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What I Do and What I *Can* Do: Testing the convergence and incremental validity of social, emotional, and behavioral skills vs. traits for predicting academic success

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A B S T R A C T

The present research examined relations between social, emotional, and behavioral (SEB) skills, personality traits, and academic success in a sample of adolescents ($N = 975$). Results indicated that both skills and traits robustly predicted school grades, educational aspirations, and performance on a standardized achievement test, even after accounting for demographic characteristics. Moreover, skills and traits were often interchangeable: when assessed using the same cognitive, affective, and behavioral referents, they converged strongly and did not provide incremental validity over each other for predicting most outcomes. However, skills provided some incremental validity beyond traits for predicting standardized test performance. Taken together, these findings highlight the importance of SEB skills and personality traits for predicting and understanding academic success.

1. Introduction

A large and growing body of research indicates that positive social, emotional, and behavioral (SEB) characteristics predict academic success, even after accounting for the effects of cognitive ability, socio-economic status, and other background factors (Casillas et al., 2015; Duckworth et al., 2007; Farrington et al., 2012; Kautz et al., 2014; National Research Council, 2012; OECD, 2015). Much of this research has been conducted within one of two research traditions. The first focuses on personality traits, which represent how someone *tends to think, feel, and behave* averaged across situations (e.g., Mammadov, 2022; Poropat, 2009). The second tradition focuses on skills or competencies, which represent how someone is *capable of thinking, feeling, and behaving* when needed (e.g., Soto et al., 2022). Recently, a number of scholars have noted that many specific skills and traits can both be organized within five major domains: Self-Management/Conscientiousness, Social Engagement/Extraversion, Cooperation/Agreeableness, Emotional Resilience/Emotional Stability, and Innovation/Openness to Experience (Abrahams et al., 2019; Casillas et al., 2022; Kautz et al., 2014; OECD, 2015; Soto et al., 2021; Walton et al., 2021). These skill and trait

domains have similar social, emotional, and behavioral referents (i.e., the specific thoughts, feelings, and behaviors used to define and assess the constructs), but are conceptualized in terms of either behavioral tendencies or functional capacities. For example, someone might usually be quiet and reserved (representing their trait level), but still be capable of asserting themselves when needed (representing their skill level). Conversely, another person might be habitually talkative without being a particularly skilled conversationalist.

Given their shared behavioral referents and parallel five-domain structures, it is important to ask whether skills and traits are essentially interchangeable constructs, or whether they can each provide unique information that matters for predicting academic success and other consequential outcomes. The present research addresses this question by asking students to report both *how often* they enact a diverse set of thoughts, feelings, and behaviors (i.e., their traits), as well as *how well* they can enact these same behaviors (i.e., their skills). We then use these parallel assessments to examine the degree of convergence between skills and traits, and to test whether they can each provide incremental validity for predicting standardized test performance, school grades, school attendance, and educational aspirations. As a secondary

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aim, we also examine the degree of convergence between two measures of skills and traits: the Behavioral, Emotional, and Social Skills Inventory (BESSI; Soto et al., 2022) and the Mosaic™ by ACT® Social Emotional Learning (SEL) assessment (ACT, 2021).

1.1. Relations of personality traits and SEB skills with academic success

Previous research has linked both personality traits and SEB skills with academic performance. For example, *meta*-analyses of the Big Five traits and school grades have identified Conscientiousness as the most robust predictor of higher grades, with effects that generalize across education levels and geographic regions (Mammadov, 2022; Meyer et al., 2023; Poropat, 2009). As for SEB skills, *meta*-analyses have found that students exposed to social and emotional learning interventions tend to earn higher school grades, both immediately following the intervention and in subsequent years (Durlak et al., 2011; Taylor et al., 2017). Moreover, two recent studies of high-school students assessed the five major SEB skill domains and identified Self-Management as the most robust predictor of school grades (Soto et al., 2022, in press). The effects of Self-Management skills on grades emerged both concurrently and prospectively, and persisted after accounting for demographic factors and overlap with the other four skill domains.

Although school grades are the most commonly studied indicator of academic success, a smaller body of research has examined the effects of traits and skills on standardized achievement test performance. One multi-site study of the Big Five traits in middle school students found that Conscientiousness, and especially Openness to Experience, positively predicted achievement test scores, with effects that generalized between public and private schools (Almlund et al., 2011). Similarly, a recent study of high school students identified trait Openness and Conscientiousness, as well as the corresponding Innovation and Self-Management skills, as the strongest predictors of achievement test performance (Yoon et al., under review).

Taken together, these findings indicate that Self-Management/ Conscientiousness and Innovation/Openness to Experience are the most robust skill and trait predictors of academic performance. Moreover, they suggest that Self-Management skills and trait Conscientiousness may be especially important for predicting school grades, whereas Innovation skills and trait Openness may be more important for predicting standardized test scores.

1.2. Convergence and incremental validity of skills and traits

Given the growing consensus that personality traits and SEB skills can both be organized in terms of five major domains, as well as empirical findings that traits and skills predict academic success in similar ways, it is important to consider the extent to which they provide unique vs. overlapping information. Conceptually, there seem to be inherent relations between skills and traits. On the one hand, skills can beget traits in that someone must be capable of enacting a thought, feeling, or behavior in order to enact it frequently. On the other hand, traits can also beget skills in that frequently enacting a particular thought, feeling, or behavior should further increase someone's capacity to enact it when needed.

However, there are also reasons to speculate that skills and traits might predict academic success for somewhat different reasons. Because personality traits represent an individual's average tendencies, they might be especially important for academic outcomes—such as school grades—that reflect aggregate performance on assignments and assessments over a long period of time. By contrast, because SEB skills represent capacities that someone can strategically enact when needed, they might be especially important for outcomes—such as standardized test scores—that reflect preparation for, and performance in, key high-stakes situations. Thus, traits and skills may both be important for academic success, but might be particularly potent predictors of somewhat different outcomes.

Empirically, recent research suggests that SEB skill assessments converge with Big Five trait inventories, while also providing some unique information and incremental validity (Soto et al., 2022, in press; Walton et al., 2021). Notably, this research has relied on measures of skills and traits that differ both in their primary focus on functional capacities vs. average tendencies and also in their specific social, emotional, and behavioral referents (i.e., the specific thoughts, feelings, and behaviors directly referenced by their item text; McCrae, 2015; Mõttus et al., 2017). For example, Soto et al. (2022) compared SEB skills as measured by the BESSI to personality traits as measured by the Big Five Inventory–2 (BFI-2; Soto & John, 2017). Within the Extraversion/ Social Engagement domain, the BFI-2 items assess behaviors reflecting sociability, assertiveness, and energy level, whereas the BESSI assesses an overlapping—but also somewhat different—set of behaviors reflecting conversation, leadership, energy regulation, persuasion, and personal expression. It is therefore unclear to what extent Soto et al.'s finding that SEB skills provide incremental validity beyond personality traits is due to skills (as capacities) and traits (as tendencies) inherently capturing different information, due to the BESSI and BFI-2 items focusing on somewhat different sets of behavioral referents, or due to a combination of these factors. This same uncertainty applies to other recent studies examining the convergence and incremental validity of skills and traits.

A complementary measurement approach is to assess personality traits and SEB skills in parallel by asking people to rate the same set of social, emotional, and behavioral referents in terms of both *how often* they tend to enact these behaviors (their traits) and *how well* they can enact them (their skills). When assessed using this approach, finding that skills and traits provide incremental validity over each other must be due to skill and trait ratings capturing different information about people's thoughts, feelings, and behaviors, rather than only differences in the specific behavioral referents used to assess skills vs. traits. Indeed, some classic research on personality capabilities has adopted this parallel assessment approach (e.g., Paulhus & Martin, 1987; Turner, 1978; Willerman et al., 1976). It has found preliminary evidence that skills and traits show substantial convergence, while still providing some incremental validity for predicting behaviors and outcomes. However, this research has focused on specific behavioral domains, such as emotional expressiveness (Willerman et al., 1976), interpersonal nurturance (Paulhus & Martin, 1987), and social dominance (Paulhus & Martin, 1987; Turner, 1978). In the present research, we extend this approach by assessing traits and skills in parallel for the five major domains of thinking, feeling, and behaving shared by the Big Five personality traits and many contemporary models of SEB skills. We then use these parallel ratings to examine the degree of convergence between skills and traits, and to provide a strict test of whether they can each provide incremental validity for predicting academic outcomes.

1.3. Overview of the present research

In sum, previous research indicates that both skills and traits predict academic success, as indexed by school grades and standardized achievement tests (e.g., Almlund et al., 2011; Mammadov, 2022; Poropat, 2009). It also suggests that skill and trait assessments converge with each other, while still providing some unique information (e.g., Paulhus & Martin, 1987; Soto et al., 2022, in press). Building on this previous work, the overarching goal of the present research was to further investigate the predictive power, convergence, and incremental validity of SEB skills and personality traits for predicting academic outcomes. A secondary goal was to investigate the convergence between two measures of skills and traits: the BESSI and the Mosaic SEL assessment.

Within these broad goals, we addressed three more-specific research questions. First, how strongly do SEB skills and traits converge when assessed using the same social, emotional, and behavioral referents? Due to these shared referents, as well as the conceptual relation between skills and traits, we hypothesized that skill-focused and trait-focused

versions of the BESSI would converge substantially with each other, and that both versions would also converge with the Mosaic SEL assessment. Second, which skills and traits predict academic outcomes? We hypothesized that school grades would be predicted by skill and trait Self-Management, whereas standardized test performance would be predicted by the combination of skill and trait Self-Management and Innovation. Third, do skills and traits provide unique information that matters for predicting academic success? We broadly hypothesized that skills and traits would provide incremental validity for at least some academic outcomes, even when assessed using the same behavioral referents.

To test these hypotheses, we analyzed data from a sample of adolescents and young adults (*N* = 975) who completed both skill-focused and trait-focused versions of the BESSI, as well as a version of the Mosaic SEL assessment. Participants also reported information about their school grades, school attendance, and educational aspirations, and took the ACT standardized achievement test. This design allowed for a strict test of whether skills and traits can provide incremental validity over each other, even when assessed using the exact same set of social, emotional, and behavioral referents.

2. Method

2.1. Participants and procedure

Participants were 975 adolescents who took the ACT standardized test in December 2021 and also completed a voluntary research survey. Participants were invited by email to complete the survey after taking the ACT test, and volunteered to participate without financial compensation. Ethical approval was obtained from the Colby College Institutional Review Board.

Of the 905 participants who provided demographic information during the ACT registration process, 65.2% identified as female, 33.6% as male, and 0.6% as another gender, with 0.7% preferring not to respond. These participants ranged in age from 15 to 20 years old (*M* = 16.75, *SD* = 0.72), and all were enrolled in either 11th grade (58.7%) or 12th grade (41.3%). Regarding race and ethnicity, 61.2% identified as non-Hispanic White, 13.1% as Hispanic/Latino, 10.1% as Black/ African-American, 7.2% as Asian/Asian-American or Pacific Islander (AAPI), and 0.4% as American Indian/Alaska Native, with 4.9% reporting more than one identification and 3.1% preferring not to respond.

The final sample of 975 participants was derived from an initial sample of 1,121 survey respondents using a set of preregistered exclusion criteria. Specifically, participants were excluded from the final sample if they completed the research survey in less than one third of the median completion time (i.e., less than 151 s) or did not provide usable data on any of the three key predictor measures: SEB skills, traits, or the Mosaic SEL assessment. For the SEB skill and trait measures, usable data was defined as answering at least 18 of the 20 items and passing an embedded attention-check item. For the Mosaic SEL assessment, usable data was defined as answering all 10 items. After applying these exclusion criteria, missing item responses on the SEB skill and trait measures were imputed conservatively as the mean response to each item, rounded to the nearest possible response.

For two-tailed tests at the 0.05 significance level, the full sample size of 975 participants provides high (95%) statistical power for detecting effects of ρ = 0.11 or stronger, and adequate (80%) power for detecting effects or ρ = 0.09 or stronger. The effective sample size varies across measures but always exceeds the minimum of 250 observations recommended for estimating correlation-based statistics (Schönbrodt & Perugini, 2013).

2.2. Measures

All 975 participants completed a paper and pencil version of the ACT

standardized test, and also completed the research survey on the Qualtrics online platform. As noted above, most participants also provided demographic and background information using a computerized version of the ACT student interest profile. All study data, analysis code, and materials (except for the copyrighted Mosaic SEL assessment items) are available at https://osf.io/478mp/.

2.2.1. SEB skills and traits

Social, emotional, and behavioral skills and traits were assessed using a 20-item short form of the Behavioral, Emotional, and Social Skills Inventory (BESSI-20; Soto et al., 2022). Each BESSI-20 item describes a specific thought, feeling, or behavior, with four items assessing each of five major domains: Self-Management, Social Engagement, Cooperation, Emotional Resilience, and Innovation. For the standard, skill-oriented version of the BESSI-20, participants were instructed to rate *how well* they can enact each behavior on a 5-point competence scale ranging from 1 = *not at all well* to 5 = *extremely well*. For the trait-oriented version developed for this study, participants were instructed to rate *how often* they enact each of the same 20 behaviors on a parallel, 5-point frequency scale ranging from 1 = *not at all often* to 5 = *extremely often*. The skill and trait versions of the BESSI-20 therefore assess the same social, emotional, and behavioral referents using the same items. The two versions differ only in their rating instructions and response scales. They can therefore provide very strict comparisons between skills and traits.

Alpha reliability coefficients for the skill version of the BESSI-20 scores were 0.74 for Self-Management, 0.71 for Social Engagement, 0.72 for Cooperation, 0.69 for Emotional Resilience, and 0.63 for Innovation. Alpha reliabilities for the corresponding trait scores were 0.70, 0.70, 0.73, 0.66, and 0.65, respectively.

2.2.2. Mosaic SEL assessment

To extend the nomological network of SEB skills and traits, participants also completed 10 forced-choice triads from the Mosaic by ACT Social and Emotional Learning assessment (ACT, 2021). Each triad consisted of three descriptive statements about skills or traits. Across the ten triads, six statements represented each of five broad domains: Sustaining Effort (similar to Self-Management/Conscientiousness), Social Connection (similar to Social Engagement/Extraversion), Getting Along with Others (similar to Cooperation/Agreeableness), Maintaining Composure (similar to Emotional Resilience/Emotional Stability), and Keeping an Open Mind (similar to Innovation/Openness to Experience). Participants were instructed to select one statement as "most like me" (coded as a score of 3) and one as "least like me" (scored as 1), with the remaining statement scored as 2. Alpha reliabilities for the ipsative domain scores were 0.47 for Sustaining Effort, 0.47 for Getting Along with Others, 0.56 for Maintaining Composure, 0.46 for Keeping an Open Mind, and 0.63 for Social Connection.

2.2.3. Academic outcomes

ACT test performance was indexed using the ACT Composite score, a standardized score computed to have a mean of 21, standard deviation of 5, and range of 1 to 36 in the population of ACT test-takers (ACT, 2022). In the present sample, scores ranged from 10 to 36 with a mean of 24.18 and standard deviation of 5.59, indicating considerable variability in achievement.

School grades were assessed in two ways. The first was a set of ACT student profile items that asked participants to report their letter grade in each of 23 core high school math, science, language arts, and social studies courses. Overall high school GPA was then computed as the mean of these course grades. The second method was a survey item asking participants to describe their grades from the past two years on a 5-point scale coded to range from 1 = *below Ds* to 5 = *mostly As*.

School attendance was assessed using a survey item that asked participants to report how many days they were absent from school in the past month. Responses were provided on a 7-point scale coded to range

from 1 = *11 or more days* to 7 = *0 days*.

Educational aspirations were assessed using an ACT student profile item that asked participants to report the highest level of education that they expect to complete. Responses were provided on a 5-point scale ranging from 1 = *business/technical or certificate program* to 5 = *doctorate or professional degree (PhD, MD, JD, etc.).*[1]

2.3. Preregistered hypotheses and analyses

Before analyzing the data, we preregistered our hypotheses and planned analyses. The complete preregistration protocol is available at https://osf.io/9qjse/. All analyses were conducted as two-tailed hypothesis tests at the α = 0.05 significance level.

3. Results

3.1. How strongly do skills and traits converge?

Our first key research question was how strongly SEB skills and traits would converge with each other when assessed using the exact same behavioral referents. We hypothesized that each SEB skill domain would converge strongly with its corresponding trait, due to the possibility that skill and trait levels might reciprocally influence each other, as well as their shared behavioral referents and assessment method in this study. To test this hypothesis, we computed partial correlations between the skill and trait versions of the BESSI-20 while controlling for gender, grade level, race/ethnicity, and parents' education level.[2] These partial correlations are presented in Table 1, and the corresponding zero-order correlations are presented in Supplemental Table S1.

As hypothesized, corresponding skill-trait pairs converged strongly, with partial correlations ranging from r = 0.82 to 0.86 (M = 0.84). In contrast, discriminant correlations were generally moderate in size, ranging from 0.20 to 0.45 (M = 0.33). These strong convergent relations indicate that, for the five social, emotional, and behavioral domains assessed here, people who are skilled at enacting a particular thought, feeling, or behavior also tend to enact it more frequently, and conversely that people who tend to frequently enact a particular thought, feeling, or behavior also tend to be good at doing so.

To extend the BESSI's nomological network, we also tested whether its skill and trait versions would converge with the Mosaic SEL assessment. Partial correlations between the BESSI and Mosaic SEL assessments are reported in Table 1, and zero-order correlations in Supplemental Table S1. As hypothesized, the Mosaic Sustaining Effort scale converged most strongly with skill and trait Self-Management, Social Connection with Social Engagement, Getting Along with Others with Cooperation, Maintaining Composure with Emotional Resilience, and Keeping an Open Mind with Innovation. These convergent correlations ranged from 0.37 to 0.64 (M = 0.48 with skills and 0.47 with traits), whereas absolute discriminant correlations ranged from 0.03 to 0.40 (M = 0.17 with skills and 0.16 with traits). Moreover, each Mosaic scale showed its strongest correlation with the corresponding SEB skill and trait. These results indicate that the Mosaic SEL assessment measures constructs related to—but also somewhat distinct from—the domains assessed by the BESSI, without drawing a clear distinction between skills and traits.

3.2. Which SEB skills and traits predict academic outcomes?

Our second research question was which SEB skills and traits most strongly predict academic outcomes including ACT standardized test performance, school grades, school attendance, and educational aspirations. We hypothesized that Self-Management would predict higher school grades and ACT performance, and that Innovation would also predict better ACT performance. To test these hypotheses, we computed partial correlations between skills, traits, and outcomes while controlling for gender, grade level, race/ethnicity, and parents' education level. To further test them while controlling for overlap between the skill and trait domains themselves, we also regressed each outcome on the set of five skill or trait domains, plus the demographic covariates.

The results of these analyses are presented in Table 2, and the corresponding results without demographic controls are presented in Supplemental Table S2. These results show robust support for most of our hypothesized outcome relations. Specifically, across all analyses (regressions and correlations, with and without demographic controls), skill and trait Self-Management predicted higher school grades, while skill (but not trait) Innovation consistently predicted better ACT performance.[3] Beyond these hypothesized associations, three additional relations also emerged as robust across all analyses: both skill and trait Social Engagement, as well as trait Self-Management, predicted higher educational aspirations. These results indicate that both SEB skills and traits robustly predict academic outcomes, with Self-Management, Innovation, and Social Engagement emerging as the most powerful predictors—albeit for different outcomes.

To test whether these findings would extend to another prominent measure of skills and traits, we also examined relations of academic outcomes with the Mosaic SEL assessment. Consistent with the BESSI results, we found that the Mosaic's Sustaining Effort domain predicted higher school grades, while Social Connection predicted higher educational aspirations. Beyond these replicated associations, the Mosaic's Getting Along with Others domain predicted higher overall high school GPA, while Social Connection predicted higher grades in the past two years. These results indicate that many—but not all—relations with academic outcomes generalize between the BESSI and the Mosaic SEL assessment.

3.3. Do SEB skills and personality traits provide unique information?

Our third and final research question was whether SEB skills and traits would each provide unique information for predicting academic outcomes. Despite the high degree of convergence between skills and traits, we hypothesized that they may still provide incremental validity. To test this hypothesis, we first regressed each outcome on the set of demographic covariates (gender, grade level, race/ethnicity, and parents' education level); in a second step, we entered the set of either five SEB skill domains or five trait domains as additional predictors; and in a final step, we entered the remaining set of skill or trait domains as predictors.

The proportion of variance in each outcome accounted for by each set of predictors is presented in Table 3, and the corresponding results without demographic covariates are presented in Supplemental

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[1] We also intended to analyze participants' occupational interests, as assessed by a set of 72 ACT student profile items. However, we excluded this measure from analysis due to the small number of respondents (n = 66).

[2] In all analyses involving demographic covariates, gender was coded as 1 = *female*, −1 = *male*; grade level was coded as grade 11 or 12; race/ethnicity was coded using three dummy variables representing Hispanic/Latino, Black/African-American, and Asian/Asian-American, with White as the comparison group; and parents' education level was computed as the mean of father's and mother's education level on a scale ranging from 1 = *less than high school* to 8 = *doctorate or professional degree.*

[3] As an exploratory robustness check of these findings, we also conducted z-tests for differences between dependent correlations to compare the relations of skill and trait Innovation with ACT performance and school grades. These tests indicated that skill Innovation correlated more strongly with ACT performance than did trait Innovation (z = 3.37, p <.001). By contrast, skill and trait Innovation did not differ significantly in their correlations with overall high school GPA (z = 1.01, p =.16) or grades from the past two years (z = 1.06, p =.15).

Table 1
Relations between SEB Skills, Traits, and the Mosaic SEL Assessment.

	BESSI skills					BESSI traits					Mosaic domains				
	SM	SE	Co	ER	In	SM	SE	Co	ER	In	SEf	SC	GAO	MC	KOM
BESSI skills															
Self-Management	–														
Social Engagement	.41 (<0.001)	–													
Cooperation	.36 (<0.001)	.41 (<0.001)	–												
Emotional Resilience	.45 (<0.001)	.40 (<0.001)	.47 (<0.001)	–											
Innovation	.20 (<0.001)	.33 (<0.001)	.30 (<0.001)	.19 (<0.001)	–										
BESSI traits															
Self-Management	**.83** **(<0.001)**	.39 (<0.001)	.27 (<0.001)	.41 (<0.001)	.19 (<0.001)	–									
Social Engagement	.35 (<0.001)	**.85** **(<0.001)**	.36 (<0.001)	.33 (<0.001)	.31 (<0.001)	.38 (<0.001)	–								
Cooperation	.33 (<0.001)	.37 (<0.001)	**.83** **(<0.001)**	.42 (<0.001)	.28 (<0.001)	.33 (<0.001)	.39 (<0.001)	–							
Emotional Resilience	.39 (<0.001)	.37 (<0.001)	.46 (<0.001)	**.84** **(<0.001)**	.21 (<0.001)	.43 (<0.001)	.35 (<0.001)	.46 (<0.001)	–						
Innovation	.20 (<0.001)	.32 (<0.001)	.25 (<0.001)	.21 (<0.001)	**.82** **(<0.001)**	.22 (<0.001)	.35 (<0.001)	.29 (<0.001)	.24 (<0.001)	–					
Mosaic domains															
Sustaining Effort	**.49** **(<0.001)**	.15 (<0.001)	.09 (0.022)	.18 (<0.001)	−.09 (0.021)	**.44** **(<0.001)**	.10 (0.009)	.08 (0.029)	.19 (<0.001)	−.06 (0.150)	–				
Social Connection	.23 (<0.001)	**.63** **(<0.001)**	.16 (<0.001)	.17 (<0.001)	.29 (<0.001)	.23 (<0.001)	**.61** **(<0.001)**	.17 (<0.001)	.17 (<0.001)	.31 (<0.001)	.09 (0.025)	–			
Getting Along with Others	.08 (0.038)	.10 (0.011)	**.38** **(<0.001)**	.17 (<0.001)	.21 (<0.001)	.08 (0.044)	.08 (0.042)	**.41** **(<0.001)**	.16 (<0.001)	.17 (<0.001)	.10 (0.012)	.15 (<0.001)	–		
Maintaining Composure	.39 (<0.001)	.39 (<0.001)	.21 (<0.001)	**.42** **(<0.001)**	.22 (<0.001)	.38 (<0.001)	.34 (<0.001)	.20 (<0.001)	**.40** **(<0.001)**	.23 (<0.001)	.46 (<0.001)	.40 (<0.001)	.26 (<0.001)	–	
Keeping an Open Mind	−.04 (0.361)	.30 (<0.001)	.07 (0.080)	.07 (0.058)	**.47** **(<0.001)**	−.02 (0.537)	.30 (<0.001)	.08 (0.036)	.07 (0.091)	**.46** **(<0.001)**	−.22 (<0.001)	.52 (<0.001)	.31 (<0.001)	.28 (<0.001)	–

Note. SM = Self-Management. SE = Social Engagement. Co = Cooperation. ER = Emotional Resilience. In = Innovation. SEf = Sustaining Effort. SC = Social Connection. GAO = Getting Along with Others. MC = Maintaining Composure. KOM = Keeping an Open Mind. Values are partial correlations controlling for gender, grade level, race/ethnicity, and parents' average education level. Values in parentheses are two-tailed *p*-values. $N = 763$ for BESSI skills and BESSI traits, and 677 for Mosaic domains. Hypothesized convergent associations are printed in boldface.

Table 2
Relations of BESSI Skills, Traits, and Mosaic Domains with Academic Outcomes.

	ACT test score	Overall high school GPA	Grades from the past two years	School attendance	Educational aspirations
BESSI skills					
Self-Management	**0.00(0.975)/−0.03 (0.403)**	**0.16(<0.001)/0.16 (<0.001)**	**0.22(<0.001)/0.25 (<0.001)**	0.11(0.008)/0.07(0.183)	0.09(0.011)/0.07(0.106)
Social Engagement	0.07(0.061)/0.01(0.772)	0.04(0.253)/−0.01(0.773)	0.11(0.005)/0.00(0.960)	0.08(0.053)/0.02(0.753)	0.14(<0.001)/0.10 (0.033)
Cooperation	0.05(0.159)/0.01(0.791)	0.06(0.103)/0.00(0.953)	0.04(0.360)/−0.04(0.460)	0.05(0.180)/0.01(0.899)	0.08(0.035)/0.02(0.645)
Emotional Resilience	0.01(0.705)/−0.02 (0.583)	0.07(0.043)/0.01(0.845)	0.05(0.221)/−0.04(0.465)	0.06(0.167)/0.02(0.771)	0.02(0.525)/−0.05 (0.247)
Innovation	**0.15(<0.001)/0.10 (0.004)**	0.00(0.956)/−0.04(0.261)	−0.03(0.461)/−0.07 (0.115)	0.01(0.882)/0.00(0.994)	0.10(0.010)/0.05(0.248)
BESSI traits					
Self-Management	**0.03(0.483)/0.01(0.696)**	**0.15(<0.001)/0.18 (<0.001)**	**0.20(<0.001)/0.22 (<0.001)**	0.11(0.006)/0.05(0.283)	0.14(<0.001)/0.10 (0.017)
Social Engagement	0.05(0.157)/0.02(0.529)	0.02(0.541)/−0.01(0.820)	0.10(0.014)/0.03(0.535)	0.07(0.093)/0.01(0.906)	0.15(<0.001)/0.10 (0.021)
Cooperation	0.04(0.294)/0.03(0.488)	0.05(0.138)/0.01(0.751)	0.05(0.241)/0.00(0.932)	0.07(0.087)/0.02(0.631)	0.11(0.003)/0.07(0.125)
Emotional Resilience	−0.03(0.383)/−0.09 (0.027)	0.03(0.478)/−0.05(0.306)	0.01(0.786)/−0.09(0.061)	0.04(0.263)/0.00(0.925)	0.03(0.493)/−0.08 (0.068)
Innovation	**0.05(0.136)/0.04(0.312)**	−0.03(0.474)/−0.06 (0.113)	−0.07(0.080)/−0.11 (0.010)	0.03(0.467)/0.04(0.407)	0.08(0.026)/0.03(0.448)
Mosaic domains					
Sustaining Effort	**0.03(0.420)/0.07(0.085)**	**0.19(<0.001)/0.21 (<0.001)**	**0.23(<0.001)/0.26 (<0.001)**	0.12(0.002)/0.09(0.089)	0.03(0.501)/0.02(0.613)
Social Connection	0.10(0.014)/0.04(0.401)	0.02(0.637)/0.00(0.967)	0.08(0.037)/0.11(0.021)	0.05(0.256)/0.03(0.626)	0.20(<0.001)/0.16 (0.001)
Getting Along with Others	0.06(0.102)/0.02(0.660)	0.11(0.005)/0.10(0.015)	0.03(0.504)/0.09(0.030)	−0.02(0.627)/−0.03 (0.540)	0.09(0.020)/0.04(0.352)
Maintaining Composure	0.03(0.515)/−0.04 (0.360)	0.06(0.114)/−0.03(0.586)	0.07(0.086)/−0.06(0.238)	0.07(0.092)/0.06(0.306)	0.10(0.011)/0.00(0.954)
Keeping an Open Mind	**0.10(0.010)/0.07(0.123)**	−0.04(0.286)/−0.01 (0.877)	−0.10(0.010)/−0.09 (0.077)	−0.03(0.491)/0.00(0.969)	0.15(<0.001)/0.06 (0.245)

Note. Values left of the forward slash are partial correlations controlling for gender, grade level, race/ethnicity, and parents' education level. Values right of the forward slash are standardized regression coefficients with the five BESSI skills, traits, or Mosaic domains, as well as gender, grade level, race/ethnicity, and parents' education level, entered as predictors. Values in parentheses are two-tailed *p*-values. For associations with BESSI skills and traits, $N = 763$ for ACT test score and overall high school GPA, 636 for grades from the past two years, 635 for school attendance, and 740 for educational aspirations. For associations with Mosaic domains, $N = 677$ for ACT test score and overall high school GPA, 636 for grades from the past two years, 635 for school attendance, and 667 for educational aspirations. Hypothesized associations are printed in boldface.

Table 3
Incremental Validity of BESSI Skills and Traits for Predicting Academic Outcomes.

	Variance explained (R^2) by demographics and…			Incremental validity (ΔR^2) of…	
	BESSI skills	BESSI traits	BESSI skills + traits	BESSI skills over traits	BESSI traits over skills
ACT composite score	0.31 (<0.001)	0.31 (<0.001)	0.32 (<0.001)	0.01 (0.018)	0.01 (0.094)
Overall high school GPA	0.14 (<0.001)	0.14 (<0.001)	0.15 (<0.001)	0.01 (0.452)	0.01 (0.429)
Grades from the past two years	0.14 (<0.001)	0.14 (<0.001)	0.15 (<0.001)	0.02 (0.074)	0.01 (0.106)
School attendance	0.03 (0.183)	0.02 (0.275)	0.03 (0.415)	0.01 (0.656)	0.00 (0.900)
Educational aspirations	0.11 (<0.001)	0.12 (<0.001)	0.12 (<0.001)	0.00 (0.681)	0.02 (0.067)

Note. Values are proportions of explained variance. Values in parentheses are *p*-values. $N = 680$ for ACT test score, 657 for overall high school GPA, 574 for grades from the past two years, 573 for school attendance, and 635 for educational aspirations.

Table S3; the regression coefficients for each analysis are presented in Supplemental Table S4. These results show that for three outcome variables—overall high school GPA, school grades in the past two years, and educational aspirations—both skills and traits provided a significant increment in predictive power over demographic factors, but neither skills nor traits provided an additional increment over each other. For

one additional outcome—school attendance—neither skills nor traits provided a significant increment in predictive power over demographics, nor over each other.

However, a different pattern emerged when predicting ACT standardized test performance. Supporting our hypothesis, SEB skills provided a modest but statistically significant increment in predictive power over the combination of traits and demographic factors for this outcome ($\Delta R^2 = 0.01$, $p = .018$). Moreover, in the full model including demographics, skills, and traits, Innovation skill emerged as a significant, positive predictor of ACT performance (β = 0.20, $p = .001$), whereas trait Innovation emerged as a significant but negative predictor (β = -0.14, $p = .024$).[4] These results suggest that performance on the ACT standardized test is predicted more strongly by a student's capacity to think and behave in creative, abstract, and artistic ways when needed than by the habitual frequency with which they tend to enact these same behaviors.

Taken together, our analyses of incremental validity provide partial, tentative support for the hypothesis that SEB skills and traits can each

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[4] As a robustness check of this finding, an anonymous reviewer suggested that we residualize each SEB skill domain on its corresponding trait domain before testing whether skills provide incremental validity beyond traits. We therefore reran the incremental validity analyses using residualized rather than raw skill scores. The results of these supplemental analyses were consistent with those reported in Table 3 and discussed in the main text. Specifically, skills continued to provide incremental validity over traits for predicting ACT test performance, and this was largely due to the effect of Innovation Skills. The results of these residual score analyses are reported in Supplemental Tables S5 and S6.

provide unique information for predicting academic outcomes. For one key outcome—ACT performance—skills, especially Innovation skill, did provide a significant increment in predictive power beyond traits. For other outcomes, skills and traits were equally powerful—and essentially interchangeable—predictors.

4. Discussion

4.1. Summary of findings

The present findings support four key conclusions. First, measures of SEB skills and traits converge strongly with each other, especially when skills and traits are assessed in parallel using the same social, emotional, and behavioral referents. Previous research using distinct measures of SEB skills and the Big Five personality traits has found strong convergence between skills and traits, with correlations of approximately 0.70 (Soto et al., 2022). In the present research, we found that measuring skills and traits using the exact same referents—skill and trait versions of the BESSI with identical items but different rating instructions and response scales—increased these convergent correlations to approximately 0.80. This finding suggests that skills and traits are very closely related constructs, and may be interchangeable in some contexts, especially when assessed using the same referents and data source.

We also found that both the skill and trait versions of the BESSI converged with the Mosaic SEL assessment, thereby extending the nomological network of both measures. Convergence was strongest between corresponding constructs: Self-Management and Sustaining Effort; Social Engagement and Social Connection; Cooperation and Getting Along with Others; Emotional Resilience and Maintaining Composure; Innovation and Keeping an Open Mind. The Mosaic SEL assessment converged about equally with the skill and trait versions of the BESSI, but less strongly than the two BESSI versions converged with each other. This lower degree of convergence may reflect differences between the BESSI and Mosaic measures in terms of their broad constructs, specific behavioral referents, response formats (rating scales vs. forced-choice triads), or all three of these factors. Thus, additional research is needed to further compare these measures.

Our second conclusion is that SEB skills and traits are important predictors of academic success. Largely supporting our preregistered hypotheses, we found that school grades were robustly predicted by skill and trait Self-Management; ACT test performance by Innovation skill; and educational aspirations by skill and trait Social Engagement, as well as trait Self-Management. Many of these outcome relations also generalized to the Mosaic SEL assessment. These findings add to a large and growing research literature that highlights the importance of social, emotional, and behavioral characteristics for academic success, as well as success in other life domains (Casillas et al., 2015; Duckworth et al., 2007; Farrington et al., 2012; Kautz et al., 2014; National Research Council, 2012; OECD, 2015; Ozer & Benet-Martínez, 2006; Roberts et al., 2007; Soto, 2019, 2021; Soto et al., 2022).

Our third conclusion is that SEB skills and traits are about equally important for predicting some important academic outcomes. For example, when predicting school grades and educational aspirations we found that both skills and traits provided incremental validity over demographic characteristics, but neither skills nor traits provided incremental prediction over each other. Thus, for some key life outcomes, skills and traits may be essentially interchangeable predictors: both provide valuable information, but assessing either skills or traits is just as good as assessing both skills and traits.

Our final, more tentative conclusion is that for some outcomes the distinction between skills and traits may be more consequential. When predicting performance on the ACT standardized test, we found that SEB skills provided a modest but statistically significant degree of incremental validity over traits. Moreover, when both skills and traits were entered together in a single model, only Innovation skill emerged as a positive predictor of test performance. We speculate that this finding

may reflect the nature of this outcome variable: standardized achievement tests like the ACT represent high-stakes situations in which individuals must draw on their academic and psychological resources to prepare and perform. Test performance thus fits well with a conceptualization of SEB skills as someone's capacity to enact particular thoughts, feelings, and behaviors when needed for a particular situation (Napolitano et al., 2021; Soto et al., 2021). This conceptualization, and the present findings, suggest that SEB skills and traits may best predict different kinds of outcomes. Specifically, skills may best predict outcomes reflecting someone's thoughts, feelings, or behavior in specific, high-stakes situations, whereas traits may best predict outcomes that reflect the gradual accumulation of someone's behavior over time and across situations (Marcus et al., 2007; Meyer et al., 2023; Ployhart et al., 2001).

4.2. Broader implications

These findings have important implications regarding whether, when, and how researchers and practitioners should assess SEB skills and personality traits. For example, they indicate that both skills and traits relate meaningfully with academic success—even when assessed using quite brief (10- to 20-item) measures. Thus, researchers and practitioners stand to benefit from routinely assessing skills and traits alongside other established predictors of achievement such as cognitive ability and demographic characteristics (Duckworth & Yeager, 2015). Doing so can lead to more accurate predictions of achievement, as well as new insights regarding the causes and mechanisms of students' success. For example, longitudinal studies could test whether changes in skills and traits are associated with changes in academic performance over time. Similarly, intervention studies could test whether changes in skills and traits mediate the effects of social and emotional learning interventions on student outcomes (Durlak et al., 2011; Taylor et al., 2017; Ura et al., 2020).

Another important implication is that the present findings can help inform decisions about whether to assess SEB skills, personality traits, or both within a particular context. For most outcomes, we found that skills and traits were essentially interchangeable: they were equally powerful but largely overlapping predictors. Thus, in many contexts it may be more efficient to assess either skills or traits than to assess both. In such cases, deciding which kind of construct to assess may be more a matter of conceptual fit than predictive accuracy. For example, when evaluating candidates' potential for an academic program or job, it may be more intuitive to assess skills (How well can they do this?) than traits (How often do they do this?). Similarly, when evaluating an intervention that trains students to enact particular thoughts, feelings, and behaviors, and then provides opportunities for practice and feedback, it may be more natural to assess the intervention's effects on skills (How well can they do this now?) than traits (How often do they do this now?). Conversely, in contexts where everyday behavior is observed over a long period of time, it may make more sense to assess traits (How often have they done this?) than skills (How well have they done this?).

In some cases, however, deciding whether to assess skills or traits may be empirically consequential. The present results concerning standardized test performance suggest that for some outcomes—especially those that involve performance in a specific, high-stakes situation—competency-based skill measures may be stronger predictors than frequency-based trait measures. However, the fact that we only observed this pattern for one outcome highlights the tentative nature of this conclusion, as well as the need for further research that assesses both skills and traits alongside a variety of outcomes.

For researchers and practitioners who wish to assess *both* skills and traits, should they administer different skill and trait measures that focus on distinct sets of social, emotional, and behavioral referents? Or should they administer parallel skill and trait measures using the same set of referents? Assessing skills and traits using different sets of referents will generally increase the amount of unique information and incremental

validity captured by each measure (Soto et al., 2022, in press). However, this approach may sometimes underestimate the true degree of convergence between parallel skills and traits (e.g., someone's tendency vs. capacity to keep things organized), due to arbitrary differences between the specific behaviors referenced by each measure (McCrae, 2015; Mõttus et al., 2017). Conversely, assessing skills and traits using the same set of behavioral referents, as we have done here, will generally provide a stricter test of incremental validity (see also Paulhus & Martin, 1987; Turner, 1978; Willerman et al., 1976). However, this approach may sometimes underestimate the amount of unique information provided by skills vs. traits that are manifested through related but somewhat distinct behaviors (e.g., someone's extraverted tendency to socialize vs. degree of social skill). We therefore encourage researchers and practitioners to carefully consider whether their skills and traits of interest are manifested through parallel vs. distinct behaviors, and then adopt the corresponding assessment approach.

4.3. Strengths, limitations, and future directions

Noteworthy strengths of the present research include its strict comparison of SEB skills and personality traits using the same behavioral referents, as well as its use of multiple self-reported and objective indicators of academic achievement. However, this research also has limitations that highlight promising directions for future research. For example, we have defined personality traits in terms of how someone typically thinks, feels, and behaves, averaged across situations, and have therefore measured traits in terms of how often someone enacts trait-relevant behaviors. This approach is consistent with personality models that focus on traits as descriptive constructs that summarize cognitive, emotional, and behavioral patterns, such as the act frequency and density distribution approaches (Buss & Craik, 1983; Fleeson, 2004). However, the frequency with which someone enacts a particular thought, feeling, or behavior is constrained by their situational opportunities to do so. Moreover, traits can also be conceptualized as explanatory constructs defined by the underlying biological and psychological factors that cause individuals' distinctive patterns of behavior (Block, 1989; DeYoung, 2015; Jayawickreme et al., 2019). Thus, future research can investigate whether adopting a descriptive vs. explanatory approach to personality traits affects their relations with SEB skills and academic success.

Regarding outcomes, we analyzed a small but diverse outcome set that included aspects of academic achievement (standardized test scores, school grades), behavior (school attendance), and goals (educational aspirations). This outcome diversity is a strength in that it allowed us to show that SEB skills and personality traits relate with multiple aspects of academic success. However, it is also worth noting that the mechanisms linking skills and traits to academic success may differ across these outcomes. In fact, skills and traits might even predict the same outcome but through different mechanisms. For example, we found that both skills and traits predict students' educational aspirations, with approximately equal strength. However, the effects of skills may be mediated by students' self-efficacy beliefs about what they are capable of doing (Zimmerman, 2000), whereas the effects of traits might be mediated by their vocational interests and higher-order goals such as striving for communion, status, autonomy, or power (Barrick et al., 2013). Future research can test such hypotheses about the mechanisms linking skills and traits with outcomes.

Methodologically, the present research measured both skills and traits, as well as most outcomes, through self-reports. This reliance on self-reports raises the possibility that some participants may have intentionally or unintentionally misreported how often and how well they enact certain behaviors (Borkenau & Ostendorf, 1987; Gosling et al., 1998). Moreover, the observed relations between skills, traits, and outcomes may be biased by common method variance (Podsakoff et al., 2003; 2013), which can inflate the strength of associations between constructs measured using the same rater (due to evaluative bias) and

items (due to shared item characteristics). To mitigate such biases, future research could assess skills and traits using alternative methods, such as peer-reports, situational judgment tests, objective recordings of behavior frequency, and performance-based skill assessments (Abrahams et al., 2019; Breil et al., 2022; Duckworth & Yeager, 2015). Multimethod designs could help disentangle the substantive relations between skills, traits, and outcomes from measurement artifacts. They may therefore find lower levels of convergence than was observed here, and can provide further insight as to whether skills and traits should be regarded as interchangeable vs. distinct constructs.

The present research also used a cross-sectional design, in which skills, traits, and outcomes were all measured on the same occasion. Future longitudinal research could repeatedly assess skills, traits, and outcomes over time, and thereby investigate their dynamic interrelations. For example, an individual with a high skill level but low trait level (e.g., a student who is not always conscientious but can work hard when needed) may be especially likely to increase in their trait level over time (as conscientious behavior becomes more habitual). Conversely, someone with a high trait level but low skill level (e.g., a student who tries to keep up with their schoolwork but doesn't have the self-management skills necessary to succeed) may become more skilled over time from practicing the relevant behaviors. Similarly, current skills and traits may predict future outcomes, and experiencing particular outcomes (e.g., the consequences of performing well or poorly in school) may promote or inhibit future skill and trait development. Thus, future research can further investigate the consequences of discrepancies between individuals' skill and trait levels, as well as dynamic interrelations between skills, traits, and outcomes over time.

A final limitation is that the present study focused on success in one particular life domain during one developmental window: adolescents' academic achievement. Thus, future research can investigate whether the relations between skills and traits differ systematically across the lifespan. For example, skills and traits might converge less strongly in childhood. Because children have had less time to develop and practice their skills, there may be larger discrepancies between how they tend to behave and how skilled they are at enacting those behaviors. In contrast, skills and traits may converge more strongly among middle-aged and older adults who have had more time to learn their strengths and weaknesses, as well as practicing behaviors that they enjoy, thereby bringing their skill and trait levels into closer alignment. Future research can also continue to examine the relations of skills and traits with success in other key life domains, such as interpersonal relationships and well-being (Beck & Jackson, 2022; Soto et al., 2022).

4.4. Conclusion

In sum, the present results indicate that both SEB skills and personality traits are important predictors of academic success in adolescence and young adulthood. Moreover, they suggest that skills and traits are about equally important and often interchangeable, but that skills may provide incremental validity over traits for predicting some outcomes—especially outcomes involving performance in high-stakes situations. These findings highlight the importance of skills and traits for predicting and understanding academic success. They can also help inform researchers' and practitioners' decisions about whether and how to assess skills and traits in a particular context.

CRediT authorship contribution statement

Christopher J. Soto: Conceptualization, Data curation, Formal analysis, Writing - original draft, Writing - review & editing. **Christopher M. Napolitano:** Conceptualization, Writing - review & editing. **Madison N. Sewell:** Conceptualization, Writing - review & editing. **Hee Jun Yoon:** Conceptualization, Writing - review & editing. **Dana Murano:** Conceptualization, Data curation, Formal analysis, Writing - review & editing. **Alex Casillas:** Conceptualization, Writing - review &

editing. **Brent W. Roberts:** Conceptualization, Writing - review & editing.

Declaration of Competing Interest

The first, second, and last authors hold the copyright for the Behavioral, Emotional, and Social Skills Inventory (BESSI). ACT, Inc. holds the copyright for the Mosaic™ by ACT[(R)] Social Emotional Learning assessment. Both the BESSI and the Mosaic SEL assessment were used in the present research.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jrp.2023.104382.

References

Abrahams, L., Pancorbo, G., Primi, R., Santos, D., Kyllonen, P., John, O. P., & De Fruyt, F. (2019). Social-emotional skill assessment in children and adolescents: Advances and challenges in personality, clinical, and educational contexts. *Psychological Assessment, 31*(4), 460–473. https://doi.org/10.1037/pas0000591

ACT. (2021). *Mosaic™ by ACT®: Social emotional learning assessment.* ACT Inc.

Almlund, M., Duckworth, A. L., Heckman, J., & Kautz, T. (2011). Personality Psychology And Economics (No. W16822). *National Bureau of Economic Research.* https://doi.org/10.3386/w16822

Barrick, M. R., Mount, M. K., & Li, N. (2013). The theory of purposeful work behavior: The role of personality, higher-order goals, and job characteristics. *Academy of Management Review, 38*(1), 132–153. https://doi.org/10.5465/amr.2010.0479

Beck, E. D., & Jackson, J. J. (2022). A mega-analysis of personality prediction: Robustness and boundary conditions. *Journal of Personality and Social Psychology, 122*(3), 523–553. https://doi.org/10.1037/pspp0000386

Block, J. (1989). Critique of the act frequency approach to personality. *Journal of Personality and Social Psychology, 56*(2), 234–245. https://doi.org/10.1037/0022-3514.56.2.234

Breil, S. M., Mielke, I., Ahrens, H., Geldmacher, T., Sensmeier, J., Marschall, B., & Back, M. D. (2022). Predicting actual social skill expression from personality and skill self-concepts. *Journal of Intelligence, 10*(3), 48. https://doi.org/10.3390/jintelligence10030048

Borkenau, P., & Ostendorf, F. (1987). Retrospective estimates of act frequencies: How accurately do they reflect reality? *Journal of Personality and Social Psychology, 52*(3), 626–638. https://doi.org/10.1037/0022-3514.52.3.626

Buss, D. M., & Craik, K. H. (1983). The act frequency approach to personality. *Psychological Review, 90*(2), 105–126. https://doi.org/10.1037/0033-295X.90.2.105

Casillas, A., Way, J., & Burrus, J. (2015). Behavioral skills. In W. Camara, R. O'Connor, K. Mattern, & M. A. Hanson (Eds.), *Beyond academics: A holistic framework for enhancing education and workplace success* (pp. 25–38). ACT.

Casillas, A., Roberts, B. W., & Jones, S. M. (2022). An integrative perspective on SEL Frameworks. In J. Burrus, M. Brenneman, & S. Rikoon (Eds.), *Assessing competencies for social and emotional learning: Conceptualization, development and applications* (pp. 9–27). Taylor & Francis.

DeYoung, C. G. (2015). Cybernetic Big Five theory. *Journal of Research in Personality, 56*, 33–58. https://doi.org/10.1016/j.jrp.2014.07.004

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087–1101. https://doi.org/10.1037/0022-3514.92.6.1087

Duckworth, A. L., & Yeager, D. S. (2015). Measurement matters: Assessing personal qualities other than cognitive ability for educational purposes. *Educational Researcher, 44*(4), 237–251. https://doi.org/10.3102/0013189X15584327

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). Teaching adolescents to become learners: The role of noncognitive factors in shaping school performance—A critical literature review. *Consortium on Chicago School Research.* https://eric.ed.gov/?id=ED542543

Fleeson, W. (2004). Moving personality beyond the person-situation debate: The challenge and the opportunity of within-person variability. *Current Directions in Psychological Science, 13*(2), 83–87. https://doi.org/10.1111/j.0963-7214.2004.00280.x

Gosling, S. D., John, O. P., Craik, K. H., & Robins, R. W. (1998). Do people know how they behave? Self-reported act frequencies compared with on-line codings by observers. *Journal of Personality and Social Psychology, 74*(5), 1337–1349. https://doi.org/10.1037/0022-3514.74.5.1337

Jayawickreme, E., Zachry, C. E., & Fleeson, W. (2019). Whole trait theory: An integrative approach to examining personality structure and process. *Personality and Individual Differences, 136*, 2–11. https://doi.org/10.1016/j.paid.2018.06.045

Kautz, T., Heckman, J. J., Diris, R., Weel, B. T., & Borghans, L. (2014). Fostering and measuring skills: Improving cognitive and non-cognitive skills to promote lifetime success National Bureau of Economic. *Research, No. w20749.* https://doi.org/10.3386/w20749

Mammadov, S. (2022). Big Five personality traits and academic performance: A meta-analysis. *Journal of Personality, 90*(2), 222–255. https://doi.org/10.1111/jopy.12663

Marcus, B., Goffin, R. D., Johnston, N. G., & Rothstein, M. G. (2007). Personality and cognitive ability as predictors of typical and maximum managerial performance. *Human Performance, 20*(3), 275–285. https://doi.org/10.1080/08959280701333362

McCrae, R. R. (2015). A more nuanced view of reliability: Specificity in the trait hierarchy. *Personality and Social Psychology Review, 19*(2), 97–112. https://doi.org/10.1177/1088868314541857

Meyer, J., Jansen, T., Hübner, N., & Lüdtke, O. (2023). Disentangling the association between the Big Five personality traits and student achievement: Meta-analytic evidence on the role of domain specificity and achievement measures. *Educational Psychology Review, 35*(1), 12. https://doi.org/10.1007/s10648-023-09736-2

Mõttus, R., Kandler, C., Bleidorn, W., Riemann, R., & McCrae, R. R. (2017). Personality traits below facets: The consensual validity, longitudinal stability, heritability, and utility of personality nuances. *Journal of Personality and Social Psychology, 112*(3), 474–490. https://doi.org/10.1037/pspp0000100

Napolitano, C. M., Sewell, M. N., Yoon, H. J., Soto, C. J., & Roberts, B. W. (2021). Social, emotional, and behavioral skills: An integrative model of the skills associated with success during adolescence and across the life span. *Frontiers Education, 6*, Article 679561. https://doi.org/10.3389/feduc.2021.679561

National Research Council. (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st century.* The National Academies Press.

Organisation for Economic Co-Operation and Development [OECD] (2015). *Skills for social progress: The power of social and emotional skills.* http://www.oecd.org/education/skills-for-social-progress-9789264226159-en.htm.

Ozer, D. J., & Benet-Martínez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology, 57*, 401–421. https://doi.org/10.1146/annurev.psych.57.102904.190127

Paulhus, D. L., & Martin, C. L. (1987). The structure of personality capabilities. *Journal of Personality and Social Psychology, 52*(2), 354–365. https://doi.org/10.1037/0022-3514.52.2.354

Ployhart, R., Lim, B.-C., & Chan, K.-Y. (2001). Exploring relations between typical and maximum performance ratings and the Five factor model of personality. *Personnel Psychology, 54*(4), 809–843. https://doi.org/10.1111/j.1744-6570.2001.tb00233.x

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Podsakoff, N. P., Whiting, S. W., Welsh, D. T., & Mai, K. M. (2013). Surveying for "artifacts": The susceptibility of the OCB–performance evaluation relationship to common rater, item, and measurement context effects. *Journal of Applied Psychology, 98*(5), 863–874. https://doi.org/10.1037/a0032588

Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin, 135*(2), 322–338. https://doi.org/10.1037/a0014996

Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science, 2*, 313–345.

Schönbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize? *Journal of Research in Personality, 47*(5), 609–612. https://doi.org/10.1016/j.jrp.2013.05.009

Soto, C. J. (2019). How replicable are links between personality traits and consequential life outcomes? The Life Outcomes of Personality Replication Project. *Psychological Science, 30*(5), 711–727. https://doi.org/10.1177/0956797619831612

Soto, C. J. (2021). Do links between personality and life outcomes generalize? Testing the robustness of trait-outcome associations across gender, age, ethnicity, and analytic approaches. *Social Psychological & Personality Science, 12*(1), 118–130. https://doi.org/10.1177/1948550619900572

Soto, C. J., Napolitano, C. M., Sewell, M. N., Yoon, H. J., & Roberts, B. W. (in press). Going beyond traits: Social, emotional, and behavioral skills matter for adolescents' success. *Social Psychological and Personality Science.*

Soto, C.-J., & John, O.-P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology, 113*(1), 117–143. https://doi.org/10.1037/pspp0000096

Soto, C. J., Napolitano, C. M., & Roberts, B. W. (2021). Taking skills seriously: Toward an integrative model and agenda for social, emotional, and behavioral skills. *Current Directions in Psychological Science, 30*(1), 26–33. https://doi.org/10.1177/0963721420978613

Soto, C. J., Napolitano, C. M., Sewell, M. N., Yoon, H. J., & Roberts, B. W. (2022). An integrative framework for conceptualizing and assessing social, emotional, and behavioral skills: The BESSI. *Journal of Personality and Social Psychology, 123*(1), 192–222. https://doi.org/10.1037/pspp0000401

Taylor, R. D., Oberle, E., Durlak, J. A., & Weissberg, R. P. (2017). Promoting Positive Youth Development through School-Based Social and Emotional Learning Interventions: A Meta-Analysis of Follow-Up Effects. *Child Development, 88*(4), 1156–1171. https://doi.org/10.1111/cdev.12864

Turner, R. G. (1978). Consistency, self-consciousness, and the predictive validity of typical and maximal personality measures. *Journal of Research in Personality, 12*, 117–132. https://doi.org/10.1016/0092-6566(78)90088-0

Ura, S. K., Castro-Olivo, S. M., & d'Abreu, A. (2020). Outcome measurement of school-based SEL intervention follow-up studies. *Assessment for Effective Intervention, 46*(1), 76–81. https://doi.org/10.1177/15345 08419862619

Walton, K. E., Murano, D., Burrus, J., & Casillas, A. (2021). Multimethod support for using the Big Five Framework to organize social and emotional skills, 107319112110457 *Assessment.* https://doi.org/10.1177/10731911211045744.

Willerman, L., Turner, R. G., & Peterson, M. (1976). A comparison of the predictive validity of typical and maximal personality measures. *Journal of Research in Personality, 10*(4), 482–492. https://doi.org/10.1016/0092-6566(76)90063-5

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology, 25*(1), 82–91. https://doi.org/10.1006/ceps.1999.1016

Yoon, H.J., Roberts, B.W., Soto, C.J., Sewell, M.N., Napolitano, C.M., Casillas, A., & Murano, D. (under review). Examining SEB skills' incremental validity over personality traits in predicting academic achievement. Manuscript under review.