A Psychological Approach to Human Capital

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Harrison J. Kell
Steven B. Robbins
Rong Su
Meghan Brenneman

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The concept of human capital originated in economics over 200 years ago. The current paper takes a novel approach to human capital by interpreting it from a psychological perspective. We divide human capital into 2 domains: traditional and nontraditional. The traditional domain consists of the constructs that have been historically classified as human capital: the cognitive skills and knowledge associated with educational success and measured by high-stakes tests. The nontraditional domain consists of constructs that have not historically been associated with human capital: personality traits, vocational interests, and psychosocial and academic-related factors. Both traditional and nontraditional human capitals are important predictors of school and work success. However, science is concerned with developing explanations in addition to making accurate predictions, and we move beyond a descriptive taxonomy of human capital constructs by providing a psychological process-based account of human capital grounded in the cognitive–affective processing system (CAPS) developed by Mischel and Shoda. To practically illustrate the power of this approach for explaining how human capital is manifested in individuals’ actions, we offer a CAPS-based model of student help-seeking behavior—a type of behavior that is an important facilitator of positive educational outcomes.

Keywords Human capital; cognitive skills; personality; predictors of school and work success

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Education is seen by many people in the United States as the gateway to the American Dream (Samuel, 2012). To some extent, these beliefs are correct, as educational attainment is associated with a wide variety of positive outcomes, including lifetime earnings, health, civic engagement, marital satisfaction, and longevity (Barro & Lee, 2001). Despite the American emphasis on education, some of the associated statistics are discouraging: Only 30% of Americans attain a 4-year degree (U.S. Census Bureau, 2012), the average 6-year graduation rate is 53% (Carey, 2004), and over 40% of incoming college students fail their first year. These statistics are intrinsically concerning, but are even more so in an age that heavily emphasizes the knowledge, skills, and abilities often attributed to postsecondary education, which is now virtually a prerequisite for obtaining many well-paying jobs that have high growth potential and are resistant to outsourcing (Friedman, 2007). For Americans to be able to function effectively in the current working world, both within the United States and abroad, more attention must be given to enhancing educational outcomes for all people (Robbins, Le, & Lauver, 2005).

There are two major perspectives on why some students succeed and others fail. Although the two perspectives are not necessarily antagonistic, research and practice often tend to focus on one or the other. The first perspective attributes student outcomes primarily to influences external to students, such as family, community, social network, and institutional (e.g., school-level) variables. This point of view largely originates in sociology and education and can be characterized as the social capital perspective (Mouw, 2006; Putnam, 2000; Rothstein & Stolle, 2008; Sanders & Nee, 1996). The second philosophy emerged from economics and psychology and prioritizes internal resources in explaining students’ outcomes. This point of view focuses on the characteristics of the students themselves (e.g., interests, knowledge, personality traits, skills) as the determinants of their outcomes, rather than the environments that surround them. It is this human capital perspective (Becker, 1964; Kiker, 1966; Lubinski, 2000) that this paper addresses.

This paper has several purposes. The first is to articulate a human capital taxonomy that is grounded in psychological constructs. We do this by defining human capital in terms of several well-studied psychological domains. For each domain, we review research evidence supporting its inclusion in the human capital framework by virtue of its association with important educational and occupational outcomes. The second purpose is to move beyond a descriptive account of human capital to an explanatory one. We do this by linking our psychological human capital taxonomy to Mischel and Shoda’s...
cognitive–affective processing system (CAPS; Mischel & Shoda, 1995, 2008), a metatheory that enables us to provide a process-based account that explains how these domains are manifested at the level of the individual. The final purpose of the paper is to provide a concrete illustration of the practical power of this CAPS-based perspective on human capital by providing a CAPS-based account of help-seeking, an important type of behavior that is linked to valuable educational outcomes. By offering a psychological explanation of a concept that originates in economics, our paper complements recent attempts in economics to demonstrate the financial importance of various psychological constructs (e.g., Heckman, 2011; Heckman & Kautz, 2012, 2013).

Human Capital Perspective

The human capital orientation focuses on the internal resources that facilitate individuals’ success. Originating in economics, the concept has deep historical roots (cf. Kiker, 1966). In The Wealth of Nations, Smith (2005) discussed human capital as

the acquired and useful abilities of all the inhabitants or members of the society. The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expense, which is a capital fixed and realized, as it were, in his person. Those talents, as they make a part of his fortune, so do they likewise that of the society to which he belongs. (p. 227)

Major modern developments of the idea were initiated by Mincer (1958) and Becker (1964), who specified that human capital consists of the knowledge, skills, and competencies that lead an individual to greater workforce productivity. Schooling is typically considered the most important investment in human capital because through it individuals acquire skills and knowledge that increase their productivity which, in turn, leads to increased earnings over the lifetime, a major component of extrinsic career success (Judge, Higgins, Thoresen, & Barrick, 1999).

Human capital underscores the economic value of education in its most basic sense: the receipt of systematic instruction. Indeed, emphasizing the economic value of education was an initial impetus for the formulation of the human capital concept (Kiker, 1966), long before the advent of compulsory public education. The emergence of the knowledge economy in the latter half of the 20th century (Powell & Snellman, 2004) has only more intimately tied the acquisition of human capital to institutionalized education, specifically of the postsecondary variety. Entrance into many high-paying, prestigious occupations (e.g., lawyer, physician, professor) requires credentials that can only be acquired after many years of schooling. Even outside normatively highly profitable jobs, economic returns to education are large, both at the individual (Hanushek & Woessmann, 2008) and national (Sianesi & Reenen, 2003) levels. Close alignment between the educational and occupational domains is also evidenced by the fact that many of the psychological variables that predict academic success also predict occupational success (Credé & Kuncel, 2008; Jensen, 1998a; Lubinski & Benbow, 2006; Roberts et al., 2007). This substantial overlap, combined with the necessity of obtaining educational credentials for many (although certainly not all) relatively well-paying, secure jobs in the modern economy, leads us to consider human capital as consisting of psychological attributes that are associated with occupational or educational success, as it is very often the case that those same attributes are associated with occupational and educational success.

Major Varieties of Human Capital

We divide human capital into two major types: traditional and nontraditional. Traditional human capital consists of variables that have long been used to predict educational success since the beginning of the 20th century. Many of these variables are also associated with vocational success. Nontraditional human capital consists of psychological attributes that have (re)emerged as predictors of educational and occupational success only in the past few decades.

Traditional Human Capital

The longest-established form of human capital is cognitive skill, or the ability to learn (Snow, 1989, p. 22). The ability to learn comprises many complex processes and components acting in unison, including induction, deduction, abstraction, and working memory (Carpenter, Just, & Shell, 1990; Carroll, 1993; Snow, 1989; Whitely, 1983). Cognitive skill has
been assessed using individual-based (e.g., Stanford-Binet, Wechsler Adult Intelligence Scale [WAIS]) and group-based (e.g., ACT, SAT®) standardized tests since the early 20th century, when those tests were developed to identify children with learning disabilities (Thorndike & Lohman, 1990). Numerous primary studies (Benbow, 1992; Benbow, Lubinski, Shea, & Eftekhar-Sanjani, 2000; Judge et al., 1999; Kell, Lubinski, & Benbow, 2013; Lubinski, Benbow, & Kell, 2014) and meta-analytic studies (Kuncel & Hezlett, 2007; Kuncel, Hezlett, & Ones, 2004; Ng, Eby, Sorensen, & Feldman, 2005; Robbins et al., 2004; Schmidt & Hunter, 1998) demonstrate the sizable association between cognitive skills and important outcomes: educational (e.g., college grade point average [GPA], highest degree earned, retention) and occupational (e.g., creative accomplishments, income, job prestige).

Although there is strong evidence for the presence of a general component of cognitive skill (Jensen, 1998a), narrower cognitive skills tied to specific content areas (e.g., mathematical, verbal, visuospatial) are also important (Carroll, 1993; Major, Johnson, & Bouchard, 2011). The average correlation between scores on tests of specific cognitive skills is .3 (Carroll, 1993), leaving substantial room for intrapersonal variation. Research findings indicate this intrapersonal variation has important practical implications. For instance, individuals with stronger verbal than visuospatial skills tend to pursue degrees, careers, and creative achievements in the arts and humanities, whereas those with stronger visuospatial than verbal skills focus their energies in science, technology, engineering, and mathematics (STEM; Coyle & Pillow, 2008; Coyle, Purcell, Snyder, & Richmond, 2014; Kell, Lubinski, Benbow, & Steiger, 2013; Wai, Lubinski, & Benbow, 2009).

Knowledge acquired through one’s application of ability (i.e., crystallized intelligence; Ackerman, 1996; Cattell, 1943) to learn constitutes a second form of traditional human capital; variables that draw on specific types of content knowledge are frequently used to predict educational and vocational success. High school GPA is associated with many important college outcomes (Robbins et al., 2004), as are topic-specific Advanced Placement® tests (Morgan & Ramist, 1998) and SAT Subject Tests™ (Humphreys, 1986). Scores on measures of this kind are strongly associated with cognitive skills (Bleske-Rechek, Lubinski, & Benbow, 2004). In turn, scores on some of these measures have been directly linked to performance on the job (e.g., college GPA; Roth, BeVier, Switzer III, & Schippmann, 1996).

Nontraditional Human Capital

The importance of psychological characteristics beyond cognitive skill for educational and occupational success has been recognized at least since the imposition of mandatory elementary education in the United States (e.g., Drought, 1938; Flemming, 1932; May, 1923; Pressey, 1920; Rugg, 1920; Spearman, 1927; Webb, 1915). In the first half of the 20th century, a wide variety of noncognitive attributes were investigated as predictors of academic accomplishment, including personality (often under the label character traits), interests, motivation, and study habits. For extensive reviews of this early literature, see Harris (1940), Himmelweit (1950), Lord (1950), and Wolf (1938). Indeed, no less than Henry Chauncey, president and founder of Educational Testing Service (ETS), once noted: “Probably little further improvement in the prediction of college success can be expected until reasonably valid and reliable measures of such personal qualities have been devised” (Chauncey & Frederiksen, 1951, p. 93). Less interested were those in business and government, who were unsupportive of these measures of noncognitive skill (Lemann, 1999). Around the same time, Guion and Gottier’s (1965) influential review showed minimal associations between personality and job performance. A few years later, Mischel’s (1968) critique led to a decades-long debate about the existence and practical importance of personality traits. Recognition of the practical significance of noncognitive variables generally did not begin to revive until the late 1980s and early 1990s (Comer, 1993; Guion, 1987), partially driven by the developing consensus on the Big Five as a unifying personality model (Goldberg, 1993). Interest in noncognitive skills has experienced an especially strong resurgence in the last 10–15 years (e.g., Duckworth & Seligman, 2005; Heckman, 2011; Heckman & Kautz, 2012, 2013).

We divide the nontraditional (i.e., noncognitive) human capital realm into three domains. The first two domains are broad and derived from the major divisions in differential psychology (Lubinski, 2000): personality traits and vocational interests. The third domain, relative to personality and interests, is narrow in that it is composed of psychosocial and academic-related factors (PSFs) that are specifically tied to student performance. We are explicit in aligning traditional human capital with cognitive skills and nontraditional human capital with noncognitive skills, but adding the human capital label introduces important divisions and subtleties into these domains.

The term, human capital, automatically confers recognition of practical value on the constructs to which it is applied because it is explicitly tied to real-world outcomes (i.e., economic, educational). Thus, a construct may belong to the domain of cognitive or noncognitive skills but not constitute a form of human capital because its manifestation has a
low probability of yielding positive educational or economic results (e.g., encyclopedic knowledge of medieval witchcraft treatises); the human capital label is intended to signal real-world relevance, negating the criticism of triviality sometimes leveled at psychological constructs (e.g., Jenkins, 1980; Kline, 1988; Mitchell, 2012). Making the application of the human capital label contingent on a construct’s reliable association with educational and economic ends also underscores the need to carefully consider the context in which these constructs—which are sometimes treated as universal (e.g., Jensen, 1998a; McCrae & Terracciano, 2005)—are being studied. A construct that counts as human capital in many Western countries may not constitute human capital in others, not because of some fundamental cross-cultural difference in the construct itself, but simply because it has educational or economic value in one culture, country, or region but not another. Similarly, a body of knowledge and skills not currently educationally or economically valuable could become so in the future; proficiency in video games was once considered useless, even harmful (Cravenson, 1982; Newman, 2017), but now some colleges award scholarships based on it (Diluna, 2017), and millions can be earned in gaming tournaments (Tucker, 2015). By the same token, knowledge and skills that are currently valuable will likely not always be so. For example, the Industrial Revolution rendered hand-weaving skill economically marginal (Hobsbawm, 1963), and many occupations that once provided a livable wage have long been all but extinct (e.g., cooper, ice cutter, knocker-up, switchboard operator, tanner, wheelwright). Thus, even if some constructs turn out to be truly invariant across time and place, their status as human capital will not be.

**Personality Traits**

Consensus emerged in the late 1980s and early 1990s that human personality differences can be summarized using five broad traits: extraversion, conscientiousness, openness to experience, neuroticism, and agreeableness (Goldberg, 1993). The Big Five have a long past but a short history, as they were first identified by Thurstone (1934), but are identifiable in Webb’s (1915) data, as noted by Deary (1996). Recognition of the theoretical status of the Big Five brought with it the realization of the taxonomy’s practical usefulness for organizing past research findings that attempted to link personality traits and real-world outcomes.

As noted previously, at midcentury, the prospect of personality traits being treated as viable predictors of academic performance was grim. Indeed, in the mid-1960s, the College Board explicitly rejected the use of personality measures for predicting educational outcomes (College Board, 1963; Kendrick, 1964). After the advent of the Big Five, however, many empirical studies demonstrated the utility of personality for predicting important educational results (e.g., Furnham, Chamorro-Premuzic, & McDougall, 2002; Higgins, Peterson, Pihl, & Lee, 2007). Poropat’s (2009) massive meta-analysis confirmed the importance of the Big Five personality traits for predicting academic performance, particularly conscientiousness. Importantly, many of the Big Five were shown to be largely independent of cognitive skills.

As late as 1989, it was stated without qualification that ”[a]n established tenet within the field of I/O [Industrial/Organizational] psychology is that individual personality variables are relatively poor predictors of job performance” (Day & Silverman, 1989, p. 25). Two years later, the situation was entirely different, and the Big Five had been definitively linked to job performance through two influential meta-analyses (Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991). Since then, many primary studies (e.g., Borman, White, & Dorsey, 1995; Borman, White, Pulakos, & Oppler, 1991; Crook et al., 2011; Hough, Eaton, Dunnette, Kamp, & McCloy, 1990; Judge et al., 1999; Kamdar & Van Dyne, 2007; Kell, Motowidlo, Martin, Stotts, & Moreno, 2014) and meta-analyses (e.g., Chiaburu, Oh, Berry, Li, & Gardner, 2011; Huang, Ryan, Zabel, & Palmer, 2014; Hurtz & Donovan, 2000; Ng et al., 2005; Roberts et al., 2007; Salgado, 1997; Schmidt & Hunter, 1998) have linked personality traits to important work-related outcomes, including contextual performance and organizational citizenship behavior, adaptive performance, income, counterproductive work behavior, number of promotions, overall job performance, and job prestige.

**Vocational Interests**

Career interests (Holland, 1997) are crucial for success in education and in the workforce. Interests serve as the impetus for individuals to navigate and function effectively in educational and work environments (Su, Rounds, & Armstrong, 2009). Mature interest formation is critical to informed career decision-making and to the match between an individual’s measured interests and corresponding education and career choices. In educational contexts, interests function as a motivational force that promotes a love of learning and sustains activities necessary for knowledge acquisition. Interests
promote dedicated and committed action, including graduating high school and pursuing a postsecondary education. Furthermore, interests drive individuals to be engaged and persist in work in such a way that promotes job performance and career success (Nye, Su, Rounds, & Drasgow, 2012; Su, 2012). Several recent studies highlighted the necessity of understanding the role of interests for academic and career success. Nye et al. (2012) reviewed over 60 studies spanning the past 70 years and found interests to be important predictors of academic achievement, including GPA and persistence in school, as well as job performance and job tenure. With an analysis of the Project Talent longitudinal data set, a study on the educational, occupational, and personal developments of over 440,000 students from over 1,300 schools across the nation, Su (2012) showed that interests provide incremental validity over cognitive ability and personality factors for predicting academic performance, degree attainment, and career success, as indicated by occupational prestige and income. In many cases, the contribution of interests is as important as, or more important than, that of personality factors. Interests turned out to be the strongest predictor of these participants’ income 11 years after their high school graduation, accounting for four times the amount of variance explained by cognitive ability and personality combined. Congruence between vocational interests and educational major is associated with persistence (Le, Robbins, & Westrick, 2014), timely degree attainment (Allen & Robbins, 2010), and GPA (Tracey & Robbins, 2006). Congruence between vocational interests and occupation is associated with income and tenure (Neumann, Olitsky, & Robbins, 2009; Strong Jr., 1955).

**Psychosocial and Academic-Related Factors**

Robbins and colleagues (Casillas et al., 2012; Le, Casillas, Robbins, & Langley, 2005; Robbins et al., 2004) derived 10 PSFs (see Table 1) by integrating diverse literatures variously treating motivation, skills, and persistence in models of educational success. Although the 10 PSFs loaded on three higher-order factors (motivation and academic skills, social engagement, self-management), the researchers argued that retaining the narrower dimensions would be most beneficial for predicting academic outcomes and designing interventions (Robbins, Allen, Casillas, Peterson, & Le, 2006), as aggregation of facet-level measures to higher levels of dimensionality can obscure relationships among lower-level constructs (Paunonen, 1998; Paunonen & Ashton, 2001). A subsequent study bore out this conclusion (Peterson, Casillas, & Robbins, 2006), as many of the PSFs were shown to be meaningfully related to the Big Five personality traits but predicted college GPA better than those broad traits. Subsequent research has demonstrated the 10 PSFs to be associated both directly and indirectly with a wide range of educational outcomes, including success in specific courses, retention, degree attainment, GPA, and use of academic services and resources (Allen, Robbins, Casillas, & Oh, 2008; Allen, Robbins, & Sawyer, 2009; Casillas et al., 2012; Porchea, Allen, Robbins, & Phelps, 2010; Robbins et al., 2006; Robbins, Oh, Le, & Button, 2009).

The most consistently impressive predictors of outcomes among the 10 PSFs were specific motivational measures (e.g., Academic Discipline, Commitment to College), which also evinced associations with educational criteria that were

<table>
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<tr>
<th>Factor</th>
<th>Definition</th>
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<tbody>
<tr>
<td>General determination</td>
<td>The extent to which students are dutiful, careful, and dependable</td>
</tr>
<tr>
<td>Academic discipline</td>
<td>The extent to which students value schoolwork and approach school-related tasks conscientiously</td>
</tr>
<tr>
<td>Goal striving</td>
<td>The extent to which students (a) set important goals, (b) make efforts to achieve the goals, and (c) are confident about their abilities to succeed</td>
</tr>
<tr>
<td>Commitment to college</td>
<td>The extent to which students appreciate the values of education and are committed to attaining the college degree</td>
</tr>
<tr>
<td>Study skills</td>
<td>The extent to which students know how to approach academic-related problems systematically and effectively</td>
</tr>
<tr>
<td>Communication skills</td>
<td>The extent to which students know how to handle interpersonal problems effectively and can work cooperatively with others in team or group settings</td>
</tr>
<tr>
<td>Social activity</td>
<td>The extent to which students are comfortable in becoming involved in social activities</td>
</tr>
<tr>
<td>Social connection</td>
<td>The extent to which students are involved in the college or school environments</td>
</tr>
<tr>
<td>Academic self-confidence</td>
<td>The extent to which students are confident that they can perform well in school</td>
</tr>
<tr>
<td>Emotional control</td>
<td>The extent to which students can effectively control their emotions and keep them from negatively affecting other activities</td>
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*Note.* Adapted from Le et al. (2005, p. 494).
Tests of the Human Capital Framework

We are not aware of any studies simultaneously examining all aspects of human capital reviewed above (cf. ACT, Inc., 2007). Two studies, however, have investigated the majority of them.

Allen and Robbins (2010) used a longitudinal database comprising 3,072 4-year college students from 15 institutions and 788 2-year college students from 13 institutions. They found direct effects of interest–major congruence, motivation, cognitive skills, high school GPA, gender, and socioeconomic status on first-year academic performance. They then tested the direct and indirect effects of these predictors as they worked through first-year academic performance to predict timely degree attainment. Interest–major congruence was shown to be a direct predictor of timely degree attainment, even after controlling for first-year academic performance, whereas motivation had indirect effects on timely degree attainment through first-year academic performance.

A second study examined the role several human capital elements play in predicting choice of and persistence in STEM majors (Le et al., 2014). This multilevel longitudinal study tracked the progress of over 200,000 undergraduates at 51 United States colleges. Students’ vocational interests (Holland, 1997) were assessed, in addition to their cognitive skill (operationalized by ACT score). It was hypothesized that students whose interests were more congruent with STEM majors would be more likely to choose and persist in those majors via mechanisms such as motivation, engagement, and satisfaction. As STEM majors are extremely intellectually demanding (Wai et al., 2009), a synergistic relation was also proposed between major–interest congruence and cognitive skill, such that individuals with lower ACT scores would be less likely to choose and persist in STEM majors than individuals with higher ACT scores. The investigation’s major hypotheses were supported, affirming the need to take into account multiple types of human capital (cf. Lent, Brown, & Hackett, 1994; Lubinski, 2010) to maximize the prediction of educational success.

Mechanisms for Explaining Success

The human capital constructs reviewed are important for forecasting school and work outcomes. However, science calls for explanation in addition to prediction (Bogen & Woodward, 1988; Magnusson & Torestad, 1993). Indeed, even while acknowledging the usefulness of the PSFs ATI noted the need for developing an understanding of the psychological mechanisms that underlie those PSFs, both for expanding basic knowledge and for designing interventions to enhance student success; similar calls have been made for other constructs included in our human capital taxonomy (e.g., Deary, 2000; McCabe & Fleeson, 2012). We propose that the CAPS (Mischel & Shoda, 1995, 2008) metatheory can answer these calls. CAPS can serve as a viable foundation for linking human capital to practical outcomes, designing interventions, and guiding future research. In what follows, we describe the general orientation and components of CAPS and how it can be used to explain a specific example of effective student behavior: help-seeking.

The Cognitive–Affective Processing System (CAPS) Approach

As noted previously, confidence in the trait approach to personality psychology was at a low ebb from the 1960s until the late 1980s. Although characteristic of the general zeitgeist of the time, part of this lack of confidence was due to Mischel’s (1968) comprehensive critique, a text which reviewed evidence that cross-situational consistency of behavior is nonzero but low—too low, it was concluded, to support the dispositional approach to personality as a viable depiction of real human beings. Although this was claimed by some to indicate that people had “no personalities” (Goldberg, 1993, p. 26), Mischel (1973) noted that claims such as this represented a misunderstanding of his point, which was that trait approaches do not accurately portray the complexity of human behavior, nor do they explain it. The CAPS model is an attempt to reconcile low cross-situational consistency of behavior with the belief that human beings nonetheless still have coherent, stable personalities.

CAPS (Mischel & Shoda, 1995, 2008) proposed that people’s behavior does vary greatly across situations, but that this variability itself is stable. Thus, people’s personalities can be described by reliable if … then … profiles or behavioral signatures. Even if people respond very differently to different situations, these differences are recurrent and coherent.
Table 2  Major Cognitive–Affective Units

<table>
<thead>
<tr>
<th>Unit</th>
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<tr>
<td>Encodings</td>
<td>Categorizations of the self, people, events, and situations</td>
</tr>
<tr>
<td>Expectancies and beliefs</td>
<td>Pertaining to the social world, behavioral outcomes in specific situations, and personal efficacy</td>
</tr>
<tr>
<td>Affects</td>
<td>Feelings, emotions and affective responses (including physiological)</td>
</tr>
<tr>
<td>Goals and values</td>
<td>Desirable or undesirable outcomes and their associated affective states; goals, values, and life projects</td>
</tr>
<tr>
<td>Competencies and self-regulatory plans</td>
<td>Behaviors and scripts that can be enacted; plans and strategies for affecting and organizing action, behavior, and internal states</td>
</tr>
</tbody>
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Note. Adapted from Mischel (1973); Mischel and Shoda (1995, 2008).

Although the characteristics of these behavioral responses can be aggregated (i.e., treating situational variance as measurement error) to form summaries representing people's standings on abstract traits (e.g., conscientiousness, extraversion), these aggregates can conceal enormous intrapersonal differences in how people act in different situations (Fleeson, 2001, 2004). For example, even if Person A scores higher than Person B on extraversion overall (i.e., on average), there can still be many situations in which Person B behaves in a more extraverted manner than Person A.

CAPS ventures an explanation for these coherent behavioral patterns through cognitive–affective units (CAUs). As shown in Table 2, these units actively construe, interpret, and react to situational features and themselves interact with each other to generate resultant behaviors that occur in response to situational demands. The personality system that these units comprise is not static but dynamic, uniquely organized in different individuals in ways reflective of their experiential histories and the functioning of their basic physiological structures. The influence of situations on behavior is posited to be wholly mediated by this personality system.

Interpreting Human Capital Through the Cognitive—Affective Processing System (CAPS) Approach

Narrow Versus Broad Traits

The person in context approach championed by CAPS fits well with our extended human capital framework and the findings that inform it. We suggest that the reason the 10 PSFs are related to the Big Five traits but are also better predictors of GPA (Peterson et al., 2006) is that broad trait scores conceal considerable within-person variance in behavior across situations. Students who are higher on conscientiousness on average are not necessarily more conscientious at school (i.e., academically disciplined), as there are certainly other areas of life (e.g., extracurricular activities, hobbies, sports) where they can demonstrate the behaviors characteristic of conscientiousness. That is, for some individuals, school-related contexts may activate very different CAUs than nonschool contexts. This interpretation is consistent with findings demonstrating that the intercorrelations of facet-level measures of personality traits leave substantial room for between-person variance on more narrow dimensions (Dudley, Orvis, Lebiecki, & Cortina, 2006; Trull et al., 1998), that these narrow measures are often more predictive of outcomes than broad measures (Dudley et al., 2006; Tett, Steele, & Beauregard, 2003), and that personality measurements specifying a frame of reference (e.g., at school, at work) have higher predictive validities than context-free personality assessments (e.g., Lounsbury, Sundstrom, Loveland, & Gibson, 2002; Shaffer & Postlethwaite, 2012). We view the Big Five traits as summaries of behaviors that occur in a wide variety of contexts—abstractions built up out of how people think, feel, and act in real-life situations—rather than the causes of those behaviors. In the classic terminology of MacCorquodale and Meehl (1948), this conceptualization treats the Big Five as intervening variables rather than hypothetical constructs—the end result of the dynamic interplay of many different psychological components and processes (Bartholomew, Deary, & Lawn, 2009; Deary, 2000; Horn, 1989; Strelau, 2001; Tryon, 1935; van Der Maas et al., 2006; van Der Maas, Kan, Marsman, & Stevenson, 2017; Whitely, 1983).

Emphasizing specificity over generality is preferable theoretically as well as practically. Recent attention has been devoted to the fallacies of automatically making inferences about within-person variation based solely on between-person variation and assuming that the causes of the two are the same (Borsboom, Kievit, Cervone, & Hood, 2009; Borsboom, Mellenbergh, & van Heerden, 2003, 2004; Molenaar, 2004; Voelkle, Brose, Schmiedek, & Lindenberger, 2014). For example, Person A and Person B may have identical standing on conscientiousness in general, but the former's may be
derived from scores on caution and order, whereas the latter’s may be derived from scores on achievement-striving and self-discipline. Further, even if people exhibit the same behaviors in the same situations, the causes of those behaviors may be different (i.e., equifinality). Students may demonstrate academic discipline for a wide variety of reasons, including associating good grades with getting a good job in the future, impressing peers, or parental expectations, and these differences can be represented by differences in the nature and organization of their CAUs. More narrow dimensions, either due to contextual or behavioral specificity, lend themselves more readily to explanation via psychological mechanisms, as the number of their likely causes is more limited than that of broad dimensions, which partake of many different behaviors over many different contexts. Indeed, it is at the level of specific behaviors, rather than abstract dispositions, that interventions aimed at changing personality are targeted and more likely to be successful (Hudson & Roberts, 2014; Magidson, Roberts, Collado-Rodriguez, & Lejuez, 2014; Roberts, Lejuez, Krueger, Richards, & Hill, 2014).

Human Beings as Motivated Agents

Traditional trait approaches have been criticized not only for not offering explanations for behavior, but also for portraying people largely as automata, essentially hosts for psychological variables that automatically respond to different situations and stimuli in accordance with their preprogrammed trait standings (Bandura, 2006; Mischel, 1973). McCrae and Costa (1995) objected to aspects of social–cognitive theory on the very grounds that much of human behavior is not goal directed, intentional, or otherwise motivated. We reject these views of human beings as unrealistic and unhelpful. We favor an overall approach that can be described as agentic, one that views people as volitional, purposeful, proactive, engaged, motivated, and exhibiting self-control and willpower. Agents proactively interact with, adjust to, and shape their environments to reach desired outcomes. The underlying assumption of the agentic perspective is that people can shape and influence the world around them and that each individual has the capacity to accumulate knowledge and skills, gather social and interpersonal resources, and pursue opportunities that will increase the likelihood of his or her success in life. We do not deny the reality of human variability and the fact that some can gather more of these resources or gather them more quickly or efficiently—but that does not change our contention that the normal population of the United States is capable of being successful (Bickel & Beaujean, 2005; Robbins et al., 2005). The agentic perspective is “potentialist” in that it emphasizes what people are capable of becoming (Allport, 1955; Bandura, 2006)—what people do rather than what they have or are (Cantor, 1990).

Behaviors that are typically described as agentic include creating and taking advantage of opportunities, risk-taking, assertiveness in protecting one’s rights and pursuing one’s goals, persistence in goal pursuits, and changing one’s situation to achieve a better fit with interests (Sadri, 1996). Agency is positively correlated with extraversion and conscientiousness and negatively correlated with neuroticism (Markey, 2002). These correlations are only moderate, however, and of similar magnitude to the correlations observed between the 10 PSFs and the Big Five traits. We suggest that agency must be considered in context and that different situations activate different CAUs in different people: The assertive, achievement-striving straight-A student may be nervous and lost on the sports field where the star athlete excels, but the psychological roles may be very much reversed in the classroom. Belief in one’s skills is partially grounded in the objective reality of those skills and past performance (Lubinski, 2010; White, 1959)—but that relationship is far from unity (Robbins et al., 2004).

Research supports the viability of the agentic perspective. Individuals actively seek out situations that are compatible with their characteristics and select them (Ickes, Snyder, & Garcia, 1997), and this consistency in choosing situations is partially responsible for the consistency of personality over long periods of time, as evidenced by the fact that heritability increases over time, largely as a function of the extent to which people have more freedom to choose their environments as they grow older (Scarr, 1996; Scarr & McCartney, 1983). Even when people find and choose surroundings amenable to their personal characteristics, they often further shape those surroundings to suit their needs, to the point that personality can be accurately inferred from bedrooms, offices, and websites (Gosling, Ko, Mannarelli, & Morris, 2002; Vazire & Gosling, 2004).

Robbins et al. (2009) demonstrated the importance of the agentic perspective in their meta-analytic path analysis of the effects of various interventions on college performance and retention. They tied the three major PSF types (motivation and skills, self-regulation and management, social engagement) to three psychological control mechanisms featured in the motivation/self-regulation, skill acquisition, and training literatures (Bell & Kozlowski, 2008; Kanfer & Ackerman, 1989; Kanfer & Heggestad, 1997; Kozlowski & Bell, 2006): motivational control, emotional control, and social control. The results of their analyses indicated that interventions targeting these three constructs have a positive, practical impact on
college outcomes, thus supporting the viability of agentic mechanisms (e.g., discipline/self-control, motivation, willpower) as psychological explanations for the correlation between PSFs and academic success.

To further strengthen our case for our agentic perspective, we tie it directly to the Bandura (2001, 2006) model of human agency. This framework underscores the importance of intentionality (i.e., cognition), willpower (i.e., self-control), and their interplay. The core of human agency, however, is the perception of efficacy, based on the simple principle that individuals are unlikely to carry out actions if they do not believe those actions will bring about the fulfillment of their desired goals. Although efficacy beliefs are partially founded on true skills (Lubinski, 2010; White, 1959), they possess incremental validity beyond those objectively assessed skills for predicting outcomes (Robbins et al., 2004). Thus, even if people have the skills needed to accomplish a task, if they do not believe they have those skills, they will not be motivated to even attempt the task or persist in it if they run into difficulties. Without adequate motivation and effort, even great skill will not be enough to yield adequate performance outcomes (Campbell, 1990), as has been found in studies of performance on low-stakes cognitive tests (Duckworth, Quinn, Lynam, Loeber, & Stouthamer-Loeber, 2011; Liu, Bridgeman, & Adler, 2012).

Critically, self-efficacy is held to be task or domain specific. Just like narrow trait measures, self-efficacy beliefs about many different areas can be aggregated to form a global index—but this index will obscure crucial cross-domain variation in those self-perceptions. Because people tend to select into situations and domains that are best suited to their strengths (Kell et al., 2013; Wai et al., 2009) and that they find engaging and intrinsically motivating (Le et al., 2014), treating self-efficacy globally may inaccurately portray individuals as less capable than they are in reality, by lumping in their beliefs about their skills in domains that they actively avoid with their perceptions about their skills in domains they actively pursue. As with personality measurement, this approach can have negative consequences for both prediction and explanation. If being a monomaniac in pursuit of excellence in a single area is truly a major key to success (Simonton, 1994), then it would be best to focus on the assessment of individuals’ strengths (subjective and objective) in that single area rather than placing heavy weight on strengths in areas partially or wholly irrelevant to them.

**Integrating Perspectives**

CAPS is intended to be a comprehensive framework that can be used to organize and integrate research findings in diverse areas, facilitating cumulative progress in scientific psychology (Miller, Shoda, & Hurley, 1996; Mischel & Shoda, 1995, 2008). We believe it can serve just this purpose in the student achievement domain.

Examination of Table 3 indicates substantial overlap of the major PSFs, control mechanisms, and the four components of the human agency model. Although these constructs differ in their nuances, we propose that they are describing the same explanatory mechanisms and that these mechanisms constitute specific examples of the broad CAUs that form the core of the CAPS personality system (compare the descriptions in Tables 2 and 3). We make the following rational (Nunnally & Bernstein, 1994) categorizations: First, the PSFs and control mechanisms are equivalent (cf. Robbins et al., 2009). Second, social engagement–social control is an example of intentionality, as it constitutes a type of action strategy. Third, motivational control—motivation and academic skills and emotional control—self-management are examples of self-reactiveness, as they are active, online processes that control and regulate behavioral strategies adopted when pursuing goals. Fourth, because the competencies and self-regulatory plans CAU includes both the regulation of behavioral strategies and the strategies themselves, it encompasses intentionality, which involves action plans, and self-reactiveness, which involves the control of those plans. Fifth, self-reflectiveness is part of the expectancies and beliefs CAU, as it refers to beliefs about personal efficacy. Finally, forethought is part of the goals and values CAU, as both concern goals. A graphical summary of this categorization is depicted in Figure 1.4

**Applying CAPS for Understanding**

Conceptualizing PSFs associated with student success as CAUs continues the theoretical integration initiated by Robbins et al. (2004). Because CAPS provides a guide for developing detailed domain-specific models, it also constitutes an opportunity for moving beyond observing correlations between PSFs and student achievement to venturing explanations for why those associations exist. We illustrate the promise of linking PSFs to CAPS by describing a CAPS-based analysis of an important behavioral domain among students: help-seeking. Among the myriad important types of behaviors that students engage in (e.g., paying attention to lessons, studying, teamwork) we have chosen help-seeking because it is philosophically aligned with our conception of human beings as motivated agents. Students who engage in effective
Table 3 Definitions of Major Psychosocial and Skill Factors, Control Mechanisms, and Components of the Human Agency Model

<table>
<thead>
<tr>
<th>Unit</th>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td></td>
<td>Intentionality</td>
<td>Deliberate and purposeful action plans and strategies (some of which may entail interactions with other people); cognitive representations of future course of action to be performed</td>
</tr>
<tr>
<td></td>
<td>Forethought</td>
<td>Goals and cognitive constructions of how they can be reached through the selection or creation of various courses of action (or the avoidance of actions likely to undermine reaching those goals)</td>
</tr>
<tr>
<td></td>
<td>Self-reactiveness</td>
<td>Motivating, enacting, monitoring, and regulating behavioral patterns (often through setting proximal goals); comparison of current state and with desired goal state; adopting more challenging goals as desired proximal goals are achieved</td>
</tr>
<tr>
<td></td>
<td>Self-reflectiveness</td>
<td>Beliefs about personal efficacy: the degree to which people believe their actions will bring about their desired outcomes</td>
</tr>
<tr>
<td></td>
<td>Motivational control</td>
<td>Self-regulatory processes through which individuals’ ability to implement training activities are enhanced</td>
</tr>
<tr>
<td></td>
<td>Emotional control</td>
<td>Processes through which individuals self-manage attitudes and feelings directly affecting their receptiveness to and implementation of training activities</td>
</tr>
<tr>
<td></td>
<td>Social control</td>
<td>Processes through which individuals engage their social environment(s) to facilitate, support, and reinforce their learning activities</td>
</tr>
<tr>
<td></td>
<td>Motivation and academic skills</td>
<td>Processes that drive student engagement with, pursuit of, and proficiency in academic-related behaviors</td>
</tr>
<tr>
<td></td>
<td>Self-management</td>
<td>Processes facilitating academic goal development and achievement through self-control, discipline, and confidence in academic skills</td>
</tr>
<tr>
<td></td>
<td>Social engagement</td>
<td>Processes facilitating students’ gaining social support from and involvement with other individuals in their school communities</td>
</tr>
</tbody>
</table>

Bandura, 2001, 2006; Kanfer and Heggestad (1997), Kanfer and Heggestad (1999); Robbins et al. (2004); Robbins et al. (2009). Le et al. (2005); Robbins et al. (2009).

Help-seeking behavior are proactively shaping their environments in addition to adjusting to their circumstances (i.e., being challenged in some way). Students who seek help are taking control of themselves and their situation by working to address their difficulties in an empowered, motivated way.

Help-seeking is an important learning and self-regulation strategy employed by students and is associated with positive educational outcomes (Ames, 1983; Karabenick & Dembo, 2011; Karabenick & Knapp, 1991). Despite this, when confronting learning difficulties or expecting unsatisfactory academic performance, many students do not seek help (Butler, 1998; Karabenick & Knapp, 1991). There are many reasons a student may choose not to seek help, ranging from fear of...
appearing incompetent, potential embarrassment, or adherence to a credo of stoic self-reliance (Butler, 1998; Karabenick & Dembo, 2011) to perceptions that peers or teachers will not provide help even if a request is put forth (Karabenick, 2004).

Among those students who do seek help, qualitative differences exist in the strategies they employ. Although several typologies of help-seeking strategies exist (e.g., Butler, 1998; Karabenick, 2004; Ryan, Patrick, & Shim, 2005), their constituent behaviors can be divided into two major categories. The first category is regarded as adaptive because it springs from a desire to increase understanding and leads to the reduced need for assistance in the future; this category is often labeled instrumental (Butler, 1998) or autonomous (Karabenick & Dembo, 2011). The second category is regarded as maladaptive because it revolves around short-term solutions to the current problem (e.g., copying or asking for answers) that will not lead to increased autonomy in the future but rather to continued dependence; frequent labels for this type of help-seeking include avoidant (Karabenick, 2004), expedient (Butler, 1998), and covert (Newman, 1990). Maladaptive help-seeking behavior is often due to concerns about one’s ability, self-esteem being threatened by admitting that help is needed, or appearing incompetent to others (Butler, 1998; Fisher, Nadler, & Whitcher-Alagna, 1982; Karabenick, 2003, 2004; Nadler & Fisher, 1986). For both students who do not seek help and students who do so in maladaptive ways, the perceived costs to self-esteem of seeking help often outweigh perceived benefits (Butler, 1998; Karabenick & Knapp, 1991; Newman, 1990).

CAPS-based models have been applied to such diverse phenomena as ethnic relations (Mendoza-Denton & Goldman-Flythe, 2009), cognitive behavioral therapy (Shoda & Smith, 2005), interpersonal relationships (Zayas, Shoda, & Ayduk, 2002), reactions to the verdict of the O. J. Simpson trial (Mendoza-Denton, Ayduk, Shoda, & Mischel, 1997), and breast cancer prevention and treatment (Shaw et al., 2008). Full-fledged CAPS models constitute entire academic papers, and space limitations prevent us from developing one here. Nonetheless, we believe even an outline of a CAPS analysis demonstrates the utility of the approach. Consequently, in Figure 2 we present a sketch of a CAPS-based analysis of the determinants of a hypothetical high school student’s (Julian) instrumental help-seeking behavior when confronted with an upcoming calculus test. We expand on several particularly important aspects of this sketch:

- Although we have outlined the activation of the CAUs in sequential, static steps, this is an oversimplification of what likely occurs in real life; CAUs are presumed to be dynamically related to each other (Mischel & Shoda, 1995, 2008). We also do not presume that all the cognitions detailed are necessarily conscious for all individuals (Karabenick & Dembo, 2011; Mischel & Shoda, 1995, 2008).
- Relevant theoretical findings are easily integrated using the CAPS approach. For example, the fact that mastery goals are related to instrumental help-seeking (Karabenick, 2004) is featured pervasively throughout Figure 2 (e.g., Steps 7, 8, 10, and 12), along with the identification of certain CAUs as instances of specific PSFs/control mechanisms (Steps 7, 14, 15, and 16).
- The cognitive–affective psychological process is initiated by the encoding of the situational feature of the upcoming calculus test and determined by perceiving this test as a meaningful event worthy of further attention. If the test was not perceived as being personally important, the entire subsequent sequence of activations would not occur and no help-seeking would have taken place. This underscores the fact that encodings of situational features are the first CAUs to be activated and arguably the most important for determining behavior (Mischel, Mendoza-Denton, & Hong, 2009).
- Even small changes to the CAUs activated (or their interrelations) could realistically result in a cascading effect resulting in no help being sought (i.e., encoding) or a maladaptive strategy being adopted. For instance, if Julian was more concerned about appearing incompetent in front of his peers (a performance goal) than lacking the necessary understanding of calculus, he may have been unwilling to put in the effort needed to develop this understanding, leading him to ask Jane for her notes and homework assignments rather than fundamentally developing his knowledge of calculus itself (expedient help-seeking). By the same token, if Julian did not believe Jane (a) had a firm grasp of calculus, (b) was good at explaining things, and (c) was willing to help him, he may never have employed the PSF of social engagement.
- It is critical to emphasize that the analysis applies to the single student (Julian) and may not necessarily generalize to any other student. The social—cognitive approach to personality theory maintains that, for the full complexity of real human beings to even begin to be understood, analysis must be conducted at the level of the individual and in the context of specific situations (Cervone & Shoda, 1999). The hypothetical analysis for Julian indicates that his if .. then profile for when he is faced with an important academic event for which he feels unprepared is to seek
**Situation:** A high school student (Julian) is sitting in calculus class. The relevant objective situational features are as follows:
- A test has just been announced that will take place next week.
- The calculus teacher is physically present in the classroom.
- A fellow student (Jane) is physically present in the classroom.

**Psychological Analysis Through Cognitive–Affective Units**

1. The calculus test is an important event. *(encoding)*
2. My goal is to get at least B on the test because I value doing well in school and because I want to go to medical school one day. *(goals & values)*
3. Based on my current understanding of the material, I don’t think I can get a B on the test. *(expectancies & beliefs)*
4. Failing to reach my goal of getting a B on the test is not something I want because it would make me feel bad and could jeopardize my grade for the semester. *(goals & values)*
5. Thinking about not getting at least a B on the test makes me anxious. *(affect)*
6. I don’t believe that just by studying on my own I’ll be able to develop enough understanding to do well by next week. *(expectancies & beliefs)*
7. I can ask someone for help in order for me to understand the material better. *(competencies & self-regulatory plans: social engagement)*
8. The teacher is a knowledgeable source of information about calculus. *(encoding)*
9. My teacher will not help me because he thinks all his students should learn things on their own. *(expectancies & beliefs)*
10. I know my friend Jane understands calculus well because I’ve seen her test grades. *(encoding)*
11. Jane might help me understand things better because she will be willing to help me and is very good at explaining things. *(expectancies & beliefs)*
12. I need to get Jane to meet with me and help me understand calculus better so I can do well on the test. *(goals & values)*
13. REALIZING that I can ask Jane for help makes me feel better and reduces my anxiety about the test. *(affect)*
14. I will talk to Jane after class and ask her if she will work with me until I understand calculus better. *(competencies & self-regulatory plans: social engagement)*
15. Once I understand calculus better I will do practice problems every day until the test. *(competencies & self-regulatory plans: motivation & academic skills–motivational control)*
16. Having concrete plans for handling the upcoming test will further reduce my anxiety about it. *(competencies & self-regulatory plans: self-management–emotional control)*
17. I feel less nervous about the test. *(affect)*
18. Behavior: Julian asks for Jane to help her with calculus concepts after school the next day. Jane agrees to help.

**Figure 2** Outline of plausible psychological processes that lead to adaptive help-seeking behavior based on the principles of the cognitive–affective processing system (CAPS). The relevant cognitive–affective unit (CAU) is presented in parentheses at each step. The psychosocial and skills factor or factors (PSFs) and control mechanisms the CAU represents are also indicated, when relevant. For the purposes of this example, we assume that all of Julian’s perceptions (of his need to better understand calculus to do well on the test, of the teacher being unwilling to help, of Jane being willing to help) are accurate.

help in an instrumental fashion; the results of this analysis do not guarantee he will seek help in response to all (or even most) situational features. Developing a fuller understanding of individuals requires intensive, repeated study of their behaviors, and the cognitive–affective units that may underlie them, across a diverse set of situations.

Our rudimentary analysis both demonstrates the feasibility of using CAPS as an overarching framework to better understand the relations of PSFs to behaviors facilitative of student success and underscores the complexity and diversity of the processes leading up to those behaviors — and their fragility. As noted, even slight changes to the CAUs activated in Figure 2 could have resulted in maladaptive behavior. Nonetheless, despite the potential explanatory power of CAPS models, the fact that they are focused on single individuals inherently limits the generalizability of predictions based on them, as opposed to less psychologically accurate but more practically powerful models based on large aggregates of individuals. This trade-off, coupled with the ever-present problem of scarce resources, may cause some to believe that the apparent drawbacks of CAPS-based models outweigh their benefits. Clearly, we do not believe that is the case, and much of that belief is based on the practical utility of CAPS for designing effective interventions to improve human well-being.
Applying CAPS for Intervention

The results of a thorough analysis of the CAUs underlying differences in the behavioral pattern of interest essentially dictate the psychological target(s) of an intervention aimed at behavioral change. In terms of practical implications, the usefulness of CAPS lies in its ability to uncover the fine-grained determinants of individual differences in human behavior. Further, although CAPS analyses aimed at developing comprehensive models of specific people necessarily entail extremely thorough and intensive study at the individual level, a CAPS approach to intervention can instead focus on groups of individuals that reliably differ on the behavior of interest (i.e., the contrasting groups approach; Cronbach & Meehl, 1955; Humphreys, Lubinski, & Yao, 1993). Initially, at a fairly molar level, specific CAUs that also differentiate the two groups can be identified. For example, as previously mentioned, mastery goals often accompany instrumental help-seeking, and performance—approach or performance—avoid goals often accompany expedient help-seeking (Karabenick, 2004). If an intervention is being designed to, for example, help undergraduates in a biology class who are currently expedient help-seekers become instrumental help-seekers, a first step can be to verify that the two groups of help-seekers in that class reliably differ in their achievement goals. If that is indeed the case, interventions can be designed to attempt to change the goals of the maladaptive help-seekers, encouraging students to develop a thorough understanding of the material, rather than simply taking shortcuts that will help them do well on tests. A possible mechanism for changing achievement goals is reframing (Miller et al., 1996), which consists of emphasizing different aspects of the subject matter so that students may become more intrinsically interested in it, encouraging a shift from a learning strategy focused simply on doing well on tests to one focused on acquiring a fundamental understanding of the material. The extent to which such an intervention was effective in shifting some students’ help-seeking from expedient to instrumental would constitute some evidence for the influence of achievement goals on help-seeking.

Even if the proposed intervention had wide-ranging effects, it would likely not facilitate the desired behavioral change in all the students to whom it was applied. This would trigger a second round of CAPS-based analyses, this time based on a different CAU. The next step might be to examine self-efficacy for the subject matter (beliefs and expectancies) among students for whom the goal-based intervention was effective and among those for whom it was not. If self-efficacy differences were discovered that differentiate the two contrasting groups, an intervention targeting this CAU could be designed, implemented, and its results assessed. This iterative process of identifying CAUs that reliably differentiate contrasting groups, attempting to change them via intervention, assessing results, and then targeting successively more select subgroups could continue until some acceptable degree of behavioral change is reached among the students or practical and economic resources are depleted to the point that no further interventions can be designed or implemented.

It is important that interventions based on CAPS adhere to the following criteria. First, they must be domain-specific. In the preceding example, the domain of interest was tightly specified: help-seeking behavior in an undergraduate biology class, not help-seeking in general (i.e., a trait). Because different situations present different situational cues that then lead to manifestations of different if … then … profiles, this approach does not assume that students will pursue the same help-seeking strategy in every class, let alone throughout all aspects of their lives. Specific interventions tend to be more effective than general ones in spurring behavioral change (Hudson & Roberts, 2014; Magidson et al., 2014; Roberts et al., 2014). Second, the recommended intervention is tailored to groups that are homogeneous in their standing on the construct of interest, rather than fully tailored to specific individuals. As noted, a potential objection to CAPS-based analyses is that they are idiographic, not generalizable, and thus impractical. We acknowledge that designing interventions based on CAPS will indeed be resource-intensive, but that, once formulated, those interventions can be generalized to the individuals who fall into the specified group. Finally, depending upon practical goals and resources, CAPS-based interventions can be designed according to a top-down or bottom-up approach (Mischel et al., 2009). The bottom-up strategy is the most comprehensive and detailed: Full-fledged CAPS-based analyses are conducted of all individuals who differ in the behavioral patterns of interest. All the CAUs related to this behavioral domain are identified and their interrelations to each other are mapped at the individual level. Interventions can then be tailored solely to individuals and the idiographic organization of their CAUs (the most resource-intensive approach) or to groups of individuals whose CAUs are similarly organized (a somewhat less resource-intensive approach). The bottom-up approach is largely atheoretical, makes no a priori assumptions about which CAUs are likely to influence behavior, and is focused on discovering (Reichenbach, 1938) and exploring (Tukey, 1969, 1977) the relevant CAUs before formulating intervention plans based on those findings. When time and material resources are scarce (as they usually are), a more limited, top-down approach can be employed. Here, only the CAUs identified by prior research that are frequently related to the behavior(s) of interest are assessed.
Interventions for the latent classes identified can be developed de novo, or intervention techniques that have been proven to be effective in the past can instead be implemented. By taking a theoretically driven approach informed by cumulative research findings, the top-down strategy makes explicit a priori assumptions about which CAUs are most important for influencing behavior and, by implementing interventions to affect those CAUs, attempts to obtain empirical evidence that confirms and justifies the theories on which they are based (Reichenbach, 1938; Tukey, 1969, 1977).

**Conclusion**

We have reviewed evidence for the importance of PSFs as predictors of student success, made a case for these PSFs being elements of the CAPS personality system, and demonstrated the theoretical and practical implications of the PSF–CAPS link for facilitating greater understanding of students’ academic success behaviors and designing interventions to enhance those behaviors. By linking PSFs to CAPS, we emphasize the importance of specificity over generality and call for research and intervention methods tailored to individual students to the greatest extent possible. We are far from the first to advocate individualized treatment of students—psychologists with such diametrically opposing viewpoints as Howard Gardner and Arthur Jensen have called for adapting educational methods to suit the needs of individual students to maximize their academic success (Gardner, 2009; Jensen, 1998b).

Although limited resources will always pose difficulties, now is an opportune time to turn our attention to tying research and practice to students’ individuality. In the past 15 years, sophisticated methodologists have criticized psychology for making inappropriate inferences about individuals from group-level data (e.g., Borsboom et al., 2004; Voelkle et al., 2014) and called for a renewed emphasis on person-centered research (Molenar, 2004; Molenar & Campbell, 2009; Sterba & Bauer, 2010). Recent research using modern statistical methods into the phenomenon of aptitude–treatment interactions (ATIs), so often the domain of weak or null results (Corno et al., 2002), has revealed evidence for reliable interactions between student subgroups and instructional methods (Fuchs et al., 2014). More fundamentally, findings from the field of behavioral epigenetics are challenging long-held beliefs about person–environment transactions at the biological level, with enormous implications for our understanding of human development (Lester et al., 2011; Miller, 2010; van IJzendoorn, Bakermans-Kranenburg, & Ebstein, 2011). With this convergence of theory, method, and research findings both inside and outside of psychology, now is the opportune time to refocus the study (and improvement) of student success according to the principles we advocate.

**Notes**

1. Rejection of noncognitive predictors may also have been due to the fact that, in the decades following World War II, external explanations for human behavior were preferred over internal ones (Gillette, 2007; Kimble, 1993; Scarr & Weinberg, 1977). During this period, differences in performance on measures of cognitive skill were considered by many to be attributable to cultural and socioeconomic bias rather than variation in substantive psychological variables (Jensen, 1980; Kamin, 1974; McClelland, 1973).
2. CAPS is about describing and understanding the determinants of behavior. CAPS arose from the social–cognitive (Cervone & Shoda, 1999), rather than the differential (Lubinski, 2000), tradition in psychology, and it does not make strict distinctions among cognitive skills, personality traits, and interests. Instead, CAPS strives to describe and understand the “whole person” or “total personality” (cf. Allport, 1924; Eysenck & Eysenck, 1985; Fromm & Hartman, 1955; Magnusson, 1999; Vernon, 1935; Wechsler, 1950), rather than breaking human beings down into prespecified measurement domains and studying them in isolation.
3. We have chosen the generic label of *agentic perspective* due to the great diversity of approaches all treating the same basic idea of human beings’ capacity to intentionally carry out actions in the pursuit of goals. Although we draw on work that is often considered social–cognitive in the psychological sciences, simply labeling this viewpoint a “social–cognitive perspective on human agency” would deny its breadth: Characterizations of human agency date back at least to Aristotle (Williams, 1992) and are found in many disciplines outside psychology, including philosophy (Berlin, 1990; Davidson, 2001), human development (Bronfenbrenner & Morris, 2006; Elder, 1994), and economics (Sen, 1985). Inside psychology, agentic principles have been broadly invoked for over a century, including by functionalists such as William James and John Dewey (Hilgard, 1987), learning theorists such as Woodworth (Woodworth & Marquis, 1948), and personality theorists such as Gordon Allport and Henry Murray (Allport, 1955; Mischel & Shoda, 1995). More recently the same theme has been treated as a part of positive psychology (Peterson & Seligman, 2000), cognitive psychology (Cantor, 1990), self-determination theory (Ryan & Deci, 2000), and...
giftedness (Lubinski & Benbow, 2000). Through its inclusion of motivation and engagement, agency also plays a pervasive role in theories of fit (Dawis & Lofquist, 1984; Schneider, 1987).

4 A careful reading of the descriptions of the constructs in Tables 2 and 3 reveals our categorizations are not perfect and likely do not hold for all individuals at all times. For example, some students may use social engagement/control processes as a means of regulating their behavioral patterns (self-reactiveness). Likewise, as forethought comprises not only goals but also cognitive representations of how goals can be reached, it could be argued that it is split between the goals and values and competencies and self-regulatory plans (CAUs). Part of the difficulty is due to the fact that the boundaries of the CAUs themselves are somewhat indistinct. For instance, setting obtainable objectives (i.e., goals & values) is often promoted (Bandura, 2001, 2006) as a means of controlling behavior (competencies & self-regulatory plans). As psychology lacks well-developed theories (Borsboom, 2005), however, open concepts with fuzzy boundaries are the norm, not the exception (Meehl, 1978, 1990). We believe our classification scheme is useful because it explicitly recognizes the recurrence of similar psychological concepts across diverse areas of inquiry (cf. Lubinski & Benbow, 2000), which is a testament to their likely importance for explaining human behavior.

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