Score Correlations Between the SLE, SAT, and ACT: Convergent and Predictive Validity of the Wonderlic Scholastic Level Exam

Brett M. Wells, Ph.D.



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INTRODUCTION

The Wonderlic Scholastic Level Exam (SLE) has been used by postsecondary institutions since 1983, and it is a fast, accurate, and easy-to-use measure of cognitive ability - the most powerful predictor of student academic success. The SLE evaluates a student's ability to learn and solve problems in order to match the student with educational or training programs that fit their learning speed and aptitude.

In addition to the SLE, the most widely used standardized postsecondary entrance exams are the Scholastic Achievement Test (SAT®) and the American College Test (ACT®).



THE ASSESSMENTS AT A GLANCE

Table 1 presents a comparison of these exams. The benefits conveyed by using the SLE as opposed to using either the SAT or ACT are readily apparent. The SLE:

- is administered in a fraction of the time
- can be administered every day of the year
- may be offered as an online assessment
- contains fewer questions than the SAT and ACT
- has available an unproctored precursor to the full, proctored version
- is offered in multiple languages

Table 1
Comparisons among standardized college entrance exams

Exam	Administration Mode	Unproctored Version	Languages Offered	Questions	Administration Time	Annual Testing Dates	Test Coverage
SLE	Online & Paper	Yes	English & Spanish	50	12 minutes	365	Ability to learn, adapt, solve problems, and understand instructions
SAT	Paper Only	No	English Only	170 + 1 essay	3.75 hours	7	Reading, Writing, and Math
ACT	Paper Only	No	English Only	215 + 1 essay	3.5 hours	6	English, Math, Reading, and Science

COMPARING THE SCORES

Although the benefits of the SLE are fairly obvious, the question remains: How do scores on the SLE compare to scores on the SAT and ACT?

The Standards for Educational and Psychological Testing state that validity is "the degree to which all the accumulated evidence supports the intended interpretation of test scores for the proposed purpose" (AERA, APA, NCME, 1999, p. 11). While validity is generally regarded as a unitary concept describing "how well [a measurement instrument] measures what it purports to measure," it is often useful to consider an instrument's properties with respect to the different facets of validity that have historically been discussed (Nunnally & Bernstein, 1994, p. 83). In short, "evidence that two measures are highly related and consistent with the underlying construct can provide convergent evidence in support of the proposed interpretation of test scores as representing a candidate's standing on the construct of interest" (SIOP, 2003, p. 5). Convergent validity evidence for the SLE was obtained through two separate studies that examined the relationship between SLE scores and scores on other standardized college entrance exams, the SAT and the ACT.

In addition to convergent validity, the second study also examined the predictive validity of the SLE. Predictive validity is the method of validation most often used with ability tests, and measures the relationship between the test score and some measure of performance, such as grades or educational outcomes. Predictive validity evidence was obtained by examining the relationship between SLE scores and an assessment of student learning outcomes.


SLE
SAT
ACT

STUDIES

THE FIRST STUDY

The first study was conducted by Dr. Shane Frederick, Professor of Marketing at Yale School of Management. In his 2005 article, Frederick examined the relationships among the SLE, SAT, and ACT. In total, 921 students completed the SLE, and several hundred students also self-reported their scores on the SAT and/or ACT. Table 2 summarizes his findings:

"As expected, all measures correlate positively and significantly correlate with one another. The moderate correlations suggest that all tests likely reflect common factors, but may also measure distinct characteristics, as they purport to."

Table 2
Correlations Among Standardized College Entrance Exams as Reported in Frederick (2005)

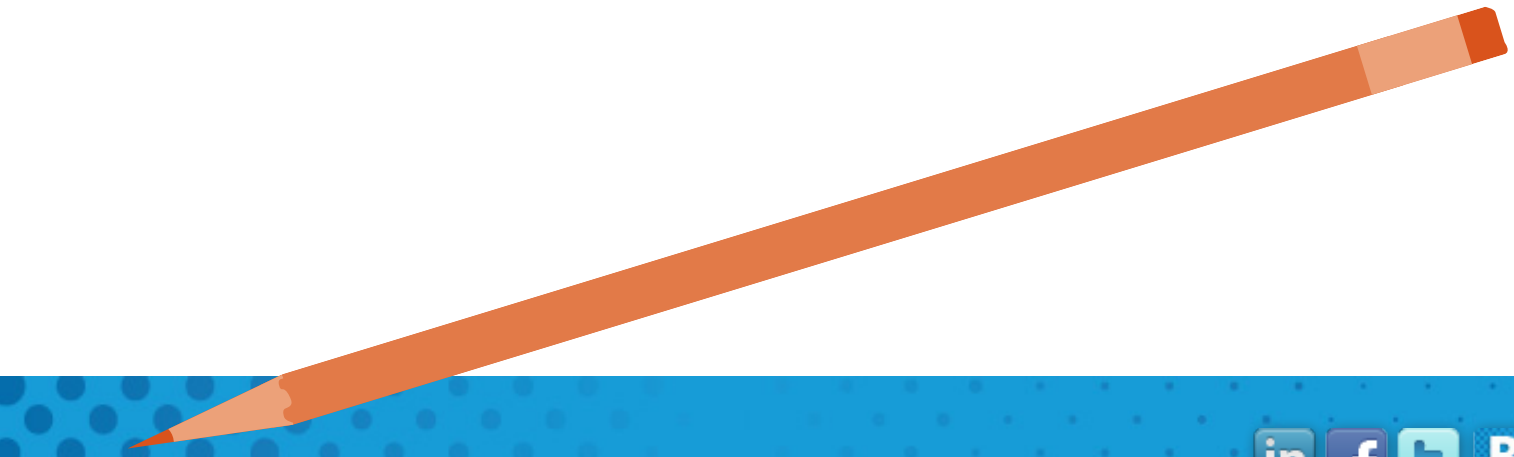
Exam	SLE	SAT	ACT
SLE	-	276	466
SAT	.49	-	152
ACT	.48	.77	-

Note. The numbers above the diagonal are the sample sizes from which the correlations were computed. For example, 152 students reported both SAT and ACT scores, and their correlation was 0.77.

Although valuable, Frederick's data are not free from limitations. Perhaps of biggest concern is that students self-reported their SAT and ACT scores. For example, Mayer et al. (2007) caution against the use of self-reported standardized exam scores in research because there is a systematic bias towards over-estimating actual exam scores. In their study, students overestimated their actual SAT scores by an average of 25 points. Hence, it is likely that the SLE-SAT and SLE-ACT correlations would have been stronger if both the SAT and ACT did not rely on the accuracy of self-reports. The second study addresses this issue, and only uses data from official test scores.

THE SECOND STUDY

The Council for Aid to Education (CAE) is a national nonprofit organization that, among other things, conducts policy research on higher education. CAE's Collegiate Learning Assessment (CLA) is central to their mission statement and is a national effort to assess the quality of undergraduate education by directly measuring student learning outcomes. In particular, the CLA is comprised of both performance tasks and analytic writing tasks: Performance tasks ask students to engage in activities that require reviewing and evaluating many documents, such as preparing a policy recommendation; analytic writing tasks ask students to either make or critique arguments. Colleges that participate in the CLA provide CAE with their students' official SAT and/or ACT scores, when available. In addition, colleges can also choose to embed the SLE into CLA testing.



CAE provided data from the spring 2010 CLA administration. In total, 5,272 college students completed the SLE. Many of these students had official SAT and/or ACT scores. Unlike Frederick's (2005) data, students' SAT and ACT scores were reported by the schools' registrars' office, and are thus official scores. Among students, 1.5% did not provide information concerning their gender, and 3.0% did not provide information regarding their race. Tables 3 and 4 summarize the demographic characteristics of those who provided this information. Of main importance, Table 5 presents the correlations among the SLE, SAT, ACT, and CLA scale scores.

Table 3
Gender of CAE Study Participants

Group	N	Percent	Valid Percent
Female	2,833	53.7	54.5
Male	2,362	44.8	45.5
Missing	77	1.5	N/A
Total	5,272	100.0	100.0



Table 4
Race of CAE Study Participants

Group	N	Percent	Valid Percent
American Indian/Alaska Native	78	1.5	1.5
Asian/Pacific Islander	613	11.6	12.0
Black, non-Hispanic	738	14.0	14.4
Hispanic	334	6.3	6.5
White, non-Hispanic	3,061	58.1	59.9
Other	290	5.5	5.7
Missing	158	3.0	N/A
Total	5,272	100.0	100.0



Table 5
Convergent and Predictive Validity of Standardized College Entrance Exams from CAE Study Participants

Exam	SLE	SAT	ACT	CLA
SLE	-	2,539	1,059	5,218
SAT	.72	-	632	2,516
ACT	.66	.87	-	1,047
CLA	.52	.57	.45	-

Note. The numbers above the diagonal are the sample sizes from which the correlations were computed. For example, 632 students had both SAT and ACT scores, and their correlation was 0.87.

Findings from the CAE Study reveal a strong correspondence between SLE and SAT scale scores (r=0.72, p<.001, n=2,539), as well as between SLE and ACT scale scores (r=0.66, p<.001, n=1,059). In addition, the SLE is able to predict CLA scores (r=0.52, p<.001, n=5,218) to relatively the same magnitude as both the SAT (r=0.57, p<.001, n=2,516) and ACT (r=0.45, p<.001, n=1,047). The predictive validity coefficients of the SLE, SAT, and ACT are strong: A coefficient of 0.20 provides some utility; most coefficients range from 0.30 to 0.40; and validities above 0.40 are rare and exceptional (Cohen, 1988; 1992). The magnitude of these relationships is also remarkable given the fact that no statistical controls were possible with respect to time differences between the dates of the various test administrations. The above reported correlations also do not employ any corrections for unreliability or range restriction. Correcting for these factors would have yielded correlations that were higher in magnitude. Nonetheless, these findings, coupled with Frederick's (2005) findings, provide strong evidence of convergent validity between the SLE and other standardized college entrance exams, the SAT and ACT.

Moreover, the **SLE is just as powerful in predicting college students' educational outcomes** as compared to the SAT and ACT.

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ABOUT WONDERLIC

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Our assessment strategy takes you beyond GPA and the application and into the world of real information with a real plan. Cloud-based, program-related and easy to administer... you're not just testing. You're diving deep into each student's potential and coming out knowing who your top choices are, no crystal balls needed.

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