

High School Size and White Student College Readiness: A Statewide, Multiyear Analysis

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We analyzed 5 years of Texas statewide data on high school size and college readiness in English Language Arts, math, and in both subjects for White students. Using Greeney and Slate's (2012) criteria, large-size high schools had over 1,500 students, medium-size high schools had 401 to 1,500 students, and small-size high schools had enrollments under 400. White students enrolled in large-size high schools had statistically significantly higher college readiness rates in English Language Arts, math, and in both subjects than White students enrolled in medium-size and small-size high schools for each of the 5 years examined in this study. Effect sizes were moderate for all 3 areas and for all 5 years. As such, support was provided for the economies of scale theoretical framework. Implications for policymakers and recommendations for research are present.

Purpose of the Study

The purpose of this study was to determine the relationship of high school size on the Texas Education Agency College-ready Graduates indicator for White high school students. The College-ready Graduates indicator is one of six indicators recognized by the Texas Education Agency in its college readiness definition. For purposes of this study, we examined the College-ready Graduates indicators for English Language Arts, Mathematics, and both subjects combined for Texas White high school students for the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 school years.

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Significance of the Study

The significance of this study is to provide empirical information to school districts, superintendents, and school boards regarding the relationship of high school size to the Texas Education Agency College-ready Graduate indicators for White students. Results from this investigation may assist educational leaders and policymakers in planning facilities that might enhance student preparation for college. Although a substantial body of literature on school size is available (e.g., Chavez, 2002; Greeney, 2010; Lee & Smith, 1997; Stiefel, Berne, Iatarola, & Fruchter, 2000; Zoda et al., 2011), research on school size and college readiness is quite limited (Morris & Slate, 2012). Accordingly, more investigation is needed (Conley, 2007; NAASP, 2004; Trusty & Niles, 2003; Venezia et al., 2003).

Theoretical Framework

In previous studies, two theoretical frameworks (i.e., economies of scale and student connectedness) have been used to describe the relationships between school size and student performance (e.g., Greeney, 2010; Riha, 2011; Zoda et al., 2011). Given the recent studies in which student performance has been statistically significantly better in larger-size schools (e.g., Greeney, 2010; Greeney & Slate, 2012; Riha et al., 2013; Zoda et al., 2011a, 2011b) than in smaller-size schools, we relied on the economies of scale theoretical framework for this investigation. The economies of scale theory was originally designed as an economics model to describe the reduction in costs that arise due to expansion (Sullivan & Sheffrin, 2003). The theory evolved in education as a way to predict the cost efficiency of achieving a particular output based on school size (Bowles & Bosworth, 2002). Larger schools are expected to provide more opportunities for students in a plethora of student production measures. Economies of scale is an important theory for school leaders to consider in facility planning that will meet not only budgetary demands but also the student production values of college readiness.

Research Questions

The following research questions were examined for the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 school years: (a) What is the effect of school size on the percent of White College-ready Graduates who score at or above the criterion score in English/Language Arts?; (b) What is the effect of school size on the percent of White College-ready Graduates who score at or above the criterion score in mathematics?; and (c) What is the effect of school size on the percent of White College-ready Graduates who score at or above the criterion score in both subjects?

Method

Selection of Participants

Data used for analyses were obtained from the Texas Education Agency Academic Excellence Indicator System database. The sample consisted of Texas public high schools that included Grades 9 to 12 students in the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011

school years. Archival data collected from the Texas Education Agency Academic Excellence Indicator System were student enrollment; percentage of White College-ready Graduates in English Language Arts, percentage of White College-ready Graduates in math, and percentage of White College-ready Graduates in both subjects combined. Schools that had nontraditional configurations (i.e., academy, charter, or alternative) were excluded from the analyses. Accordingly, a sample size of approximately 1,000 high schools in the state of Texas was used to determine the relationship between school size and the College-ready Graduates indicators.

The school size criterion established by Greeney and Slate (2012) was applied for the size categories. Greeney and Slate (2012) recommended classifying schools into three size categories based upon the frequency distribution of students enrolled in high schools in the state of Texas. The three size categories were large-size, medium-size, and small-size. Large-size schools enrolled over 1,500 students, medium-size schools enrolled 401 to 1,500 students, and small-size schools had enrollments under 400.

College Readiness

The Texas Education Agency (2006) first collected the college readiness information in 2006 as a response to the Governor's order to track information that related to college preparedness of students graduating from Texas public high schools. Each of the three College-ready Graduate values (i.e., English Language Arts, mathematics, and both subjects) are presented as a percentage of the school's high school graduates who met or exceeded the criterion score on the Texas Assessment of Knowledge and Skills, SAT, or ACT. Calculations for each value are derived using the following formula: the number of graduates who met the criterion divided by the total number of graduates who had results to evaluate. The College-ready Graduate indicator is unique in that the indicator includes scores on all three examinations (i.e., TAKS, SAT, and ACT), is based on prior year graduates, has a measure for both subjects combined, and is tied to the district and campus where the student graduated.

Results

Before calculating an inferential statistical procedure to address the three research questions in this investigation, the underlying assumptions of an analysis of variance (ANOVA) procedure were checked. The data for the three college-readiness indicators for the 5 years of data were determined to be largely normally distributed (Onwuegbuzie & Daniel, 2002). Moreover, the assumption verified by the Levene's Test of Equality of Error Variance for the three college-readiness indicators for the 5 years of data was met. Accordingly, a parametric ANOVA procedure was justified (Field, 2009).

Results for English Language Arts College Readiness

For the 2006-2007 school year, the ANOVA resulted in a statistically significant difference, $F(2, 877) = 27.20, p < .001, \eta^2 = .06$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in English Language Arts between large-size high schools and small-size and medium-size high schools. College readiness rates in English Language Arts for

White students in large-size high schools were 9.68 and 6.28 points higher than the college readiness rates in English Language Arts for White students in small-size and medium-size high schools, respectively. College readiness rates in English Language Arts for White students in medium-size high schools were 3.40 points higher than in small-size schools. Delineated in Table 1 are the descriptive statistics for the English Language Arts college readiness rates of White students in Texas high schools by school size for the 2006-2007 school year.

Regarding the 2007-2008 school year, the ANOVA resulted in a statistically significant difference, $F(2, 897) = 51.64, p < .001, \eta^2 = .10$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in English Language Arts between high school sizes. College readiness rates in English Language Arts for White students in large-size high schools were 13.21 and 6.88 points higher than the college readiness rates in English Language Arts for White students in small-size and medium-size high schools, respectively. Additionally, White students who were enrolled in medium-size high schools had higher college readiness rates in English Language Arts than White students in small-size high schools by 6.33 points. Depicted in Table 1 is a clear stair step in performance, with increases in White student college readiness in English Language Arts as school size increased.

Concerning the 2008-2009 school year, the ANOVA revealed a statistically significant difference, $F(2, 899) = 57.48, p < .001, \eta^2 = .11$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in English Language Arts between large-size high schools and small-size and medium-size high schools. College readiness rates in English Language Arts for White students in large-size high schools were 11.21 and 6.68 points higher than the college readiness rates in English Language Arts for White students in small-size and medium-size high schools, respectively. College readiness rates in English Language Arts for White students in medium-size high schools were 4.53 points higher than in small-size schools. Represented in Table 1 are the descriptive statistics for the English Language Arts college readiness rates of White students in Texas high schools by school size for the 2008-2009 school year.

With respect to the 2009-2010 school year, the ANOVA indicated a statistically significant difference, $F(2, 893) = 53.81, p < .001, \eta^2 = .11$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in English Language Arts between large-size high schools and small-size and medium-size high schools. White students' college readiness rates in English Language Arts in large-size high schools were 10.57 and 5.99 points higher than the college readiness rates in English Language Arts for White students in small-size and medium-size high schools, respectively. College readiness rates in English Language Arts for White students in medium-size high schools were 4.58 points higher than in small-size schools. Table 1 presents the descriptive statistics for the English Language Arts college readiness rates of White students in Texas high schools by school size for the 2009-2010 school year.

Table 1
Descriptive Statistics for White Students' College Readiness Rates in ELA by School Size for the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 School Years

School Year and School Size	<i>n</i> of schools	<i>M</i>	<i>SD</i>
2006-2007			
Small-size	314	48.78	18.07
Medium-size	277	52.18	14.89
Large-size	289	58.46	15.45
2007-2008			
Small-size	323	46.06	17.52
Medium-size	278	52.38	16.49
Large-size	299	59.27	14.33
2008-2009			
Small-size	317	59.10	14.82
Medium-size	281	63.63	12.41
Large-size	304	70.31	11.69
2009-2010			
Small-size	315	62.11	14.35
Medium-size	278	66.69	12.16
Large-size	303	72.67	11.21
2010-2011			
Small-size	327	66.94	14.29
Medium-size	259	73.21	11.07
Large-size	307	76.52	11.74

For the 2010-2011 school year, the ANOVA resulted in a statistically significant difference, $F(2, 890) = 47.64, p < .001, \eta^2 = .10$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in

White students' college readiness rates in English Language Arts between large-size high schools and small-size and medium-size high schools. College readiness rates in English Language Arts for White students in large-size high schools were 9.58 and 3.31 points higher than the college readiness rates in English Language Arts for White students in small-size and medium-size high schools, respectively. College readiness rates in English Language Arts for White students in medium-size high schools were 6.27 points higher than in small-size schools. Delineated in Table 1 are the descriptive statistics for the English Language Arts college readiness rates of White students in Texas high schools by school size for the 2010-2011 school year. The college readiness rates in English Language Arts for this school year were higher than the college readiness rates in English Language Arts for the previous 4 school years.

Results for Math College Readiness Analyses

With respect to the 2006-2007 school year, the ANOVA resulted in a statistically significant difference, $F(2, 876) = 34.91, p < .001, \eta^2 = .07$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in math between large-size high schools and small-size and medium-size high schools. As delineated in Table 2, the college readiness rates in math for White students in large-size high schools were 9.70 and 6.86 points higher than the college readiness rates in math for White students in small-size and medium-size high schools, respectively. Small-size and medium-size high schools had comparable college readiness rates in math for White students in the 2006-2007 school year.

Regarding the 2007-2008 school year, the ANOVA resulted in a statistically significant difference, $F(2, 899) = 33.22, p < .001, \eta^2 = .07$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in math for 2007-2008 between the high school sizes. College readiness rates in math for White students in large-size high schools were 9.91 and 5.93 points higher than the college readiness rates in math for White students in small-size and medium-size high schools, respectively. Additionally, White students who were enrolled in medium-size high schools had higher college readiness rates in math than White students in small-size high schools by 3.98 points. As noted in Table 2, a clear stair step in student performance was present for this school year, with higher college readiness rates in math as school size increased.

Concerning the 2008-2009 school year, the ANOVA revealed a statistically significant difference, $F(2, 893) = 32.91, p < .001, \eta^2 = .07$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in math between large-size high schools and small-size and medium-size high schools. As revealed in Table 2, the college readiness rates in math for White students in large-size high schools were 8.79 and 4.39 points higher than the college readiness rates in math for White students in small-size and medium-size high schools, respectively. College readiness rates in math for White students in medium-size high schools were 4.40 points higher than in small-size schools.

Table 2
Descriptive Statistics for White Students' College Readiness Rates in Math by School Size for the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 School Years

School Year and School Size	<i>n</i> of schools	<i>M</i>	<i>SD</i>
2006-2007			
Small-size	313	54.44	16.74
Medium-size	277	57.29	13.27
Large-size	289	64.15	13.09
2007-2008			
Small-size	324	56.25	17.70
Medium-size	278	60.23	14.36
Large-size	300	66.16	12.97
2008-2009			
Small-size	314	60.38	16.18
Medium-size	280	64.78	11.77
Large-size	302	69.17	11.62
2009-2010			
Small-size	319	61.50	14.21
Medium-size	278	65.51	11.92
Large-size	306	70.90	11.70
2010-2011			
Small-size	327	63.38	16.19
Medium-size	265	71.68	11.20
Large-size	309	74.97	12.02

For the 2009-2010 school year, the ANOVA indicated a statistically significant difference, $F(2, 900) = 42.94, p < .001, \eta^2 = .09$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in

White students' college readiness rates in math between large-size high schools and small-size and medium-size high schools. As delineated in Table 2, White students' college readiness rates in math in large-size high schools were 9.40 and 5.39 points higher than the college readiness rates in math for White students in small-size and medium-size high schools, respectively. College readiness rates in math for White students in medium-size high schools were 4.01 points higher than in small-size schools.

With respect to the 2010-2011 school year, the ANOVA resulted in a statistically significant difference, $F(2, 898) = 62.41, p < .001, \eta^2 = .12$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in math between large-size high schools and small-size and medium-size high schools. College readiness rates in math for White students in large-size high schools were 11.59 and 3.29 points higher than the college readiness rates in math for White students in small-size and medium-size high schools, respectively. College readiness rates in math for White students in medium-size high schools were 8.30 points higher than in small-size schools. Presented in Table 2 are the descriptive statistics for the math college readiness rates of White students in Texas high schools by school size for the 2010-2011 school year.

Results for College Readiness in Both Subjects

Regarding the 2006-2007 school year, the ANOVA resulted in a statistically significant difference, $F(2, 876) = 37.55, p < .001, \eta^2 = .08$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in both subjects between large-size high schools and small-size and medium-size high schools. As revealed in Table 3, the college readiness rates in both subjects for White students in large-size high schools were 10.87 and 7.08 points higher than the college readiness rates in both subjects for White students in small-size and medium-size high schools, respectively. College readiness rates in both subjects for White students in medium-size high schools were 3.80 points higher than in small-size schools.

Concerning the 2007-2008 school year, the ANOVA resulted in a statistically significant difference, $F(2, 897) = 63.69, p < .001, \eta^2 = .12$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in both subjects between the high school sizes. College readiness rates in both subjects for White students in large-size high schools were 14.16 and 8.01 points higher than the college readiness rates in both subjects for White students in small-size and medium-size high schools, respectively. Additionally, White students who were enrolled in medium-size high schools had higher college readiness rates in both subjects than White students in small-size high schools by 6.15 points. Presented in Table 3 is a stair step in college readiness rates, with White students in large-size schools having higher college readiness rates than White students in medium-size and White students in medium-size schools having higher college readiness rates than White students in small-size schools.

Table 3
Descriptive Statistics for White Students' College Readiness Rates in Both Subjects by School Size for the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 School Years

School Year and School Size	<i>n</i> of schools	<i>M</i>	<i>SD</i>
2006-2007			
Small-size	313	35.86	16.55
Medium-size	277	39.66	13.98
Large-size	289	46.74	15.84
2007-2008			
Small-size	323	34.77	16.74
Medium-size	278	40.92	15.59
Large-size	299	48.93	14.45
2008-2009			
Small-size	311	45.26	15.50
Medium-size	281	50.49	12.67
Large-size	304	57.34	13.05
2009-2010			
Small-size	319	47.70	15.59
Medium-size	278	52.90	13.61
Large-size	306	60.06	13.38
2010-2011			
Small-size	328	52.59	16.06
Medium-size	266	60.91	13.45
Large-size	309	65.57	13.55

For the 2008-2009 school year, the ANOVA yielded a statistically significant difference, $F(2, 893) = 58.88, p < .001, \eta^2 = .12$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in

White students' college readiness rates in both subjects between large-size high schools and small-size and medium-size high schools. College readiness rates in both subjects for White students in large-size high schools were 12.08 and 6.85 points higher than the college readiness rates in both subjects for White students in small-size and medium-size high schools, respectively. College readiness rates in both subjects for White students in medium-size high schools were 5.23 points higher than in small-size schools. As noted in Table 3, White students were progressively more college ready in both subjects as the size of the school increased. Furthermore, more than 50% of White students were college ready in both subjects at the medium-size and large-size schools.

With respect to the 2009-2010 school year, the ANOVA indicated a statistically significant difference, $F(2, 900) = 58.93, p < .001, \eta^2 = .12$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in both subjects between large-size high schools and small-size and medium-size high schools. As delineated in Table 3, White students' college readiness rates in both subjects in large-size high schools were 12.36 and 7.15 points higher than the college readiness rates in both subjects for White students in small-size and medium-size high schools, respectively. College readiness rates in both subjects for White students in medium-size high schools were 5.20 points higher than in small-size schools. White students were progressively more college ready in both subjects as the school size category increased. As such, a stair step effect was present in White students' college readiness rates in both subjects.

For the 2010-2011 school year, the ANOVA resulted in a statistically significant difference, $F(2, 900) = 65.72, p < .001, \eta^2 = .13$, a medium effect size (Cohen, 1988). Scheffé post hoc procedures revealed that statistically significant differences were present in White students' college readiness rates in both subjects between large-size high schools and small-size and medium-size high schools. College readiness rates in both subjects for White students in large-size high schools were 12.98 and 4.66 points higher than the college readiness rates in both subjects for White students in small-size and medium-size high schools, respectively. College readiness rates in both subjects for White students in medium-size high schools were 8.32 points higher than in small-size schools. Presented in Table 3 are the descriptive statistics for the college readiness rates in both subjects of White students in Texas high schools by school size for the 2010-2011 school year.

Discussion

White students attending large-size high schools had higher college readiness rates in ELA than did White students in small-size high schools during the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 school years. Similarly, White students attending large-size high schools obtained higher college readiness rates in ELA than their peers in medium-size high schools during the 5 years analyzed. College readiness rates in ELA for White students in medium-size high schools were higher than the college readiness rates in ELA of White students enrolled in small-size high schools. Over the 5 years examined in this study, a stair step increase in college readiness rates in ELA was clearly present for White students. Represented in Table 4 is a summary of the college readiness rates in ELA for White students by school year.

Table 4

Univariate ANOVA Results for White Students' College Readiness Rates in ELA, Math, and in Both Subjects by School Year as a Function of School Size

Subject Area and School Year	Result	η^2	Effect Size Range	School Size with Highest College Readiness Rate
ELA				
2006-2007	Significant	.06	Medium	Large
2007-2008	Significant	.10	Medium	Large
2008-2009	Significant	.11	Medium	Large
2009-2010	Significant	.11	Medium	Large
2010-2011	Significant	.10	Medium	Large
Math				
2006-2007	Significant	.07	Medium	Large
2007-2008	Significant	.07	Medium	Large
2008-2009	Significant	.07	Medium	Large
2009-2010	Significant	.09	Medium	Large
2010-2011	Significant	.12	Medium	Large
Both Subjects				
2006-2007	Significant	.08	Medium	Large
2007-2008	Significant	.12	Medium	Large
2008-2009	Significant	.12	Medium	Large
2009-2010	Significant	.12	Medium	Large
2010-2011	Significant	.13	Medium	Large

White students who were enrolled in large-size high schools attained higher rates in college readiness in math than their peers in small-size high schools during the 5 years of data analyzed. Similarly, White students in large-size high schools had higher college readiness rates in math than their White peers in medium-size high schools. White students attending medium-size high schools obtained higher rates in college readiness in math than White students attending small-size high schools for 4 of the 5 years, with the exception occurring in the 2006-2007 school year. A summary of the college readiness rates in math for White students by school year is presented in Table 4.

White students attending large-size high schools achieved higher college readiness rates in both subjects than White students in small-size high schools for the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 school years. Similarly, White students enrolled in large-size high schools had higher college readiness rates in both subjects than their peers in medium-size high schools during the 5 years examined. College readiness rates were higher in both subjects for White students in medium-size high schools than White students in small-size high schools. Presented in Table 4 is a summary of the college readiness rates in both subjects for White students by school year.

Studies conducted on the financial benefits realized by the construction of larger schools have demonstrated the cost savings associated with larger facilities (Andrews, Duncombe, & Yinger, 2002; Dodson & Garrett, 2004; Fox, 1981; Nelson, 1985). Small school advocates claim that higher achievement was realized in smaller schools (Cotton, 1996; Howley, 1995; Kober, 2006). However, academic achievement rates on standardized

tests in Texas indicated higher achievement rates in larger schools at the elementary (Zoda et al., 2011), middle (Riha, 2011; Riha et al., 2013a, 2013b), and high school levels (Greeney, 2010; Greeney & Slate, 2012). The current study about college readiness rates and school size further adds validation to claims that larger-size schools are academically more efficient than small-size schools in Texas. Some states have incentivized the buildings of larger schools (Lawrence et al., 2002). In lieu of the findings, Texas legislators could consider similar actions in their attempts to conform to standards that promote a college-ready education in Texas. Further studies are warranted regarding the effect of school size on student college readiness to expand the existing body of knowledge.

Finally, some district administrators are faced with the decision to consolidate small schools. Advocates for small schools voice concerns that the consolidation of several small schools into one large school will depersonalize education and undermine community identity, resulting in lower student achievement (Cotton, 2001; Krysiak & DiBella, 2002). Little convincing evidence exists regarding the effect of school consolidation on school and student outcomes (Andrews et al., 2002). Although findings delineated herein support the presence of larger high schools, mixed methods studies might be useful to compare factors associated with student college readiness before and after consolidation of small schools.

References

- ACT, Inc. (2009). *The condition of college readiness, 2009*. Iowa City, IA: Author. Retrieved from <http://www.act.org/research/policymakers/pdf/TheConditionofCollegeReadiness.pdf>
- ACT, Inc. (2012). *The condition of college readiness, 2012: Texas*. Iowa City, IA. Retrieved from <http://www.act.org/newsroom/data/2012/states/pdf/Texas.pdf>
- Andrews, M., Duncombe, W., & Yinger, J. (2002). Revisiting economies of size in American education: Are we any closer to a consensus? *Economics of Education Review, 21*(3), 45-62. doi:10.1016/S0272-7757(01)00006-1
- Barnes, W., & Slate, J. R. (2011). Ethnic differences in college-readiness rates: A multi-year, statewide study. *Education and Urban Society, 20*(10), 1-29. doi:10.1177/0013124511423775
- Barnes, W., Slate, J. R., & Rojas-LeBouef, A. (2010). College-readiness and academic preparedness: The same concepts? *Current Issues in Education, 13*(4). Retrieved from <http://cie.asu.edu/>
- Bowles, T. J., & Bosworth, R. (2002). Scale economies in public education: Evidence from school level data. *Journal of Education Finance, 28*, 285-300.
- Chavez, J. J. (2002). *School size and academic accountability of Texas secondary public school students* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3049697)
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Complete College America. (2011). *The completion shortfall*. Retrieved from <http://www.completecollege.org>
- Conley, D. T. (2005). *College knowledge: What it really takes for students to succeed and what we can do to get them ready*. San Francisco, CA: Jossey-Bass.

- Conley, D. T. (2007). *Redefining college readiness*, (Vol. 3). Eugene, OR: Educational Policy Improvement Center. Retrieved from https://www.epiconline.org/files/pdf/RedefiningCR_Vol3.pdf
- Conley, D. T. (2010). *College and career ready: Helping all students succeed beyond high school*. San Francisco, CA: Jossey-Bass.
- Conley, D. T., Aspengren, K., Stout, O., & Veach, D. (2006). *College Board Advanced Placement best practices course study report*. Eugene, OR: Educational Policy Improvement Center. Retrieved from <https://epiconline.org/files/pdf/CBAPFinalReport.pdf>
- Cotton, K. (1996). *School size, climate, and student performance: Close-up #20*. Portland, OR: Northwest Regional Education Laboratory. Retrieved from http://upstate.colgate.edu/pdf/Abt_merger/Cotton_1996_Size_Climate_Performance.pdf
- Cotton, K. (2001). *New small learning communities: Findings from recent literature*. Portland, OR: Northwest Regional Education Laboratory. Retrieved from ERIC database. (ED459539)
- Dodson, M. E., & Garrett, T. A. (2004). Inefficient education spending in public school districts: A case for consolidation? *Contemporary Economic Policy*, 22, 270-280. doi:10.1093/cep/byh019
- Fox, W. F. (1981). Reviewing economics of size in education. *Journal of Education Finance*, 6, 273-396. doi:10.1021/ed058p972.1
- Greeney, B. S. (2010). *High school size, student achievement, and school climate: A multi-year study* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3448046).
- Greeney, B. S., & Slate, J. R. (2012). School climate and high school size: A multi-year analysis of Hispanic students. *American Clearinghouse on Educational Facilities Journal*, 3(2), 26-44. Retrieved from http://online.tarleton.edu/ACEF/ACEF_Journal_Vol2_Issue2_March_2012/index.html#/26/
- Howley, C. B. (1995). The Matthew Principle: A West Virginia replication. *Education Policy Analysis Archives*, 3(18), 1-27. Retrieved from <http://epaa.asu.edu/epaa/v3n18.html>
- Jenkins, D., & Boswell, K. (2002). *State policies on community college workforce development: Findings from a national survey*. Retrieved from <http://www.ecs.org/clearinghouse/40/82/4082.pdf>
- Krysiak, B., & DiBella, C. (2002). Why small schools now? *School Business Affairs*, 68(7), 25-29. doi:10.1145/505289.505291
- Lawrence, B., Bingler, S., Diamond, B., Hill, B., Hoffman, J., Howley, C.,... Washor, E. (2002). *Dollar & sense: The cost effectiveness of small schools*. Retrieved from The Rural School and Community Trust website: <http://www.ruraledu.org/docs/dollars.htm>
- Lee, V. E., & Smith, J. B. (1997). High school size: Which works best and for whom? *Educational Evaluation and Policy Analysis*, 19, 205-227. doi:10.3102/01623737019003205
- LeFevre, A. T., & Hederman, R. R. (2001). *Report card on American education: A state-by-state analysis, 1976-2000*. Washington, DC: American Legislative Exchange Council. Retrieved from http://news.heartland.org/sites/all/modules/custom/heartland_migration/files/pdfs/8119

- Morris, J., & Slate, J. R. (2012). Advanced Placement and International Baccalaureate performance differences as a function of gender and school size. *American Clearinghouse on Educational Facilities Journal*, 3(1), 5-15. Retrieved from <http://online.tarleton.edu/ACEF/JournalVol3Issue1Dec/#/4/>
- National Association of Secondary School Principals. (1996). *Breaking ranks: Changing an American institution*. Reston, VA: Author.
- National Association of Secondary School Principals. (2004). *Breaking ranks II: Strategies for leading high school reform*. Reston, VA: Author.
- National Center for Education Statistics. (2012). *Digest of educational statistics: 2011*. Retrieved from <http://nces.ed.gov/programs/digest/d11/>
- Nelson, E. (1985). *School consolidation: ERIC Digest, Number 13*. Eugene, OR: ERIC Clearinghouse on Educational Management. Retrieved from ERIC database. (ED282346)
- Onwuegbuzie, A. J., & Daniel, L. G. (2002). Uses and misuses of the correlation coefficient. *Research in the Schools*, 9(1), 73-90.
- Riha, M. W. (2011). *Middle school size and student performance: A multi-year study* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3500203).
- Riha, M., Slate, J. R., & Martinez-Garcia, C. (2013). What we know about middle school size and student performance: A review of the literature. *Journal of Education Research*, 7(3), 1-25.
- Slate, J. R., & Jones, C. H. (2005). Effects of school size: A review of the literature with recommendations. *Essays in Education*, 13, 1-22. Retrieved from http://www.ecasd.k12.wi.us/cms_files/resources/referendum%20related%20topics%202%20of%203.pdf
- Slate, J. R., & Jones, C. H. (2006). African-American students' performance and secondary school size in the state of Texas. *Essays in Education*, 16, 90-105. Retrieved from <http://www.usca.edu/essays/vol132005/slate.pdf>
- Slate, J. R., & Jones, C. H. (2008a). School size and gender differences in the state of Texas. *Essays in Education*, 23, 159-176. Retrieved from <http://www.usca.edu/essays/vol232008/slate%20revised.pdf>
- Slate, J. R., & Jones, C. H. (2008b). Secondary school size and Hispanic student performance in Texas. *Essays in Education*, 23, 196-203. Retrieved from <http://www.usca.edu/essays/vol232008/slate2.pdf>
- Stiefel, L., Berne, R., Iatorola, P., & Fruchter, N. (2000). High school size: Effects on budgets and performance in New York City. *Educational Evaluation and Policy Analysis*, 22(1), 27-39. doi:10.3102/01623737022001027
- Sullivan, A., & Sheffrin, S. M. (2003). *Economics: Principles in action*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Texas Education Agency. (2006). *Academic Excellence Indicator System*. Retrieved from <http://ritter.tea.state.tx.us/perfreport/aeis/2006/index.html>
- Trusty, J., & Niles, S. (2003). High-school math courses and completion of the bachelor's degree. *Professional School Counseling*, 7, 99-107.
- U.S. Census Bureau. (2006). *Current population survey, annual social and economic supplements: Historical income tables*. Retrieved from <http://www.census.gov/hhes/www/income/histinc/p28.html>

- Venezia, A., Kirst, M. W., & Antonio, A. L. (2003). *Betraying the college dream: How disconnected K-12 and postsecondary education systems undermine student aspirations*. Retrieved from <http://www.stanford.edu/group/bridgeproject/betrayingthecollegedream.pdf>
- Zoda, P. F., Combs, J. P., & Slate, J. R. (2011a). Elementary school size and student performance: A conceptual analysis. *International Journal of Educational Leadership Preparation*, 6(4). Retrieved from <http://cnx.org/content/m41722/latest/>
- Zoda, P., Slate, J. R., & Combs, J. (2011b). Public school size and Hispanic student achievement in Texas: A 5-year analysis. *Educational Research for Policy & Practice*, 10, 171-188. doi:10.1007/s10671-011-9103-z