



PRELIMINARY REPORT

Reliability and Validity of Panorama's Social-Emotional Learning Measures



Over 1,000 schools use Panorama Education to measure and improve their students' social-emotional learning (SEL). Panorama helps schools and districts assess SEL, distribute results to stakeholders with customized reports, and take targeted next steps to improve social-emotional skills and supports.

In this document, we provide a brief conceptual overview of [Panorama's SEL measures](#), as well as evidence of the reliability and validity of our scales.

Background

SEL captures a broad array of the competencies, attitudes, and dispositions that help individuals succeed in school, career, and life. At Panorama, we organize our thinking in this area by drawing from the most compelling theories and the most persuasive data. In reading through the voluminous literature, one sees that three domains consistently produce outsized impacts on student outcomes: social relationships (Gehlbach et al., 2016; Walton & Cohen, 2011), motivation (Hulleman & Harackiewicz, 2009), and self-regulation (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011).

Our measurement tools are designed with these three crucial domains in mind. Some of our measures fit squarely within a domain: self-efficacy, for example, is a core part of every major theory of motivation (students must feel confident that a task is doable if they are to attempt it). In other instances, our measures stretch across these domains: "grit" is a combination of motivation and self-regulation. Some measures focus more on the individual student (e.g., their mindset); others focus more on the environment (e.g., classroom climate); and others focus on interactions between the two (e.g., sense of belonging).

Some organizations take slightly different approaches to thinking about which are the most important competencies, attitudes, and dispositions to measure. At the core of the most compelling of these frameworks, you'll find a shared emphasis on three ingredients needed for thriving: social relationships, motivation, and self-regulation. For example, Panorama's SEL measures are consistent and [well-aligned with frameworks](#), such as those from the Collaborative for Academic, Social, and Emotional Learning (CASEL) and the California Office to Reform Education (CORE).

Panorama offers a variety of SEL measures for schools to use. Our own measures were developed by education researchers and practitioners, including researchers at UC Santa Barbara and the Harvard University Graduate School of Education. We also give schools access to measures from our partners at Transforming Education and the CORE districts. Measures include student self-reports, student perceptions of the school environment and supports, and teachers' perspectives and skills.



All of the items in our scales are worded and structured in accordance with the current best practices in the science of survey design. However, this step alone does not insure high quality measures. For that reason, we test our items and how well they function together as a holistic scale to measure the underlying aspect of schooling that they are supposed to measure. The remainder of this report details the data that speak to the reliability and validity of our scales.

Reliability and Validity

To provide initial evidence of the reliability and validity of our SEL measures, we analyzed data from three school districts on seven measures. Each measure contained between five and ten self-report items. Because an instrument’s validity depends on how it is used, it’s worth noting that these schools were measuring student SEL for formative purposes only—they were not evaluating students or teachers based on the results.

The three district samples of student SEL data came from diverse public and charter school contexts. Data were gathered from middle and high schools with enrollments ranging from 310 to 1350 students, FRPL percentages ranging from 5 to 81%, and non-white student percentages ranging from 7 to 79%.

Our SEL measures are reliable, with an average Cronbach alpha coefficient of .78 and minimum of .68. Confirmatory factor analyses verified that a single-factor model fit the data well for each measure across all three samples. For example, for sense of belonging, there was significant model fit, all $X^2(5)s > 17.8$, $ps < .003$, $RMSEAs < .034$, $CFIs > .98$.

The SEL measures correlate with each other as expected. On the whole, the different measures are moderately correlated with each other, with higher correlations for more related constructs (e.g., sense of belonging and teacher-student relationships) and lower correlations for less related constructs (e.g., sense of belonging and grit). The below table shows the SEL intercorrelations, with the shading and numbers indicating the size of the (Spearman) correlations.

	safety						
sense of belonging (SoB)	0.16	SoB					
growth mindset (GM)	0.01	0.28	GM				
grit	0.06	0.29	0.30	grit			
self-efficacy (SE)	0.10	0.43	0.34	0.50	SE		
teacher student relationships (TSR)	0.20	0.56	0.25	0.29	0.48	TSR	
social awareness (SA)	0.07	0.49	0.36	0.43	0.46	0.42	SA
self-management (SM)	0.16	0.37	0.34	0.46	0.52	0.38	0.69



The SEL variables displayed measurement invariance, in that their intercorrelations were stable across districts (i.e., the three data samples) and student populations. Across samples, the difference between SEL intercorrelations (e.g., the growth-mindset and social awareness correlation for sample A versus sample B) differed on the average by .09, with a maximum difference of .23. The intercorrelations also showed stability with respect to student demographics—for both gender and FRPL, the average difference (between men and women, and FRPL and non-FRPL) was .05.

To further investigate the validity of our SEL measures, we correlated them with student GPA (cumulative and last semester), absences (total, excused, and unexcused, as percentage of enrolled days), tardiness (as percentage of enrolled days), behavioral referrals, grade level, gender, and FRPL status. The SEL measures correlate as expected with these variables. Most notably, higher SEL scores were associated with higher GPAs and fewer absences, tardy days, behavioral referrals. The below table present these results, with number (and shading) indicating the size (and direction) of the correlations and non-significant correlations omitted. For example, there is a relatively strong positive correlation ($r = .40$) between self-efficacy and grades as indicated by the deep red shading, a relatively weak negative correlation ($r = .08$) between grit and behavioral referrals as indicated by the light green shading, and no significant correlation between self-efficacy and grade in school as indicated by the empty cell. (Note: For gender, positive/green correlations indicate that females scored higher than males, and negative/red correlations indicate that males scored higher than females).

	GPA	GPA (last)	absences (total)	absences (excused)	absences (unexcused)	days tardy	behavioral referrals	grade	gender	FRPL
grit	0.26	0.29	-0.09	-0.08	-0.12	-0.14	-0.08	0.14		-0.08
teacher-student relationship	0.23	0.23	-0.18	-0.18	-0.17	-0.25	-0.18			
self-efficacy	0.40	0.42	-0.19	-0.18	-0.18	-0.26	-0.13			-0.12
growth mindset	0.16	0.17								
social awareness	0.22	0.23				-0.10	-0.08	0.11	0.17	
self-management	0.37	0.38	-0.16	-0.15	-0.16	-0.28	-0.20		0.19	-0.08
sense of belonging	0.14	0.14	-0.12	-0.12	-0.13	-0.11	-0.08		-0.10	
school safety	0.22	0.22	-0.15	-0.15	-0.11	-0.22	-0.16			-0.09
emotion regulation	0.09	0.10							-0.25	

In summary, Panorama’s SEL measures—administered for formative purposes—exhibit the psychometric properties of good instruments: reliability and validity. As we continue to collect, analyze, and interpret SEL data, we will update and expand this report accordingly.



Interested in learning more?

Visit [Panorama for SEL](#) to download all 22 SEL measures. Contact us for more information about how Panorama can help you measure and act on social-emotional skills and competencies in your school, network, or district. For more details on specific measures or analyses, contact SEL_Team@panoramaed.com.

References

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