

Metacognition as an Epistemic Virtue

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§1. Introduction

Metacognition, often glossed as ‘thinking about thinking’ or ‘cognition about cognition,’ is a buzzword in education, a battleground in philosophy of mind, and a central area of study in psychology. But it is rarely discussed in epistemology, which is somewhat surprising given its deep roots in the field stretching back to Plato’s *Charmides* and Aristotle’s *De Anima*. In this paper, I will argue that metacognition deserves a bigger role in epistemology. More specifically, I will argue that metacognition qualifies as an epistemic virtue, and is therefore of interest in the currently flourishing subfield of virtue epistemology.

In §2 I will survey discussion of metacognition across disciplines, marshalling support for a specific conception of metacognition that I believe tracks a real mental phenomenon. I will show that metacognition is not just a process or skill, but in fact a robust character trait centered on a variety of abilities. This means that epistemic agents can be more or less metacognitive *qua* agent insofar as they are disposed to engage in metacognitive activity. In §3 I go further, showing that metacognition qualifies as an epistemic virtue: it makes the same contribution to an agent’s motivation, affect, competence, and judgment as other virtues, it makes an epistemic agent better *qua* agent, and leads to epistemic success.

§2. What is Metacognition?

The concept of metacognition was formally introduced into the literature by Flavell (1979), who defined it as “knowledge and cognition about cognitive phenomena” (1979, p. 906). He singled out four specific classes of cognitive phenomena: knowledge, experiences, goals, and strategies (Flavell, 1979, pp. 906-09). This intellectualist conception of metacognition set the standard for its use in developmental psychology and education, though it was of course expanded in ways we will see shortly.

Given how broad and ambiguous terms like ‘knowledge’ and ‘cognition’ can be, it is no surprise that there is serious debate over how exactly metacognition is manifested. Among philosophers of mind and cognitive scientists, the debate has settled between two camps. The self-attributive view (SAV) characterizes metacognition in terms of recursive meta-representations of one’s epistemic states, making metacognition a

kind of self-directed mind-reading (see Carruthers, 2008; 2009; Dennett, 1991; Gopnik, 1993). A paradigmatic occurrence of metacognition on this view would be forming the belief ‘I am confused by this concept’ or ‘I have evidence that p but doubt that p .’ By contrast the *self-evaluative view* (SEV) characterizes metacognition in terms of a broader category of epistemic self-evaluation and control, without the need for explicit conceptual representation (Proust, 2010; 2012).¹ On this view, metacognition can be expressed through things like a feeling of fluency or comfort in a given task, or a felt need to go slowly and carefully through a problem, in addition to more explicit linguistic representations of one’s epistemic condition.

The central disagreements between these views revolve around the relationship between mindreading and metacognition, and whether metacognition is found in children and non-human animals (and hence not explicitly linguistic). But thankfully there is a way to avoid becoming mired in this back-and-forth. Arango-Muñoz (2011) and Koriatic (2000) have independently argued that there are in fact two distinct levels of metacognition, and that each theory is describing a different level.² Roughly speaking, SAV is based on an epistemic theory (though often a kind of folk epistemology), while SEV is based on behavior and experience. This distinction maps onto the now-familiar Dual Process Model of cognition defended by Evans (2009), Evans and Stanovich (2013), Kahneman (2011), and Stanovich and West (2000). So we need not choose between these alternatives; rather, we can understand both as capturing different facets of a complex phenomenon. In other words, even if self-directed mindreading is neither necessary nor sufficient for metacognition, the ability may nevertheless play an important role in paradigmatic cases of metacognition in sophisticated epistemic agents.

In any case, the SEV view highlights several important features of metacognition in addition to the ability to represent our own epistemic condition linguistically. On this view, “metacognition essentially consists in a capacity for cognitive self-evaluation” (Proust, 2010, p. 993). But we should note from the outset that self-evaluation contains much more than just rendering judgment on one’s cognitive states. It also involves things like “deciding how to mentally act here and now, based on an evaluation of one’s current mental dispositions, given one’s commitment to various epistemic requirements” (Proust, 2010, p. 992), the ability to “adjust our cognitive goals and effortful activity to our cognitive resources” (Proust, 2010, p. 994), “sensitivity to epistemic normative requirements associated with the corresponding intentions to act” (Proust, 2010, p. 995). These normative requirements can be represented propositionally, but may also

be filtered through affective responses and awareness (Proust, 2010, pp. 99-96).

In order to engage in self-evaluation, however, one must have both (a) standards for evaluation and (b) awareness of how one's epistemic states meet these standards. Consequently, discussion of metacognitive has focused on two constitutive elements of metacognition, *cognitive knowledge* and *cognitive regulation* (Lai, 2011, pp. 5-10). Cognitive knowledge ranges over a variety of concepts, but in essence it involves understanding how thinking works, what factors can affect thinking, and what strategies tend to work to solve a given task. Cognitive regulation is equally broad, covering monitoring of one's abilities and progress, awareness of what strategies one is using or has used, and self-assessment of one's cognitive performance. In other words, these elements of metacognition focus on *what* one is thinking, *how* one is thinking, and *how well* one is thinking.

Though the gloss 'thinking about one's thinking' has an air of introspective naval-gazing, the above characterization should make clear that metacognition is an inherently practical enterprise. Cognitive regulation in particular focuses on selecting a viable strategy to realize a goal, monitoring one's progress toward that goal, and evaluating one's performance once that goal has been reached or abandoned. Hence metacognition plays an important role in an agent's epistemic behavior (see Koriat, 2007; 2008; Koriat et al., 2006; see also the works collected in Perfect and Schwartz, 2002).

One key aspect of this regulation that has only been alluded to thus far involves epistemic feelings. One key insight of the SEV approach to metacognition is that it makes a place for non-linguistic representations of one's cognition through affective states, from more robust states like fluency, novelty, 'eureka' moments, and the like, to more nebulous feelings like the 'tip of the tongue' state, the 'feeling of knowing,' or the 'feeling of forgetting' (Arango-Muñoz, 2014a; Sousa, 2008). Such feelings are "phenomenal experiences that point towards mental capacities, processes, and dispositions of the subject such as knowledge, ignorance, or uncertainty... [which] guide mental action/or self-ascriptions" (Arango-Muñoz, 2014b, p. 158). In particular, metacognition correlates with motivation; Efklides, for instance, shows that "[metacognitive knowledge] of persons and tasks is implicated in motivation in the sense of creating expectations of success" and that "epistemological beliefs can exert their motivational effects through their associations with motivational beliefs and goal orientations but also through their effect on [metacognitive skills] and selection of cognitive strategies and the decision regarding how much

time and effort to be invested in task processing” (Efklides, 2011, p. 11).³

One final point about metacognition is worth making. Metacognition is more than a mere skill or ability. Rather, it is a *disposition*: an internalized tendency or habit to engage in certain activities in appropriate contexts (i.e. metacognizers recognize when it is appropriate to engage in metacognition). And this disposition is fairly robust. Metacognition has been found to be both longitudinally stable and correlated with academic performance and interest in children throughout their schooling (Denissen et al., 2007),⁴ and the importance of cultivating metacognition in education and childhood development is well-documented (Kurtz and Borkowski, 1987; Schneider, 2008; van der Stel and Veenman, 2010; Veenman et al., 2004). There is empirical support for believing in “the role of relatively stable person characteristics such as motivation and metacognitive beliefs on task-dependent metacognitive experiences such as confidence” (Jian and Kleitman, 2015, p. 229).⁵

Given this discussion, I believe we are justified in viewing metacognition as a character trait. We can take the following definition of a character trait as our guide:

A character trait is a disposition to form beliefs and/or desires of a certain sort and (in many cases) to act in a certain way, when in conditions relevant to that disposition. (Miller and Knobel, 2015, p. 21)

This gives us a template to define metacognition as follows:

Metacognition is a disposition to (a) form beliefs, desires, and feelings about one’s own epistemic situation, processes, goals, and performance, which lead to (b) the mental activity of monitoring, regulating, adapting, and evaluating about one’s own epistemic situation, processes, goals, and performance, when (c) in conditions prompting self-aware attempts at problem-solving or strategic thinking.

Note that we have made feelings an explicit component here, rather than leaving it implied or subsumed under desire. Conceptualized in this way, the term ‘metacognition’ can be ambiguous between the trait itself and the exercise of the trait. This is to be expected: courageous people exhibit courage, open-minded people exhibit open-mindedness, and so on for other virtues. Likewise, metacognitive agents exhibit metacognition.

This analysis of metacognition helps us accomplish an important

first step in our attempt to show that metacognition could be an epistemic virtue. We started with the gloss that metacognition is ‘thinking about thinking.’ So glossed, metacognition could not be a virtue, because virtues are character traits and cognition as such is not a character trait. But we have seen that metacognition can be fruitfully viewed as a character trait after all, in which case it is at least in the running to count as an epistemic virtue.

§3. Metacognition as an Epistemic Virtue

So far we’ve seen that metacognition can be understood as a character trait, one which involves a disposition to consider and regulate one’s own epistemic status and activity. In this section I will argue that metacognition qualifies as an epistemic virtue, and hence that a metacognitive person is, all else equal, an epistemically virtuous agent.

I should start by specifying what kind of epistemic virtue I have in mind here. Broadly speaking, intellectual virtues can be approached in two ways. Reliabilist virtue epistemology focuses on reliable faculties, like sense perception or memory (Sosa, 2007; Greco and Reibsamens, 2018). By contrast, the responsibilist approach to virtue epistemology focuses on epistemic character traits like open-mindedness or honesty (Axtell, 1997; Baehr, 2011; Code, 1987; Montmarquet, 1993; Zagzebski, 1996). As can be inferred from the last section, here we are considering metacognition as a responsibilist epistemic virtue, a character trait that contributes to excellent epistemic agency.⁶ In this section, I will defend two claims about metacognition: (i) it meets the structural demands to qualify as an epistemic virtue, and (ii) it contributes to excellent epistemic agency in the way characteristic of epistemic virtue.

In a recent paper Jason Baehr proposes four dimensions for intellectual virtues. These features, he argues, are “central dimensions of an intellectual virtue” which “serve as theoretical model that covers enough of the relevant cases to be explanatorily illuminating and useful” (Baehr, 2018, p. 87). This will give us a tangible target to guide our investigation without begging any questions about the nature of virtue.⁷

The first dimension deals with a virtuous agent’s motivation. According to Baehr’s first principle:

Motivational Principle (MP): A subject *S* possesses an intellectual virtue *V* only if *S*’s possession of *V* is rooted in a “love” of epistemic goods. (Baehr, 2018, p. 87)

Baehr glosses “love” in a generic sense of ‘being for,’ which can manifest

as a desire, as a rational commitment, or being properly oriented or motivated toward an intrinsic good (Baehr, 2018, pp. 87-88). So, our questions are, ‘Do metacognitive agents love epistemic goods?’ and ‘If so, which goods?’

We have already seen a partial answer to the first question: metacognition is motivational. But is metacognition directed toward *epistemic* goods in particular? We might worry that metacognition is centered on non-epistemic concerns like, say, executive functioning or alleviating unpleasant sensations like cognitive dissonance or confusion. However, there are other ways of accomplishing these aims which don’t require an agent to engage in metacognition. What makes metacognition unique is its thoroughly epistemic character: it is itself an epistemic process concerned with epistemic activity and epistemic status. And given the goal-directed nature of metacognition, it makes sense to interpret its activity in terms of the same kind of love of truth that characterizes other epistemic virtues. Characteristically metacognitive people are those that monitor and regulate their only thinking in order to get the right answer by the best means.

This is part of the reason why metacognition plays such an important role in education. For instance, a metacognitive student in a math class has the aim of getting the right answer on a math problem. But she will not be interested in just any way of getting the right answer. Rather, she will reject options like merely guessing, or memorizing lists of relationships, or brute force calculation, as inappropriate strategies in this case. Instead, she will think about how to get the answer the *right way*. This suggests a love of truth, or at least a love of justification.⁸

Baehr’s second dimension of intellectual virtue concerns the conative states a virtuous agent experiences:

Affective Principle (AP): S possesses an intellectual virtue V only if S takes pleasure in (or experiences other appropriate affections in relation to) the activity characteristic of V. (Baehr, 2018, p. 89)

As Baehr himself emphasizes, “appropriate affections” is an important qualification: some virtues call for unpleasant emotions, like regret or pity (Baehr, 2018, p. 90). Metacognitive agents will express a range of affective states, depending on their situation. The feeling of fluency is a case in point: metacognitive agents are aware of when they know how to do something and are doing it well, and this feeling of competence is itself pleasant. Conversely, they feel troubled when they don’t understand

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something, surprised when they discover unexpected information or results, determined when they realize they need to do more to solve a problem or complete a task. By contrast, agents who do not metacognize often feel the wrong feelings: they are sanguine about a test they're unprepared for, confident in a wrong answer, or even uncertain about a correct answer. Metacognitive agents also feel appropriate levels of pride in their abilities and accomplishment: this contrasts with phenomena like the Dunning-Kruger Effect or Imposter Syndrome, where low metacognitive ability leads to inappropriately high or low confidence, respectively (Kruger and Dunning, 1999; Clance and Imes, 1978).

While Baehr's first two dimensions of intellectual virtue are internal, the third focuses on external manifestations of the relevant trait:

Competence Principle (CP): S possesses an intellectual virtue V only if S is competent at the activity characteristic of V.

In many ways this is the easiest dimension for metacognition to satisfy. I argued in the last section that metacognition is more than a skill, but this doesn't mean metacognition doesn't involve skill. Metacognitive agents are good at thinking about their own thinking. This is a distinct skill from being good at strategizing or problem solving, though of course metacognitive agents tend to be good at these too (as we will see momentarily). In particular, metacognitive agents are skilled at monitoring and evaluating their own knowledge and abilities, and at having an accurate assessment of their own status and performance. This ability to maintain an accurate self-assessment can be practiced and improved over time, which Baehr (2018, p. 92) argues is an important connection between virtue and skill.

Baehr's fourth and final dimension of intellectual virtue connects virtue's internal and external features:

Judgment Principle (JP): S possesses an intellectual virtue V only if S is disposed to recognize when (and to what extent, etc.) the activity characteristic of V would be epistemically appropriate.

One reason Lepock (2014, pp. 44-46) argues that metacognition is a constituent of epistemic virtue is that it helps an agent effectively control when and how to use a reliable epistemic process. I do not deny this, but it doesn't help on this dimension, since we are concerned with knowing when it is appropriate to engage in metacognition itself, rather than

metacognitively knowing when it is appropriate to deploy some other procedure for some goal.

Like any other cognitive activity, metacognition is not appropriate to all situations. Open-mindedness does not require taking an obviously bad-faith argument seriously, nor does curiosity require seeking out obscure trivia at all costs. Likewise, metacognition does not require obsessive introspection or a regression of thinking about thinking about thinking.... Rather, situations will vary in how appropriate it is to engage in metacognition to deal with them (see Paris, 2002, esp. pp. 116-120). But whereas we often have little to say about this awareness in other virtues (e.g. ‘an open-minded person just knows when open-mindedness is called for, because they understand the nature and value of open-mindedness’), the reflexive nature helps us say a bit more about metacognition. Because metacognitive agents are good at self-awareness and strategy selection, they will be better at realizing when their own metacognition is not conducive to accomplishing their cognitive goals.

One last point to make: metacognition is conducive to individual success and epistemic flourishing. Individual success can be understood as being good *qua* epistemic agent (Zagzebski, 1996, pp. 92-101), and also as reliably meeting one’s epistemic goals, such as knowledge (Zagzebski, 1996, pp. 176-193). That metacognition makes an epistemic agent successful is most easily seen where it has been most thoroughly studied, in an academic setting. In short, metacognitive students retain motivation and perform better than their less metacognitive counterparts in epistemically demanding contexts (in addition to the sources cited earlier, see Cornoldi, 2009; Kitsantas et al., 2008; Vanderswalmen et al., 2010). And while this point needs further defense, I submit that metacognition is also conducive to epistemic flourishing.⁹ After all, metacognition helps its possessor avoid committing errors and give into epistemic vices, in addition to being partially constitutive of good epistemic agency and helping its possessor meet their epistemic goals. While not as widely studied as academic performance, there is empirical backing for the connection between metacognition and well-being in a range of areas outside the classroom (e.g. Hertzog and Hultsch, 2000; Kiaei and Reio, 2014; Siegel, 2007; Valiente et al., 2012; Wells and Carter, 2001).

§4. Conclusion

I have argued that metacognition is a robust disposition to engage in a range of cognitive and conative activities which prompt self-reflective awareness and regulation of one’s own epistemic situation in appropriate conditions. This makes metacognition a character trait. I’ve argued further that this

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trait (a) has the same features as paradigmatic epistemic virtues like open-mindedness or curiosity, and (b) contributes to excellence epistemic agency and long-term epistemic flourishing. This makes metacognition a virtue. There is much more to be said on this topic: how metacognition relates to other virtues, how it can be habituated, what its corresponding vices are and where to draw the line between them, etc. This paper is, I hope, a contribution to this larger project.

Notes

¹ Rosenthal (2000a; 2000b) suggests a view that lies between the two options: literal metacognition involves explicit representation of our mental states, but we can explicitly represent the state of being unable to explicitly represent another state, and so use the former to cognize aspects of the latter. See also Hieronymi (2009).

² See also Nagel (2014) for a similar approach. Proust (2012, p. 587) reaches a similar conclusion herself: even though she insists on retaining ‘metacognition’ as a label for one phenomenon, she also suggests that there are two functions that map onto System 1 and System 2 thinking.

³ See also Luther et al. (2016); Schraw et al. (2006); Zimmerman and Moylan (2009).

⁴ See also Kurtz and Borkowski (1987); van der Stel and Veenman (2010).

⁵ The paragraph continues “This study contributes significant advances in accounting for the robust individual differences in confidence in relation to both motivational tendencies and metacognitive beliefs.”

⁶ Hence we are going further than Lepock (2014), who argues that metacognition is a component of epistemic virtue that distinguishes it from a mere reliable process.

⁷ Strictly speaking, Baehr’s approach is to look at paradigm cases of intellectual virtue, allowing that these four features may be neither necessary nor sufficient. Even so, I will argue here that metacognition meets all four of these dimensions, such that it qualifies as a paradigmatic virtue on Baehr’s model.

⁸ See Zagzebski (2003; 2004) on how love of truth is connected to our others aims and values.

⁹ On the topic of epistemic flourishing, see Brogaard (2012; 2014).

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