



# SEL SKILLS: SCIENCE & MYTH

## ABSTRACT

This working paper evaluates some of the claims around social and emotional learning skills that appear misguided in light of contemporary scientific evidence. I first posit the erroneous assumption (i.e., myth) and then provide commentary on what is more likely the empirical case (i.e., science).

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WORKING PAPER 2018-2

## Table of Contents

Background	.....	2
The Myths	.....	3
Discussion	.....	11
References	.....	12

## Author Notes

1. The views expressed in this paper are those of the author and do not reflect the official opinions or policies of RAD Science or any of its partner’s host affiliations.
2. Portions of this paper are likely to appear in revised form in a book currently being written by the author with two other scientist/practitioners: Martin, J., Burrus, J., & Roberts, R. D. (accepted, due 2018). *Assessing noncognitive skills: Research, theory, and applications*. New York: Taylor & Francis.
3. Regardless of this possibility, this paper serves as an independent, living document that I will continually be updating, including adding any new issues raised, or controversies resolved, which readers may wish to provide. Future versions will also seek to include broader background and discussion where appropriate.
4. If there is interest, the RAD Science team will also create a set of quizzes around this topic.

## Background

Contemporary research has demonstrated the critical role that social and emotional (SEL) skills play in an individual's academic performance, as well as the role that these skills have in work settings and general life functioning (e.g., Burrus, MacCann, Kyllonen, & Roberts, 2011; Roberts, Martin, & Olaru, 2015). A litany of studies has thus shown that, as early as preschool, behavioral skills predict achievement (e.g., Abe, 2005), with these skills also shown to predict reading, science, and mathematics achievement on both large-scale domestic and international assessments (e.g., Campbell, Voelkl, & Donahue, 1997; Connell, Spencer, & Aber, 1994). Furthermore, meta-analyses have shown that these behavioral skills incrementally predict both achievement and retention of college students above and beyond the effects of grades and test scores (e.g., Poropat, 2009).

Important SEL factors related to academic achievement, and workforce performance include: conscientiousness or work ethic (e.g., Schmidt & Hunter, 1998; Wagerman & Funder, 2006), integrity (e.g., Schmidt & Hunter, 1998), self-control (e.g., Judge & Hurst, 2005), resilience (e.g., Elliott, Kaliski, Burrus, & Roberts, 2013), and interpersonal skills, such as teamwork (Zhuang, MacCann, Wang, Liu, & Roberts, 2008) and emotional management (MacCann & Roberts, 2008). There is also emerging evidence that these SEL skills play a critical role when the research studies have been broadened to include factors beyond academic (i.e., grade point average [GPA]) and job performance (i.e., supervisor ratings), such as absenteeism (MacCann, Duckworth, & Roberts, 2009), counterproductive workplace behaviors (Mount, Isles, & Johnson, 2006; Salgado, 2002), and chronic unemployment (Lindqvist & Vestman, 2011). Indeed, studies emanating largely from economics (with the Nobel Laureate James Heckman at the forefront) have demonstrated that measures of behavioral skills, in particular, meaningfully predict wages, employment status, and incarceration rates (e.g., Borghans, Duckworth, Heckman, & ter Weel, 2008; Heckman, Malofeeva, Pinto, & Savelyev, 2007; Heckman & Rubinstein, 2001).

While new curriculum have been – or are being -- developed across the globe to promote SEL skills (see <https://casel.org/>), I note that there are not many resources out there that educators, policy-makers, and sometimes even assessment developers can use to separate fact from fiction, science and myth in this domain. (Indeed, to do so actually requires relatively expansive knowledge of educational, psychological, and even economic principles). Moreover, there are relatively few (if any) institutes of higher education, to present knowledge, offering SEL teaching as a career trajectory. The goal of this working paper is to highlight a subset of these myths and provide compelling arguments as to what scientific evidence currently suggests. I do this initially in this working paper with seven illustrative examples, where a claim is first proposed, and then shown to be a counterfactual statement. Over time, I will add to these claims, based on user feedback and interaction.

### **Myth 1: SEL Skills are Set Like Plaster Very Early in Life!?**

It remains the case that a good many educational (and for that matter, social science introductory text books more broadly), state relatively unequivocally that personality constructs (which the SEL skills demonstrably fall-under [see Camara et al., 2015; Roberts et al., 2015]) is fixed. The idea can be traced to William James, who famously contended that personality was set like plaster fairly early on in life (see also, e.g., McCrae & Costa, 1994). More recently, however, meta-analyses have questioned this assertion and suggest instead that these behavioral skills develop over the lifespan. In the first of these studies, Roberts and DelVecchio (2000) examined 152 longitudinal studies to show that the rank-order consistency of personality was moderate: .31 in childhood, .54 in college, .64 by age 30, and .74 by ages 50-70 (values much closer to one would have supported the idea of personality being immutable). In a follow-up study, Roberts, Walton, and Viechtbauer (2006) examined mean-level change in personality over the lifespan. They found that individuals became more socially dominant, conscientious, agreeable, and emotionally stable throughout the lifespan particularly in adolescence and early adulthood. And the effects were not slight: Change over the lifespan

was up to a full standard deviation. The figure below distills the main findings from these studies in a compelling fashion.

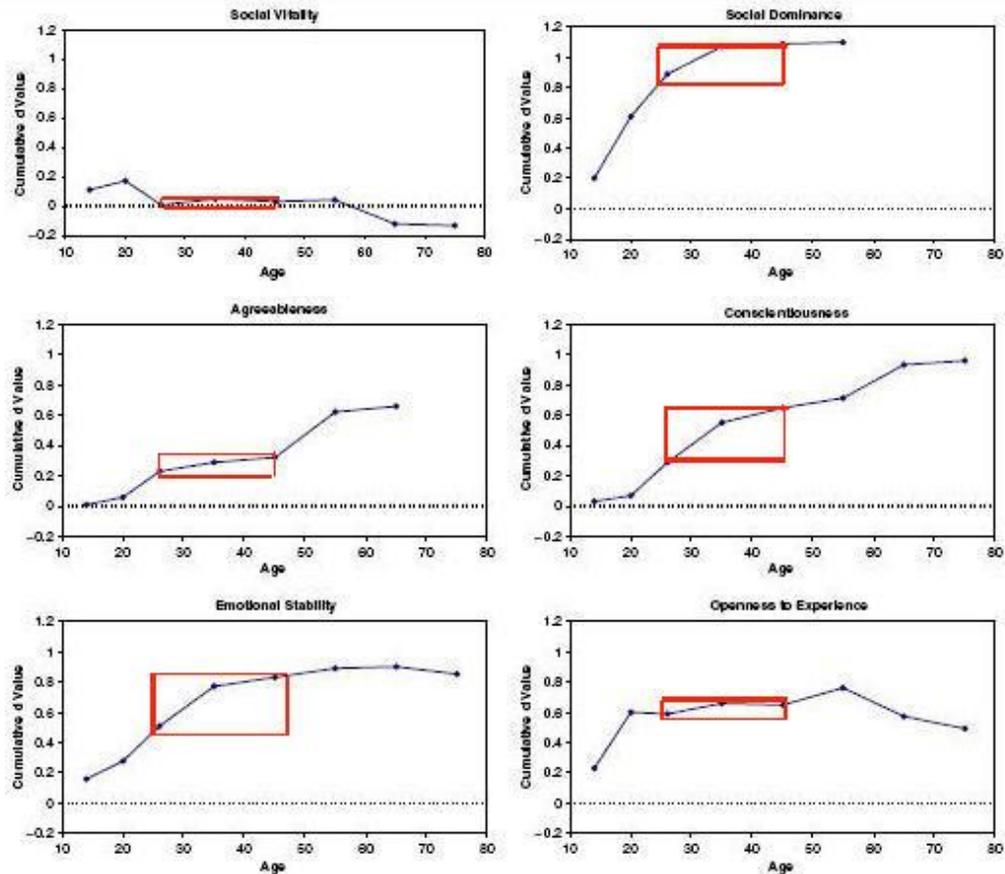


Fig. 1. Change in personality traits over time for six trait domains. These graphs were created by adding average amounts of standardized mean-level change from separate decades of the life course together, under the assumption that personality-trait change may be cumulative. Extraversion is broken into its constituent subdomains of social vitality and social dominance.

## Myth 2: Teachers and Educational Policymakers Accept Self-Report Assessments of SEL Skills as Valid and Reliable as There are Few Other Cost-Effective Alternatives!?

This claim, I would argue, is best seen in the wide-spread adoption of various self-report assessments by the educational community in the United States, Europe, Asia, and South America, especially when assessing behavioral skills (see e.g., <https://www.panoramaed.com/>; <http://coredistricts.org/our-data-research/research-report-findings/>). Indeed, in recent work

that I was involved in carrying out under contract with a stellar group of collaborators, this can, and has been adopted, by whole country systems (e.g., Roberts et al., 2017).

And it is certainly the case that self-report assessments have proven to be very efficient in gathering a lot of information, reliably, in a brief period of time (Lipnevich, MacCann, & Roberts, 2013). Surveyed persons are asked to indicate their agreement with a small number of different statements (e.g. “I like to work hard”). In order to gain more detailed information, respondents are not just answering whether they agree or not, but instead also report their level of agreement via Likert-type scales, which provide anywhere between three and ten response options that represent increasing levels of endorsement.

However, items of this type are also associated with a significant number of problems, rendering use in many contexts problematic. For instance, there tend to be cultural differences in response styles, with people from some cultures tending to respond in an extreme style, whereas people from other cultures tend to respond by using midpoints (Danner et al., 2016). Indeed, it is for this reason the OCED has never issued league tables around many of its so-called background variables, though there is clearly country demand (see e.g., Naemi et al., 2013). Furthermore, these item types are very easy to fake, particularly if the individual wishes to avoid having to attend training programs or wish to appear more attractive to a prospective school admission officers, a university system, or prospective employer (Ziegler, MacCann, & Roberts, 2011). Even more disconcerting, self-report assessments are poor vehicles for evaluating the changes that might be brought about by an intervention. Lacking self-insight prior to treatment, individuals may rate themselves highly post the intervention and lowly after the intervention (see e.g., Burrus, Jackson, Holtzman, & Roberts, 2017; Duckworth & Yeager, 2015).

Over the past decade, numerous new approaches to assessing behavioral skills have emerged including the use of biodata (e.g., Schmitt, Oswald, Kim, Gillespie, & Ramsay, 2003), situational judgment tests (e.g., Lievens & Coetsier, 2002; MacCann & Roberts, 2008), and forced-choice

procedures (e.g., Anguiano-Carrasco, MacCann, Geiger, Seybert, & Roberts, 2015; Drasgow et al., 2012). I might consider each of these approaches in this account, but it could serve as a distraction from the main impetus of the paper. Consider thus only the following: Forced-choice.

This procedure has many different aspects, including paired comparisons, rank-ordering, and multidimensional forced-choice. In paired comparisons, the test-taker must choose between two statements (e.g., which is more like you: “I work hard” or “I enjoy working in teams”?). In rank-ordering, test-takers must rank a series of equally desirable statements in order from “most like me” to “least like me”. In multi-dimensional forced-choice assessments, test-takers are presented with a dichotomous quartet of four different traits in which two socially desirable statements are paired with two socially undesirable statements (Jackson, Wroblewski, & Ashton, 2000). There is compelling evidence to suggest that forced-choice tests are less fakeable than standard rating scales, show stronger relationships with performance outcomes, and may get around the types of issues generally found when using self-reports to evaluate an intervention (e.g., Drasgow et al., 2012; Jackson et al., 2000). An empirically-based procedure for item selection and test development combined with new statistical modeling techniques seems to produce the best of all worlds: Fake-proof normative tests, which can also tell the individual how they score relatively on each dimension.

In short, it is simply not the case that self-report assessments are the only option to assess key SEL skills. While cheap, they are also likely dirty, certainly in the sense intended by the passages on construct irrelevant variance of the authoritative Test Standards (AERA, 2014). Educators should be exposed to the viable alternatives, including school administrators who are empowered with purchasing power. If one accepts the adage – what is measured, is treasured – any attempt to measure SEL, absent of alternatives to the self-report approach, is bound to problematic interpretation. And the effects are wide ranging impacting as it will individual reporting all the way to broad educational policy decisions.

**Myth 3: Even the Most Cognitively Challenged Student Can Learn to be Creative!?**

While this would appear a claim that all educators would like to make and is likely behind at least some of the impetus for PISA 2021, it is demonstrably false. The so-called cognitive threshold hypothesis states that a minimal level of cognitive ability and achievement is required in order to be considered creative (e.g., Guilford, 1967; Jauk, Benedek, Dunst, & Neubauer, 2013). While this does not render the importance of this SEL skill any less important within the classroom or educational policy, it does suggest that it represents a particularly complicated construct to change.

**Myth 4: While Teaching SEL Skills May Have an Impact on Student’s Lives and Citizenship Behaviors, the Extant Literature Does Not Provide Strong Evidence They Will Influence the Thing an Educator Cares About in Today’s Educational Policy Environment: Academic Achievement!?**

A good portion of our background section of this working paper was taken up expunging this myth. But the meta-analysis conducted by Poropat (2009) bears further mention on this score. The Table below gives a summary of the research that has this far been conducted on the relationship between several key behavioral skills and academic performance with an accumulated sample size of over 70,000 students.

In the area of immediate interest to this issue, the research is compelling; these traits matter, most particularly in the primary grades, but also to a substantial extent in the secondary and post-secondary educational environments. Indeed, in secondary education, Conscientiousness/Work Ethic appears as important for academic performance as does cognitive ability. Given the fact that cognitive enhancement per se is far more complicated to inculcate than first thought (see Kyllonen, Roberts, & Stankov, 2008) suggests educators may be

wise to certainly entertain the measurement and enhancement of SEL skills even if GPA and achievement are the only yardsticks they are interested in being held accountable.

*Correlation of key behavioral skills and cognitive ability with grade point average in primary, secondary, and tertiary educational sectors as determined by a meta-analysis of over 70,000 students*

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	Educational Level		
	Primary	Secondary	Tertiary
Conscientiousness	.28	.21	.23
Agreeableness	.30	.05	.06
Emotional Stability	.20	.01	-.01
Openness	.24	.12	.07
Extraversion	.18	-.01	-.03
<b>Cognitive Ability</b>	<b>.58</b>	<b>.24</b>	<b>.23</b>

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**Myth 5: New SEL Concepts are Unique Gemstones That Have Not Otherwise Been Provided to the Educational Community Before Its Key Developer’s Scientific Research!?**

In some very important respects the field of SEL owes much of its funding, conceptual, and policy impetus from landmark work done on emotional intelligence (EI), including the New York Times best-selling book, *Emotional Intelligence* (Goleman, 1995). Now a concept having over two decades of the scientific spotlight shone on it, it is worth making a few telling observations. In particular, while assessments of EI remain the subject of research, they are seldom used in operational settings to make any high-stakes decisions, nor are they widely used in educational settings. We suggested this might happen nearly two decades ago, by carefully inspecting the content of available assessments of EI and including measures of it, along with Big Five personality indicators (e.g., Davies, Stankov, & Roberts, 1998; Matthews, Zeidner, & Roberts,

2003). The result, which has subsequently been borne out by further studies and meta-analyses (for a summary, see Zeidner, Matthews, & Roberts, 2009) is striking: Self-report assessments of EI are nothing more than Big Five constructs repackaged under different, but ultimately analogous, labels.

Similarly, while work on grit is ostensibly important (e.g., Duckworth, 2016) -- if none other than the manner it has centered attention on an important SEL skill -- it is a field of research that is anything but new. Thus, as was also suggested by empirical data some time ago (MacCann & Roberts, 2010), and more recently given greater impetus by an expansive meta-analysis (representing 66,807 individuals), grit is not much more than a repackaging of the Conscientiousness SEL skill mentioned throughout this paper (Crede, Tynan, & Harms, 2017). Notably reinterpreting grit in this manner would, indeed does, have profound implications for assessment opportunities and remediation.

The problem of not carefully linking new constructs to old, then garnering more expansive claims may extend beyond emotional intelligence and grit to a wide range of constructs. For example, this excellent EdWeek blog by John Hattie points out compellingly how much of what has been said of growth mindset (which appears closely related to Openness) clearly falls outside the more careful purview of its progenitor:

[http://blogs.edweek.org/edweek/finding\\_common\\_ground/2017/06/misinterpreting\\_the\\_growth\\_mindset\\_why\\_were\\_doing\\_students\\_a\\_disservice.html](http://blogs.edweek.org/edweek/finding_common_ground/2017/06/misinterpreting_the_growth_mindset_why_were_doing_students_a_disservice.html)

**Myth 6: Evidence for the Value of SEL Programs is Weak to Non-Existent and is Most Problematic for the Underserved!?**

I have heard this claim uttered many times at conferences, read about it in blogs, and engaged in long debates with colleagues more au fait with typical cognitive assessments. The statement

is largely misleading. A number of peer-reviewed meta-analyses show the effects of carefully operationalized SEL programs on a range of factors, including discipline rates, GPA, absenteeism, health and well-being indicators, and school climate (e.g., Durlak et al., 2011). Moreover, these programs work both within school, and as after school, activities (e.g., Durlak, Weissberg, & Pachan, 2010). In an especially rigorous evaluation that looked especially at studies employing rigorous methodological evaluation designs, SEL programs were also shown to lead to gains in academic achievement, though the effect sizes were slighter than some might have liked (Corcoran, Cheung, Kim, & Chen, 2017). Equally important, a rigorous return-on-investment (ROI) study of SEL programs has also been conducted, with the analysis suggesting that for every dollar spent society can expect up to a seventeen-dollar return (Belfield et al., 2015); I am unaware of similar returns for cognitive programs, though I welcome such data. There is also a gem of information tucked within the lining of this paper: In three samples of undeserved students undertaking SEL programs the ROI appears even larger. And in cutting-edge research where specific underserved populations are given highly customized SEL interventions, emerging results are compelling (e.g., Jagers et al., 2007).

**Myth 7: All Educators Have a Clear Understanding of the Current Definitions of SEL Skills, How They are Measured, and What Programs Might Offer the Best Value-Add to Incultation Within the Classroom!?**

To some significant extent this a corollary of the preceding arguments, though it would be well worth collecting empirical data supporting this assertion for self-evident reasons. If one accepts that this assertion may be false, it begs a bigger set of questions. Should teacher leaders who are fully proficient in this domain be rewarded in a meaningful way? Should teaching these classes be contingent on some form of credential (or micro-credential, badge)? And are we certain that educators that lead SEL classes are enabling students appropriately, especially since we know modeling of these skills may be an especially effective form of intervention? These

and others like it, appear questions worth addressing and one's RAD Science will be actively exploring in the years ahead.

### **Discussion**

To reiterate what was said previously, I believe these claims may just be the tip of an iceberg regarding disinformation. We know, for example that this claim -- SEL skills appear as likely to lead to similar score gaps as those found for cognitive measures -- has been made and is likely false (Sackett, Schmitt, Ellingson, & Kabin, 2001 provide verifiable arguments to the contrary). And there are also likely less consequential claims that may be important for educators to be made patently aware. For example, I contend that many educators believe current critical thinking measures capture all the key components of the concept. The definition of critical thinking provided on Wikipedia is insightful in this instance: "Critical thinking is the objective analysis of facts to form a judgment. The subject is complex, and several different definitions exist, which generally include the rational, skeptical, unbiased analysis, or evaluation of factual evidence". And yet I know of no instances where sub-scores related to biases and heuristics comprise critical thinking assessments, when they should (Gertner, Zaromb, Schneider, Rhodes, Matthews, Burrus, Roberts, & Bowen, 2013).

While I acknowledge that for at least some of the aforementioned issues my own knowledge may bias a particular take (though by focusing on available scientific evidence, delimiting it considerably), it is certainly the case many are open to considerable debate. And yet the weaker argument (certainly in light of contemporaneous scientific evidence) more often than not is thought of as a truism. Moreover, I contend holding them as such, renders individual school adoption of SEL skills, within the complex dynamic of teacher, school, parent, community, state and national policy entirely problematic. It is with this goal in mind – to create more informed conversation – that this working paper was written. I trust it has served its intended purpose.

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