & Pritchard (2011; 2012; 2013) and Pritchard (2016*a*). My current view is that while epistemic dependence does offer us a basis for rejecting epistemic individualism, this basis is independent of extended cognition. Thus by advancing the thesis of epistemic dependence one thereby makes it easier to defend the possibility of extended knowledge. See Pritchard (2016*a*) for more on this point.

[11] Of course, one might have certain innate dispositions that make the acquisition of an intellectual virtue much easier (or harder) for that subject. One might innately be disposed to be bold, for example, in which case the development of the virtue of intellectual courage will be much easier. The point, however, is that there is much more to manifesting an intellectual virtue than simply manifesting these innate dispositions. These dispositions—helpful or otherwise to the task in hand—must be moulded into intellectual virtues. I am grateful to an anonymous referee from *Inquiry* for pressing me on this issue.

[12] For some key discussions of the intellectual virtues, see Montmarquet (1993), Zagzebski (1996), Roberts & Wood (2007), and Baehr (2011).

[13] For a helpful recent collection of papers exploring the notion of intellectual character and virtue, and its role in education, see Baehr (2015). For a recent defence of the claim that the epistemic goal of education is the development of intellectual character, see Pritchard (2013). See also Pritchard (2014*b*; 2016*b*) and Carter & Pritchard (*forthcoming*). See also MacAllister (2012).

[14] And not just technologically-embedded either, but also *socially* embedded (including being embedded in technological environments which are distinctively social). Recall, however, that our focus is on extended cognition involving technology (see endnote 2), and hence I shall be putting this point to one side in what follows.