

# Validity

## BCSSE-NSSE Relationships

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*Do BCSSE scales (pre-college student characteristics, high school engagement, and college environment) predict NSSE benchmarks (first-year engagement)?*

### Purpose

Many researchers agree that high school experiences, engagement, and academic achievement, as well as entering expectations and attitudes, are important predictors of first-year student success (see Pascarella & Terenzini, 2005). For instance, Astin and Lee (2003) found that precollege characteristics of hours spent studying in high school, academic ability, leadership ability, and developing a meaningful philosophy of life predict 61 percent of the variance in time spent studying in college.

This study will investigate the extent to which entering first-year student characteristics including high school engagement, first year expectations and other attitudes and institutional characteristics are predictive of their first-year academic engagement.

If BCSSE scales are highly related to NSSE benchmarks, then based on the NSSE Psychometric Validity Framework, this would be an evidence for concurrent validity for both instruments. As both of these instruments measure very similar constructs (student engagement, expectations, etc.), one would expect the earlier measured scale to predict the latter scale.

### Data

The data for this study are from the 2008 administration of the Beginning College Survey of Student Engagement (BCSSE) and the 2009 administration of the National Survey of Student Engagement (NSSE).

### Sample

The sample for this study includes a total approximately 13,000 first-year, full-time students enrolled at one of the 91 baccalaureate-granting colleges and universities in the United States that completed BCSSE during the summer of 2008 and then NSSE in the spring of 2009.

### Variables

For this study, five BCSSE scales are included as indicators of a student's high school academic engagement, their college expectations, and attitudes toward their academic work in the first year of college. Scores for the six scales range from 0 (low) to 10 (high) and include High School Academic Engagement ( $\alpha=.76$ ), Expected First-Year Academic Engagement ( $\alpha=.72$ ), Academic Perseverance ( $\alpha=.80$ ), and Expected Academic Difficulty ( $\alpha=.62$ ).

The dependent variables were three scales that represent meaningful academic engagement and are commonly referred to as "Benchmarks of Effective Educational Practice" (National Survey of Student Engagement, 2009). The three scales included Level of Academic Challenge (LAC), Active & Collaborative Learning (ACL), and Student

Faculty Interaction (SFI). Scores for these scales range from 0 (low) to 100 (high). Internal consistencies for LAC, ACL, and SFI are all adequate for analysis (.714, .644, and .719, respectively).

## Method

As a result of the nested nature of these data, hierarchical linear modeling (HLM) (Raudenbush & Bryk, 2002) was used to estimate student and the institutional effects on level of academic challenge, active and collaborative learning, and student faculty interaction.

## Results

From the base (unconditional) model, 8.0% of the variance in the level of academic challenge was explained by institutional characteristics and the remaining 92.0% was explained by student characteristics. Adding the institutional characteristics in step 1, explained approximately 59% of the variance. Being private institution had the highest positive effect followed with institution average SAT/ACT score. In the second step, we included the student level stable characteristics which accounted for 12% variance in the student level. The effect size for high school academic engagement was highest with .37. The high school GPA was positively related while male and SAT/ACT score were negatively related. The effects of gender, high school GPA, and SAT/ACT on level of academic challenge did not change much after adding the student expectations and attitudes.

Adding student expectations and attitudes in step 3 added additional 3.1% variance explained at the student level. The final model explained 15.4% variance at the student level and 67.9% of the variance in the institution level. The effect of high school academic engagement dropped slightly but still the most significant factor. Among step 3 variables, expected academic engagement (.10), academic perseverance (.11), and academic preparation (.07) were significantly positively related to level of academic challenge while expected academic difficulty was not related.

The largest effect on level of academic challenge was of direct effect of high school academic engagement (.19). However, student expectations and attitudes had greater effect when taken into consideration together (.29). At the institutional level characteristics, private and more selective institutions were more advantageous than their peers in predicting level of academic challenge. Table 1 (below) provides detailed results of the HLM analysis. HLM results for ACL and SFI were similar and not provided here.

The purpose of this study was to investigate the influence of pre-college student characteristics and institution characteristics on subsequent first year academic engagement. The results showed that both student characteristics as well their expectations and attitudes are important predictors of first-year student engagement, but there is still a large amount of variance unexplained, leaving open the possibility that the greatest influence on student engagement is from factors within the immediate campus environment.

In terms of the validity framework, the high school academic engagement scale was hypothesized to be related to the level of academic challenge benchmark. As seen from the results, the effect of high school academic engagement in step 2 has an effect size of .31. And in the final step, the academic perseverance and expected academic engagement were significantly related to level of academic challenge even after controlling for various student and institutional characteristics.

## References

- Astin, A. W., & Lee, J. J. (2003). How Risky Are One-Shot Cross-Sectional Assessments of Undergraduate Students? *Research in Higher Education, 44*, 657–672.
- Raudenbush, S.W. & Bryk, A.S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage Publications.
- Pascarella, E.T., & Terenzini, P.T. (2005). *How college affects students: A third decade of research*. Indianapolis, IN: Jossey Bass.

## Additional Details

**Table 1.** The effect size and significance level for student and institutional characteristics and the variance explained for each step in level of academic challenge model

Independent Variables	Base Model	Step 1		Step 2		Step 3	
		<i>Inst Char</i>		<i>Student Chars</i>		<i>Expectation/Attitudes</i>	
<b>Intercept</b>							
<i>Intercept2</i>	.00	-.24	***	-.19	***	-.16	**
<i>Size (FY enrollment)</i>		-.04	^	-.03	^	-.04	*
<i>SAT/ACT Average</i>		.13	***	.12	***	.12	***
<i>Percent of on-campus students</i>		-.01		-.02		-.02	
<i>Private</i>		.28	***	.19	***	.18	**
<i>Carnegie:</i>	Masters Large	-.03		.03		.02	
<i>Doctoral</i>	Masters Medium-Small	.05		.09		.06	
<i>Insts as</i>	Baccalaureate - AS	.03		.05		.04	
<i>reference</i>	Other	-.01		.06		.04	
<b>Level-1 (Student)</b>							
Male				-.09	***	-.11	***
<i>Race:</i>	African American			.02		-.04	
<i>White as</i>	Asian American			.04		.07	
<i>reference</i>	Hispanic			.05		.03	
	Other			.02		.00	
SAT/ACT score				-.05	***	-.05	***
High school GPA				.10	***	.09	***
Father Education				.02		.02	
Mother Education				.00		.00	
High school Academic Engagement				.31	***	.19	***
Expected Academic Engagement						.10	***
Academic Perseverance						.11	***
Academic Difficulty						.01	
Academic Preparation						.07	***
<b>Variance Components</b>							
Total variance	1.00	.96		.84		.81	
Variance within institutions	.92 ***	.92 ***		.81 ***		.78 ***	
Variance between institutions	.08	.03		.03		.03	
Proportion between institutions	8.0%	3.4%		3.4%		3.2%	
Variance between Explained		59.2%		65.1%		67.9%	
Variance within explained		0.0%		12.1%		15.4%	
Deviance	27859.47	27829.75		26588.97		26222.33	

^ p<.1, \* p<.05, \*\* p<.01, \*\*\* p<.001