

Validity of ACT Tessera Unified Score

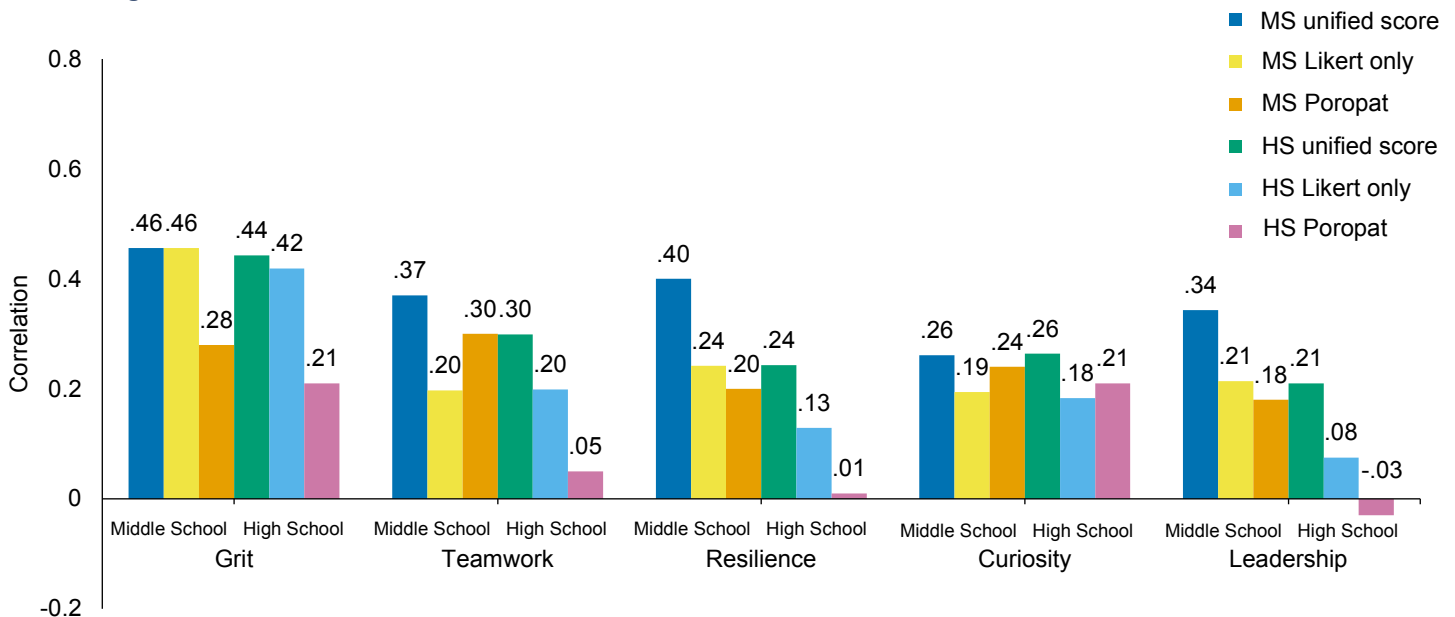
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Social and emotional skills impact many aspects of life, including academic achievement (Poropat, 2012; Richardson, Abraham, & Bond, 2012). Several methods for measuring and scoring social and emotional skills have been developed, from traditional Likert-type items to the recently developed IRT-based approaches for normative forced choice scoring, and each has its own challenges. Despite this, most assessments are based on one single item type, most commonly Likert items. Although they have multiple advantages, Likert items have shortcomings that threaten their measurement accuracy (Kankaraš, 2017).

To mitigate the problems associated with using only one item type, ACT® Tessera® uses a multi-trait multi-method approach; three item types (Likert, forced choice, and Situational Judgment Test [SJT]) measure five social and emotional skills (Grit, Teamwork, Resilience, Curiosity, and Leadership). We developed a scoring model that combines response data from all three item types, yielding a unified score for each skill. To combine the scores from the three item types, forced choice data were initially modeled as a five-factor Thurstonian Item Response Theory model (Brown & Maydeu-Olivares, 2011). Likert items were then added as indicators of factors. Finally, SJT items were added using a bifactor modeling approach, where each SJT response loads on a skill factor and on a scenario-specific factor.

We fit the scoring model and generated unified scores as well as scores using only the Likert items for each social and emotional skill using data from 10,387 middle school students and 4,738 high school students who completed Tessera and provided a self-reported GPA. We then explored the validity evidence for the scores by correlating them with GPA and comparing the correlations to meta-analytic findings (Poropat, 2009).

Figure 1. Correlations Between Social and Emotional Skills and GPA



We also regressed GPA on each of the Tessera scales to determine the amount of GPA variance accounted for by Likert scales alone compared to the unified scores. As can be seen in Table 1, the amount of GPA variance accounted for by unified scores was higher for almost all scales.

Table 1. Percentage of GPA variance accounted for by each scale.

	Middle School GPA		High School GPA	
	Likert Scores	Unified Scores	Likert Scores	Unified Scores
Grit	20.8	20.8	17.6	19.6
Teamwork	3.9	13.7	3.9	8.9
Resilience	5.9	16.0	1.7	5.9
Curiosity	3.8	6.8	3.4	7.0
Leadership	4.6	11.8	.6	4.0

The results provide criterion validity evidence for the unified scoring approach. Moreover, without exception, the unified scores have stronger correlations with GPA than the Likert scales do, which suggests that the Tessera approach for combining different item types has great potential to enhance social and emotional skill measurement by increasing score validity.

References

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