Links Between Intellectual Virtues, Intellectual Character Education, and Academic Performance

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On behalf of the Intellectual Virtues of Academy of Long Beach
For the John Templeton Foundation
Spring 2015

A request has been made for further information regarding the connection between intellectual virtues and academic performance, including performance on standardized exams, GPA, and college retention. This is a reasonable, if somewhat tricky, request. It is tricky for two reasons.

First, most of the people who have conducted empirical research that bears on the link between intellectual character and academic performance haven't used the terms "intellectual character" or "intellectual virtues." Instead they have used terms like "thinking dispositions" and "noncognitive skills." However, what these researchers refer to by these terms are the same (or nearly the same) personal qualities and strengths that we refer to as "intellectual virtues"—qualities like curiosity, open-mindedness, and intellectual autonomy, tenacity, carefulness, and courage. (We elaborate on this point below.) So, while not specifically about "intellectual character" or "intellectual virtues," we believe these bodies of research bear directly on the link between intellectual virtues and academic performance.

Second, some of the relevant research addresses, not the relationship between intellectual virtues and academic performance per se, but rather the relationship between interventions aimed at fostering intellectual character growth and academic performance. Put another way, it measures the relationship between methods and practices proper to intellectual character education, on the one hand, and academic performance, on the other. While these two foci are not identical, we will assume that research of the latter sort is relevant to the request in question.

With these caveats noted, we now turn to an overview of empirical research that we believe supports a strong positive connection between intellectual virtues—or an approach to education aimed at fostering these virtues—and all three areas of academic performance that have been mentioned: standardized test scores, GPA, and college retention. We group this research into three categories: (1) Research on thinking and "thinking dispositions," much of which has emerged in connection with Project Zero at the Harvard Graduate School of Education; (2) Research on a "love of learning" and curiosity; and (3) Research on "noncognitive skills," with special attention to Angela Duckworth's work self-control and grit.

1. Research on Thinking and Thinking Dispositions

In "Teaching Intelligence" (1997), David Perkins and Tina Grotzer from Harvard University discuss some of the earliest research connecting intellectual character education with

academic performance. Their immediate focus is curricular programs aimed at fostering "good thinking," which they characterize in a largely negative fashion as thinking that is neither hasty, narrow, fuzzy, nor sprawling (ultimately, their concern is with "thinking dispositions," which are dispositions to engage in good thinking—see Tishman, Perkins, and Jay 1994). As these terms suggest, their conception of good thinking fits nicely within an intellectual virtues framework, according to which good thinking is careful, open-minded, thorough, rigorous, and autonomous (and thus the opposite of hasty, narrow, etc.). Accordingly, we take the data from these studies to bear significantly on the relationship between intellectual character education and academic performance, for the latter centrally involves giving students ongoing opportunities, encouragement, and support to engage in good thinking as these programs conceive of it. Some highlights from the paper by Perkins and Grotzer (which again chronicles some of the earliest relevant research) include:

a. In a formal evaluation (Herrnstein et al 1986) with students in 24 classes from families of low socioeconomic status and parental education using a matched sample design, intervention students made higher performance gains than controls in general aptitude, showed greater gains on tests of targeted cognitive abilities (e.g. problem-solving, reasoning, language, and inventive thinking), and outperformed controls on an open-ended design problem and on an everyday reasoning task that assessed students' ability to transfer what they had learned to new contexts (1126).

b. In an evaluation of the Philosophy for Children Program (which is thinking-based and deeply similar to an intellectual virtues approach) involving 400 fifth to eighth graders, the Educational Testing Service found that PFC students showed significant gains in mathematics performance and reading performance when compared with controls on the standard scores of the Metropolitan Achievement Tests (Psychological Corporation 1978).

c. The Practical Intelligence for Schools (PIFS) program is aimed at strengthening students' academic performance along five dimensions: "knowing the point of the topic, technique, and assignment; knowing one's strengths and weaknesses; knowing the demands of different subjects and assignments; knowing steps and strategies; and reflection in assessing and revising" (1127). In an evaluation of 260 fifth and sixth graders (Chen 1993), PIFS students outperformed controls on measures of practical and academic abilities in writing, in practical abilities in reading, homework, and test taking, and were rated more apt to display active-learning skills and behaviors.

Ron Ritchhart, a frequent collaborator with Perkins, principal researcher at Harvard's Project Zero, and author of the book "Intellectual Character: What It Is, Why It Matters and How to Get It" (2002), has also drawn attention to empirically supported connections between intellectual character education and academic performance. He gives special attention to research conducted by Fred Newmann and colleagues and published by the Consortium on Chicago School Research (2001). Newmann's extensive study spanned three years and examined more than 400 Chicago classrooms from 19 different elementary schools. It focused, in particular, on the importance of "authentic intellectual work" to students' performance on two standardized tests: the Iowa Test of Basic Skills (ITBS) and

the Illinois Goals Assessment Program (IGAP).

Newmann defines "authentic intellectual work" as work that involves "construction of knowledge, through the use of disciplined inquiry, to produce discourse, products, or performances that have value beyond school" (14). As Ritchhart has observed, engaging students with authentic intellectual work is an integral means to improving their intellectual character and thus is central to the practice of intellectual character education. This is evident in Newmann's elaboration on the demands of such work. He comments: "When students 'construct knowledge' through 'disciplined inquiry,' they must often consider alternative solutions, justify their conclusions with reasons and evidence, apply their knowledge to new contexts, develop deep understanding of topics (rather than superficial awareness), and express themselves through elaborated communication (rather than in terse linguistic frameworks)" (30). This is precisely the sort of activity characteristic of intellectual virtues like open-mindedness, attentiveness, intellectual thoroughness, autonomy, and tenacity. Newmann offers the following summaries of his findings:

"We found a consistent positive relationship between student exposure to high-quality intellectual assignments [i.e. assignments demanding the kind of intellectual activity noted above] and students' learning gains on the ITBS. Evan after controlling for race, socio-economic class, gender, and prior achievement, differences among classrooms, the benefit of exposure to assignments that demand authentic intellectual work in writing and mathematics are quite substantial. In Chicago classrooms with high-quality assignments, students' record learning gains were 20 percent greater than the national average. In contrast, Chicago classrooms where assignment quality reflects less demand, students gained 25 percent less than the national average in reading and 22 less in mathematics." (23)

"[For] IGAP tests … we computed an adjusted mean outcome for each classroom on the IGAP reading, mathematics, and writing tests after controlling for differences among classrooms in student demographics and their prior year ITBS test scores in reading and mathematics … To make these findings concrete, we consider two students who shared identical background characteristics, attended the same school, and had the same ITBS test scores from the prior year. Student A was assigned to a classroom that presented assignments demanding high levels of authentic intellectual work in both writing and mathematics. Student B, in contrast, attended a classroom where both writing and math assignments were weak. In the IGAP test assessments the following spring, student A would, according to our analyses, outperform his or her schoolmate, student B, by 32 points on the IGAP reading test and by 48 points on the IGAP math test. He or she would also be predicted to score 2.3 points higher on the IGAP writing rubric. These differences translate into standard effect sizes of 0.43, 0.64, and 0.52, respectively. In both substantive and statistical terms, these effects are quite large." (24-25)

Given the centrality of authentic intellectual work to the kind of curriculum and pedagogy that define intellectual character education, Newmann's findings suggest that educating for intellectual virtues enhances academic performance, even on standardized tests like the

ITBS and IGAP.

This conclusion is also supported by some preliminary data emerging in connection with Ritchhart's own work. In recent years, Ritchhart's focus has been on developing "cultures of thinking" (2015) as a way of fostering intellectual character growth. As part of the worldwide Cultures of Thinking Project, Ritchhart and colleagues have produced extensive curricular materials and interventions that are presently being implemented in schools throughout the world (including at IVA). While his and others' research on the effectiveness of these materials is just getting underway, Ritchhart shared the following preliminary data with co-PL Baehr:

a. In a recent study at Way Elementary School in Bloomfield Hills, Michigan, where Ritchhart's "cultures of thinking" program is being implemented, 4th grade students at the school outperformed a matched cohort of students using the same writing program by 16 percentage points on the Michigan Educational Assessment Program, making the school one of the top performing schools in the state.

b. At Washington International School in Washington DC, which is also implementing Ritchhart's program, English IB Diploma scores have risen significantly, with 38% of students receiving a top score of 7 and 52% receiving a 6—this despite their classes having a significant percentage of students receiving learning support.

Because Ritchhart's "cultures of thinking" program is aimed at fostering growth in intellectual virtues, we think these preliminary results also speak favorably of the connection between intellectual virtues and academic performance, including performance on some standardized exams.

2. Research on a Love of Learning and Curiosity

From the standpoint of virtue epistemology (Zagzebski 1996; Roberts and Wood 2007; Baehr 2011), intellectual virtues have a common motivational basis: they arise or flow from a positive orientation toward "epistemic goods," including a love of learning and a desire for knowledge and understanding. Because of their motivational connection to all intellectual virtues, a love of learning and curiosity occupy a deep and fundamental role within intellectual character education. It bodes well for intellectual character education, then, that there is a growing body of empirical research that establishes a connection between a love of learning and curiosity, on the one hand, and academic importance, on the other. We will focus here on three recent studies:

a. In "An Investigation of Character Strengths in Relation to the Academic Success of College Students" (2009), J.W. Lounsbury and colleagues report on a study of 237 undergraduates that examined 24 Values in Action (VIA) character strengths in relation to two indices of academic success: namely, student satisfaction and GPA. Most relevant to our concern, they found that 16 of the VIA strengths were significantly, positively related to GPA. Among these strengths was the Love of Learning. Second only to the strengths of Persistence and Judgment, a Love of Learning had the highest magnitude correlation with GPA at r = .26 (p

< .01). The authors write:

"In the case of academic performance, there is a fairly straightforward interpretation, based on construct meaning, for the higher magnitude relationships. To illustrate, regarding the five character strengths (Persistence, Judgment, Self-Regulation, Love of Learning, and Prudence) which correlated at a magnitude of .25 or higher with GPA … [s]tudents who have a greater love of learning would be expected to engage voluntarily in a number of behaviors leading to better grades, including attending classes, reading and studying course materials, and mastering concepts presented in textbooks and lectures."

b. Recent research on curiosity suggests a similar connection between what we might call "intrinsic epistemic motivation" and academic success (such motivation being a common element in a love of learning and curiosity). In a recent paper, psychologists Paul Silvia and Todd Kashdan (2009) argue that curiosity is an important element of (or at least very closely related to) general intelligence: "It is difficult to envision high intelligence without at least some semblance of elevated curiosity, including the ability to manage novelty and uncertainty and to solve new problems by taking an interest in varied ideas and perspectives" (791). In support of this claim, they cite a recent study by Adrian Raine and colleagues (Raine, Reynolds, Venables, and Mednick 2002):

"[I]n a sample of 1795 children, curiosity and intelligence were measured at ages 3 and 11. Even after accounting for the children's intelligence at age 3, being more curious at age 3 predicted a growth in intelligence over time. To quantify the value of curiosity, children in the top 15% on measures of curiosity at age 3 scored 12 points higher on general intelligence tests at age 11 compared with the least curious children (bottom 15%). Thus, regardless of a child's initial intelligence, the existence of intense curiosity leads to impressive cognitive development during formative years" (791).

Given a connection between intelligence and academic performance, and given that intellectual character education can successfully increase students' curiosity, this research suggests that educating for intellectual virtues is an effective way of enhancing academic performance.

c. In "The Hungry Mind: Intellectual Curiosity is the Third Pillar of Academic Performance" (2011), psychologist Sophie von Stumm at the University of Edinburgh and colleagues contend that the "g-nexus" should be expanded beyond "intelligence and Conscientious" to include a "third factor: intellectual curiosity" (583). This is the conclusion of a study in which the authors "empirically evaluate [their] proposal of intellectual curiosity as a core determinant of academic performance, compare associations of Openness to Experience and intellectual curiosity with academic performance, and disentangle curiosity's associations with intelligence and Conscientiousness" (577-78). They offer the following summary of their findings:

"Over the past century, academic performance has become the gatekeeper to institutions of higher education, shaping career paths and individual life trajectories. Accordingly, much psychological research has focused on identifying predictors of academic performance,

with intelligence and effort emerging as core determinants … A series of path models based on a meta-analytically derived correlation matrix showed that … the additive predictive effect of the personality traits of intellectual curiosity and effort rival that the influence of intelligence. Our results highlight that a 'hungry mind' is a core determinant of individual differences in academic achievement." (574)

In particular, one of their path models "conceptualized Conscientiousness, intelligence and TIE [i.e. 'people's typical expression of engaging with and understanding their environment and their desire to solve and be absorbed by complex, intellectual problems] as direct predictors of academic performance while controlling for the predictor's intercorrelations … This model accounted overall for 25.7% of the variance in academic performance and proved a superior and acceptable fit" (580).

Apropos of our project, the authors conclude by noting implications of their findings for education, which include the following:

"[A]cademic performance may be further enhanced if students' intellectual curiosity is continuously stimulated and nurtured … Schools and universities must early on encourage intellectual hunger and not exclusively reward the acquiescent application of intelligence and effort … educational settings should fully exploit their plentiful opportunities to induce and inspire curiosity … selection methods for university admissions and professional recruitment should pay greater attention to intellectual curiosity as important indicator of potential and ability. In fact, intellectual curiosity incorporates intelligence, zeal, and the hunger for information and novelty in one." (582-83)

If these authors are correct, an approach to education that aims systematically and deliberately at fostering growth in curiosity and related qualities is empirically justified and sorely needed.

3. Research on Noncognitive Skills

Noncogntive skills refer to "sets of behaviors, skills, attitudes, and strategies that are crucial to academic performance … but that may not be reflected in [students'] scores on cognitive tests" (Farrington et al, p. 2). One of the best-known and most-studied noncognitive skills is self-control or self-discipline; another that is receiving increasing attention, owing to the influential work of Angela Duckworth (2007), is "grit." There is sufficient conceptual between self-control and grit manifested in the context of thinking and learning, on the one hand, and several intellectual virtues, on the other, to treat findings about the relationship between these noncognitive skills and academic achievement as also relevant to the relationship between intellectual virtues and academic achievement.

In an educational context, self-control involves the use of personal volition or agency to overcome temptation and the allure of immediate gratification in the service of productive thinking and learning. Several intellectual virtues characteristically involve the same, including intellectual carefulness, autonomy, and courage. In fact, we find it eminently reasonable that a person cannot be truly intellectually careful, autonomous, and

courageous without a high level of self-control or self-discipline. A similar point holds regarding "grit." Indeed, grit manifested in an epistemic or educational context—what we might call "epistemic" or "intellectual grit"—strikes us as nearly identical to what virtue epistemologists refer to as intellectual tenacity and perseverance. Accordingly, we feel justified in regarding recent education research on self-control and grit as highly relevant to the prospects of intellectual character education.

(This stance is confirmed by a recent major literature review of "noncognitive factors" and academic performance by Camille Farrington and colleagues [2012] and published by the University of Chicago Consortium on Chicago School Research. The report divides noncognitive factors into five categories, one of these being "academic perseverance" [a virtual synonym with "intellectual perseverance" or "intellectual tenacity"]. And it describes academic perseverance as a combination of self-control and grit manifesting in an academic context: "To persevere academically requires students to stay focused on a goal despite obstacles [grit or persistence] and forego distractions or temptations to prioritize higher pursuits over lower pleasures [delayed gratification, self-discipline, self-control]" [9; bracketed references to grit, self-control, etc., are the authors'].)

In our discussion of noncognitive skills and academic performance, we will focus primarily on two main studies led by Angela Duckworth at the University of Pennsylvania:

a. Duckworth and Martin Seligman (2005) conducted a longitudinal study of 140 eighth-grade students using a combination of self-reports, parent reports, teacher reports, and monetary choice questionnaires to assess the relationship between "self-discipline" and several elements of academic performance. Their findings were striking:

"Highly self-disciplined adolescents outperformed their more impulsive peers on every academic-performance variable, including report-card grades, standardized achievement test scores, admission to a competitive high school, and attendance. Self-discipline measure in the fall predicted more variance in each of these outcomes than did IQ, and unlike IQ, self-discipline predicted gains in academic performance over the school year."

Subsequent work by Duckworth and colleagues (e.g. Duckworth, Quinn, and Tsukayama 2011) has confirmed this general picture, particularly the connection between self-discipline (or self-control) and grades and related academic behaviors.

b. Duckworth is best known, of course, for her more recent work on grit. Though her focus has not been limited to the relationship between grit and academic performance, it has shed significant light on this connection. In a 2007 paper, "Grit: Perseverance and Passion for Long-Term Goals," Duckworth, Christopher Peterson, and colleagues report on a series of studies that measured (among other things) the relationship between grit, on the one hand, and education-level and GPA, on the other.

They found, first, that "more educated adults were higher in grit than were less educated adults of equal age" (1091). More specifically:

"[P]ost hoc comparisons revealed that when age is controlled for, postcollege graduates were higher in grit than most other groups. Similarly, participants with an Associate's degree were significantly higher in grit than those with less education, and, interestingly, also higher in grit than those with a Bachelor's degree, although this difference failed to reach significance" (ibid).

In a related study, they found, similarly, that "individuals who had completed only 'some college' were lower in grit than any other group, and individuals who had earned an Associate's degree or a graduate degree were higher in grit than individuals with a Bachelor's degree" (1093). They also found that "[g]ritty students outperformed their less gritty peers: Grit scores were associated with higher GPAs ($r = .25$, $p < .01$), a relationship that was even stronger when SAT scores were held constant ($r = .34$, $p < .001$)" (ibid.).

One reasonable interpretation of this research is that grittier students tend to rise to higher levels of education, complete their degrees more often, and earner higher GPAs than their less gritty counterparts. Given current problems with retention in higher education, this bodes well for educational approaches that seek to foster grit and closely related qualities like intellectual tenacity and perseverance.

In keeping with this picture, and by way of conclusion, we share the following excerpt from a recent white paper for the Gates Foundation written by Carol Dweck and colleagues titled "Academic Tenacity: Mindsets and Skills that Promote Long-Term Learning" (2011):

"Most educational reforms focus on curriculum and pedagogy—what material is taught and how it is taught. However, curriculum and pedagogy have often been narrowly defined as the academic content and students' intellectual processing of that material. Research shows that this is insufficient. In our pursuit of educational reform, something essential has been missing: the psychology of the student. Psychological factors—often called motivational or non-cognitive factors—can matter even more than cognitive factors for students' academic performance. These may include students' beliefs about themselves, their feelings about school, or their habits of self-control. Educators, psychologists, and even economists recognize the importance of non-cognitive factors in achievement both in school and in the labor market. These factors also offer promising levers for raising the achievement of underprivileged children and, ultimately, closing achievement gaps based on race and income. The research reviewed in this paper shows that educational interventions and initiatives that target these psychological factors can transform students' experience and achievement in school, improving core academic outcomes such as GPA and test scores months and even years later." (3)