

# Where are virtues?

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**Abstract** This paper argues that the question, ‘where are virtues?’ demands a response from virtue theorists. Despite the polarizing nature of debates about the relevance of empirical work in psychology for virtue theory, I first show that there is widespread agreement about the underlying structure of virtue. Namely, that virtues are comprised of cognitive and affective processes. Next, I show that there are well-developed arguments that cognitive processes can extend beyond the agent. Then, I show that there are similarly well-developed arguments that affective processes can extend beyond the agent. I then introduce three cases to establish that these cognitive and affective processes are relevantly similar to the cognitive and affective processes countenanced by plausible theories of virtue. Finally, I conclude that virtue theorists must abandon default internalism, the (often implicit) view that the cognitive and affective processes comprising virtues are internal to the agent.

**Keywords** Moral psychology · Virtue theory · Extended mind

## 1 Introduction

Two decades ago, a sub-discipline in the philosophy of cognitive science was born with the provocative claim that ‘cognitive processes ain’t (all) in the head!’ (Clark and Chalmers 1998: 8). Around the same time, a number of philosophers (e.g. Flanagan 1991; Doris 2002) called attention to the implications of research in psychology and cognitive science for virtue ethics. Surprisingly, these two strands of inquiry have remained mostly distinct. Despite numerous pleas for conducting empirically responsible moral philosophy, few moral philosophers have engaged

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with the extended mind research program.<sup>1</sup> And despite Andy Clark's observation that the extended mind research program reveals the pressing need for 'an account of personal responsibility and moral agency which respects the thin, decentralized, and distributed nature of situated intelligent control' (2001: 141), few extended mind theorists have engaged with the normative implications of their view.<sup>2</sup> The present paper closes this gap by showing how the conjunction of two well-developed arguments from the extended mind literature yields a heretofore unrecognized question for virtue theory: Where are virtues?

In Sect. 2, I show that, despite the polarizing nature of debates about the relevance of empirical work in psychology for virtue theory, there is still widespread agreement about the underlying structure of virtue. Namely, that virtues are comprised of cognitive and affective processes. In Sect. 3, I show that there are well-developed arguments that cognitive processes can extend beyond the agent. Next, in Sect. 4, I show that there are similarly well-developed arguments that affective processes can extend beyond the agent. Then, in Sect. 5, I introduce three cases to establish that the cognitive and affective processes described in Sects. 3 and 4 are relevantly similar to the cognitive and affective processes countenanced by the plausible theories of virtue from Sect. 2. Finally, I conclude that virtue theorists must abandon default internalism, the (often implicit) view that the cognitive and affective processes comprising virtues are internal to the agent. Put another way, when virtue theorists talk about cognition, perception, emotion, etc. it is safe to assume that they are not considering the challenges posed by the extended mind research program. My aim is to show why this is a problem.

## 2 The structure of virtue

A defining feature of recent work in virtue theory has been the debate about the relevance of empirical work in psychology for normative theories of character and virtue. Despite the polarizing nature of these debates, I contend that both empirically minded and non-empirically minded virtue theorists agree about the underlying structure of virtue.

Annas (1993) lays out a general theory of the structure of virtue. Hers is useful for two reasons. First, the framework is general enough to cover a variety of ancient Western virtue theories (e.g., Aristotelean, Stoic, Cyrenaic, Epicurean, Sceptic). Second, Annas has long been sceptical about the empirical challenges to the adequacy of virtue ethics (e.g. Annas 2005: 641–2). By setting out from this framework, we can avoid objections about stacking the deck in favor of more recent,

<sup>1</sup> Following Bernecker (2014), I distinguish here between claims about extended *mind* and *cognition*. I will use the latter in a narrow sense to refer to specific cognitive processes (e.g. reasoning, problem solving, remembering, etc.), and the former more broadly to refer to claims about extended cognition and extended emotion.

<sup>2</sup> Sneddon (2011), Cash (2013), Howell (2016), Carter & Palermos (2016) and Alfano and Skorburg (2017) excepted, though these will be discussed in more detail below.

empirically informed theories of virtue. What, then, is the general metaphysical structure of virtue?

In ancient ethical theory considerable attention was paid to three points: (1) virtues are dispositional. (2) Virtues have an affective aspect: they involve our feelings, especially our feelings of pleasure and pain, and developing a virtue involves habituating our feelings in certain ways. (3) Virtues have an intellectual aspect: they involve reasoning about, and grasp of, the right thing to do, and developed virtue implies good practical reasoning or practical intelligence. The development of all three points contributes to our understanding of what a virtue is (1993: 48–9).

There is near consensus on the first of the three components.<sup>3</sup> As a result, my focus here will be on the second and third components: cognitive and affective processes. To show that there is also widespread agreement that virtues are essentially comprised of cognitive and affective processes, consider that recent work (e.g. Miller 2013, 2014) linking virtue ethics and social and personality psychology converges on the same framework laid out by Annas.

People have traits like height, weight, extraversion, shyness, honesty, and compassion. Miller distinguishes among non-personality traits (like height and weight), personality traits (like extraversion and shyness), and character traits (like honesty and generosity). Personality traits are broadly ‘concerned with the mental life of a creature, that is, the mental states and processes that constitute thinking.’ For example, the shy person ‘wants to avoid speaking in public, and so may decline speaking invitations because of that. A sociable person, on the other hand, may get excited by an upcoming party and spend hours mingling with the crowd’ (2013: 4). Personality traits are thus comprised of these cognitive and affective processes.

According to Miller, character traits just are those personality traits for which we are accountable. It often doesn’t make sense to praise someone for being short or blame them for being shy. But it often does make sense to blame someone for being stingy or praise them for being honest. Character, then, is understood as the sum of these character traits and their interrelations. Virtues (and vices), for Miller, are just morally valenced character traits. Thus, the generous person is disposed (among other things) to *notice* when others are in need, *feel* appropriate emotions toward them, and *reason* well about how best to help them.

Despite long-standing disagreements in the literature about the relevance of research in social and personality psychology for virtue ethics, we can see how proponents of each camp agree about the general structure of virtue. That is, for both Annas and Miller, virtues essentially involve cognitive and affective processes. There is little doubt then, about *what* virtues are. In the balance of the paper I will show that questions about *where* they are are less settled. At first pass, the argument runs as follows:

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<sup>3</sup> A veritable who’s who list of recent virtue theorists—Williams (1985: 8–9), Flanagan (1991: 282), Annas (1993: 50), Hursthouse (1999: 108), Swanton (2003: 19), Slote (2003: 4), MacIntyre (2007: 219), and Russell (2009: 13–4)—all cast virtues in terms of dispositions. Doris (2002: 174) and Miller (2013: 7) have collected another forty or so references to this effect.

- (P1) Virtues are comprised of cognitive and affective processes.  
 (P2) Well-developed arguments in the extended mind literature hold that cognitive processes sometimes extend beyond the boundaries of the agent.  
 (P3) Well-developed arguments in the extended mind literature hold that affective processes sometimes extend beyond the boundaries of the agent.  
 (P4) These extended cognitive and affective processes are relevantly similar to the cognitive and affective processes countenanced by plausible theories of virtue  
 (C) The processes comprising virtues ain't (all) in the agent!

I take it that the present section has established the first premise. I will consider the second, third, and fourth in turn.

### 3 Extended cognition

A cursory literature review reveals the existence of many arguments aimed at supporting the second premise. Much ink has been spilled about how various technologies can embed, scaffold, or extend cognitive processes such as remembering, planning, reasoning, or problem solving. I will not rehearse those accounts here. Instead, I will argue for the initial plausibility of these claims by focusing on the robust body of rebuttals to persistent objections. The operative assumption is that a body of arguments can be regarded as well-developed if there are numerous and convincing rebuttals to strong and persistent objections.

For example, opponents have shown that many early accounts of extended cognition confused mere coupling with full-blown constitution (e.g. Adams and Aizawa 2010), and that this confusion leads to the problem of cognitive bloat (e.g. Rupert 2004). While these objections have taken many forms, one of the most compelling is Rupert's (2004, 2009) assertion that we can grant cognitive processes *depend* on environmental resources without claiming that such environmental resources are themselves *constitutive* of cognition. In other words, Rupert concedes that external entities might be more important for cognitive scientific explanations than we would have thought, but this does not entail a commitment to the more radical claim that various props, devices, agents, etc. are *constitutive* of cognitive processes. If a more traditional internalist framework (e.g. the hypothesis of embedded cognition) can account for the same range of cases without attempting the tricky inference from coupling to constitution, the argument goes, then we should, *ceteris paribus*, endorse the hypothesis of embedded cognition over the hypothesis of extended cognition by 'the methodological principle of conservatism' (Rupert 2004: 395).

Extended mind proponents have developed various strategies to meet these objections: Palermos's (2014: 33–4) ongoing feedback loops criterion; Heersmink's (2015) dimensional analysis; Huebner's (2016: 52) distinction between exploitation and collaboration; Wilson's (2010: 285) notion of a functionally integrated gainful system; Skorburg's (2017) account of interactionism; De Jaegher, Di Paolo, and Gallagher's (2010: 443) distinctions among contextual factors, enabling factors, and constitutive elements; Kirchhoff's (2015) notion of diachronic process. All are

aimed at providing principled criteria for demarcating extended cognitive systems and blocking coupling-constitution and cognitive bloat objections.

In the interest of brevity, I will focus here on just two of these accounts, but the lessons drawn should generalize. First, Palermos's account<sup>4</sup> is worth singling out here because it specifically provides a strong reason to adopt an extended framework over a more conservative, internalist one: 'the postulation of [extended] coupled systems is necessary with respect to the explanation of certain systemic properties, which we would otherwise be at a loss how to account for.' (2014: 32). Not only is there a principled criterion (ongoing feedback loops) by which we can distinguish cases of mere coupling from full-blown constitution, but this account also specifies why we should bother with more radical claims about extended systems. Namely, there is an *explanatory payoff* for doing so. Indeed, as we will see below, this same move will be required to make sense of the unique dynamics of some dyadic relationships.

Second, Heersmink (2015) offers a fine-grained analysis of the continuum between coupling and constitution. The main idea is that there are varying degrees of functional integration between agents and artifacts. The deeper the functional integration is along these various dimensions, the stronger the case for positing an extended coupled system:

This framework consists of the following dimensions: information flow, reliability, durability, trust, procedural transparency, informational transparency, individualization, and transformation. These dimensions are all matters of degree and jointly they constitute a multidimensional space in which situated cognitive systems can be located and have certain dimensional configurations. The higher a particular system scores on these dimensions, the more deeply the functional integration is (2015: 579).

As a segue to the next section, I would also propose a friendly amendment to this framework: affective attachment, or the degree to which an agent *feels* attached to an artifact. For example, Gazzaley and Rosen (2016: 11) report a finding that 75% of smartphone users feel panicked when unable to locate their phone. One could also imagine the feeling of arriving at some destination, only to realize that one's tablet or laptop has been stolen. The phenomenology might suggest that our devices

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<sup>4</sup> Borrowing terminology from Dynamical Systems Theory, Palermos makes the following argument for the ontological postulation of the kinds of tightly coupled systems which underwrite arguments for extended cognition:

'(I)n cases where two nonautonomous systems mutually interact on the basis of feedback loops, there is an ongoing causal amalgam between the two units that disallows their decomposition into two separate systems on the basis of distinct inputs and outputs... The reason is that the way each component is affected is not exogenous to the component itself, and so cannot be properly thought of as its input. Likewise, the way each component affects the other is directly and synchronically related to the component to be affected and so cannot be properly conceptualized as output of the affecting component...We can call this the 'ongoing feedback loops' argument for the (ontological) postulation of coupled systems...In other words, ongoing mutual interdependence on the basis of feedback loops is the criterion by which we can judge whether two seemingly distinct systems constitute an overall system, consisting of both of them' (2014: 33–4).

are less like tools—easily set aside when the task at hand is complete—and increasingly more like parts of who we are. Indeed, there is some neuroscientific evidence to this effect (see e.g. Kim and Johnson 2014; Salerno et al. 2012).

For both Palermos and Heersmink, when a system (agent-artifact or agent-agent) becomes so tightly coupled, treating that system as comprised of two independent components often does not do justice to the dense patterns of interaction, especially the ways in which, over time, such interaction transforms downstream cognitive processing.<sup>5</sup> As we will see below, adopting an extended coupled systems framework can also yield unique explanatory and predictive resources.

These are but two examples of well-developed responses to persistent objections in the extended cognition literature. When these accounts aimed at blocking coupling-constitution and cognitive bloat objections are linked with the arguments from functional parity (Clark and Chalmers 1998), complementarity (Sutton 2010), or integration (Menary 2007), the case for extended cognition looks formidable.

Meeting the objections in this way, however, has come at the cost of severely restricting the class of extended cognitive processes. Thus, extended cognition is rarer than the original Clark and Chalmers paper might have us think. In fact, the (in)famous case of Otto and his notebook does not pass muster on the more sophisticated accounts given above. But by setting the bar higher, the cases that do get over—such as the Tactile Visual Substitution Systems (TVSS) discussed in Palermos (2014: 31ff) or the air traffic control interfaces discussed in Noë (2009: 84ff), among others—should suffice to establish the claim that sometimes, cognitive processes can extend beyond the agent. Moreover, the kinds of perceptual and cognitive processes described in the literature (e.g. noticing, deliberating, planning, etc.) have a clear connection to the components of virtue described in the previous section.

To be sure, I have not established that the case for extended cognition is definitive. More argumentation would be required to show that the range of objections considered is comprehensive, and that the responses are sound.<sup>6</sup> But the foregoing has established that it is difficult to deny that the arguments for extended cognition are worthy of serious consideration and engagement, and this is all that is needed to secure the second premise. If it can be shown that the same is true of the arguments for extended affective processes (Sect. 4), and that the cognitive and affective processes posited in the extended mind literature are sufficiently similar to

<sup>5</sup> Heersmink (2015: 591) argues that the representational structures of language and mathematics are paradigm examples: ‘During ontogenetic development, we interact with public representational systems such as language and mathematics. By so doing, we soak up and learn to think in terms of those systems and the brain takes on the representational properties of those systems.’ He also provides a more colloquial example: ‘after navigating a city with a map for a certain period of time, the interaction with the map and the city has changed our internal spatial representation, i.e., our cognitive map, of parts of the city. At a certain point, we no longer need the actual map to navigate and we have to a certain degree internalized the information of the map’ (2015: 592).

<sup>6</sup> Wagman and Chemero (2014) provide one example of how this might be accomplished. They show that both proponents and opponents agree that the debate over the existence of extended cognition is an empirical one. Then, after marshalling a range of experimental evidence in support of extended cognition, they conclude that the debate is, as a matter of empirical fact, over.

the cognitive processes countenanced by plausible theories of virtue (Sect. 5), then the question, ‘where are virtues?’ will demand a response from virtue theorists.

## 4 Extended emotion

Though relatively newer, similar arguments have been developed for extended emotional or affective (I use the two interchangeably) processes. For example, Stephan et al. (2014: 67) claim that the argument for extended cognition ‘applies *mutatis mutandis* to emotions.’ Colombetti and Roberts (2015: 1261) similarly contend that ‘only if one were to endorse a very strict conceptual separation between cognition and emotion, would the claim that one but not the other might be realized within an extended system be a sustainable theoretical position.’ Thus, if there are good reasons to take extended cognition seriously—and if the arguments from the previous section are on the right track, then there are—then this is a reason to take seriously extended emotions. In this section, I will survey a wide range of arguments in the constellation of extended emotions (including extended moods, temperaments, musical experience, emotion-regulation, and motivation) to support the claim that accounts of extended emotion are well-developed, worth taking seriously, and highly relevant to virtue theory.

The most straightforward brief for extended emotions comes from Carter et al. (2016), who argue that if cognitivist theories of emotion are plausible on independent grounds, then it is not at all implausible to think that if cognitive processes are sometimes extended, perhaps the relevant processes (e.g. judgments, appraisals) posited by the cognitivist might be similarly extended.

Their argument can be strengthened by linking an offhanded remark (2015: n. 39) with a large body of research on biofeedback in clinical psychology (for a review, see Schoenberg and David 2014). For example, heart rate feedback has long been used as a strategy to treat panic, anxiety, and performance disorders. The basic idea is that by having a real-time measure, patients can attempt to consciously lower their heart rate (e.g. by deep breathing), which can reduce anxiety symptoms, which in turn reduces heart rate, and so on. Given the proliferation of wearable technologies such as the Apple Watch or Fitbit—which use photoplethysmography (PPG) to measure heart rate in real time—it seems likely that these devices could extend the judgments or appraisals characteristic of other morally relevant emotions such as fear or enjoyment.

In what is perhaps the most wide-ranging argument in the literature, Colombetti and Roberts (2015) formulate the Hypothesis of Extended Affectivity, which claims that ‘the arguments deployed to motivate an extended treatment of belief, memory, planning, and calculation can be applied to cases of mood, sentiment, temperament, character, and emotion’ (2015: 1260). For example, we are asked to imagine the case of Eve, who dispositionally resents her parents. In her diary, she tracks the many ways her parents make her angry: lack of warmth, constant criticism, etc. As she ages, she grows out of her resentment and does not regularly, consciously exhibit resentment toward her parents. Except, that is, when she reads and re-reads her diary. Colombetti and Roberts thus write:



Without the diary, we can imagine, she would not rekindle her resentment that often, in fact she may even be able to forget her negative relationship with her parents, and cultivate more positive memories and feelings toward them. Without the diary, that is, she is not (or need not be) so disposed to manifest parent-directed resentment. This scenario strikes us as plausible, and one in which, if one endorses ExM [Extended Mind], one also ought to say that Eve's diary is part of the supervenience base of the system that realizes her standing, dispositional resentment toward her parents (2015: 1253).

While it is not clear that Eve and her diary will meet the strict standard for extension outlined in the previous section, this case does highlight the parallels between arguments for extended cognition and extended emotion, as well as their intuitive appeal. After making similar arguments for the various ways in which wider ranging, multi-track affective states (like moods and temperaments) can be similarly extended, Colombetti and Roberts go on to claim that:

The fact that some extra-neural artefacts are deployed for their transformative effects only within a certain domain—workplace, home, public transport—is no barrier to their being *true extensions of a person's character*. Moreover, environmental components may lend a degree of stability to a person's dispositions, enabling her to exhibit responses with a greater degree of uniformity across different social contexts than would otherwise be possible (2015: 1255, emphasis mine).

On their telling, introversion can be extended to include, for example, headphones one always wears in public, so as to effectively discourage small talk. I simply want to flag that it is a short leap from here to the normatively evaluable traits of character (e.g., (un)friendliness) that comprise the currency of virtue ethics.

Yet another argumentative strategy for extended emotions has looked to various aspects of musical experience (Krueger and Szanto 2016; Krueger 2014a, b; Kersten 2017; Kersten and Wilson 2016). Echoing Clark's (1998: 63) notion of *continual reciprocal causation*, Krueger and Szanto (2016: 867) argue that when a musician is performing, qualities of the instrument and the produced sound can be characterized as 'an ongoing process of emotional self-stimulation,' where specific emotional responses are coaxed out, which regulate the 'quality and dynamics of her experience in real time—experiences that affect what she plays next, which regulate her further emotional experiences.'

Importantly for our purposes, arguments for extended emotion are not limited to artifacts, gadgets, or instruments. Drawing from a rich tradition in developmental psychology, Varga (2016) explores how the process of *emotion regulation* might be extended to include other agents. To see this, consider that newborns are intimately attuned to their caregiver's gaze, level of arousal, orientation, tone, and facial expressions. Varga argues that the interactions between newborns and caregivers are best characterized as *synchronic*, where 'synchrony refers to an unforeseen degree of temporal coordination of non-verbal behaviors of the child and the caretaker,' (2016: 2474). Especially important in this interpersonal context is the child's capacity to *regulate emotions*—both in real time, and across the developmental



trajectory. Indeed, Varga claims that such ‘dyadic synchronic interaction and the matching of micro-level face-to-face interactions *make possible the cognitive regulation of the infant’s emotions*’ (Varga 2016: 2475, emphasis mine). Put another way, the process of emotion regulation in the infant *extends* to include the caretaker. Recalling Palermos’s (2014) ongoing feedback loops criterion, Varga continues:

the emotion regulation of the infant is not only not brain-bound, but realized by vehicles that extend beyond organism boundaries and include extra-somatic environmental resources provided by the caretaker. Also, the contribution of the dyadic interaction is not merely causal, but genuinely constitutive for the infant’s emotion regulation. The caretaker partly serves as an indispensable vehicle of the infant’s cognition, through which the infant is able to accomplish the previously unattainable cognitive achievement of emotion regulation (2016: 2477).

There are (at least) three points worth noting here. First, these ongoing synchronic interactions are precisely what an extended systems perspective is meant to capture.<sup>7</sup> Thus, there is a ready-made reply to a Rupert-style objection: the process of emotion regulation (both in the moment, and the longer-term development of the capacity) is not de-composable into simple child inputs and caretaker outputs. Such a decomposition would be inadequate to fully capture dynamics of the dyadic interactions (what Varga calls the properties of ‘uncontrollability’ and ‘irreducibility’).

Second, independently formulated, but converging accounts suggest that these interactive dynamics are by no means unique to parent–child dyads, and are also reliably present in adult, romantic partner dyads. For example, Transactive Goal Dynamics (Fitzsimons et al. 2015)—a burgeoning research program in social psychology itself a descendant of a long tradition of interdependence research in psychology (see Rusbult et al. 2009 for a review)—suggests that construing romantic partner dyads in terms of an extended system reveals novel resources for understanding, predicting, and explaining emotion, motivation, and goal-directed behavior:

the theory [of transactive goal dynamics] depicts relationship partners as exerting such a great deal of mutual influence in each other’s goals, pursuits, and outcomes that the partners’ self-regulatory systems become inextricably linked, part of a complex and messy web of interdependence. Ultimately, we suggest that relationship partners are best conceptualized not as mostly independent goal pursuers who occasionally influence each other, but instead,

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<sup>7</sup> However, Varga (2016) argues that the Hypothesis of Extended Cognition (HEC), as it is usually understood, is inadequate to capture the unique dynamics of synchronic dyadic interactions. He thus introduces two varieties of the Hypothesis of Emergent Extended Cognition (HEEC) to deal with this problem, though he contends: ‘rather than being a rival to the HEC, it will be argued that the HEEC should be understood as complementing it. More precisely, the HEEC may be understood as a version of the HEC that explains cases of socially extended cognition, in which cognitive properties are sometimes irreducibly emergent properties of coupled systems’ (Varga, 2016: 2472).

as interdependent subparts of one self-regulating system (Fitzsimons et al. 2015: 648).<sup>8</sup>

Here again, there are *epistemic gains* to be made by adopting an extended systems perspective on questions of emotion regulation. Indeed, the potential real-world payoffs for understanding better how self-regulatory processes contribute to motivation and goal pursuit are especially salient. Of course, whether or not such payoffs materialize is largely an empirical question that cannot be settled here. Regardless of how the evidence shakes out, this leads to our third and final point. Namely, that the body of psychological research introduced here is highly relevant to virtue theory, as Lorraine Besser (2014: 145ff, 2017) has convincingly argued: ‘the psychological process of self-regulation can be seen not only as a form of practical reasoning, but as a virtue—as an excellent state of our cognitive capacities’ (2017: 516).<sup>9</sup>

In this section, we have seen how a range of entities external to the agent—smartwatch, violin, or spouse—can become so tightly integrated as to form an extended affective system. Again, this is not to say that the case for extended emotions is airtight. But the fact that these views potentially enjoy converging empirical support should suffice to demonstrate that the arguments are well-developed, and worth taking seriously, thus establishing the third premise.

We are now in a position to see how the conjunction of extended cognition and extended emotion raises a question about the location of virtues. If the arguments in Sects. 2 through 4 are on the right track—that is, if virtues are essentially cognitive and affective, and if cognitive and affective processes are sometimes extended—then the question before us now is the soundness of the fourth premise. Are the cognitive and affective processes described in the extended mind research program sufficiently similar to those countenanced by plausible theories of virtue?

## 5 From extended mind to extended virtues

At this point, one might object that even if we grant the existence of some extended cognitive and affective processes, it does not follow that these extended processes are themselves part of virtues. So far, I have only suggested in passing how claims from the extended cognition literature (e.g. perceiving or noticing features in the environment) and the extended emotion literature (e.g. feeling excitement,

<sup>8</sup> It is particularly striking that, without any reference to the extended mind research program, Finkel et al. (2016: 3) straightforwardly anticipate and defuse a Rupert-style objection: ‘Why must we consider a challenge to the pervasive (if implicit) assumption that goal-related processes predominantly reside within a single individual?’ The answer, they contend, is that: ‘If the goal of self-regulation research is to develop models of goal-relevant processes that emerge within prototypical laboratory experiments...then the individual unit of analysis may well be optimal. If, in contrast, self-regulation researchers want to understand how people set, pursue, and achieve goals in their everyday lives, then a predominant focus on individual-level processes is likely to yield an incomplete, perhaps even inaccurate, understanding of goal dynamics.’

<sup>9</sup> See also Besser’s discussion (2017: 513ff) of how the framework of self-regulation bears on specific virtues such as generosity.

regulating emotions) are relevant to virtue theory. In this section, I will present three cases—Officer Courage, Sibling Gratitude, and Smartdevice Curiosity—which more fully demonstrate the relevance of extended cognitive and affective processes for virtue theory. These cases highlight different dimensions along which the cognitive and affective processes constituting moral (or intellectual virtues) can be extended by artifacts or other agents.

### 5.1 Officer courage

To further establish a relationship between the processes discussed in the extended mind literature and the processes countenanced by virtue theory, consider the classic virtue of courage. Let us stipulate, plausibly enough, that the courageous person lies at the mean between the coward who feels too much fear, and judges too many situations as dangerous, and the rash person, who feels too little fear, and judges too few situations as dangerous.

Let us also stipulate, plausibly enough, that military and police soon will be (if they aren't already) widely equipped with Augmented Reality (AR) interfaces implemented on smartglasses. Currently available consumer models are essentially hands-free, heads-up display extensions of smartphones; whatever is on the smartphone can be projected onto the lenses. Cyclists, for example, can project turn-by-turn navigation onto the heads-up display, along with information from other connected sensors such as speed, distance, heart rate, power, and cadence. These glasses also integrate high-definition cameras and microphones on the frame to capture videos, pictures, and sounds.

It is not at all unreasonable, then, to think that military and police-grade interfaces will be able to implement facial recognition, target detection, and risk assessment (drawn from criminal records, for instance) on the heads-up display in real-time. For example, the AR interface could enable police officers to search crowds using the on-board camera and facial recognition software to identify outstanding warrants.<sup>10</sup> Or the heads-up display could integrate intelligence information necessary for locating, identifying, and assessing enemy combatants in a war zone. To be sure, the regulatory and privacy issues raised by such technologies are legion. But in the present context, the question is whether there are reasons to think that the components of a specific virtue—cognitive and affective processes like judging danger and feeling fear—extend to include the AR glasses.

Imagine the scene after an event like the 2013 Boston Marathon bombing. If an officer equipped with an AR interface was able to identify an attacker in the crowd, I am inclined to think that their resultant appraisal of the situation as *dangerous* and *requiring pursuit*, and the subsequent engagement of the sympathetic nervous

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<sup>10</sup> Lest the reader think this is still the stuff of dystopian sci-fi: Security cameras in Moscow have already deployed this technology, resulting in multiple arrests (McGoogan, 29 Sept., 2017). Indeed, the ability to link facial recognition with criminal record and propensity to violence seems a likely outcome from the trove of data collected using Taser's Axon body cameras, which have been adopted by an estimated one-third of American police departments (Kofman 30 Apr., 2017). Thanks to Mark Alfano for calling these sources to my attention.

system would extend to include the AR device. After all, when first responders made such judgments and appraisals in the absence of AR, we did not hesitate to praise their courageous acts. To insist that the case is somehow different because the judgments and appraisals are implemented in a hybrid Officer-AR system is to beg the question. Indeed, the processes implemented by the hybrid Officer-AR system look to be a paradigmatic instance of Palermos's (2014) ongoing feedback loops criterion. Save internalist or bioconservative prejudice, it is hard to see how the cognitive and affective processes of judging danger and feeling fear would not extend to include an AR device, especially when this technology potentially enables faster and more effective responses.<sup>11</sup>

Of course, one might object that the AR interface is merely *coupled* to the officer, or that it plays a *causal* rather than *constitutive* role in the relevant components of the virtue (e.g. feelings and judgments). A consideration of the real-time interaction dynamics as well as the transformative, downstream effects of the AR interface, however, can deflect this objection.

First, characterization in causal terms (as opposed to constitutive) might well be apt if the influence ran just one way—from information on the heads-up display to the officer, say. However, this description is, at best, incomplete. It is far more accurate to characterize the influence *bi-directionally* and *reciprocally*. It is not just that information 'inputs' on the heads-up display lead to the officer's cognitive, affective, and behavioral 'outputs.' Instead, these 'outputs,' in real-time, function as further 'inputs' to the heads-up display, which, in turn, produce new 'outputs,' and so on. The hybrid system allows the officer to perceive the environment in ways which open up new modes of engagement, which in turn afford new perceptual, cognitive, and affective experiences, which subsequently open different modes of engagement, and so on. The feedback and feedforward loops are so tightly integrated on spatial and temporal scales that they cannot be accurately decomposed into simple informational inputs and behavioral outputs.

Second, it seems highly likely that after prolonged use, the officer's cognitive and affective processing will be transformed by the AR interface. In much the same way reliable access to information on the internet is thought to transform meta-cognitive strategies (e.g. Sparrow et al. 2011), so too might officers' perceptual, cognitive, and affective repertoires be transformed by the reliable presence of AR interfaces. More specifically, AR interfaces are likely to become increasingly *personalized for*, *transparent to*, and *trusted by* users. Such are the hallmarks of the most stringent accounts of extended cognitive and affective systems (Heersmink 2015: 579). Taken together, the real-time interaction dynamics and longer-term transformative effects undermine the objections from mere coupling or causation. As a result, it looks like

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<sup>11</sup> This argument can be understood as an iteration of Sutton's (2010: 193–4) complementarity principle or Menary's (2007) notion of *cognitive integration*, both of which have enjoyed broad support in the extended mind literature. It should also be noted that many critics rightly worry that AR interfaces will lead to less effective responses, such as increased hostility toward citizens with a criminal background. A full treatment of this important issue is beyond the scope of this paper. However, my arguments are perfectly compatible with the claim that the bearer of the vice of rashness could be the hybrid Officer-AR system.

cognitive processes such as judging danger and affective processes such as feeling fear—essential components of cowardice, courage, and rashness—can be extended by AR devices.

## 5.2 Sibling gratitude

To be sure, Officer Courage is a single schematic example. But it is not difficult to construct similar cases for other moral virtues (or vices), and perhaps even intellectual virtues (or vices). For example, Roberts (2013), drawing on a passage from Matthews (1980), explores the importance of expectation and confirmation of emotional states within close relationships. One illustrative case involves a sister who generously gives up a concert ticket so that her brother can go instead. In this scenario, it is plausible to think that when the brother receives the ticket, he may feel the emotion of gratitude for the gift from his sister, which he expresses by some token of thanks. According to Roberts:

She responds to his gratitude by acknowledging his acknowledgment and his desire. She is gratified by his gratitude. His gratitude fulfils her concern that he be gratified by what she has given him and that he acknowledge her as his benefactor. And he may in turn be gratified that she is gratified by his gratitude. This brother-sister relationship seems to be going on swimmingly (2013: 137).

For Roberts, these positive feedback loops are constitutive of friendship and other close relationships (and when oppositely valenced, they are constitutive of enmity). The important point for present purposes is that this example highlights how affective components of a virtue might be said to extend to include other people. That is, essential features of the brother's gratitude are partially constituted by his sister's second-order gratitude about his first-order gratitude for her generosity.

As Roberts points out, the prepositions used to describe the exchange illustrate this reciprocal structure. For the sister's act to be fully generous, the gift must be *for* her brother's sake (rather than creating a debt he must repay later). In turn, the brother's gratitude is the proper response *to* his sister's generosity. Her second-order gratitude is her feeling grateful *for* her brother's first-order gratitude *for* her generosity which was *for* his sake in the first place. What starts off as a decidedly one-way interaction (giving for the sake of another) quickly unfolds into a meaningful and edifying reciprocal exchange of affective states. This ping-ponging between the expectation, expression, and confirmation of affective states again illustrates the densely interactive, reciprocal influence between components of extended coupled systems.<sup>12</sup>

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<sup>12</sup> This case can be supplemented by Palermos's (2016) account, which examines group dynamics through the lens of distributed cognition. Thanks to an anonymous referee for this suggestion.

### 5.3 Smartdevice curiosity

Finally, I will very briefly suggest how these arguments might be extended, as it were, to the domain of intellectual virtues (conflation problem (Driver 2003) notwithstanding). Consider how smartphone, smartwatch, smartspeaker, or smart-glasses users can configure their devices to be a single press or voice command away from Google or Wikipedia's search engines—or for that matter, any informational resources that they have cultivated themselves. These tools afford information and knowledge seeking with unprecedented ease and speed. It is easy to imagine that once an agent is equipped with these resources, their propensity to seek information and knowledge may increase: “Why sit and wonder when the answer is at my fingertips?” In turn, this propensity may lead agents to further engineer their epistemic environment which will subsequently entrench the propensity to seek information, and so on.<sup>13</sup> This process of entrenching habits is, of course, precisely how many theorists (e.g., Zagzebski 1996) describe the cultivation of virtue.

If we stipulate that the virtue of curiosity consists in (among other things) a reliable disposition to seek out new information and to feel excitement while so doing, can these smartdevices extend curiosity? As before, I am inclined to think that the more the querying process becomes *specifically tailored* and *personalized*, the more it *transforms* downstream searching, encoding, recall, etc., and the more *trusted* the interface becomes, the stronger the case that agents are not merely coupled to these devices, but that these devices are so deeply integrated as to partially constitute the agent's curiosity. It would seem little more than the manifestation of an internalist bias, then, to deny that smartdevices, when properly integrated with the agent, could thus partially constitute the agent's intellectual character.<sup>14</sup>

To sum up, in this section I presented three cases meant to demonstrate the relevance of extended cognitive and affective processes for virtue theory. The overall argument here depends less on the specific features of a given case, and more on the cumulative picture that emerges. Namely, that there are at least three ways in which the extended mind research program is directly relevant to virtue theory. The (1) *cognitive* or *affective* processes constituting (2) *moral* or *intellectual* virtues can be extended to include (3) *artifacts* or other *agents*. As a small subset of the possible combinations, the cases introduced here should secure the fourth premise: The cognitive and affective processes described in the extended mind literature are relevantly similar to those posited by plausible theories of virtue. In the next and final section, I will lay out how this argument bears on the paper's

<sup>13</sup> My account is agnostic on whether agent-smartdevice coupled systems do, in fact, promote curious inquiry. As before, there is nothing which would preclude the possibility that such coupled systems are bearers of intellectual vices such as close-mindedness or intolerance.

<sup>14</sup> In this vein, Miller and Record (2013: 121; 2017: 6ff) have explored how to conceptualize our epistemic interactions with internet search engines, including possible harms (e.g., filter bubbles, echo chambers, epistemic injustice, etc.) It is worth noting, if only in passing, that the account of extended cognition and its relationship to virtue theory developed in this paper is well-positioned to respond to their worries about extended varieties of reliabilism or responsibilism.

eponymous question, and I will contrast my response with recent proposals in the literature.

## 6 Conclusion: default internalism and extended persons

I began in Sect. 2 by finding a common-ground view of the structure of virtue that is endorsed by both empirically minded and non-empirically minded virtue theorists. Namely, that virtues are comprised of cognitive and affective processes. In Sects. 3 and 4, I showed that there are a number of well-developed arguments for the existence of extended cognitive and affective processes. In Sect. 5, I showed how the kinds of processes described in Sects. 3 and 4 are relevantly similar to those in Sect. 2. If everything is on the right track, then we will have arrived at the conclusion that the processes comprising virtues ain't (all) in the agent!

So what does this engagement with extended mind arguments mean for virtue theory? I contend that it requires the rejection of default internalism about the cognitive and affective processes relevant to virtue theory. But before unpacking this claim, I will briefly review another more radical proposal in the literature and then provide a number of reasons to reject it in favor of my more moderate view.

Howell (2016) argues that the evidence from the extended cognition literature and the situationist psychology literature entails a rejection of 'skindividualism' and an endorsement of *extended persons* in virtue theory: 'most philosophers assume skindividualism: the person does not extend beyond her or his skin. In particular, when it comes to virtue, skindividualism would maintain that a person's virtue must involve a disposition that is wholly grounded by features inside the person's skin' (Howell 2016: 147).<sup>15</sup> While I am sympathetic to these aims, there are strong reasons to think that the evidence does not support this conclusion. In short, the account of extended persons for virtue theory relies on questionable readings of the relevant psychological and philosophical literatures.

Rather than engaging the work in extended mind and cognition to mount the argument against skindividualism in virtue theory, Howell leans on philosophical summaries of situationist social psychology. I will not re-rehearse tired arguments about the situationist challenge to virtue theory here. It suffices to note that philosophical accounts of situationist social psychology underwrite Howell's account of extended persons.<sup>16</sup> Insofar as the case for extended persons in virtue theory relies on this philosophical rendering of the situationist literature, it will likely fail. The simplest reason is that the claim 'if one is looking for a predictor of behavior, one does much better to look at the context of action than at the dispositions of the agent' (Howell 2016: 152) is highly suspect. Situations do not, in

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<sup>15</sup> Alfano (2014: 84) has similarly argued that virtues inhere not so much inside individuals as 'in the interstices between the person and her world. The object that possesses the virtue in question would be a functionally and physically extended complex comprising the agent, her social setting, and her asocial environment.'

<sup>16</sup> For example: 'situationism speaks against skindividualism' (Howell, 2016: 148) and 'the situationist challenge thus offers us an argument for extended virtues and against skindividualism.' (156).



fact, account for significantly more variance in behavior than do personality variables (Richard et al. 2003: 337). Psychologists have long recognized (e.g. Funder and Ozer 1983) that it is not situationism which explains the most variance in people's behavior, but rather, *interactionism* between situational variables and personological variables. Add this nearly universally accepted conclusion (among psychologists, anyway)<sup>17</sup> to the ongoing replication crisis in social psychology (Open Science Collaboration 2015) and the prospects for philosophical arguments built on situationism look, at best, shaky, and at worst, wrong-headed.<sup>18</sup> Perhaps persons are extended. But by making this case via situationism, Howell has forged a solution to a non-problem.

A second and related set of worries is that the coupling-constitution and cognitive bloat-style objections are likely to hit their mark against Howell's account. The former objection is only mentioned in passing, and here too, situationism shoulders the burden.<sup>19</sup> More worrisome is that the issue of cognitive bloat is not considered. The analogous charge is that there are no criteria for determining where persons stop. When these are coupled with explicit arguments in the literature that extended cognition does not entail extended persons (e.g. Olson 2011; Rudder-Baker 2009; Buller 2013), the case for extended persons in virtue theory looks to be in bad shape.

To be clear, I am not arguing in favor of skindividualism here. The principled formulations and distinctions I surveyed in Sect. 3 may well guard against these objections to extended persons. But Howell has not provided that evidence. The evidence presented here does, however, support a more moderate conclusion. Namely, that *default internalism about the cognitive and affective processes comprising virtues stands in need of justification*. The existence of well-developed arguments for extended cognition, extended emotion and their relevance to virtue theory now precludes a default assumption that virtues are inside agents. Of course, it might still turn out that some of the cognitive and affective processes comprising some virtues are indeed inside the agent. But specific arguments will be needed to undermine the case for extended cognition, extended emotion, or their relationship to virtue theory. Internalism must be argued for, it can no longer be assumed. To deny this claim would be to either ignore serious proposals in the philosophy of cognitive science literature, or to deny a widespread, plausible view in the virtue

<sup>17</sup> To cite just one example, Walter Mischel, a pioneer of the situationist critiques of personality psychology argues that the most promising approaches in social and personality psychology: 'bridge the classic partitioning most unnatural and destructive to the building of a cumulative science of the individual—the one that splits the person apart from the situation, treating each as an independent cause of behavior' (2009: 289). Philosophers would do well to take note that among psychologists, 'nowadays, almost everyone is an interactionist' and the debates are no longer about whether dispositions or situations are better predictors of behavior, but instead, 'the major issues in contention center on the type of interactionism espoused' (Bandura 1999: 157).

<sup>18</sup> Though Sneddon's (2011: 157ff) discussion of psychological situationism and philosophical externalism is more nuanced and historically informed, this same criticism - overselling the situationist evidence and downplaying or ignoring the interactionist consensus - will apply.

<sup>19</sup> 'We can take the situationist critique as essentially making the point that the skindividualist way of cutting things up does not jibe with personality and trait talk. The extended persons approach does much better on this score. This suggests that in the case of the extensions of persons, we have reason to speak of constitution instead of mere coupling' (Howell 2016: 158).

literature. Thus, at the least, virtue theorists ought to have something to say about the location of the cognitive and affective processes comprising virtues.

So where, then, are virtues? The answer is that ‘it depends.’ As I have been arguing throughout, it will depend on factors such as the presence of ongoing feedback loops or the degree of functional integration. Or whether we are concerned with the cognitive or affective components of moral or intellectual virtues. Or whether we are talking about agent-artifact or agent–agent coupled systems. If these are taken into consideration in future virtue ethical theorizing, then this paper will have achieved its stated aim. And in a world where there are more active mobile devices than people, where many check their devices up to 150 times a day—roughly every seven minutes they are awake (Gazzaley and Rosen 2016: 11), where a smartphone is often the last thing seen at night and the first thing grabbed in the morning (Twenge 2017), and where 46% of Americans say their phone “is something they couldn’t live without” (Pew Research Center, June 28, 2017), such considerations seem all the more pressing.

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## References

- Adams, F., & Aizawa, K. (2010). Defending the bounds of cognition. In R. Menary (Ed.), *The extended mind* (pp. 67–80). Cambridge: MIT Press.
- Alfano, M. (2014). What are the bearers of virtues? In H. Sarkissian & J. C. Wright (Eds.), *Advances in experimental moral psychology* (pp. 73–90). New York: Continuum.
- Alfano, M., & Skorburg, J. A. (2017). The embedded and extended character hypotheses. In J. Kiverstein (Ed.), *Philosophy of the social mind* (pp. 465–778). New York: Routledge. <https://www.routledge.com/The-Routledge-Handbook-of-Philosophy-of-the-Social-Mind/Kiverstein/p/book/9781138827691>.
- Annas, J. (1993). *The morality of happiness*. New York: Oxford University Press.
- Annas, J. (2005). Comments on John Doris’s ‘Lack of character’. *Philosophy and Phenomenological Research*, 71(3), 636–642.
- Bandura, A. (1999). Social cognitive theory of personality. In L. Pervin & O. John (Eds.), *Handbook of personality: Theory and research* (pp. 154–197). New York: Guilford Press.
- Bernecker, S. (2014). How to understand the extended mind. *Philosophical Issues*, 24(1), 1–23.
- Besser, L. L. (2014). *Eudaimonic ethics: The philosophy and psychology of living well*. New York: Routledge.
- Besser, L. L. (2017). Virtue of self-regulation. *Ethical Theory and Moral Practice*, 20(3), 505–517.
- Buller, T. (2013). Neurotechnology, invasiveness and the extended mind. *Neuroethics*, 6(3), 593–605.
- Carter, J. A., Gordon, E. C., & Palermos, S. O. (2016). Extended emotion. *Philosophical Psychology*, 29(2), 198–217.
- Carter, J. A., & Palermos, S. O. (2016). Is having your computer compromised a personal assault? The ethics of extended cognition. *Journal of the American Philosophical Association*, 2(4), 542–560.
- Cash, M. (2013). Cognition without borders: Third wave socially distributed cognition and relational autonomy. *Cognitive Systems Research*, 25–26, 61–71.
- Clark, A. (1998). *Being there: Putting brain, body, and world together again*. Cambridge: MIT Press.
- Clark, A. (2001). Reasons, robots and the extended mind. *Mind and Language*, 16(2), 121–145.
- Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis*, 58(1), 7–19.
- Colombetti, G., & Roberts, T. (2015). Extending the extended mind: The case for extended affectivity. *Philosophical Studies*, 172(5), 1243–1263.
- De Jaegher, H., Di Paolo, E., & Gallagher, S. (2010). Can social interaction constitute social cognition? *Trends in Cognitive Sciences*, 14(10), 441–447.

- Doris, J. (2002). *Lack of character: Personality and moral behavior*. Cambridge: Cambridge University Press.
- Driver, J. (2003). The conflation of moral and epistemic virtue. *Metaphilosophy*, 34(3), 367–383.
- Finkel, E. J., Fitzsimons, G. M., & van Dellen, M. R. (2016). Self-regulation as a transactive process. In K. Vohs & R. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications*. New York: Guilford Press.
- Fitzsimons, G. M., Finkel, E. J., & van Dellen, M. R. (2015). Transactive goal dynamics. *Psychological Review*, 122(4), 648–673.
- Flanagan, O. (1991). *Varieties of moral personality: Ethics and psychological realism*. Cambridge: Harvard University Press.
- Funder, D. & Ozer, D. (1983). Behavior as a function of the situation. *Journal of Personality and Social Psychology*, 44(1), 107–112.
- Gazzaley, A., & Rosen, L. D. (2016). *The distracted mind: Ancient brains in a high-tech world*. Cambridge: MIT Press.
- Heersmink, R. (2015). Dimensions of integration in embedded and extended cognitive systems. *Phenomenology and the Cognitive Sciences*, 13(3), 577–598.
- Howell, R. J. (2016). Extended virtues and the boundaries of persons. *Journal of the American Philosophical Association*, 2(1), 146–163.
- Huebner, B. (2016). Transactive memory reconstructed: Rethinking Wegner's research program. *Southern Journal of Philosophy*, 54(1), 48–69.
- Hursthouse, R. (1999). *On virtue ethics*. Oxford: Oxford University Press.
- Kersten, L. (2017). Extended music cognition. *Philosophical Psychology*, 30(8), 1078–1103.
- Kersten, L., & Wilson, R. A. (2016). The sound of music, externalist style. *American Philosophical Quarterly*, 53(2), 139–154.
- Kim, K., & Johnson, M. K. (2014). Extended self: Spontaneous activation of medial prefrontal cortex by objects that are 'mine'. *Social Cognitive and Affective Neuroscience*, 9(7), 1006–1012. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4090970/>.
- Kirchhoff, M. D. (2015). Extended cognition & the causal-constitutive fallacy: In search for a diachronic and dynamical conception of constitution. *Philosophy and Phenomenological Research*, 90(2), 320–360.
- Kofman, A. (2017). Taser will use police body camera videos to 'anticipate criminal activity'. *The Intercept*. Retrieved from: <https://theintercept.com/2017/04/30/taser-will-use-police-body-camera-videos-to-anticipate-criminal-activity/>. Accessed April 30, 2017.
- Krueger, J. (2014a). Affordances and the musically extended mind. *Frontiers in Psychology*, 4(1003), 1–13.
- Krueger, J. (2014b). Varieties of extended emotions. *Phenomenology and the Cognitive Sciences*, 13(4), 533–555.
- Krueger, J., & Szanto, T. (2016). Extended emotions. *Philosophy Compass*, 11(12), 863–878.
- MacIntyre, A. (2007). *After virtue: A study in moral theory* (3rd ed.). South Bend: University of Notre Dame Press.
- Matthews, G. (1980). Ritual and religious feelings. In A. Rorty (Ed.), *Explaining emotions* (pp. 339–353). Berkeley: University of California Press.
- McGoogan, C. (2017). Facial recognition fitted to 5,000 CCTV cameras in Moscow. *The Telegraph*. <http://www.telegraph.co.uk/technology/2017/09/29/facial-recognition-fitted-5000-cctv-cameras-moscow/>. Accessed September 29, 2017.
- Menary, R. (2007). *Cognitive integration: Mind and cognition unbounded*. Basingstoke: Palgrave Macmillan.
- Miller, C. (2013). *Moral character: An empirical theory*. New York: Oxford University Press.
- Miller, C. (2014). *Character and moral psychology*. New York: Oxford University Press.
- Miller, B., & Record, I. (2013). Justified belief in a digital age: On the epistemic implications of secret Internet technologies. *Episteme*, 10(2), 117–134.
- Miller, B., & Record, I. (2017). Responsible epistemic technologies: A social-epistemological analysis of autocompleted web search. *New Media & Society*, 19(12), 1945–1963.
- Noë, A. (2009). *Out of our heads: Why you are not your brain, and other lessons from the biology of consciousness*. New York: Hill & Wang.
- Olson, E. (2011). The extended self. *Minds and Machines*, 21(4), 481–495.
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251), 1–8.

- Palermos, S. O. (2014). Loops, constitution and cognitive extension. *Cognitive Systems Research*, 27, 25–41.
- Palermos, S. O. (2016). The dynamics of group cognition. *Minds and Machines*, 26(4), 409–440.
- Pew Research Center. (2017). 10 facts about smartphones as the iPhone turns 10. <http://www.pewresearch.org/fact-tank/2017/06/28/10-facts-about-smartphones/>. Accessed June 28, 2017.
- Richard, F. D., Bond, C. F., & Stokes-Zoota, J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology*, 7(4), 331–363.
- Roberts, R. C. (2013). *Emotions in the moral life*. Cambridge: Cambridge University Press.
- Rudder-Baker, L. (2009). Persons and the extended mind thesis. *Zygon*, 44(3), 642–658.
- Rupert, R. (2004). Challenges to the hypothesis of extended cognition. *Journal of Philosophy*, 101, 389–428.
- Rupert, R. (2009). *Cognitive systems and the extended mind*. Oxford: Oxford University Press.
- Rusbult, C. E., Finkel, E. J., & Kumashiro, M. (2009). The Michelangelo phenomenon. *Current Directions in Psychological Science*, 18(6), 305–309.
- Russell, D. C. (2009). *Practical intelligence and the virtues*. Oxford: Oxford University Press.
- Salerno, S., Zamagni, E., Urquizar, C., Saleme, R., Farnè, A., & Frassinetti, F. (2012). Increases of corticospinal excitability in self-related processing. *European Journal of Neuroscience*, 36(5), 2716–2721.
- Schoenberg, P. L., & David, A. S. (2014). Biofeedback for psychiatric disorders: A systematic review. *Applied Psychophysiology and Biofeedback*, 39(2), 109–135.
- Skorburg, J. A. (2017). Lessons and new directions for extended cognition from social and personality psychology. *Philosophical Psychology*. <https://doi.org/10.1080/09515089.2017.1282606>.
- Slote, M. (2003). *Morals from motives*. New York: Oxford University Press.
- Sneddon, A. (2011). *Like-minded: Externalism and moral psychology*. Cambridge: MIT Press.
- Sparrow, B., Liu, J., & Wegner, D. M. (2011). Google effects on memory: Cognitive consequences of having information at our fingertips. *Science*, 333(6043), 776–778.
- Stephan, A., Walter, S., & Wilutzky, W. (2014). Emotions beyond brain and body. *Philosophical Psychology*, 27(1), 65–81.
- Sutton, J. (2010). Exograms and interdisciplinarity: History, the extended mind and the civilizing process. In R. Menary (Ed.), *The extended mind* (pp. 189–225). Cambridge: MIT Press.
- Swanton, C. (2003). *Virtue ethics: A pluralistic view*. Oxford: Oxford University Press.
- Twenge, J. M. (2017). *iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy—And completely unprepared for adulthood—And what that means for the rest of us*. New York: Simon and Schuster.
- Varga, S. (2016). Interaction and extended cognition. *Synthese*, 193(8), 2469–2496.
- Wagman, J. B., & Chemero, A. (2014). The end of the debate over extended cognition. In T. Solymosi & J. Shook (Eds.), *Neuroscience, neurophilosophy and pragmatism* (pp. 105–124). Basingstoke: Palgrave Macmillan.
- Williams, B. (1985). *Ethics and the limits of philosophy*. London: Fontana Press.
- Wilson, R. A. (2010). Extended vision. In N. Gangopadhyay, M. Madary, & F. Spicer (Eds.), *Perception, action and consciousness* (pp. 277–290). New York: Oxford University Press.
- Zagzebski, L. T. (1996). *Virtues of the mind: An inquiry into the nature of virtue and the ethical foundations of knowledge*. Cambridge: Cambridge University Press.