**Implications for virtue epistemology from psychological science:**

**Intelligence as an interactionist virtue**

Joshua August Skorburg, University of Oregon

Mark Alfano, Delft University of Technology

**Abstract:** This chapter aims to expand the body of empirical literature considered relevant to virtue theory beyond the burned-over districts that are the situationist challenges to virtue ethics and epistemology. We thus raise a rather simple-sounding question: *why doesn’t virtue epistemology have an account of intelligence?* In the first section, we sketch the history and present state of the person-situation debate to argue for the importance of an interactionist framework in bringing psychological research in general, and intelligence research in particular, to bear on questions of virtue. In Section 2, we discuss the history and present state of intelligence research to argue for its relevance to virtue epistemology. In Section 3, we argue that intelligence sits uneasily in both responsibilist and reliabilist virtue frameworks, which suggests that a new approach to virtue epistemology is needed. We conclude by placing intelligence within a new interactionist framework.

**Keywords:** virtue epistemology, situationism, psychology, intelligence

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**Introduction**

A notable trend in recent virtue theory scholarship is the engagement with research in empirical psychology as it bears on central themes in both virtue ethics (e.g. Alfano 2013, chapters 1-4; Doris 2015) and virtue epistemology (e.g., Alfano 2013, chapters 5-7; Fairweather & Montemayor 2013). Ours is another contribution to the confluence of these fields. We aim to expand the body of empirical literature considered relevant to virtue theory beyond the burned-over districts that are the situationist challenges to virtue ethics and epistemology. To do so, we will raise a rather simple-sounding question: *why doesn’t virtue epistemology have an account of intelligence?* With the exception of Alfano et al. (forthcoming), this essential question has received little attention.[[1]](#footnote-1)

In the first section, we sketch the history and present state of the person-situation debate to argue for the importance of an interactionist framework in bringing psychological research in general, and intelligence research in particular, to bear on questions of virtue. In the next section, we discuss the history and present state of intelligence research to argue for its relevance to virtue epistemology. In section 3, we argue that intelligence sits uneasily in both responsibilist and reliabilist virtue frameworks, which suggests that a new approach to virtue epistemology is needed. We conclude by placing intelligence within a new interactionist framework.

**1. The misguided person-situation debate**

There is no doubt that Milgram’s obedience experiments (1974), Darley & Batson’s Good Samaritan experiment (1973), Darley & Latané’s bystander experiments (1968), and other situationist studies like them delivered surprising and important results. In turn, these results have sparked a lively debate about neo-Aristotelian theories of virtue and character. We worry, however, that the situationist challenges that have been mounted against virtue theory on these grounds risk misrepresenting the actual state of affairs in the social and personality psychology literatures. In other words, the pendulum may have swung too far in the direction of the situationists. While it is certainly philosophically intriguing, situationism is not, and should not be considered, the only game in town for empirically-minded virtue theorists. To make this case, we briefly review the history of the person-situation debate from which the philosophical controversies were born.[[2]](#footnote-2)

Many introductory courses and textbooks in social psychology begin with a salutatory reference to Lewin’s (1938) equation: B = *f*(P,E), where “B” refers to behavior, “P” refers to the person, and “E” refers to the environment. In plain English, behavior is a function of the person and the environment. When written in this way, the comma indicates agnosticism about the precise nature of the relationship between person and environment. On one reading, the comma separates two independent entities, such that the effect of some aspect of personality on behavior is the same regardless of the environment or situation (we use the two interchangeably here), and the effect of some aspect of the situation on behavior is the same regardless of the person.

According to Kihlstrom (2013), this reading characterized traditional approaches in social psychology and personality psychology, as well as the resulting division of labor in psychology departments, for most of the 20th century. “The canonical method of traditional personality psychology thus exemplifies the *Doctrine of Traits*, which may be stated as follows: Social behavior varies as a function of internal behavioral dispositions that render it coherent, stable, consistent, and predictable” (Kihlstrom p. 793). The canonical method of traditional social psychology, by contrast, “is captured by what might be called the *Doctrine of Situationism*: Social behavior varies as a function of features of the external environment, particularly the social situation, that elicit behavior directly, or that communicate social expectations, demands, and incentives” (p. 793).

In these terms, the person-situation debate is about how best to explain and predict behavior. Will the doctrine of traits explain more of the variance in behavior? Or will the doctrine of situationism? Around the time of the publication of Walter Mischel’s (1968) *Personality and Assessment*, the answer seemed clearly to be the latter. And indeed, it is hard to overstate the effect Mischel’s critique had on the discipline of personality psychology. After the publication of *Personality and Assessment*, personality psychology wandered in the wilderness for a decade: fewer studies were conducted, graduate training languished, and fewer dissertations were produced (Swann & Seyle 2005, p. 156). If, as was claimed, personality traits accounted for less than 20% of the variance in behavior, then the debate might well have been settled in favor of the situationists.

There are, however, several reasons to emphasize possible methodological and interpretative qualms with Mischel’s critique. Funder & Ozer (1983), for example, showed that once the *t* and *F* statistics often reported in social psychological and situationist studies are converted to the *r* statistic often reported in personality and individual difference studies, situations explain just about as much variance in behavior as do personality traits. In other words, when apples are compared to apples, the predictive and explanatory power of traits is not much different from that of situations.[[3]](#footnote-3)

Situations aren’t much better at explaining and predicting behavior than are persons, and even adding them together doesn’t account for a majority of the variance in behavior. Where does that leave us? Recall that the preceding discussion has been based on the assumption that the comma in Lewin’s equation signified an additive, or independent, relationship between persons and environments. As a matter of contingent historical fact, this is how social psychology and personality psychology developed as disciplines, but it is not the only way to interpret the relationship between persons and situations. As Mischel (2009, p. 289) himself notes in a retrospective on *Personality and Assessment*, the most promising approaches in psychology are those that “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.”

Even a brief review of the contemporary psychological literature suggests that the person-situation debate is over and that pretty much all psychologists claim to be interactionists. In other words, the standard interpretation is that the relationship between persons and situations is interactional, or in terms of Lewin’s equation, the comma signifies a non-linear relationship. With few exceptions (e.g., Alfano 2016a, 2016b), however, this consensus has not been reflected in the philosophical literature that brings psychological research to bear on virtue theory.

**2. Intelligence and its measurement**

Why talk about intelligence at all? We contend that any adequate virtue epistemology must make a place for the epistemic or intellectual virtues that are best empirically substantiated.[[4]](#footnote-4) In other words, if empirical research suggests that disposition D is realized to some extent among humans and D is intuitively an intellectual virtue, then D must be classifiable as an intellectual virtue by every adequate virtue epistemology. Note that this principle is the converse of the one usually deployed in debates about situationism and virtue theory. Situationists have by and large made the following type of argument: according to virtue theory, D is a virtue, but there is no empirical evidence that D is realized (or, more strongly, there is evidence that D is not realized), so virtue theory is empirically inadequate. Decades of situationist arguments have thus relied on the sting of modus tollens. By contrast, we here employ modus ponens: for some D, there is empirical evidence that D is realized, but according to extant virtue theories, D is not a virtue, so extant virtue theories are empirically inadequate. Intelligence is one such disposition, or so we shall argue.

It is difficult to achieve an appreciation of the robustness of different portions of psychological research. This problem is exacerbated by the ongoing replication and reproducibility crisis in psychological science (Open Science Collaboration 2015), which has cast doubt on many seemingly robust findings. In some cases, it is straightforward to dismiss an alleged empirical finding. Bem (2011) notwithstanding, there is no evidence that humans have realized psi, so no adequate virtue epistemology needs to make room for psi. It is also straightforward to dismiss merely anecdotal findings. Zagzebski (2015) notwithstanding, there is no evidence that humans have been genuine prophets or received divine revelation, so no empirically adequate virtue epistemology needs to make room for prophecy or revelation. (Note that the stronger claim, that no adequate virtue epistemology may make room for psi or prophecy, is analogous to the conclusions that situationists have tended to draw.) By contrast, there is plenty of evidence that many humans have decently reliable (within certain boundaries) dispositions of perception. For this reason, it’s a mark in favor of reliabilist and reliability-embedding virtue epistemologies that they typically count perception as an epistemic virtue (Goldman & Beddor 2015). Likewise, there is plenty of evidence that many humans, like most other mammals, are (within certain boundaries) curious or inquisitive. For this reason, it’s a mark in favor of responsibilist and responsibility-embedding virtue epistemologies that at least some of them count curiosity or inquisitiveness as an epistemic virtue.[[5]](#footnote-5)

What about intelligence? In this section, we will review some of the evidence that suggests that intelligence may be the best-substantiated personal disposition in psychology, and that most humans realize this disposition to a lesser or greater extent. Moreover, at first blush, it seems obvious that if anything is a global intellectual virtue, intelligence is. Indeed, the claim has the ring of analyticity. Yet, as we argue in the next section, intelligence sits uneasily in both responsibilist and reliabilist virtue epistemic frameworks. First, though, let’s consider the empirical evidence.

In the early 1900s, Alfred Binet developed a scale to identify students who were struggling in school so that they could receive supplemental instruction. In collaboration with his student Theodore Simon, he developed an array of tasks thought to be representative of typical children’s abilities at various ages. They administered the tasks, now known as the Binet-Simon test, to a sample of fifty children: ten children in each of five age groups. The children in the sample were selected by their schoolteachers for being average, or representative, for their age group (Siegler 1992). The test initially consisted of 30 tasks of increasing difficulty. The simplest tasks tested a child’s ability to follow instructions. Slightly more difficult tasks required children to repeat simple sentences and to define basic vocabulary words. Among the hardest tasks were a digit span test, which required children to recall 7 digits in correct serial order, and a rhyming task, which required children to generate rhyming words given a target word (Fancher 1985). Binet and Simon administered all the tasks to the sample of children, and the score derived from the test was thought to reflect the child’s mental age. This initial standardization allowed educators to determine the extent to which a child was on par with their peers by subtracting their mental age from their chronological age. For example, a child with a mental age of 6 and a chronological age of 9 would receive a score of 3, indicating that they were mentally three years behind their average peer.

While Binet and Simon were primarily interested in identifying children with learning disabilities, their methodology was quickly adapted and extended. For example, at Stanford University in 1916, Lewis Terman expanded the battery of tasks and adopted the intelligence quotient (IQ) rather than Binet’s difference score, an idea first proposed by German psychologist and philosopher William Stern. IQ is the ratio of a child’s mental age to their chronological age, times 100. Terman used IQ scores not only to identify children at the low end of the distribution, as Binet did, but also at the top of the distribution, as he began to study factors that lead to giftedness and genius (clear examples of extreme intellectual virtues).

While Terman and others can be credited with the first instances of group intelligence testing, the first large-scale testing was conducted with 1.7 million US soldiers during World War I. The US military, in consultation with psychologists such as Terman and Robert Yerkes, developed two tests, the Army Alpha and the Army Beta, to help categorize army recruits based on intelligence and aptitude for officer training. The Army Alpha was a text-based test that took an hour to administer. The Army Beta was a picture-based test designed for non-readers, who made up approximately 25% of the recruits. The administration of intelligence tests for job placement in the military continues to this day; the modern test is known as the ASVAB (Armed Services Vocational Aptitude Battery). It was first administered in 1968 and currently consists of eight subtests: word knowledge, paragraph comprehension, mathematics knowledge, arithmetic reasoning, general science, mechanical comprehension, electronics information, and auto and shop information.

Besides the ASVAB, the most popular intelligence tests in use today are the WAIS (Wechsler Adult Intelligence Scale) and the WISC (Wechsler Intelligence Scale for Children), which were originally developed by psychologist David Wechsler. The WAIS and the WISC each consist of several subtests. The verbal subtests, such as vocabulary, comprehension, and general knowledge questions, are not unlike components of Binet’s original test battery. However, the non-verbal subtests, which consist of matrix reasoning, working memory, and processing speed tests, differentiate the WAIS and WISC from most other tests. These components, which Wechsler referred to as Performance IQ, are linked to a psychological construct known as *fluid reasoning*, the capacity to solve novel problems – surely an intellectual virtue if anything is. Importantly, fluid reasoning is largely independent from prior knowledge. Furthermore, it is strongly correlated with a range of complex cognitive behaviors, such as academic achievement, problem solving, and reading comprehension.

At the same time that Binet was developing the first modern intelligence test, British psychologists were developing the statistical tools necessary to analyze the measures obtained from such tests. Francis Galton, along with his student Karl Pearson, proposed the correlation coefficient, which is used to assess the degree to which two measurements are related, or co-vary. The Pearson product moment correlation coefficient, *r*, ranges from -1, which is a perfect negative correlation, to +1, which is a perfect positive correlation. Perhaps the best-replicated empirical result in the field of psychology is the *positive manifold*: the all-positive pattern of correlations that is observed when several intelligence tests, of varying format, are administered to a large sample of subjects. While the positive manifold may not seem surprising, it is important to note that, a priori, one may not have predicted such results from intelligence tests. One may have predicted instead that individuals who do well on one type of test, say vocabulary, may suffer on a different kind of test, such as mental rotation. This raises the question: what accounts for the positive manifold? Why is it that any measure of any facet of intelligence correlates positively with any other measure of any other facet of intelligence?

One natural answer is that all measures of intelligence tap aspects of the same *general ability*. This is Spearman’s (1904) solution to the positive manifold, according to which there is a single general factor, *g*, of intelligence. Spearman’s model has been criticized for failing to account for the fact that some intelligence tests correlate more strongly with each other than others. For example, a verbal test of intelligence will typically correlate positively with both another verbal test of intelligence and a spatial test of intelligence, but more strongly with the former than the latter. Such patterns of clustering led Thurstone (1938) to argue for a model of intelligence that included seven primary mental abilities and no general factor. In the ensuing decades, it has become clear that both Spearman’s model and Thurstone’s models capture part of the truth, leading to the development of higher-order and bi-factor models. These models have a hierarchical structure in which a general factor explains the co-variance of multiple domain-specific factors (Carroll 1993).

It is important to bear in mind that these factors, whatever their exact structure, are mathematical abstractions based on inter-individual differences. While it is tempting to reify them as referring to concrete intra-individual properties or processes, one must proceed with caution when identifying the grounds of intelligence. Moving from a mathematical structure to a biological or psychological process should be construed as an inference to the best explanation (Harman 1965), not a straightforward identification. This is not to say that identifying the neural or cognitive mechanisms that explain intelligence is impossible, just that it is fraught with uncertainty.

Spearman notoriously identified *g* with “general mental energy,” a rather mysterious domain-general process. A more attractive alternative, first proposed by Godfrey Thompson in 1916, is that the positive manifold manifests itself because any battery of intelligence tests will sample processes in an overlapping manner, such that some processes will be required by a shared subset of tasks, while others will be unique to particular tasks. This idea was given a cognitive-developmental twist by van der Maas et al. (2006), who suggested that the positive manifold arises because independent cognitive processes engage in mutually beneficial interactions during cognitive development. Through a process of virtuous feedback loops, these processes eventually become correlated, resulting in the positive manifold.

These results and the “process overlap model” that emerges from them are explored at greater length in Conway & Kovacs (2013; 2015). The basic upshot, however, should be clear: the best explanation of inter-individual differences on intelligence tests and the positive manifold is that intelligent performance results from the interaction of multiple, partially overlapping processes that sometimes feed into one another both ontogenetically and synchronically. Hence, to describe someone as more or less intelligent is to say that the overlapping psychological and neurological processes that conspire to produce their behavior in the face of cognitive tasks tend to work together better or worse than the average person’s in the context in which those tasks are administered.

**3. Intelligence for Virtue Epistemologists**

We presented the argument above that for some disposition, D, if D is intuitively an epistemic virtue and there is empirical evidence that D is realized, but according to extant virtue theories D is not a virtue, then extant virtue theories are empirically inadequate. The previous section aimed to substantiate the empirical premise of this argument by showing that there is indeed ample evidence that intelligence is one such disposition. In this section we’ll try to make good on the conclusion by arguing that no extant virtue epistemologies have an account of it. Section 3.1 thus aims to show how intelligence sits uneasily in a virtue responsibilist framework, and Section 3.2 does the same for virtue reliabilism.

*3.1. Intelligence is not a Responsibilist Virtue*

 If epistemic virtues are construed as acquired, deep excellences of intellectual character such as open-mindedness, curiosity, humility, and conscientiousness, does intelligence fit into this framework? We see (at least) two reasons to think not: (1) intelligence is not easily acquired through acts of will or habituation, and (2) intelligence crucially depends on conditions outside of the agent’s control.

 In a classic formulation of virtue responsibilism, Zagzebski (1996, p. 116) notes that it “takes time to develop virtues and vices, and this feature is connected with the fact that we hold persons responsible for these traits. [...] Virtues and vices form part of what makes a person the person that she is. The features of gradual acquisition and entrenchment suggest that a virtue is a kind of habit.”[[6]](#footnote-6) On this and other neo-Aristotlean views, the intellectual virtues are developed in much the same way as moral virtues: practice, habituation, and imitation of exemplars. If intelligence is a responsibilist epistemic virtue, then it should be acquirable, cultivatable, and entrenchable through these means.

As we mentioned above, there is a wealth of empirical research exploring the relationships between working memory and various components of intelligence, such as fluid reasoning. It would be very natural, then, to think that something like working memory might be the kind of deep intellectual trait, acquired and refined over time – in short, the kind of trait one is *responsible* for – that would fit the bill for a responsibilist epistemic virtue. So can intelligence (or its components) be acquired and become entrenched in this way?

Based on the amount of money spent[[7]](#footnote-7) on cognitive training programs offered by companies like Lumosity, Cogmed, and Posit Science, one might be tempted to answer in the affirmative. And there is empirical evidence as well. A meta-analysis conducted by Au et al. (2015) attempted to estimate the effect size of improvements on fluid intelligence as a function of working memory training. They found a small mean difference (*g* = .24; *SE* = .07) between training and control groups at post-test, with no significant difference between groups at baseline (*g* = -0.003; *SE* = 0.08). This suggests that if there are no salient individual differences before the cognitive training regimen, then the differences in working memory observed at post-test could be chalked up the effects of the training program.

However, a detailed meta-analysis by Melby-Lervag & Hulme (2013) shows that while cognitive training programs can reliably improve short-term performance (e.g. between baseline and post-test) on the kinds of tasks similar to those in the training regimen, these effects all but disappear after a few months at a follow-up test. In their analysis, the mean differences in gains between training and control groups from baseline to follow-up (a few months after post-test) were all non-significant.[[8]](#footnote-8) This leads the authors to conclude that cognitive training programs “give only near-transfer effects, and there is no convincing evidence that even such near-transfer effects are durable.” And further, there is “no evidence these programs are suitable as methods of treatment for children with developmental cognitive disorders or as ways of effecting general improvements in adults’ or children’s cognitive skills or scholastic attainments” (p. 283). The most recent pre-registered, randomized clinical trial (Roberts et al., forthcoming) examining whether working memory training improves academic outcomes also points in the same direction: some limited task-specific improvements but little to no durability or generalizability.

It would be unfair to say that components of intelligence such as working memory or fluid reasoning are strictly not acquirable or cultivatable. There do seem to be some short-term, domain-specific effects of cognitive training, and these effects do seem to increase as a function of the amount of time spent training. It does seem fair, however, to say that the ephemeral, highly context-specific dispositions developed through cognitive training fall far short of the deeply entrenched trait virtues countenanced by the responsibilist. Surely such virtuous intellectual dispositions ought to be more durable and longer-lasting than a few months, and surely they ought to generalize beyond the scope of a computerized *n*-back task.

Another strike against the responsibilist account of intelligence is that there are social factors, largely outside of the agent’s control, that reliably mask the disposition to perform intelligently in the face of cognitive tasks. One of the best-studied phenomena in social psychology is stereotype threat: when a member of a negatively stereotyped group is reminded of their membership in that group, their performance on stereotype-relevant tasks often suffers. The best-known examples have to do with stereotypes about intelligence.[[9]](#footnote-9)

One of the key findings from the seminal paper exploring stereotype threat (Steele & Aronson 1995, p. 801) was that “Black participants performed worse than White participants when the test was presented as a measure of their ability, but improved dramatically, matching the performance of Whites, when the test was presented as less reflective of ability.” However, when racial identity was primed – by simply filling out demographic information before the test – Black participants’ performance decreased, even when the test was not described as intellectually diagnostic. While the precise mechanisms underpinning stereotype threat are unknown,[[10]](#footnote-10) it is clear that an environment rife with negative stereotypes reliably decreases intellectual performance for members of that negatively stereotyped group. In Nguyen & Ryan’s (2008) meta-analysis of 116 studies, the mean effect size of stereotype threat was *d* =|.26|, and ranged as high as *d* = |.64| for minority test takers. What’s more, the extant stereotypes in the environment that drive stereotype threat effects are almost entirely outside the control of those most affected by them, and even if the stereotypes aren’t endorsed, the effect still manifests.

At a more basic level, there are material and environmental factors, again largely (if not entirely) outside of the agent’s control which are similarly constitutive of intelligence. The political scientist James Flynn famously showed that every Stanford-Binet and Weschler (WAIS) standardized IQ test in America from 1932 to 1978 demonstrated an increased average score from its predecessor (Flynn 1984). For example, the same subject who scored a 103 on a newer version of the WAIS, scored a 111 on an older version of the test. In explaining this “Flynn Effect,” Neisser (1997) notes that the increases happen far too quickly to be attributed to any kind of genetic changes, and are much more likely the result of better nutrition, better schooling, increased test-taking sophistication, better child-reading practices, and increased exposure to complex media. In other words, the location of your neighborhood, what your teachers were like, and what you ate growing up crucially contribute to the development of intelligence, at least as measured by IQ tests. These factors are hardly the sort of thing one can be held responsible for.

All of the foregoing spells trouble for a responsibilist account of intelligence. In the first place, intelligence and its component parts don’t seem to be acquirable, cultivatable, and entrenchable in the way responsibilism requires. And even if we ignore that problem, intelligence (at least as measured by widely used diagnostic exams) seems to be constituted by factors largely outside of the agent’s control, whether it be the stereotypes in their social and cultural milieu or a dearth of high-quality grocery stores in their childhood neighborhood. On these grounds, we can either reject the highly intuitive claim that intelligence is an epistemic virtue, or we can accept that virtue responsibilism is empirically inadequate. We’ll opt for the latter while also trying to show how our preferred interactionist conception of the epistemic virtues can account for intelligence. But first, we’ll try to show how virtue reliabilism doesn’t fare much better than virtue responsibilism.

*3.2. Intelligence is not a Reliabilist Virtue*

If epistemic virtues are instead construed as faculties such as perception and memory, does intelligence fit into this framework? At first blush, virtue reliabilism may seem a better fit for intelligence than virtue responsibilism, but we will argue that there are reasons to think that intelligence is not a reliabilist virtue.

Perhaps in the same way that, under normal conditions, vision reliably produces more true beliefs than false ones, intelligence, too, reliably produces more true than false beliefs. Indeed, intelligence as we have discussed it is constituted by overlapping processes including memory and perception. But we see (at least) two reasons to doubt that intelligence is therefore best understood in reliabilist terms. First, it makes sense to answer to the question, “How did you know?” by saying things like “I perceived it,” or “I remembered it.” It would be very strange, however, to reply “I used my intelligence.” Moreover, such a response would lack the explanatory force characteristic of epistemic virtues. On its own, this objection might not be an insurmountable hurdle for the reliabilist account of intelligence. The real question, however, is whether or not intelligence *reliably* produces a preponderance of true beliefs. Put another way, if the overlapping processes constituting intelligence fail to reliably produce true beliefs, then intelligence is not a reliabilist virtue.

Part of what makes an epistemic virtue a virtue is that people who have it are more likely to produce true beliefs and arrive at knowledge than those who don’t. Classic reliabilism has it that hoping will not reliably produce true beliefs, but deduction will; hasty generalizations won’t, but distinct memories will; biased or one-sided thinking won’t, but careful, critical thinking will. If intelligence is a virtue in this vein, then it seems reasonable to think its possessor should be more likely than not to arrive at true beliefs while rejecting false ones. But does this actually bear out? We have empirically-motivated reasons to think not.

If intelligence is a reliabilist virtue, then possessors of this virtue should presumably be less likely to form false beliefs when faced with cognitive tasks. Stanovich & West (2008a, Study 1) test a plausible and reliabilist-friendly hypothesis: more intelligent individuals should be less susceptible to some of the classic fallacies described in the heuristics and biases literature, such as the conjunction fallacy, base-rate neglect, framing effects, anchoring effects, and outcome biases. Using SAT scores as their measure of cognitive ability,[[11]](#footnote-11) they found that subjects scoring above the median were, almost across the board, no less susceptible to bias than subjects below the median and were in some cases worse off. Subjects scoring below the median were actually less likely to neglect base rates, less susceptible to framing effects, and significantly less susceptible to the conjunction fallacy than subjects above the median. In other words, these findings suggest that not only does intelligence fail to buffer against classic cognitive biases, but it may sometimes exacerbate them.

Stanovich & West (2008b, Studies 1, 2) also show that intelligence fails to mitigate against the well-known myside bias – the tendency to generate and evaluate evidence in accordance with one’s prior beliefs. Using the same index, they find “no evidence at all that myside bias effects are smaller for students of higher cognitive ability” (p. 140). One might suppose, though, that intelligence would at least dispose its possessor to be more sensitive to these shortcomings. That is, one might expect that intelligent individuals would be less susceptible to the bias blind spot – the tendency to see others as more susceptible to bias than themselves (e.g., Pronin, Lin, & Ross, 2002). But using scores from the SAT, Cognitive Reflection Test (CRT), Need for Cognition Scale (NFC), and Actively Open-Minded Thinking Scale (AOT) as measures of cognitive sophistication, West et al. (2012) found exactly the opposite. They report positive correlations between each of the four cognitive sophistication measures and a composite measure of bias blind spot (encompassing blind spots with respect to outcome, base-rate, framing, conjunction, anchoring, and myside biases). This leads them to conclude “that more cognitively sophisticated participants showed larger bias blind spots” (p. 511). Again, not only does intelligence fail to mitigate (meta)biases, it may even amplify them.

To be fair, we of course recognize that there are a number of biases which are negatively correlated with intelligence, that there are good reasons to think diagnostic exams such as the SAT don’t capture the full breadth of intelligence, and that the notion of rationality in the heuristics and biases research program is similarly non-exhaustive of intelligence. But all we need to show here is that there are good empirical reasons to doubt that intelligence *reliably* produces a preponderance of true beliefs. It would probably suffice for these purposes to show that intelligence merely fails to protect against biases which systematically lead to false beliefs. But the evidence that intelligence may actually magnify these biases surely undermines any virtue epistemological account of intelligence cast in terms of reliability.

In the previous sections, we have advanced largely negative arguments about why intelligence sits uneasily in both responsibilist and reliabilist frameworks. In the remainder of the chapter, we articulate a new interactionist framework for epistemic virtues which can better account for intelligence.

**4. Conclusion**

Intelligence is a well-documented epistemic virtue, but it fits in neither the responsibilist nor the reliabilist framework. However, intelligence fits snugly in the interactionist framework developed in Alfano (2014, 2016a) and Alfano & Skorburg (forthcoming) in which traits are construed as dependent on the environment, context, or situation. The dependence in question can be developmental: it may be difficult or impossible to *acquire* a virtue absent certain contextual supports or in the face of certain contextual impediments. The dependence can be structural: it may be difficult or impossible to *manifest* a virtue absent certain contextual supports or in the face of certain contextual impediments. The dependence may even be constitutive: it may be difficult or impossible to *have* a virtue absent certain contextual supports or in the face of certain contextual impediments.

In addition, in this framework, contextual supports and impediments may be material, social, or political. These distinctions are cross-cutting, leading to a 3x3 matrix of potential dependencies. Alfano (2016a) has argued, for instance, that the virtue of being a friend is constitutively dependent on the social context: you can’t be a friend if there isn’t some other person who reciprocates. And Alfano & Skorburg (forthcoming) have argued that intelligence is structurally dependent on the social context: belonging to a stigmatized minority group makes it more difficult to manifest intelligence to its full extent if stereotype threat is triggered. We won’t fill in all of the remaining seven cells here, but we contend that intelligence is also developmentally dependent on the material and political context. A recent international meta-analysis conducted by Lanphear et al. (2005), for example, showed that even low levels of lead in children’s environments is associated with significant intelligence decrements. An increase in blood lead levels from 2.4 to 30 micrograms per deciliter (the standard unit of measurement) was associated with a 6.9-point decrement in IQ. There is no known safe blood lead level, and the Centers for Disease Control estimate that at least half a million children in the United States between one and five years of age have a blood lead level above the admittedly arbitrary (but still important) cutoff of 5 micrograms per deciliter (Edwards, Anthopolos, & Miranda 2013). And Black children in the USA are more than twice as likely to be above this threshold than their White counterparts – a disheartening consequence of a long history of racist political and economic decisions.

This suggests that, rather than focusing our efforts on improving our own cognitive capacities through working memory training, it’s more effective and important to create and maintain a material, social, and political context that fosters the development and structures the manifestation of the intelligence of members of future generations. This strategy resonates with recent approaches advocating distal ecological control (Clark 2007; see also Washington & Kelly 2016 and Alfano 2016b). Likewise, the structural effects of stereotype threat could be attenuated through positive propaganda. And the biases discussed in Section 3.2 can be dampened, allowing intelligence to manifest effectively, by placing people in a trusting but adversarial social-intellectual culture (Mercier & Sperber 2011).

All of this jibes with Kvanvig’s (1992) recommendation that virtue epistemology switch from an individualistic and synchronic to a community-centered and diachronic perspective. While people cannot be held accountable or take responsibility for their own intelligence, communities can and should be held accountable and take responsibility for the intelligence of those raised in the community. If this is on the right track, virtue epistemologists would be well-served by reflecting on the traditional Mencian notion of a sprout of virtue. Mencius identifies two main factors that contribute to the cultivation and extension of such sprouts (van Norden 2014). First, just like agricultural sprouts, they grow best when nourished and protected. In other words, people are more disposed to develop virtues under material and political conditions of prosperity, safety, and security. Virtues depend developmentally on external features of the physical and social world. Second, just like agricultural sprouts, the sprouts of virtue grow best in a fitting culture. Corn grows well next to beans, peas, and parsley, but not next to cabbage or celery. Likewise, virtue sprouts grow best in good socio-cultural company. For Mencius, this involves both traditional rituals and deep normative relationships, such as those between family members and friends. Thus, we, like Mencius, conceive of virtues as essentially depending on interactions with the social world.

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1. Intelligence is mentioned in some discussions of epistemic virtue (e.g. Driver 2001, p. 45; Baehr 2011, p. 25), but only in passing, and without any reference to the massive body of psychological research on the topic. [↑](#footnote-ref-1)
2. This section draws on Skorburg (in prep). [↑](#footnote-ref-2)
3. In a meta-analysis of over 25,000 studies, Richard et al. (2003, p. 337) found that the mean effect size of situational effects is .22 compared to a mean effect size of .19 for person effects. More recent work comparing the power of personality and situation has led to broadly similar conclusions (Rauthmann et al. 2014); these researchers propose a “Situational Eight DIAMONDS” model, which countenances the following factors as major situational influences on thought, feeling, and behavior: Duty, Intellect, Adversity, Mating, pOsitivity, Negativity, Deception, and Sociality. Together, these situational factors account for just over a quarter of the variance in behavior, while traits account for perhaps one fifth. [↑](#footnote-ref-3)
4. We use ‘intellectual virtue’ and ‘epistemic virtue’ interchangeably. [↑](#footnote-ref-4)
5. See Watson (current volume) for a recent review. [↑](#footnote-ref-5)
6. For a discussion of the varieties of responsibilism and reliabilism, see Alfano (2013) and Turri, Alfano, & Greco (2016). [↑](#footnote-ref-6)
7. A 2014 *Boston Globe* article (Fitzgerald 2014) had it over $1 billion in 2013, with projections over $6 billion by 2020. [↑](#footnote-ref-7)
8. 95% confidence intervals around the effect sizes for nonverbal ability, attention, decoding, and arithmetic variables all included zero. [↑](#footnote-ref-8)
9. For a more detailed treatment, see Alfano (2014) and Alfano & Skorburg (forthcoming) [↑](#footnote-ref-9)
10. Schmader & Johns (2003) hypothesize that the decrease in intellectual performance is mediated by a decrease in working memory capacity. [↑](#footnote-ref-10)
11. Citing Frey & Detterman (2004) and Unsworth & Engle (2007), they note that the SAT is a reliable index of cognitive ability and intelligence as it loads heavily on the psychometric *g* factor we discussed in Section 2. [↑](#footnote-ref-11)