

NONCOGNITIVE OUTCOMES OF LIBERAL ARTS EDUCATION

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For the majority of students attending college in the United States, undergraduate education coincides with a critical developmental period: the transition from adolescence to young adulthood. While learning to navigate complex institutional contexts, build peer relationships, and engage in a new level and pace of academic study, many college students are also in the midst of a consequential period of psychosocial growth and change. Chickering and colleagues enumerated “seven vectors of development” to describe the changing social-emotional world of traditional college-aged students, which include: “developing competence, managing emotions, moving through autonomy toward interdependence, developing mature interpersonal relationships, establishing identity, developing purpose, and developing integrity” (Chickering & Reisser, 1993). How successfully young adults navigate these developmental tasks—situated largely during the college years—will have profound implications for the people they become and the lives they will lead.

Recognizing the importance of this developmental period, as well as the particular demands of the 21st century, the Association of American Colleges & Universities in 2005 challenged undergraduate institutions to take a more intentional role in student development. In the AAC&U’s Liberal Education and America’s Promise (LEAP) initiative, the Association set forth a list of “Essential Learning Outcomes” to provide guidance to member colleges as they sought to produce graduates who were able “to contribute in a world marked by open or unscripted problems...[that] we face both in the global community and in our own diverse and deeply divided democracy” (Schneider, 2015). Included in LEAP’s accompanying set of assessment rubrics were specific psychosocial or “noncognitive” developmental goals: the ability to be proactive, responsible, self-aware, and self-reflective; to communicate effectively and work collaboratively; to set and achieve goals; to be able to understand others’ perspectives;

and to adjust one's own attitudes and beliefs by learning from diverse communities and cultures (Rhodes, 2009).

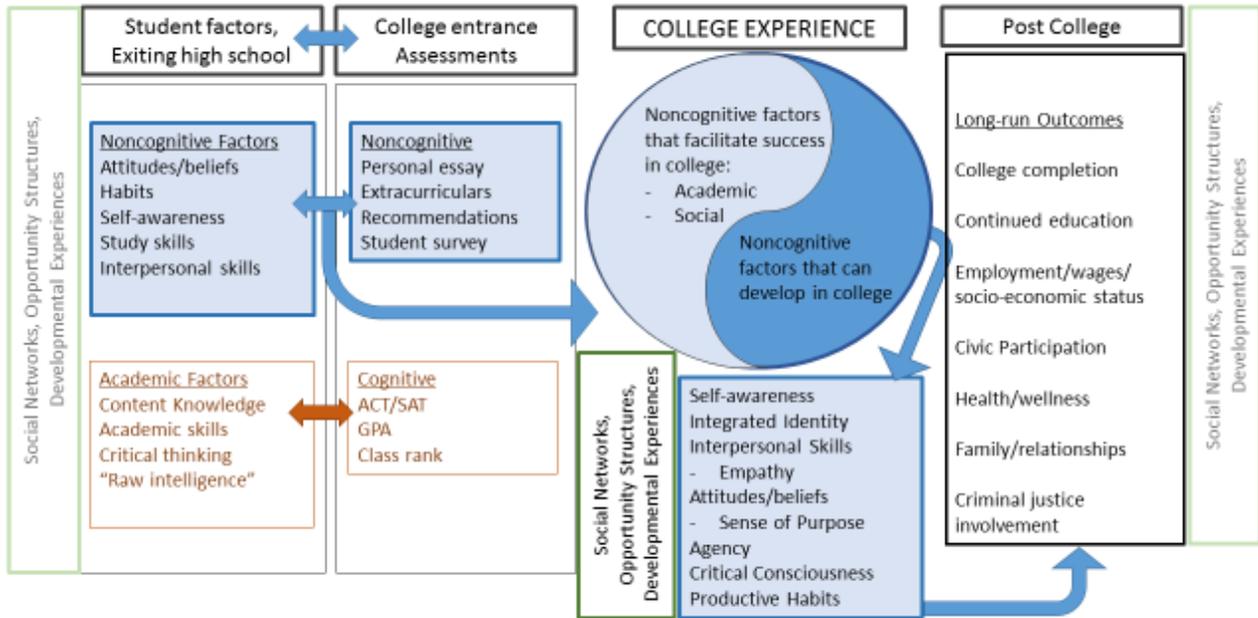
As part of the Mellon Research Forum initiative on the value of a liberal arts education, scholars are considering a range of potential outcomes of such an education, including knowledge development and critical thinking, health and well-being, civic engagement, and the economic returns to college attendance. Here I engage with some of the more intangible potential returns of liberal education related to the noncognitive development of young adults. I consider this question in a particular historical moment, amid widening socio-economic inequalities, geopolitical instability, and global environmental crises. Such a time calls for human beings who are able to recognize the partiality of their own perspectives; make sense of complex phenomena; direct their thoughts, feelings, and behaviors to act responsibly for the greater social good; and work effectively across social and cultural differences to solve pressing local, regional, and global problems. In other words, we need people with the qualities that liberal arts education espouses to develop: leaders, neighbors, co-workers, and citizens who are self-aware, empathetic, open-minded, agentic, committed to pro-social values and causes, capable of establishing and nurturing intimate relationships, and inspired by and able to achieve meaningful personal, community, and social goals.

Does an undergraduate liberal arts education contribute positively to the development of these critical competencies in young people in the United States? Further, do any noncognitive benefits of a liberal arts education accrue equally to all college students, or do we see systematic differences by important social subgroups? Given the pivotal developmental transition that coincides with traditional college attendance, do colleges generally, and liberal arts institutions specifically, fully leverage their opportunities to support students' noncognitive

development? Finally, how *might* liberal arts education play a more impactful role in building the capacity of young people to take up the work of the 21st century? These are the critical questions at the heart of this essay, questions to which there are, I will note at the outset, very incomplete answers at present.

What follows is a review of selected bodies of literature, coupled with critical commentary. By way of introduction, I first take up the definitional question of what is meant by noncognitive development/noncognitive outcomes in order to more precisely set some boundaries on the scope of the paper. I offer a preliminary illustration of the role of noncognitive factors at various points before, during, and after a young person's undergraduate education to situate the literature under review. (See Figure 1.) Drawing from research in secondary schooling (middle school and high school), I outline what we know about the relationships between noncognitive factors and school performance broadly, as well as the developmental tasks that young people are assumed to have achieved by the time they enter college.

Figure I. Noncognitive Factors in the College Experience



I then provide a brief overview of selected evidence of noncognitive development in the research literature on undergraduate education to date. This includes noncognitive skills assessments in college admissions decisions, research on effective social supports, and mindset interventions within undergraduate institutions to better serve and retain students once they have enrolled. Collectively, this body of work convinces us that noncognitive factors are important to academic success *within* college, but says nothing of how colleges might contribute to noncognitive developmental outcomes *beyond* college. Much of the research also suggests that different student subgroups may have very different psychosocial experiences and opportunities for development within their undergraduate institutions.

The next section takes up the “value added” question: What does a liberal arts education contribute to noncognitive development? This section addresses the methodological challenges of landing on a satisfying answer. Looking at selected intra- and interpersonal

competencies, I examine the evidence as to whether liberal arts education contributes to these important developmental outcomes, briefly considering whether benefits of a liberal arts education might accrue differently to students of different racial/ethnic or socio-economic backgrounds.

The final section of the essay is devoted to implications for research going forward. Included here is the question of how liberal arts programs and colleges might better focus efforts on the intentional noncognitive development of their students, and the role future research might play in that endeavor.

One note at the outset: The literature on noncognitive factors *in liberal arts education specifically* is quite limited. Much of the evidence highlighted here comes from studies of undergraduate college experience more generally. I attempt to differentiate the institutional context of the studies cited to the extent possible. I also confine my review to studies of traditional college-aged students, roughly ages 18–22, as the developmental needs of older adult students might reasonably differ from those in the transition to adulthood.

Defining Noncognitive Development

Human development is a complex, multifaceted, and self-reinforcing phenomenon wherein cognitive, affective, and social processing are deeply intertwined (Immordino-Yang, 2011) and development begets further development (Masten & Cicchetti, 2010). Any classification scheme that requires us to divide psychological constructs into distinct categories will inadequately capture the complexity and interdependence of developmental processes. Nonetheless, at least at the conceptual level we need language for differentiating the many facets of development, even if these distinctions are somewhat contrived and simplistic.

One blunt categorization often seen in the literature is the bifurcation of *cognitive* and *noncognitive* factors in human development. The latter term comes from work in economics referring to independent variables not measured by cognitive assessments such as IQ tests or standardized achievement tests (see Heckman & Rubinstein, 2001; Jacob, 2002). For example, if differences in labor market outcomes are not adequately explained by differences in cognitive skills, the unmeasured explanatory variable must be “noncognitive.” *Noncognitive factors* is a handy umbrella term to refer to all things not directly related to intelligence or substantive knowledge. But the term grossly misrepresents the complex and irreducible dance among affective, social, and cognitive processes in human learning and development.¹ Further, the term paints with too broad a brush, obscuring the very different kinds of phenomena (e.g., attitudes, behaviors, identities, feelings) that fall under the “noncognitive” umbrella. Nonetheless, in keeping with the extant literature, I will use this term as necessary to refer broadly to “everything that is not content knowledge or general intelligence but that matters for academic performance or long-run outcomes.”

Noncognitive outcomes encompass two broad sets of competencies:

- *Intrapersonal* competencies, having to do with self-awareness and self-management of one’s emotions, thoughts, and behaviors; identity development; self-efficacy; sense of purpose; and mindsets, attitudes, and beliefs; and
- *Interpersonal* competencies including empathy, social and relational skills, and recognition of and appreciation for experiences and perspectives other than one’s own (National Research Council, 2012).

¹ It is worth noting the “noncognitive” is a term that is universally rejected by developmental and social psychologists.

It is easy to see how these two categories of intra- and inter-personal competencies are mutually constitutive. As one's perception of a world of others shifts or expands, so too does one's understanding of oneself in relation to those others, calling into question one's place and obligations in this larger world. A focus on noncognitive development seems closely aligned with the core aims of liberal education: "expanding horizons, building understanding of the wider world, honing...communication skills, and fostering responsibilities beyond self," in short, the "kinds of learning needed for a free society and for the full development of human talent" (Association of American Colleges & Universities, 2011, p. 8).

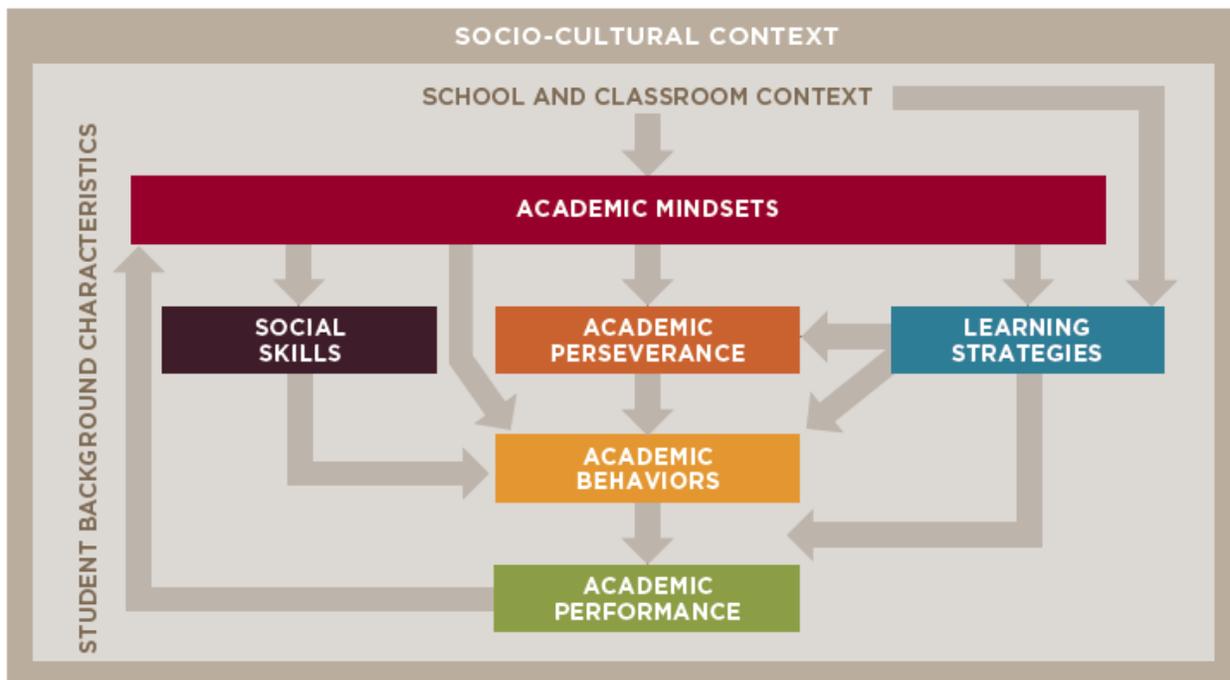
Given the limited scope of this essay, I provide only a brief overview of noncognitive development, going more in-depth in selected areas as illustrative examples. But in broad terms my focus is on the question of whether college generally – and liberal arts education specifically – contributes to the development of young people's interpersonal and intrapersonal competencies across these general constructs.

Research Evidence from Middle Schools and High Schools

A central aim of liberal arts education is for students to develop deep and broad content knowledge in the sciences, mathematics, history, humanities, social sciences, languages, and the arts (Association of American Colleges & Universities, 2011). To develop deep knowledge, college students need to be good learners. Recent scholarship on adolescents and young adults has built a strong case for the important role of noncognitive factors and related behaviors in student learning, as measured by academic course performance (Farrington et al., 2012; Lee & Shute, 2009; Rosen et al., 2010). My colleagues and I reviewed cross-disciplinary literature examining the relationships among five categories of noncognitive factors (academic

behaviors, academic perseverance, academic mindsets, learning strategies, and social skills) and students' course grades, for students ages 10 to 20 (Farrington et al., 2012). From this study, we created a hypothesized model of how noncognitive factors interact to produce academic performance. (See Figure 2.) The most significant findings summarized here from middle grades and high school studies are drawn largely from this comprehensive review.

Figure 2. A Hypothesized Model of How Noncognitive Factors Affect Academic Performance (from Farrington et al., 2012, *Teaching Adolescents to Become Learners*)



In the broad category of behavioral and cognitive self-regulation (i.e., the ability to manage and direct one's attention and behaviors), empirical evidence consistently finds that adolescents with better *academic behaviors* (school attendance, studying, focusing on academic tasks, and homework completion) earn higher grades in their classes, controlling for other

factors (Allensworth & Easton, 2007; Cooper, Robinson, & Patell, 2006; Keith, 1982). Further, students with more *academic perseverance*, which refers to the quality, intensity, and duration of their behaviors (e.g., sticking doggedly to a school task, not giving up despite setbacks or negative feedback) have better academic behaviors and earn higher grades (Duckworth & Seligman, 2005). This seems largely self-evident: young people who, by their behaviors, are “better students” (e.g., come to class, arrive prepared, participate, complete their homework, persist at difficult assignments) are also better students as judged by their course grades.

Teachers and other observers often interpret good academic behavior as being a function of moral character, effort, or will power. But both correlational and experimental studies suggest that perseverance and related academic behaviors are largely driven by a student’s beliefs: how one construes (i.e., perceives and interprets) the academic task at hand, as well as how one construes one’s competence, one’s environment, and one’s place within it (Yeager & Walton, 2011). Four specific beliefs—referred to as *academic mindsets* or *learning mindsets*—are each related to increased perseverance, better academic behaviors, and higher grades, controlling for demographic factors and prior achievement (Farrington et al., 2012). These four mindsets, stated in the first person from the student’s point of view, include:

- *I belong in this learning community*: A sense of connectedness, full membership, and belonging to an intellectual community of learners (Battistich et al., 1995; Furrer & Skinner, 2003; Goodenow, 1993; Osterman, 2000);
- *This work has value for me*: A belief that the academic work one is engaged in is worthwhile, that it has personal meaning and relevance or future value (Eccles et al., 1983; Lee & Anderson, 1993; Wigfield, 1994);

- *I can succeed at this*: A sense of self-efficacy, or belief that one is capable of achieving the goals of a task and that one's efforts will be rewarded with success (Bandura, 1997; Lent, Brown, & Larkin, 1984; Pajares, 1996); and
- *My ability and competence grow with my effort*: A "growth mindset," conceiving of one's intelligence as plastic and responsive to effort as opposed to a fixed and limited quantity (Dweck, 2006; Dweck & Leggett, 1988; Weiner, 1986).

Each of these four mindsets serves as a motivating factor for students to engage in academic work, to persevere in the face of difficulty, and to regroup after failure. There is clear evidence that positive mindsets are associated with higher academic performance, creating a positive feedback loop where academic success in turn validates a student's sense of belonging, self-efficacy, relevance, and belief that one's ability can further expand through additional effort.

Of course, for each adaptive mindset (expressed in the positive, as above), there is a negative corollary which is associated with an opposite set of characteristics. Students who feel like they don't belong, who see no purpose in the work they are asked to do, who doubt their ability to succeed, or who interpret struggle as a sign that they have reached the limits of their natural ability are all more likely to withdraw from academic tasks, to give up when they encounter a setback or critical feedback, and to distance themselves increasingly from school (Farrington et al., 2012). Maladaptive mindsets are associated with lower grades and poorer school performance, which validate these mindsets and feed into a negative recursive cycle. Note that these patterns hold regardless of the tested achievement level of the student.

Research in the middle grades and high schools also highlights the role of *learning strategies* in school performance. Learning strategies are acquired (and eventually automated) procedures for engaging effectively in learning. These include strategies for organizing and

comprehending academic material (i.e., study skills), time management, goal setting, and work completion. If mindsets contribute to the *why* of academic performance, learning strategies are part of the *how*. Across a large number of studies, self-regulated learners, i.e., those who employ metacognitive strategies to monitor their focus and understanding, manage their time, and direct their efforts toward their learning goals, had more positive academic mindsets, increased perseverance, better academic behaviors, and higher grades (see, for example, Pintrich & DeGroot, 1990; Zimmerman & Schunk, 1989). Further, there is clear evidence that learning strategies are best taught and learned in the context of academic classes, where their application is immediately relevant and useful (Bransford, Brown, & Cocking, 2000; Haller, Child, & Walberg, 1988; Palinscar, 1986).

Interestingly, the evidence on *social skills* yielded mixed results in their relationship with course grades in middle and high school. Much of the research on social-emotional learning (of which social skills is a subset) focuses on the elementary grades (Bierman & Furman, 1984; Ladd, 1981). Research on adolescents often looks at reduced risk behaviors (e.g., teen pregnancy, drug and alcohol abuse, truancy) rather than academic grades as outcomes (Collaborative for Academic, Social, and Emotional Learning, 2003; Hawkins et al., 1999). Further, interventions focused on social-emotional learning often include skill building across multiple psychosocial constructs (e.g., self-regulation and related self-concepts in addition to interpersonal skills), making it difficult to isolate the relationship of social skills *per se* to academic achievement. There is no direct evidence that being a more sociable student leads to better course grades. Still, some studies did find positive academic effects of social skills interventions (Durlak et al., 2011) or relationships between measures of pro-social behaviors (Wentzel, 1993) and course grades or test scores.

Summarizing several decades of research on middle grades and high school, though we see variability across individual studies and differences in the definition and measurement of individual constructs, a solid weight of evidence suggests that:

- 1) Positive academic behaviors are critical to learning and academic performance;
- 2) Academic perseverance is positively related to the duration, quality, and intensity of one's academic behaviors and improved academic performance;
- 3) Academic mindsets (belonging, self-efficacy, growth mindset, and relevance/purpose) are associated with increased perseverance, better academic behaviors, and higher grades;
- 4) Learning strategies are more likely to be employed in the presence of positive academic mindsets and are associated with increased perseverance and improved academic behaviors and performance; and
- 5) Social skills generally have a weaker relationship to academic outcomes, though meta-analyses have found relationships between social-emotional interventions and improved academic performance (Farrington et al., 2012).

A critical insight from this body of research literature from secondary schooling relates to the importance of *school and classroom context* and the role of teachers in students' development and utilization of noncognitive factors in pursuit of learning. As shown in Figure 2, learning contexts have a direct effect on students' mindsets (by creating conditions that support belonging, self-efficacy, and a growth mindset and by ensuring that academic tasks are interesting and relevant to the learners) and on students' learning strategies, which are directly teachable within the course of instruction. For example, showing students "study tricks" for

remembering information, teaching specific strategies for textual analysis, or requiring students to plan ahead and turn in larger assignments in manageable chunks (e.g., topic idea, outline, rough draft) are all examples of directly building learning strategies into content instruction. Following development of the model in Figure 2, my colleagues and I conducted studies of students in grades 6–12 using a self-report survey we developed and validated (*Becoming Effective Learners Student Survey, or BEL-S*) to measure the impact of classrooms on student noncognitive factors (n=8,318; Farrington, Porter, & Klugman, in press). We asked each student to report on two specific academic classes (referred to as their target classes), preselected from their current course schedule. For each target class, students responded to survey questions about their mindsets, use of learning strategies, academic perseverance, and academic behaviors *within that class*. The target class was cued both in the question (e.g., *How true are the following in your [Algebra I] class?*) and in each survey item (e.g., *I feel comfortable sharing my opinions in this class*). Students also reported on classroom conditions (e.g., teacher support, organization of instruction, quality of academic work) in each of their two target classes.

There were clear differences *between* students in their self-reported noncognitive factors. Students who reported having a positive mindset and strong academic behaviors in one of their target classes were likely to have a positive mindset and strong behaviors in their second target class as well. In this way, the set of noncognitive factors we were studying (academic mindsets, academic perseverance, learning strategies, and academic behaviors) seemed to be properties of students, i.e., a set of beliefs and competencies that students applied wherever they went.

However, looking at *within*-student comparisons (comparing the student to him/herself across two target classes), we found that classroom contexts did matter for students' reports

of their own noncognitive factors. This points to a difference between “possessing” noncognitive competencies and “choosing to apply” them in any given setting. We aggregated classroom-level reports of classroom contexts for all the students in each classroom from whom we had survey measures, so that we were able to rank-order classrooms by student reports. If a student’s two target classes were measurably different from one another according to these aggregate student reports of the classrooms, on average these differences in classroom context predicted significant differences in individual students’ self-reported noncognitive factors between their two classes. In other words, students reported more positive mindsets, perseverance, strategy use, and behaviors in classes that were rated more favorably by their peers (e.g., better organized, more support, clearer goals, more relevant work) than the same students did in classes that were rated less favorably. Further, within-student differences in self-reported noncognitive factors between classes predicted differences in students’ final course grades in their two target classes, i.e., students earned higher grades in the classes in which they reported better noncognitive factors than they earned in the classes in which they reported worse noncognitive factors (Farrington et al., in press).

The takeaways from the large body of research in K–12 schooling are not only that noncognitive factors matter for adolescents’ performance in school but that they are malleable and responsive to context. Teachers and the learning environments they create can have powerful influences on the extent to which young people experience academic tasks as meaningful, experience their classrooms as welcoming, or experience themselves as invested and capable. The same student may have a different experience and behave differently from one class to another, and those experiential and behavioral differences predict measurable differences in academic performance. *Academic mindsets* (sense of belonging, relevance, self-

efficacy, and growth mindset) represent a particularly critical idea as we think ahead about college students' experience of liberal arts education and the value they derive from that experience.

Another key takeaway from the K–12 literature has to do with the importance of institutional transitions. While, over time, academic mindsets become habitual patterns of perception and meaning-making (default assumptions) students bring with them from class to class and year to year, there is evidence that institutional transitions (for example, the move from eighth grade to high school, or twelfth grade to college) provide a window in which mindsets seem to be more sensitive to change. This makes sense: when students enter a new school context with new norms, demands, and expectations, they reappraise how they might fit into this new academic space. When educators provide supports that enable incoming ninth-graders to succeed academically, it tends to set students on a positive trajectory that carries them through to high school graduation (Roderick, Kelley-Kemple, Johnson, & Beechum, 2014). In fact, how well students make the academic transition to ninth grade is more predictive of their likelihood to graduate from high school than are their grades and test scores from eighth grade (Allensworth & Easton, 2007; Neild, Stoner-Eby, & Furstenberg, 2008; Roderick & Camburn, 1999). We will see this mirrored in the research literature on the postsecondary transition: freshman year in college is also a critical period for reappraisal and offers both a window of opportunity as well as a time of increased risk, depending on students' early experiences in the entrance to college.

Noncognitive Factors in the Research Literature on College

Much of the literature on achievement motivation (e.g., academic self-efficacy, competence beliefs, conceptions of ability, expectancies for success, achievement values, goal orientation, self-regulation) locates the development of these constructs in childhood and early adolescence (see, for example, Wigfield & Eccles, 2002). As we saw in the previous section, noncognitive factors in middle and high school are powerful predictors of students' academic performance there. Research and practical guides for social-emotional learning, likewise, focus primarily on K–12 schools as sites for development (e.g., Zins, Weissberg, Wang, & Walberg, 2004). This leads to the implicit or explicit view that students should enter college *already knowing how to learn* and *already motivated* to do so.² Accordingly, undergraduate institutions (and the testing companies who market to them) have shown increasing interest in assessing college applicants on the noncognitive skills they already possess, either to inform admissions decisions or to identify students in likely need of support among an entering freshman class. Where such assessments are used, they complement more traditional assessments of noncognitive competencies garnered through students' personal essays, reports of extracurricular participation, and letters of recommendation. (See Figure 1.)

Noncognitive skills assessments for undergraduate admissions

Colleges have long used a combination of cognitive and noncognitive assessments to make admissions decisions (under the broad definition of noncognitive as meaning “anything that is

² While a young person's K–12 schooling experience certainly is the optimal place to have developed productive habits, helpful learning strategies, and academic mindsets that will support a student in college, two important caveats must be noted. First, it is not “too late” to develop these in college if they were insufficiently established prior to freshman year. Indeed, a little maturity should in fact help support their development. Second, there is a difference between “having” a particular competence and “using” it. Just as we saw the powerful relationship of context to the development and expression of noncognitive factors in middle and high school, so too does research show that college learning environments are critical influencers of whether or not young people utilize the habits and strategies they may have developed in prior environments.

not measured by cognitive tests but that matters for achievement”). Letters of recommendation, high school transcripts, lists of volunteer and extra-curricular activities, and personal essays are all ways to assess something about a student’s character, persistence, passions, and interests – both inside and outside of a classroom. Grades themselves are understood to provide both cognitive and noncognitive information; many scholars argue that this is why high school GPA is more predictive of long-run outcomes than are college entrance exams or other standardized test scores (Bowen, Chingos, & McPherson, 2009; Roderick, Nagaoka, & Allensworth, 2006; Geiser & Santelices, 2007; Larose, Robertson, Roy, & Legault, 1998).

The idea of including formal noncognitive assessments (e.g., self-report surveys, interest inventories, situational judgment tests) to inform college admissions decisions has a long history. The Educational Testing Service (ETS), creator of the SAT, has conducted research and development on noncognitive assessments since the 1960s (Lemann, 1995). Though concerns about validity and practicality prevented ETS from making any noncognitive assessments operational until recently (Kyllonen, 2005), the company has now introduced its *SuccessNavigator* Assessment “designed to measure proven, noncognitive predictors of college success” and produce individualized student reports for use by college advising and support personnel (Educational Testing Service, 2018; Markle et al., 2013). Likewise, ACT has developed a suite of “college readiness” assessments that includes expanded domains such as behavioral skills, described as “interpersonal, self-regulatory, and task-related behaviors important for adaptation to and successful performance in education and workplace settings,” as well as education and career navigation skills (Camara, O’Connor, Mattern, & Hanson, 2015).

These testing companies and other actors are capitalizing on renewed calls for alternatives or supplements to standardized cognitive assessments that might better align with colleges' more holistic interests in college applicants. They are also responding to concerns about the limitations of existing cognitive instruments for predicting student success, particularly for certain subgroups of students (Jencks & Phillips, 1998; Reeves & Halikias, 2017), and the potential of cognitive tests to exacerbate persistent racial differences in college admission or matriculation rates (National Association for College Admission Counseling, 2008; Thomas, Kuncel, & Credé, 2007). Some scholars have argued that including assessments of noncognitive variables in college admissions decisions would provide a fairer appraisal of the readiness and likely success of students of color and other underrepresented or nontraditional college students and would allow colleges to more accurately target supports to incoming freshmen (Larose et al., 1998; Sedlacek, 2004; Tracey & Sedlacek, 1984). In contrast to this argument, Students for Fair Admissions has sued Harvard College for its use of "personality" as a factor in admissions decisions, alleging that this practice has had a discriminatory effect against Asian-American applicants, significantly depressing their numbers among admitted undergraduate students (Hartocollis, 2018).

One survey instrument that garnered early attention is the Non-Cognitive Questionnaire (NCQ; Tracey & Sedlacek, 1984). The NCQ assesses eight noncognitive variables: positive self-concept; realistic self-appraisal; understanding of and an ability to deal with racism; preference for long-term goals over more immediate, short-term needs; availability of a strong support person; successful leadership experience; demonstrated community service; and knowledge acquired in a field (i.e., outside of traditional learning settings). Theory and prior research had suggested these noncognitive variables were related to academic success in

college and may play a role in racial differences in college outcomes. The NCQ has been used by several undergraduate institutions and was instrumental in scholarship award decisions for the Gates Millennium Scholars program (Sedlacek, 2011; Thomas, Kuncel, & Credé, 2007).

Early studies by Sedlacek and colleagues and others showed encouraging results, with at least some constructs on the scale predicting grades or persistence, as well as interesting differences by race. For example, in their study of 250 African American students in four colleges, Nasim, Roberts, Harrell, & Young (2005) found that availability of a strong academic support person and ability to understand and deal with racism were the most reliable predictors of college grades at the two predominantly White institutions (PWIs) in their study, while positive academic self-concept was the only reliable predictor at the two historically black colleges and universities (HBCUs). SAT scores were not predictive in any setting.

In 2007, Thomas, Kuncel, & Credé conducted a meta-analysis of studies using the NCQ. Across 47 independent samples that met their inclusion criteria ($n=9,321$), they found that none of the NCQ scales adequately predicted either college GPA or persistence. Based on these results, the authors recommended that the NCQ not be used for either research or practice.

Despite inconsistent evidence as to the predictive validity of various noncognitive assessments, there is still widespread agreement that noncognitive factors matter for students' success in college. In any given study with null results, it is unclear if the noncognitive variables being tested are in fact unimportant to the outcomes of interest for the sample in the study, or whether the assessments themselves are not valid or reliable indicators of the underlying constructs they purport to measure. Particularly in relation to self-report surveys, two key questions are whether students are sufficiently and realistically aware of their own noncognitive competencies to be accurate reporters, and whether the internal standards and frames of

reference used to self-assess these competencies are comparable across survey takers or time points (Duckworth & Yeager, 2015; Kyllonen, 2005). Other concerns have to do with the ability of students to “fake” their responses to skew scores in their favor, particularly in high-stakes situations (e.g., college admissions decisions), or with the long history of college admissions criteria—including noncognitive assessments—favoring wealthier students (Zwick, 2017). Given these concerns, colleges are urged to be cautious as they explore uses of noncognitive assessments.

Research on mindset interventions with college students

In the earlier review of K–12 research, we saw that academic mindsets were motivational drivers of students’ behavior and performance in middle school and high school. In the past decade, there has been an exploding body of evidence from psychological interventions targeting college students’ perceptions and interpretations of their institutional environments. Similar to the findings in K–12 settings, these studies provide insight not only into the importance of noncognitive factors for students’ engagement and performance in college, but also to the critical role that institutional contexts and relationships can have in shaping how students make sense of themselves and their world.

A central concept in many mindset interventions is the idea of recursive cycles (Cohen & Garcia, 2008; Yeager & Walton, 2011). Social psychologists argue that what makes mindsets so powerful is that they shape not only one’s perceptions and behaviors in the moment, but that they animate a feedback loop that tends to reinforce a pattern of perception and behavior. An incoming freshman’s construal of the events and interactions she observes in her first few days of college will influence her immediate psychological bearing (for example, being on guard

or at ease) and behavior (joining in activities or refraining from doing so). The student's psychological bearing and behavior then influence the behaviors of other people and their interactions with her. If this student entered college feeling concerned that she might not fit in socially (belonging uncertainty) or will not be able to keep up with the academic work (low academic self-efficacy), these concerns will shape her experience and behavior. An offhand comment from a professor or an ambiguous social cue might be interpreted as an affirmation of her fears. Over time, this student's initial impressions will be either dispelled or solidified, based on her ongoing psychological experience, the social interactions she has with people in that setting, and the meaning she makes of these experiences. Thus, mindsets can become self-fulfilling prophecies, as young people respond to their construal of events, essentially acting the situation into the way they perceived it to be.

Social psychologists use this concept of recursive cycles to customize psychological interventions that target students' maladaptive construals and shift them to more personally beneficial ways of seeing the world. Seminal work in this area targeted academic mindsets (e.g., belonging, growth mindset, sense of purpose/relevance) with experiments designed to prevent or disrupt a negative feedback loop by seeding a more adaptive way to construe common college experiences. Two early examples include:

- Sense of belonging interventions, in which entering college students are introduced to the idea that everybody struggles in college (normalizing difficulty), so as to preempt the interpretation that academic or social struggle indicates that one does not belong or is unlikely to succeed (Cohen & Garcia, 2008; Walton & Cohen 2007, 2011; Wilson & Linville, 1982, 1985);

- Growth mindset interventions, where students receive information that depicts the brain as being “like a muscle” that gets stronger with use, rather than being a stable entity with fixed capacity. An overarching message is that encountering difficulty just means that your brain is growing (rather than being an indication that you have reached the limits of your ability). Interventions frame college as an opportunity to really dig into challenge, exercise your brain, and make yourself smarter through effort (Aronson, Fried, & Good, 2002).

Well-designed mindset interventions target specific attitudes and beliefs that are likely and reasonable responses for particular groups of students to have, in light of the broader social and historical contexts in which people and institutions are situated and the pervasive messages about ability, meritocracy, deservingness, and belongingness/otherness that young people have absorbed throughout their lifetimes. Those social systems and internalized messages work to the advantage of some students and to the disadvantage of others. Claude Steele and colleagues have demonstrated that negative stereotypes, particularly those concerning the alleged intellectual inferiority of particular racial/ethnic groups (most often targeting African American or Latino students) or genders (e.g., women in math), can depress the cognitive performance of students in the stereotyped group (Steele, 1997; Steele & Aronson, 1995). Further, when these stereotypes are removed or defused through experimental manipulation, the performance of students in stereotyped groups improves (Good, Aronson, & Inzlicht, 2003; Steele & Aronson, 1995).

Mindset interventions are often designed to alleviate the disadvantage that social systems and stereotypes place on students who are likely to experience some kind of situational identity threat by virtue of their social category (Cohen & Garcia, 2008). Much of the mindset research shows improved engagement and academic performance of targeted students

in randomized treatment groups (e.g., Black students in a selective, predominantly White institution), while having little or no effect on groups not subject to stereotype threat (e.g., White students, male students). Mindset intervention studies such as these reveal (by removing) some of the hidden burden carried by socially or economically marginalized students that may routinely suppress their academic performance. A few relevant studies from the past five years are highlighted below.

Stephens, Fryberg, Markus, Johnson, & Covarrubias (2012) conducted a series of studies to understand why first-generation college students underperformed academically relative to their peers, even when their tested achievement was equal. They hypothesized that differences in university norms and students' own ideas of self and community were affecting the performance of working-class students. In a series of studies, the researchers demonstrated a common mismatch between a university's cultural norms emphasizing individualism and independence and the social norms of working-class students that tended to emphasize communal interdependence. They further showed that (controlling for race and SAT scores) this mismatch was associated with working-class students earning lower grades compared with peers who had independent orientations that more closely matched university norms. Experimentally, they showed that when first-generation college students perceived their university as promoting an independent ("pave your own path") rather than an interdependent ("part of a community") orientation toward learning, they would perceive academic tasks as being more difficult, and they performed more poorly. When university materials were manipulated in an experimental intervention (in this case, a letter from the university president) to convey an interdependent orientation, first-generation students perceived academic tasks as less difficult and their performance improved. The experimental manipulations had no

measurable effect on the perceptions of task difficulty or the task performance of continuing-generation students (those whose parents had college degrees). Study authors pointed to the “unseen disadvantage” experienced by first-generation college students whose cultural norms might be at odds with the predominantly White, upper-middle-class institutional cultures of the colleges they attend.

In a randomized control trial, Stephens, Hamedani, & Destin (2014) tested an hour-long intervention designed to help students recognize that their diverse social-class backgrounds, while likely to present challenges in college, could also provide them with effective strategies for overcoming obstacles. The intervention consisted of hearing senior students sharing stories of their college experiences that emphasized how they drew on their social-class backgrounds as a source of strength. (Control students heard stories of students learning how to be successful in college that did not mention the role of students’ backgrounds.) At the end of the first year of college, students in the treatment group had better academic outcomes and were better adjusted socially than students in the control group (reporting higher levels of social fit, academic identification, and psychological well-being). First-generation students in the treatment condition showed the strongest effects, earning higher grades and more frequently utilizing campus resources than first-generation students in the control group. Two years after the original experiment, Stephens, Townsend, Hamedani, Destin, & Manzo (2015) followed up to specifically test for evidence of recursive effects. In a lab setting in which students were asked to give a short speech, the researchers found that students in the original treatment condition used more specific examples drawn from their own backgrounds than did students who had been in the control condition. When confronted with a series of stressful tasks similar to those a student might encounter in college, first-generation students in the original treatment

condition showed better physiological thriving than any other group (as measured by anabolic-balance reactivity from a saliva test). Researchers concluded that the earlier intervention had equipped first-generation students to draw on their social-class background as a strength to help them cope with the stresses of college.

Finally, Yeager et al. (2016) conducted three large-scale ($n > 9,500$), randomized, double-blind experiments with active controls to test the effects of different mindset interventions (focused on social belonging, growth mindset, cultural fit, or critical feedback) on first-year college outcomes. The second and third of these experiments delivered the interventions to incoming freshmen *before* they began college in a flagship public university (Experiment 2) and a selective private university (Experiment 3). In both experiments, researchers sought to compare students from advantaged versus disadvantaged social groups within a particular institution (by race/ethnicity, socio-economic status, and first-generation vs. continuing generation students), based on historical student subgroup performance from administrative data.

In Experiment 2, all three mindset interventions tested had positive impacts for disadvantaged students on full-time enrollment through the first year, while having no effect on advantaged students. As a result, each treatment condition nearly cut in half the full-time enrollment differences between advantaged and disadvantaged students. In Experiment 3, which looked at first year GPA, disadvantaged students in all treatment groups were less likely to be in the lowest achievement quintile (29% vs. 46% in control) and their GPAs were 0.09 grade points higher than disadvantaged students in the control group. There were no intervention effects for advantaged students. In both of these experiments, further analysis showed that effects were mediated by improving the social and academic integration of treated, disadvantaged students, who were more likely than control-group students to have close

friends, a close mentor, be involved in extracurricular group, and use academic services. In Experiment 2, this led to higher full-time enrollment, and in Experiment 3, this led to improved academic performance.

Across mindset intervention studies, we see that targeted experiments can remove “unseen disadvantages” that otherwise depress the academic performance of historically marginalized students. Further, they provide evidence of lasting recursive effects, as well as insights into the mechanisms whereby social identity threats might affect students’ academic performance or persistence in college—most notably by influencing their academic and social engagement, their connection to peers and faculty, and their utilization of college resources. On the basis of this evidence, over 20 institutions of higher education are now partnering with the College Transition Collaborative (2018) to deliver these targeted interventions to all incoming freshmen.

The Contribution of Liberal Arts Education to Noncognitive Development

I turn now to the central question of this essay: What is the evidence that liberal arts education contributes to college students’ noncognitive development? At the outset, we need to acknowledge the methodological and measurement challenges of identifying the effects of college generally, or liberal arts education specifically, on any kind of long-run outcomes. There are a limited number of longitudinal datasets that can be used to investigate the question, and within available datasets, there is limited inclusion of noncognitive variables. The National Center for Education Statistics’ Baccalaureate and Beyond (B&B) 1993–2003 study offers a rich, nationally representative dataset of college graduates followed for 10 years and includes college transcripts for almost 11,000 bachelor’s degree recipients. Yet, in their study of the effect of

humanities course taking on noncognitive outcomes, Bradburn and Fuqua lamented, “there are little or no data on measures of subjective well-being, personal efficacy, or cultural participation, nor on communication, analytic, or interpersonal skills” in the B&B (n.d., p. 1).

Another challenge has to do with selection effects, as researchers cannot randomly assign people to go to college. The vast majority of studies of noncognitive development in college settings do not account for selection. A small number of datasets, for example the NCES’ National Education Longitudinal Studies (NELS 1998 and 2002) and the Bureau of Labor Statistics’ National Longitudinal Surveys of Youth (NLSY 1997), have the advantage of including a general population of young people, allowing for comparisons between non-college-goers and college-goers attending different types of undergraduate institutions. But no available dataset can illuminate what might have happened had a representative sample of college-going students not gone to college, or a sample of non-college-going youth had.

A third challenge has to do with isolating which aspects of college attendance might be responsible for producing any observed outcomes. Arum & Roksa (2011) found that college students report spending less than 10 percent of their time in class, compared with a full 51 percent of time socializing, recreating, or in other non-academic activities. A student’s undergraduate college experience is an amalgamation of the daily living situation, courses taken, interactions with peers and faculty, academic pressures, financial considerations, and involvement in other aspects of campus life (Arum & Roksa, 2011). Any and all of these components can contribute to a young person’s learning and development.

Perhaps the most directly useful data to study college effects come from the Wabash National Study of Liberal Arts Education, a large-scale, longitudinal, mixed methods study from 2005–2008 designed to shed light on the institutional features and instructional practices that

best support liberal arts education. The qualitative study was particularly focused on student development of seven desirable liberal arts outcomes, including a set of inter- and intrapersonal competencies (e.g., inclination to inquire and lifelong learning, moral character, intercultural effectiveness, leadership, well-being) and the experiences that gave rise to their development (King, Kendall Brown, Lindsay, & VanHecke, 2007). Researchers surveyed students from 19 colleges and universities, reflecting a range of institutional characteristics, and conducted annual interviews with hundreds of students over three years from a subset of six of these institutions (n=315 in Year 1, down to n=204 by Year 3) (Barber, King, & Baxter Magolda, 2013).

Still, few studies looked specifically at the effects of *liberal arts education* on noncognitive outcomes. Most research on college effects has relied on cross-sectional studies, oftentimes of single institutions, with no reasonable comparison group and no counterfactual. As a result, we have limited opportunities to understand the extent to which liberal arts education may contribute to students' noncognitive development or the mechanisms by which any such development might happen.

In considering the relationship between liberal arts education and noncognitive development, the question of *malleability* is worthy of attention. If one interest of the Mellon Research Forum's current initiative is in the potential role of liberal arts education in supporting noncognitive development, then it is important for the focus to be on factors that are malleable, i.e., changeable or responsive to intervention. A great deal of work in higher education has focused on the "Big Five" personality traits, and most particularly Conscientiousness.³

Conscientiousness is a popular focus of study because it has been clearly defined, is measurable

³ The traits in the "Big Five" personality model are openness (to experience), conscientiousness, extraversion, agreeableness, and neuroticism. The assumption is that these are each on a bipolar scale, and everyone falls somewhere along a continuum on each trait.

across populations using a standardized instrument, and has been repeatedly shown to be related to academic achievement (Poropat, 2009). There is disagreement as to the extent to which Conscientiousness, along with the other four aspects of personality, is a stable trait (Robins, Fraley, Roberts, & Trzesniewski, 2001). While human beings generally become more conscientious as they grow from childhood to adulthood (assumed a normal part of maturation), one's rank ordering in the distribution of measured Conscientiousness does not seem to change much over time. In reviewing the research on personality development, Caspi, Roberts, & Shiner (2005) noted that rank-order consistency for Conscientiousness was "remarkably high," second only to cognitive ability in consistency over time (p. 467).

Further, theory and empirical evidence from longitudinal studies suggests that personality tends to get solidified by experience rather than changed (Caspi, Roberts, & Shiner, 2005). That is, "the most common effect of life experiences on personality development is to deepen the characteristics that lead people to specific environments" in the first place⁴ (Roberts, Wood, & Caspi, 2008). All of this suggests that Conscientiousness (as well as other personality traits) may be a poor candidate for a college's intervention efforts—though it is notable that early adulthood (which extends from ages 20 through 40) has been identified as the time period in which most personality development occurs. The position I espouse here—to avoid the Big Five as indicators of noncognitive development—is somewhat contentious.

⁴ It is worth noting the similarities of this concept of cumulative continuity with the concept of recursive effects discussed earlier in relation to mindset interventions. Both concepts emphasize the idea that early patterns of mutually reinforcing perceptions and behaviors tend to be repeated and become more stable (and more resistant to change) over time. Why then would mindsets be good targets for intervention, while personality traits would not? One distinction is that mindset interventions tend to target a specific belief in a localized context (i.e., a mindset), rather than a global understanding of one's own nature (i.e., personality). The empirical evidence suggests that shifting one's perception of a very specific context (e.g., the degree to which your math teacher cares about your personal well-being) is easier to do than shifting one's global understanding of essential qualities of the self and ways of being (e.g., the degree to which one is an extrovert).

Large-scale efforts around the globe have chosen to focus on personality traits to understand psychosocial development, in part because personality has been measured more reliably than many other noncognitive constructs (Kautz, Heckman, Diris, Weel, & Borghans, 2014). My argument is not that personality traits are not important to long-term life outcomes (they are), but that there is lower-hanging fruit if one wants to influence college students' development. I focus my review on some of these potentially more malleable constructs.

Summary of Evidence on Key Noncognitive Outcomes

The evidence summarized below comes in part from the comprehensive research reviews conducted by Pascarella & Terenzini (*How College Affects Students, Vol. 2, 2005*) and Mayhew et al. (*How College Affects Students, Vol. 3, 2016*), looking at the effects of development during college, net effects of college attendance, between-college effects, within-college effects, and conditional effects. The overall results of this body of research point to one general conclusion: while much of the research did find evidence that college contributed positively to the growth of some students, college attendance in general, and liberal arts education specifically, does not *reliably* result in noncognitive development. Two clear exceptions are leadership development and openness to diversity. There is evidence that college experiences do contribute to the growth of leadership skills across institutional types, and studies specifically focused on liberal arts education show consistently positive effects. Liberal arts education also seems to play a particularly significant role in increasing students' openness to diversity. Given the limited number of studies that differentiate between institutional types or that report separate outcomes for liberal arts education, much of the research summarized here focuses on students' undergraduate experience generally, unless otherwise noted. Table I

shows bottom-line results of the effects of college on an abbreviated set of intra- and interpersonal competencies: identity development, self-authorship, socially responsible leadership, and openness/commitment to diversity.

Table I: Summary of effects of higher education on noncognitive development (from Mayhew et al., 2016)

Noncognitive Outcome	Summary of Evidence	Significant Institutional Characteristics or Individual Experiences
Racial/ethnic identity development	No evidence of net effects of college on racial/ethnic identity development	Exposure to diversity Intergroup dialogue Experiences with peers Critical incidents Support & validation Population-specific organizations
Leadership development	Evidence of positive effects of college on leadership development	Faculty interactions Mentoring Engaging with diverse others Sociocultural conversations with peers Reflective learning Active & collaborative learning Integrative learning Involvement in cocurricular/ extracurricular activities
Self-authorship	Inconclusive or mixed findings	Provocative moments Experiences with dissonance in academic courses Leadership or work roles Experiences with others that prompt identity exploration & refinement Engaging & evaluating multiple perspectives Major life events Interaction with diverse others Academic, political, and current events discussions with peers or classmates Relationship challenges & difficulties

		Quality relationships with other students
Openness to diversity; commitment to promoting racial understanding; cultural awareness	Inconclusive or mixed findings of the effects of college on openness to diversity	Campus climate Perceived faculty support for diversity

Identity development (including racial/ethnic identity development)

The college years correspond to the period in which young people are actively engaged in forging an adult identity. In classical developmental theory, late adolescence/early adulthood was seen as a time of identity exploration (in occupational, political, religious, racial, and sexual domains) and ultimate commitment to a stable adult self and a set of adult roles (traditionally associated with marriage, a job, and a family). Most studies of identity development in college draw on Marcia’s (1966) theory of identity exploration and commitment and Luyckx and colleagues’ theory of identity formation (Luyckx, Goossens, & Soenens, 2006; Luyckx, Goossens, Soenens, & Beyers, 2005; Luyckx, Klimstra, Schwartz, & Duriez, 2013). Despite these identity processes co-occurring with traditional undergraduate education, there is limited evidence that college makes any unique contribution to general identity development. Studies of change *during* college show mixed results in different aspects of identity development (variably reporting gains, fluctuations, and/or declines over time) with no clear or consistent patterns or replication of results. Though students do engage in identity exploration, commitment, and reexamination during college, studies suggest multiple pathways rather than a common linear model of identity development. I found no studies with sufficient controls to show net benefits of college attendance to identity development.

In addition to studies of the effects of college on general identity development, research also explored the effects of college attendance on racial/ethnic identity development. Despite rich theory and the level of attention focused on race and identity in college, longitudinal studies generally found little change in students' racial/ethnic identity during college. What emerges is a picture of relative stability in racial identity in late adolescence/young adulthood. The majority of studies did not sufficiently control for selection into college, so there is no existing evidence base that attending college itself influences the development of one's racial identity relative to other settings. In reviewing evidence from the 2000s, Mayhew et al. (2016) concluded, "no studies of acceptable rigor convince us of a net effect of college on racial and ethnic identity development" (p. 237). Evidence is likewise sparse on between-college differences in racial/ethnic identity development. In the review by Mayhew et al., studies examining conditional effects of college on racial/ethnic identity were rare (two studies) and had small samples. While mean-level changes during college generally failed to reach significance, there was evidence of significant individual-level change for some students.

Despite the lack of evidence of net effects and between-college effects on identity development, there is compelling evidence *within* colleges that some students experience significant change in identity over time, and particularly in relation to racial/ethnic identity development. Some of these changes are associated with differences in students' exposure to particular kinds of experiences in college. For example, in both cross-sectional (Hurtado, Ruiz, & Guillermo-Wann, 2011) and longitudinal studies (Ford & Malaney, 2012; Nagda, Gurin, Sorensen, & Zuniga, 2009), researchers found that intergroup dialogue had positive effects on ethnic identity development.

Self-Authorship

The Association of American Colleges and Universities (2007), in its report on *College Learning for the New Global Century*, lays out the challenge of preparing young people for an era marked by a “dizzying pace of change and the unabated prospects for social and environmental disruption” (p. 23). The report calls on liberal arts institutions to support students in developing “sources of inner fortitude, self-knowledge, and personal renewal” and “taking time for reflection on one’s own values” (p. 23). To what extent is there evidence that liberal arts education currently contributes to these capacities?

The most relevant body of research here may be the work on self-authorship. The self-authorship framework posits that developing the “internal capacity to define one’s beliefs, identity, and social relations” (Baxter Magolda, 2008) allows one to navigate the complexity of adult life, form a coherent identity, and engage in authentic relationships with others (Kegan, 1994). Development of self-authorship is thought to entail moving from a simplistic view of the world to an appreciation of its complexity and ambiguity, and from a reliance on external sources for guidance to an increasing trust of one’s own inner resources to make meaning. Qualitative longitudinal studies have found that movement toward self-authorship often begins during one’s 20s, corresponding with the traditional undergraduate years. Baxter Magolda, King, Taylor, & Wakefield (2012) noted a pattern in the Wabash National Study data of students relying less over time on external sources to understand the world (i.e., to make meaning of one’s own beliefs, identity, and relationships). Some students shifted to relying more on internal sources rather than external authorities for meaning making, though students did not tend to achieve self-authorship during college. Nonetheless, most students (63%) in the Wabash

qualitative study engaged in more nuanced and complex meaning making over time, moving away from relying on simplistic black/white judgments (Baxter Magolda et al., 2012).

Across college studies, researchers found that experiences and relationships that caused students to question their prior assumptions were instrumental in moving them toward self-authorship. Experiences of dissonance—or “provocative moments” (Pizzolato, 2005)—were also important catalysts to self-authorship. This could take the form of college courses that required students to explore a topic from different (conflicting) perspectives or defend taken-for-granted beliefs, or social interactions with roommates or peers that contradicted one’s preconceptions about particular social groups (Barber et al., 2013; Baxter Magolda et al., 2012). Some students of color who experienced identity threats in college—i.e., conflict between their social identities and the cultural norms of the institution or others’ perceptions of them—were able to use these experiences to move toward self-authorship (Abes & Jones, 2004; Pizzolato, Nguyen, Johnston, & Wang, 2012; Torres & Hernandez, 2007). However, researchers found this was only true for students with good coping skills (Pizzolato, 2004) or “volitional efficacy,” i.e., belief in one’s own ability to persist despite obstacles (Pizzolato, 2005).⁵

Socially Responsible Leadership

The aims of liberal arts education include (among others) teamwork and problem solving, civic knowledge and engagement, intercultural knowledge and competence, and ethical reasoning and action. Liberal arts institutions want to produce college graduates who take

⁵ Separate work on stereotype threat has found that identity threats can also have a depressive effect on students’ academic performance and otherwise undermine students’ success or persistence in college. See, for example, Cohen & Garcia, 2008; Good, Aronson, & Inzlicht, 2003; Murphy & Zirkel, 2015; Steele, 1997; Steele & Aronson, 1995.

“personal and social responsibility...anchored through active involvement with diverse communities and real-world challenges” (Association of American Colleges & Universities, 2011). These desirable outcomes are resonant with the social change model of leadership developed by UCLA’s Higher Education Research Institute (Tyree, 1998). In contrast to an “industrial” command-and-control model of a single powerful leader, the social change model of leadership was developed for use with college students and emphasizes social responsibility and working toward a common good. To be a good leader in the social change paradigm requires a high level of “self-knowledge and capacity to engage others in collaborative work” (Dugan, 2006, p. 219). The seven dimensions of leadership in the social change model—collaboration, common purpose, controversy with civility, consciousness of self, congruence, commitment, and citizenship—generally mirror the kinds of noncognitive outcomes liberal arts education aspires to foster. Much of the research on leadership development in college reviewed here used the Socially Responsible Leadership Scale (SRLS) to assess leadership skills.

Undergraduate education does seem to contribute to leadership development as defined by the SRLS. Evidence of change during college comes from two longitudinal national studies, using self-reported measures; the general conclusion is that, on average, students’ leadership skills increase over the course of their college careers. For example, O’Neill (2012) found change in self-reported leadership skills (socially responsible leadership) of approximately .37 of a standard deviation from the first to fourth year of college. Several studies found gender differences in leadership development, though these varied by construct/dimension. Sax (2008) found men had stronger growth in leadership orientation than did women, where Shim (2013) found that only women showed growth in consciousness of self and in the ability to adapt to change. Effect sizes of between-college differences were quite small compared to within-college

differences, with differences in the growth of leadership skills favoring smaller colleges over large ones (Sax, 2008), and favoring women's colleges (Renn, 2012) and work colleges⁶ over liberal arts colleges or regional colleges (differences in the range of .34 to .46 of a standard deviation) (Wolniak & Pascarella, 2007).

Several between- and within-college studies found that close faculty interactions, opportunities for mentoring (Campbell, Smith, Dugan, & Komives, 2012), sociocultural conversations with peers (Dugan, Kodama, & Gebhardt, 2012), and exposure to diverse others, particularly high-quality opportunities for intergroup dialogue (Parker & Pascarella, 2013), were particularly predictive of leadership development. Frequent engagement with diverse peers produced the largest positive effects on leadership skills (Bowman, 2013). Using longitudinal data from the 2004 and 2007 College Students' Beliefs and Values (CSBV) surveys (n=14,527 in 136 institutions), Park & Millora (2012) tested the role of "frequent, extended, or intentional times spent in reflection" in developing leadership. Of 30 variables related to students' college experiences, the two most strongly related to higher levels of leadership were engaging in self-reflection and taking courses that included reflective writing/journaling. The study authors posited that "reflection gives individuals the time and space to clarify their values and assess their priorities in relationship to themselves and to others," which in turn "positively influences leadership development" (Park & Millora, p. 236).

Liberal arts education, specifically, has been shown to have positive effects on leadership development across multiple studies. In a pilot study of the Wabash National Study, liberal arts

⁶ Work colleges are "an exceptional group of four-year, degree-granting, liberal arts institutions that engage students in the purposeful integration of work, learning and service. Unique to work colleges is the requirement that all resident students participate in a comprehensive-work-learning service program for all four years of enrollment. Therefore, all resident students have jobs" that give them work experience, build their sense of responsibility, and reduce the cost of their education (Work Colleges Consortium, 2018).

experiences (assessed with a holistic measure) had a positive effect on socially responsible leadership (Seifert et al., 2008), with significant relationships to each of eight subscales with a magnitude between .21 and .39 of a standard deviation. This finding was confirmed in longitudinal data from the full study, where hallmarks of liberal arts instruction—academic challenge, high expectations, reflective learning, active and collaborative learning, and integrative learning—were associated with positive effects on socially responsible leadership (.20 to .29 SD) (O’Neill, 2012).

Commitment or Openness to Diversity

Another area in which liberal arts education has been found to contribute to noncognitive development is in students’ openness or commitment to diversity. Strong evidence comes from a three-year longitudinal study following a representative sample of roughly 1,000 students in 16 colleges and universities using data from the National Study of Student Learning (NSSL) (Pascarella, Wolniak, Seifert, Cruce, & Blaich, 2005). Looking at relationships among institutional types (liberal arts colleges, research universities, and regional colleges), good instructional practice in undergraduate education, and personal development outcomes, researchers found that liberal arts colleges had a particularly strong effect on students’ openness to diversity. This effect was mediated through good practices—related to student-faculty contact, cooperative learning, active learning, prompt feedback, high academic expectations, quality of teaching, influential interactions among students in and out of class, and a supportive campus environment—that differentiated liberal arts colleges from other types of institutions. Findings were consistent regardless of the level of institutional selectivity or average academic ability of students.

Researchers in the NSSL study did not find any conditional effects by race, gender, achievement level, or parental education, suggesting that liberal arts education had a general positive effect on openness to diversity across student subgroups, though there were clear individual differences (Pascarella et al., 2005). [In a separate study using NSSL data, researchers also found no difference in the development of openness to diversity between first-generation students and students whose parents had attended college (Pascarella, Pierson, Wolniak, & Terenzini, 2004).] Interestingly, most of the total change in students' openness to diversity happened within their freshman year, though on average students continued to become more open in subsequent years. While there were measured differences in the incoming levels of openness to diversity that liberal arts students brought with them to college relative to their peers in research universities and regional colleges, the net effect of attending a liberal arts institution was to further increase this difference (Pascarella et al., 2005).

In a separate study utilizing data from the Wabash National Study, Seifert et al. (2008) found that liberal arts experiences (measured holistically) had a net positive effect on multiple liberal arts outcomes, including openness to diversity/challenge (.43 SD) and intercultural effectiveness (.14 SD). Similarly, in an ambitious study of the impact of college on students' cognitive and noncognitive development utilizing a large, longitudinal data set, Astin (1993) determined that college environments with a "Humanities Orientation" were positively associated with students' commitment to promoting racial understanding. Other institutional variables associated with increased racial understanding included having discussions about race, socializing with people of different races/ethnicities, taking ethnic studies courses, taking foreign language courses, and attending cultural awareness workshops. Having a more diverse student body had indirect effects on students' understanding of people from diverse backgrounds and

openness to diversity via increased cross-racial interactions and friendships (Chang, Astin, & Kim, 2004; Fischer, 2011; Pike, Kuh, & Gonyea, 2007; Sáenz, 2010). The general level of cross-racial interactions and peer racial attitudes on campus were also related to students' growth in openness to diversity (Chang, Denson, Sáenz, & Misa, 2006).

Summary of the Research Evidence on Noncognitive Outcomes

Across all the potential personal and social competencies that might be the products of a liberal arts education, this review focused on four noncognitive outcomes: identity development, self-authorship, socially responsible leadership, and openness to diversity. Table I draws from Mayhew et al.'s (2016) extensive review of *How College Affects Students* to summarize the general conclusions to date about the effects of college on these four noncognitive variables and the institutional characteristics or individual experiences that are significantly related to these outcomes. Nonetheless, the general state of evidence on noncognitive outcomes of liberal arts education is sparse, and much of the existing research is inconclusive. Too few studies look specifically at the effects of liberal arts education.

Across studies of noncognitive constructs, several clear patterns emerge that have implications for both research and practice. The first is that there seems to be a wide range of individual differences in noncognitive development: where mean effects may be small or null, some individuals experience significant growth and development during their college years. The second is that there are generally much larger within-college differences than between-college differences in the extent to which students report significant personal development. This pattern points to the critical importance of *individual opportunities and experiences* during college, which currently appear to be unequally distributed. These points are explored further below.

Realizing the Potential of Liberal Arts Education for Fostering Noncognitive

Development: Notes on a Research and Practice Agenda

The final section of this essay is devoted to the question of how liberal arts programs and colleges might better focus efforts on the intentional noncognitive development of a diverse population of students, and the role of research in understanding these efforts. To take up these questions, it is helpful to begin with a basic truth: human development is situated in the interplay between individuals and their environment—inclusive of people, artifacts, social systems, and the natural world. Development is the product of nature *and* nurture: experiences and relationships shape our behavior and affect our neural circuitry and gene expression (Cantor, Osher, Berg, Steyer, & Rose, 2017; Ridley, 2003), contributing to our social, emotional, and cognitive development, and we in turn shape the world. As such, college students will realize their innate potential—or retard their development—through their interactions with others and the institutional and social environments they inhabit. Thus, while we have seen only limited evidence of what liberal arts education *does* contribute to noncognitive development, the more important question might ask what liberal arts education *potentially could* contribute to noncognitive development if college faculty and staff focused on that goal and college environments were designed for that purpose.

Across a wide variety of studies from 1990 to the present, researchers consistently noted specific features of students' college experience as important for noncognitive development. These included: close interaction with supportive faculty; mentoring; engagement with peers; exposure to new or different ideas, people, beliefs, and perspectives, including opportunities for intergroup dialogue; engagement in co-curricular activities, including service

learning or volunteer activities; and other “developmentally effective experiences” (as described by King, Baxter Magolda, Barber, Brown, & Lindsay, 2009). Diversity experiences were particularly important to students’ leadership development and complex thinking, and these effects seemed to persist beyond college.

One of the most critical kinds of experiences that a liberal arts education can provide to students is the opportunity to *encounter* new things (Farrington, 2017; Nagaoka, Farrington, Ehrlich, & Heath, 2015). While the research reviewed earlier generally showed that college attendance often had small or null main effects on noncognitive development, there was much variability *within* colleges on any given outcome. A consistent finding across the research was that exposure to diverse peers, engaging in new ways of thinking, taking on new roles and responsibilities, and navigating novel situations were all associated with student learning and development. Opportunities for dialogue across racial and cultural groups appeared to be a particularly impactful practice in developing leadership skills, positive racial/ethnic identity, and openness to diversity. College students develop more complex adult identities, more open attitudes on racial/ethnic diversity, and better leadership skills by interacting with new people, ideas, perspective, and roles.

In conjunction with opportunities for new encounters, liberal arts education can provide students with rich opportunities for *reflection*. The four noncognitive outcomes reviewed here (identity development, self-authorship, socially responsible leadership, openness to diversity) require active reflection on oneself and one’s relationship with others. Reflection allows students to make meaning of experience and to build and rebuild their understanding of the world (Baxter Magolda, 2008; Kegan, 1994; Farrington, 2017; Nagaoka, Farrington, Ehrlich, & Heath, 2015).

Liberal arts colleges and programs can also intentionally provide students with opportunities to foster close relationships with others in the campus community. Across studies, students who had mentors and/or close relationships with peers, faculty, or other college staff tended to see beneficial effects on their noncognitive development (Campbell, Smith, Dugan, & Komives, 2012; Komives, Owen, Longerbeam, Mainella, & Osteen, 2005; Renn & Bilodeau, 2005).

In addition to creating opportunities for developmental experiences, colleges and universities can substantially shape the ways young people interpret their environments at critical junctures. Drawing from the mindset intervention research reviewed earlier, we see that college faculty and staff have many high-leverage opportunities to shape students' mindsets throughout their undergraduate experience. Moments of transition or difficulty are particularly important points for intervention, as the meaning students make of critical experiences could have lasting recursive effects. Key opportunities to mediate students' meaning-making include: admissions notifications when students are first informed that they have been accepted into the college or university; the first few weeks on campus as students get oriented and build first impressions; and whenever colleges have to communicate unwelcome news regarding students' academic performance, disciplinary infractions, financial support, or other setbacks in the college journey (College Transition Collaborative, 2018). Social psychologists and others have been actively testing out how different kinds of messages or experiences can shape students' construals of events and in turn contribute to their overall psychological well-being and academic performance.

The influence of liberal arts education on students' development depends in part, of course, on how the liberal arts, how college in general, and how particular subgroups of students are

situated in the broader contexts of society and time, as well as where individual students are situated in socio-economic structures relative to their peers. As numerous observers have pointed out, the value of a liberal arts education comes under increased scrutiny in times of economic uncertainty and a weak job market (Bradburn & Fuqua, n.d.; Labaree, 2017; Nussbaum, 2010). The broader social framing of the liberal arts affects how young people understand the world, the extent to which they view college in merely utilitarian terms, and, no doubt, their choices about which colleges to apply to and attend, and what program of study they decide to pursue. In addition to the kinds of work in higher education currently pursued by mindset scholars⁷ and other social scientists, future research could dig more deeply into the impact of implicit or explicit messages salient to college contexts. These might focus on notions of meritocracy and deservingness, academic achievement as a competitive zero-sum game, or the aims of education (e.g., job training versus pursuing social purpose; education as a private versus public good) and how these messages might have differential impacts on students by race/ethnicity, socioeconomic status, or first-generation status.

Research going forward would benefit substantially from longitudinal, multi-institutional studies of young people into, through, and beyond college. Almost all of what we know currently about the effects of liberal arts education on noncognitive outcomes comes from earlier longitudinal studies (e.g., NSSL, Wabash National Study). But much can also be learned by going in the opposite direction. Small, local studies of college courses and programs co-developed by teams of faculty instructors and developmental researchers, collecting qualitative and quantitative data to understand both students' subjective experiences and the impact on objective outcomes,

⁷ The Mindset Scholars Network website (mindsetscholarsnetwork.org) is a good source for current research in higher education and K–12 settings.

could shed further light on the “active ingredients” of any given course or program in supporting broader student development. Research utilizing improvement science methodologies, such as those employed by the Carnegie Foundation in their Math Pathways initiative focused on first-year developmental math,⁸ provides a good model for future work of this kind (Huang, 2018). College courses or programs developed and scaled up through improvement networks could then be tested more broadly with experimental designs.

The field of noncognitive research is hampered by the difficulty of reliably and accurately measuring the noncognitive constructs that are the focus of development efforts. Self-report surveys are the most frequent mode of assessment, though their limitations have been well documented (Duckworth & Yeager, 2015). Future research can follow two paths to circumvent these limitations. One is laid out by much of the experimental mindset intervention research, which targets a specific noncognitive construct (e.g., belonging uncertainty or latent theories of intelligence) hypothesized to suppress or enhance the academic performance or college persistence of a particular social subgroup in a specific context. If a well-designed intervention is effective, i.e., if members of the social subgroup in the treatment condition outperform their peers in the control condition, that is taken as evidence that the hypothesis was correct—without ever directly measuring the targeted construct.

The second path is to conduct research that shifts away from individual-level measures of noncognitive competencies (whether as incoming predictors of achievement or as outcomes of liberal arts education) and focuses instead on developing measures of learning settings, developmental experiences, and the conditions they afford for student growth and development. A whole line of research could focus on documenting the opportunities students

⁸ See carnegiemathpathways.org for more information.

have to engage in developmental experiences; how those opportunities vary by student, micro-context (e.g., classrooms, student dorms, dining facilities, co-curricular activities, sports fields), and by institutional characteristics; and how students prioritize or make sense of these experiences in light of their overall goals and values. Mixed methods research to measure environments and opportunities, understand students' subjective experiences and choices, and assess long-run impacts on development could make major contributions to both basic research and direct practice.

In summary, we see that liberal arts education does not automatically produce beneficial noncognitive outcomes for college students. Instead, students develop noncognitive competencies when they are engaged in meaningful work, feel connected to the people around them, and are able to discover passion and purpose for their lives (Farrington et al., 2012). College students benefit from meaningful interactions with diverse peers; support and challenge from faculty members; grappling with conflicting perspectives; reflecting on the origins of one's own values and beliefs; mentoring by faculty and staff; and opportunities to exercise leadership. By attending to the research on social, emotional, and cognitive development, liberal arts educators can intentionally design courses and programs that create the conditions and provide the opportunities for young people to bring forth the best of what is within them.

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