Ethnic Differences in Completion Rates as a Function of School Size in Texas High Schools

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Abstract: *The purpose of this study was to investigate differences in high school completion rates among White, African American, and Hispanic students enrolled in different school sizes—small, medium, and large. For this causal-comparative research design, this study utilized archival data from the Texas Education Association's Academic Excellence Accountability System. The researchers utilized a convenience sample of the state's public high school students for the 2008-2009 (n = 527 schools), 2009-2010 (n = 606 schools), and 2010-2011 (n = 549 schools) school years. Two Friedman's nonparametric repeated measures analysis of variance revealed no statistically significant differences among the three groups for small and medium schools for the 2008-2009 and 2009-2010 school years. However, for large schools, statistically significant differences emerged in favor of White students for both the 2008-2009 and 2009-2010 school years, representing large and moderate effect sizes, respectively. For the 2010-2011 school year, a statistically significant difference emerged among the three groups for small, medium, and large schools, in favor of White students. Implications are discussed.*

Introduction

Since the 1970s, there has been ongoing research investigating the relationship of school size with a number of variables such as student achievement, attendance, retention rates, graduation rates, engagement in school culture, levels of parental involvement, and discipline referrals (Lee & Smith, 1995; Stewart, 2009). Researchers suggest that whatever the size of the school, coherent instruction, competent faculty, strong parent/community bonds, student-centered instruction, engagement, and strong leadership contribute to the success of schools and the learning of U.S. school children (Bryk, 2010; Janosz, Archambault, Morizot, & Pagani, 2008). However, the statistics revealing dramatic differences in high school completion rates among White, African American, and Hispanic students suggest the need for more research on school size as one variable that might be impacting ethnic minorities in their ability to complete high school (Daire, LaMothe, & Fuller, 2007).

Further, shifts in public education have prompted educational leaders to use data as more than just a tool to monitor and to report outcomes, but as a tool for powerful and transformative ways to address inequities that are unacceptable (Erford, 2011). The Transforming School Counseling Initiative (TSCI; The Education Trust, n.d.) specified that school leaders must better address ways to attend to academic goals and high school completion for all students, especially ethnic minority groups. In fact, the American School Counselor Association (2005) National Model identifies the school counselor as an "agent of systemic change" and calls for the use of disaggregated data to identify gaps in achievement and high school completion rates (Akos & Galassi, 2008, p. 66). Recently, a sense of urgency has surfaced across the country for educational leaders to close the achievement gap for students considered at risk of dropping out of school and to address school reform pertaining to high school completion and college readiness (Martin & Robinson, 2011).

High school completion is consistently associated with higher lifetime income, better health, and lower probability of social deviancy (Cataldi, Laird, & KewalRamani, 2009), making this a crucial factor in the productivity and economic survival of emerging generations of students. The 2007-2008 school year national graduation rates were 81.0 % for White students, 63.5 % for Hispanic students, and 61.5 % for African American students (Stilwell, 2010). Not only are there discrepancies in completion rates among the ethnic groups, but in the last 10 years, there has been a decrease in high school completion rates for all three ethnic groups (Stillwell, 2010; Woolley, 2009).

Literature suggests that attending to the social and psychological needs of students; maintaining strong connections between students and their parents, peers, and teachers; and diligent concern with students' academic needs contribute to high school completion (Gunn, Chorney, & Poulsen, 2009). Policymakers have continually sought to design schools that lead to the academic achievement and graduation of their students (Bryk, 2010), with school size as one of the most influential

and controversial criteria to be considered. Experiments in school reform nationwide, including those that emphasize smaller learning communities, have generally supported the hypothesis that schools with between 400 and 900 students are most effective in responding to the learning needs of high school students (Kuo, 2010; Lee & Smith, 1995; Stewart, 2009; Weiss, Carolan, & Baker-Smith, 2010). Werblow and Duesberry (2009) concluded that the effect of school size on achievement was significant but small compared to the effect of other individual student factors such as socioeconomic status, race, and urbanicity. Conversely, they found a clear positive relationship between school size and dropout rate, leading them to continue to advocate for smaller schools in spite of the ongoing controversy and need for further research on school size (Werblow & Duesberry, 2009).

The purpose of this research was to examine differences over a three-school-year period in high school completion rates among White, African American, and Hispanic students in small, medium, and large Texas high schools. High school completion is defined as either graduation in four years with the student's ninth-grade cohort or graduating a year later (Texas Education Association [TEA], 2010). Researchers have undertaken investigations into school size and completion rates; yet, studies have yielded mixed results (Werblow & Duesberry, 2009). It is vital to continue the investigation into how school size affects completion rates among different ethnicities to gain greater clarity on how these variables intersect. The specific research question addressed was: What is the difference in completion rates among African American, Hispanic, and White students in small, medium, and large Texas high schools?

We approached the data analysis based on the hypothesis that there are differences in completion rates among small, medium, and large Texas high schools for African American, Hispanic, and White students. This nondirectional hypothesis was founded primarily in two theoretical models; the theory of stereotype threat (Osborne & Walker, 2006) and the theory of economies of scale (Werblow & Duesberry, 2009). The former theory posits that minority students are more subject to negative expectations of their school performance and, therefore, are less likely to achieve or to complete their education at the same levels as do their nonminority counterparts (Osborne & Walker, 2006). This might be further influenced by the size of their schools and their engagement in the culture of those schools (Werblow & Duesberry, 2009). The latter theory is useful in examining the use of financial and human resources in large schools to optimize access to programs that aid in student achievement and completion (Osborne & Walker, 2006; Werblow & Duesberry, 2009). A close and current examination of these relationships in light of these theoretical constructs can inform educators and policymakers as they make decisions concerning the preferred population sizes of Texas high schools. It was hoped that the conclusions reached would suggest further research to understand better the types of interventions and reforms that might assist high school students of all ethnicities to complete their education successfully.

Review of Literature

Each year, approximately 1.2 million students fail to complete high school, which translates to one third of all high school students not graduating from high school at the appointed time of graduation (Watson & Gemin, 2008). These statistics include approximately one half of all African American and Hispanic students in public schools (Watson & Gemin, 2008). Researchers have identified many factors that lead to high school completion (Bryk, 2010; Suh, Suh, & Houston, 2007). School officials and policymakers have attempted to design and to reform schools to promote the academic achievement and graduation of their students (Bryk, 2010).

For decades, researchers have sought to determine whether large, medium, or small schools are better environments to support student achievement (Lee & Smith, 1995; Slate & Jones, 2005, 2006; Stewart, 2009; Werblow & Duesberry, 2009). There has been ongoing research investigating the relationship of school size with a number of variables, including ethnicity, the transition to high school, engagement in school culture, levels of parental involvement, and curricular offerings (Lee & Smith, 1995; Slate & Jones, 2006; Stewart, 2009). Research studies undertaken to explore these questions have yielded mixed results due to the complexity of demographic and other confounding variables (Slate & Jones, 2005; Werblow & Duesberry, 2009). Even researchers using a rigorous hierarchical linear model research design with a large sample size acknowledged the difficulty in asserting strong effect sizes between outcome variables (e.g., math achievement) and school size alone (Werblow & Duesberry, 2009).

Transition to High School

The transition to high school is a critical juncture in students' lives, influencing high school achievement and graduation rates (Hardy, 2006; McCallumore & Sparapani, 2010; Neild, 2009). Jay Hertzog, education dean at Slippery Rock University, expressed that, "If we can get kids to the 10th grade, they're going to graduate" (Hardy, 2006, p. 21). It is in the transition to high school that students either mature to meet heightened academic, social, and parental expectations, or they fall behind, delaying their graduation (Hardy, 2006). Ninth-grade students are faced with the tasks of navigating unfamiliar settings, conquering more complex academic demands, and adjusting to new relationships with peers (Neild, 2009). In the Chicago Public Schools, only 22 % of those who fell behind on credits in the ninth grade graduated on time with their original cohort of ninth graders (Neild, 2009). If students pass ninth grade with an adequate number of credits, then they are likely to graduate (Hardy, 2006; McCallumore & Sparapani, 2010).

Educators across the country have sought to ease the transition to high school by creating smaller ninth-grade learning communities that are sensitive to the transitional needs of students at this juncture (Chmelynski, 2004; Hardy, 2006). Researchers have contended that smaller school environments are more conducive to creating supportive school cultures that will aid students' transition to a more demanding set of academic and social expectations (Black, 2004; Chen, 2008; Chmelynski, 2004). Students who were studied by representatives of The National Middle School Association reported that homework, academic difficulties, and the size of the school were their chief concerns as they transitioned into high school (Chen, 2008). Ninth-grade students in smaller-learning communities have reported feeling more protected and cared for, and experienced a greater connection to the culture of the school as they made the shift to the greater academic and social demands of high school (Hardy, 2006).

Parental Involvement

Parental involvement is a factor that contributes to high school completion and has been shown to increase success in the educational process (Anguiano, 2004; Keith et al., 1998; Slate & Jones, 2005). When students enter high school and face a plethora of transitional factors, parents tend to become less involved in their children's education (Chmelynski, 2004). Researchers have investigated the relationship between parental involvement and high school completion among various ethnic minority groups and have found that parental involvement increases the likelihood of high school completion among these populations (Anguiano, 2004). Ethnic minority parents as well as White parents have demonstrated greater involvement in the educational process in smaller schools (Walberg, 1992). In smaller schools, parents are more informed about their children's progress, participate more in school functions, are more likely to know their child's principal, and have more influence in school decision making (Walberg, 1992). Heightened parental involvement often occurs in smaller schools because those schools tend to have closer proximity to students' homes and stronger community bonds than do larger schools (Walberg, 1992).

School Engagement

Students are able to make a more positive transition to the academic and social demands of high school when they can quickly develop a sense of belonging and connectedness to the identity and culture of the school (Newman, Newman, Griffen, O'Connor, & Spas, 2007). Janosz et al. (2008) reported that students who showed higher school engagement in early adolescence had higher high school completion rates. Some students benefit from the new start represented by the transition to high school because they have the opportunity to establish a new social identity and form new peer attachments, but a significant number of high school students do not form these new attachments (Newman et al., 2007). The breaking of bonds formed in junior high school, relative anonymity in a large high school, and the new influence of older students can lead to academic failures, social alienation, or an increase in risk-taking behaviors in young adolescence (Chmelynski, 2004; Neild, 2009; Newman et al., 2007). Kuo's (2010) review of school reforms over the last 30 years indicates that small learning communities, those ranging from 600 to 900 students, might be more effective in providing this sense of connectedness.

Extracurricular activities play a significant role in creating a sense of connectedness. Researchers have documented that in smaller schools, there is an opportunity for everyone who wants to participate (Slate & Jones, 2005), but this might not be true in larger schools. On athletic teams, for example, there is only room for a certain number of players, regardless of school size. In smaller schools everyone can play who would like to, whereas in larger schools, a considerable number of students are cut from the team, leaving a substantial portion of the student body in the role of spectators. Crosnoe, Johnson, and Elder (2004) discovered that as school size increased, participation in extracurricular activities decreased. Thus, students in small schools are more likely to be involved in extracurricular activities, have a greater sense of connectedness, and are more likely to complete high school (Slate & Jones, 2005; Weiss et al., 2010; Werblow & Duesberry, 2009).

Curriculum

A large part of the argument for larger schools includes the ability to offer a greater diversity of curricular offerings (Slate & Jones, 2006). Researchers have agreed that larger schools have more varied course offerings, but after a threshold of around 400 students, the variety does not increase. There has not been consensus that a more diverse curriculum is synonymous with enriched academics (Slate & Jones, 2006). Researchers have discovered conflicting differences in achievement between small schools and large schools; thus, although economies of scale benefit large schools, smaller schools might offer a more focused core curriculum that provides more quality instruction to students (Slate & Jones, 2006; Werblow & Duesberry, 2009).

Teachers who are pressed for time to meet the curricular demands for multiple large classes of students often are unavailable or are perceived as being unavailable to students who are struggling (Smith-Mumford, 2004). In smaller schools, students have reported greater bonds with their teachers (Crosnoe et al., 2004). Thus, both large schools and small schools offer varied curricular benefits to students (Crosnoe et al., 2004; Slate & Jones, 2006; Smith-Mumford, 2004; Werblow & Duesberry, 2009).

School Size

As of 2004, approximately one half of the high schools in the United States sustained enrollment of more than 1,500 students (Ingels, Burns, Chen, Cataldi, & Charleston, 2005). In recent years, larger schools have emerged across the country (Werblow & Duesberry, 2009). Their existence is substantiated by the economies of scales concept. This idea, in relation to school size, postulates that larger institutions can operate with more economic efficiency, providing more resources and giving students additional opportunities, higher level courses, and curricular diversity (Werblow & Duesberry, 2009). In a review of literature, Slate and Jones (2005) concluded that campuses with between 500 and 1,000 students are operating at peak economic efficiency. Schools that are larger or smaller become more expensive to operate in terms of cost per student.

Researchers are consistently looking at how school size affects academic achievement and completion rates (Slate & Jones, 2005; Stewart, 2009; Werblow & Duesberry, 2009). When using the economies of scale argument, the assumption is that larger schools lead to peaked academic achievement because the money saved in operating cost is re-distributed into improved academics (Slate & Jones, 2005). Werblow and Duesberry (2009) ascertained that both small schools and large schools had similar improvements in mathematics achievement, whereas medium schools showed less improvement. Stewart (2009) discovered higher academic achievement in small schools in Texas. In contrast, Slate and Jones (2005) concluded that studies have generally shown increased achievement in smaller schools, but a significant number of studies also have revealed greater academic achievement in larger schools. Due to conflicting results, researchers agree that mediating factors along with school size contribute to academic achievement (Slate & Jones, 2005).

High school completion rates, however, have been consistently higher in smaller schools (Slate & Jones, 2005; Werblow & Duesberry, 2009). In schools with graduating classes under 667 students, 6.4 % of students failed to graduate; whereas in graduating classes greater

than 2,091 students, 12.1 % of students failed to graduate (Slate & Jones, 2005). The rate of students who did not complete high school doubled as school size increased. Researchers have linked increased daily attendance with high school completion (Slate & Jones, 2005; Werblow & Duesberry, 2009). Daily attendance rates are consistently higher in small schools (Slate & Jones, 2005; Werblow & Duesberry, 2009).

Ethnicity, School Size, and Graduation Rates

Texas graduation rates show slightly higher completion rates than the national average at 81.6 % for White students, 65.9 % for Hispanic students, and 65.7 % for African American students (Stilwell, 2010). Lower graduation percentages are consistent in the African American and Hispanic student population across the United States. Students considered at risk for failure to complete high school are those who, due to their environments or backgrounds, are at a higher risk for educational failure (Suh et al., 2007). This might be due to low test scores, living at or below the poverty line, emotional or physical abuse, limited English proficiency, or reading below grade level. The risk factors for dropping out of school affect disproportionate numbers of African American and Hispanic students who often live in impoverished environments that lead to an increased risk of academic failure (Suh et al., 2007; Watson & Gemin, 2008). The stereotype threat also might impact these trends. This theory proposes that minority students might react to negative self-fulfilling prophecies related to their academic abilities (Osborne & Walker, 2006).

High school success in ethnic minority populations is linked to their social environments and, more specifically, to the influence of supportive adults (Woolley, 2009). Research has shown that when African American, Hispanic, and White students emerge from environments with similar risk, and adult support, the achievement difference is eliminated (Woolley & Bowen, 2007). Thus, the key to diminishing the achievement gap among African American, Hispanic, and White students is to influence the supportive adults in the lives of African American and Hispanic children to hold high educational expectations and encourage academic success (Woolley, 2009).

In regards to ethnicity and school size, Crosnoe et al. (2004) examined the interpersonal effects of school size across ethnic groups. Specifically, they examined how school size impacted student attachment to school, connection to teachers, and participation in extracurricular activities. When controlling for socioeconomic status, they found that there was no statistically significant difference in interpersonal effects across ethnicity, specifically among African American students, Hispanic students, and White students, in regards to school size. They postulated that the increased negative effect of ethnicity upon school size found in previous studies is more related to socioeconomic status than to ethnicity. They did, however, observe that African American students participated in and enjoyed extracurricular activities more, and all students felt most comfortable in their schools when they attended schools where a large portion of the student population was of their own ethnicity.

In sum, school size has been researched with multiple variables including ethnicity, the transition to high school, engagement in school culture, levels of parental involvement, and curricular offerings (Lee & Smith, 1995; Slate & Jones, 2006; Stewart, 2009). Further, a smooth transition to high school, parental involvement, and engagement in school culture contributes to a higher probability of high school graduation across ethnicities (Anguiano, 2004; Hardy, 2006; Janosz et al., 2008). It is apparent that studies have shown conflicting results in regards to whether small schools, medium schools, or large schools lead to higher student achievement, but researchers have consistently revealed larger high school completion rates in smaller schools (Slate & Jones, 2005; Stewart, 2009; Werblow & Duesberry, 2009).

Method
Selection of Participants

Participants for this study were students from traditional Texas public high schools with Grades 9-12 listed in the Texas Education Agency database for the 2008-2009, 2009-2010, and 2010-2011 school years. Data collected from secondary schools included completion rates and ethnicity. The sample was limited to African American, Hispanic, and White students who completed high school in small, medium, or large schools across these three school years. Excluded from this study were alternative schools, private schools, or charter schools. Schools that had fewer than 100 students also were eliminated from this study because of the inability of the state to gather accurate data from these schools (Greeny, 2010).

A convenience sampling technique was utilized that represented students in small, medium, and large high schools, based on enrollment for that school year. A frequency distribution was conducted and cutpoints were formed to determine the number of students in each school size category. Specifically, small high schools were defined as having student enrollment of 327 and below; medium schools had an enrollment of 328-1,337 students; and large high schools had student enrollments of 1,338 and higher. Consequently, for the 2008-2009 school year, the number of schools that were selected for the study was distributed as follows: 64 small schools, 170 medium schools, and 293 large schools for a total of 527 secondary traditional public high schools in Texas. For the 2009-2010 school year, the number of schools that were selected for the study was distributed as follows: 111 small schools, 198 medium schools, and 297 large schools for a total of 606 secondary traditional public high schools in Texas. For the 2010-2011 school year, the number of schools that were selected for the study was distributed as follows: 71 small schools, 172 medium schools, and 306 large schools for a total of 549 secondary traditional public high schools in Texas. These data were selected because they were the most current data available at the time of the research study.

In order to protect the confidentiality of research participants, the Academic Excellence Indicator System (AEIS) does not include data that could potentially identify students due to low student population. According to the Family Education Rights, and Privacy Act (FERPA), certain values of the AEIS must be masked if individual students could be identified (FERPA, 2010). In this study, all precautions were taken to maintain confidentiality of our participants.

Instruments

This quantitative study examined the relationship of school size, ethnicity, and completion rates. Archival data were obtained for the 2008-2009, 2009-2010, and 2010-2011 school years from the AEIS. Further, AEIS has aggregate student data for the entire state that are

easily accessible to the public. All schools were required to report data to the AEIS system during these years (e.g., TEA, 2010). Data examined were from students in Grade 12 (who graduated with their original cohort) or within 1 year of the expected graduation year and included student ethnicities and completion rates. Data were analyzed for statistically significant differences among African American, Hispanic, and White students related to completion rates as a function of secondary school size.

Procedures

Approval for this study was obtained from the Institutional Review Board (IRB) at the institution where the study took place. After obtaining approval, the researchers analyzed archival quantitative data from the AEIS database. Sizes of schools were based on initial analysis of a frequency distribution for secondary public schools in Texas. This study examined the differences in completion rates among African American, Hispanic, and White students in small, medium, and large Texas high schools using a causal-comparative research design (Creswell, 2008). A causal-comparative design was utilized because the independent variables were not manipulated for this study. In this type of design, archival data were analyzed to determine differences among the subgroups. An advantage of causal-comparative design is that existing data can be used to determine differences in combined variables (Creswell, 2008). However, caution should be used when interpreting results of a causal-comparative study because the independent variables have already occurred (Creswell, 2008).

Analysis

In order to address the research questions, a series of nonparametric analyses of variance (ANOVAs) was utilized to analyze the differences in completion rates among African American, Hispanic, and White students. The independent variables for this research study were school size and ethnicity. The categorical dependent variable for this study was completion rate for high school students. SPSS, version 19, was used to conduct the ANOVAs (SPSS Inc., 2011).

Results

Before conducting the inferential analyses, it was necessary to test assumptions of the data. Histogram plots were examined (not presented) and the standardized skewness coefficient (i.e., skewness coefficient divided by the standard error of skewness) and the standardized kurtosis coefficient (i.e., kurtosis coefficient divided by the standard error of kurtosis) were calculated. For the 2008-2009, 2009-2010, and 2010-2011 school years, all of these standardized skewness coefficients and standardized kurtosis coefficients were far outside the bounds of normality (i.e., ± 3), thereby justifying a nonparametric analysis (Onwuegbuzie & Daniel, 2002). Thus, a nonparametric repeated measures analysis of variance (ANOVA), namely, Friedman's ANOVA was conducted (cf. Field, 2009). For the 2008-2009 school year, the means and standard deviations of the completion rates as a function of ethnicity and school size are presented in Table 1. Friedman's ANOVA revealed no statistically significant difference ($X^2[2] = 0.90, p = .637$) among African American, Hispanic, and White students for small schools. Similarly, for medium schools, no statistically significant difference ($X^2[2] = 4.07, p = .131$) among African American, Hispanic, and White students. However, for large schools, a statistically significant difference ($X^2[2] = 120.80, p < .0001$) emerged among African American, Hispanic, and White students, with the effect size, as measured by Cramer's V, being large ($V = .45$), using Cohen's (1988) criteria. A series of nonparametric pairwise follow-up tests (i.e., Wilcoxon signed-rank tests) was conducted to examine further the nature of the differences among the three ethnic groups. The Bonferroni adjustment was applied to take into account the fact that three pairwise follow-up tests were undertaken, such that the total experimentwise error rate did not exceed 5% (Chandler, 1995; Ho, 2006; Manly, 2004; Vogt, 2005). This correction was undertaken by dividing the nominal alpha value by 3 (i.e., .05/3 = .0167). Therefore, the adjusted level of statistical significance was .0167. After applying the Bonferroni adjustment, the Wilcoxon signed-rank tests indicated that White students had statistically significant higher completion rates than did both Hispanic

Table 1

Means, Standard Deviations, Medians, and Ranges of Completion Rates by Ethnicity and by School Size: 2008-2009

Size of School	Ethnicity											
	White				African American				Hispanic			
	M	*SD*	Mdn	Range	*M*	*SD*	Mdn	Range	*M*	*SD*	Mdn	Range
Small (*n* = 64)	85.75	20.81	93.4	0 - 100	83.84	21.86	91.3	0 - 100	84.19	20.22	88.9	0 - 100
Medium (*n* = 170)	91.92	8.63	94.6	28.6 - 100	90.38	10.19	92.3	54.7 - 100	89.43	9.98	91.0	25.0 - 100
Large* (*n* = 293)	91.16	8.77	93.8	30.0 - 100	87.88	9.90	89.7	20.0 - 100	87.09	7.31	86.9	62.0 - 100

Note: Mdn = Median

*Statistically significant difference among African American, Hispanic, and White students.

(z = 10.16, p < .0001; Cramer's V = .56) and African American (z = 7.41, p < .0001; Cramer's V = .43) students, representing large effect sizes. However, no statistically significant difference in completion rates emerged between Hispanic and African American students.

For the 2009-2010 school year, the means and standard deviations of the completion rates as a function of ethnicity and school size are presented in Table 2. Friedman's ANOVA revealed no statistically significant difference (X^2[2] = 2.91, p = .236) among African American, Hispanic, and White students for small schools. Similarly, for medium schools, no statistically significant difference (X^2[2] = 3.25, p = .197) among African American, Hispanic, and White students. However, for large schools, a statistically significant difference (X^2[2] = 68.71, p < .0001) emerged among African American, Hispanic, and White students, with the effect size being moderate (V = .34). A series of Wilcoxon signed-rank tests, after applying the Bonferroni adjustment, indicated that White students, again, had statistically significant higher completion rates than did both Hispanic

(z = 8.94, p < .0001; Cramer's V = .49) and African American (z = 6.74, p < .0001; Cramer's V = .39) students, representing large and moderate-to-large effect sizes, respectively. However, no statistically significant difference in completion rates emerged between Hispanic and African American students.

Most recently, for the 2010-2011 school year, the means and standard deviations of the completion rates as a function of ethnicity and school size are presented in Table 3. Friedman's ANOVA revealed statistically significant difference (X^2[2] = 4.28, p = .003) among African American, Hispanic, and White students for small schools, with the effect size being small (V = .17). A series of Wilcoxon signed-rank tests, after applying the Bonferroni adjustment, indicated that White students had statistically significant higher completion rates than did both Hispanic (z = 3.55, p < .0001; Cramer's V = .19) and African American (z = 7.69, p < .0001; Cramer's V = .18) students, representing small-to-moderate effect sizes. However, no statistically significant difference in completion rates emerged between Hispanic

Table 2

Means, Standard Deviations, Medians, and Ranges of Completion Rates by Ethnicity and by School Size: 2009-2010

Size of School	Ethnicity											
	White				African American				Hispanic			
	M	*SD*	Mdn	Range	*M*	*SD*	Mdn	Range	*M*	*SD*	Mdn	Range
Small (*n* = 111)	73.93	30.97	86.0	0 - 100	70.29	32.46	81.4	0 - 100	72.37	30.86	83.6	0 - 100
Medium (*n* = 198)	91.25	12.10	95.2	16.7 - 100	89.37	12.34	92.3	31.8 - 100	89.56	10.81	91,7	49.4 - 100
Large* (*n* = 297)	92.28	8.46	94.5	37.5 - 100	89.59	8.14	91.0	54.0 - 100	89.49	6.55	90.3	60.3 - 100

Note: Mdn = Median
*Statistically significant difference among African American, Hispanic, and White students.

Table 3

Means, Standard Deviations, Medians, and Ranges of Completion Rates by Ethnicity and by School Size: 2010-2011

Size of School	Ethnicity											
	White				African American				Hispanic			
	M	*SD*	Mdn	Range	*M*	*SD*	Mdn	Range	*M*	*SD*	Mdn	Range
Small (*n* = 71)	80.17	22.14	88.6	0 - 100	72.97	29.37	88.9	0 - 100	73.75	27.75	95.7	0 - 100
Medium (*n* = 172)	90.37	11.57	90.9	29.3 - 100	89.32	12.13	89.5	27.8 - 100	87.05	11.29	94.7	13.3 - 100
Large* (*n* = 172)	90.05	9.39	87.5	42.9 - 100	85.90	9.83	84.4	45.9 - 100	84.27	7.98	92.7	20.0 - 100

Note: Mdn = Median
*Statistically significant difference among African American, Hispanic, and White students.

and African American students ($z = 0.34$, $p = .73$). Similarly, for medium schools, a statistically significant difference ($X^2[2] = 30.93$, $p < .0001$) emerged among African American, Hispanic, and White students, with the effect size being moderate ($V = .30$). A series of Wilcoxon signed-rank tests, after applying the Bonferroni adjustment, indicated that Hispanic students had statistically significant lower completion rates than did both White ($z = -7.04$, $p < .0001$; Cramer's $V = .16$) and African American ($z = -3.62$, $p < .0001$; Cramer's $V = .14$) students, representing small effect sizes. However, no statistically significant difference in completion rates emerged between White and African American students ($z = 1.37$, $p = .17$). Finally, for large schools, a statistically significant difference ($X^2[2] = 172.40$, $p < .0001$) emerged among African American, Hispanic, and White students, with the effect size being large ($V = .53$). A series of Wilcoxon signed-rank tests, after applying the Bonferroni adjustment, indicated that White students, again, had statistically significant higher completion rates than did both Hispanic ($z = 12.285$, $p < .0001$; Cramer's $V = .18$) and African American ($z = 8.81$, $p < .0001$; Cramer's $V = .17$) students, representing small-to-moderate effect sizes. Also, African American students had statistically significant higher completion rates than did Hispanic students ($z = 4.25$, $p < .0001$; Cramer's $V = .12$), representing a small effect size.

Discussion

Prior research supports the premise that there is a relationship among school size, ethnicity, and high school completion rates (Cotton, 1996; Darling-Hammond, 2004b; Lee & Smith, 1995, 1997; Slate & Jones, 2005; Stewart, 2009; Werblow & Duesbery, 2009). In our research study, we hypothesized a relationship between ethnicity and completion rates for the three school sizes (i.e., small, medium, and large) that we examined, and our hypothesis was partially confirmed. Specifically, although there was no difference in completion rates among the three ethnic groups for both small schools and medium schools for either the 2008-2009 and 2009-2010 school years, statistically significant differences in completion rates emerged among the three groups for the 2010-2011 school year, in favor of White students. These findings suggest that, in small and medium schools, the ethnic gap in completion rates might have widened in this last year. If this is the case, this would be a very disturbing development. As such, future research should investigate the 2011-2012 school year to determine if this gap widens further.

For all three years, White students had statistically significant higher completion rates than did both Hispanic and African American students in large schools. Further, for the 2010-2011 school year, in small schools, White students had statistically significant higher completion rates than did both Hispanic and African American students; and in medium schools, White students had statistically significant higher completion rates than did Hispanic students. These findings suggest that, compared to White students, large schools in particular and small and medium schools to some extent appear to place African American and Hispanic students at a significant disadvantage with respect to completion rates.

That White students in large schools had higher completion rates than did African American and Hispanic students appears to support the economies of scale argument. That is, large schools are able to offer greater diversity of courses and resources, but at some point become impersonal and inefficient, leading to discouragement in some students—particularly minority students (i.e., African American students, Hispanic students)—and their subsequent failure to complete school (Slate & Jones, 2006; Werblow & Duesberry, 2009). Also, according to the economies of scale argument, large school populations might have accessibility to greater resources, but, in reality, lower student/teacher ratio and other factors might provide compensatory benefits for students in smaller schools.

Interestingly, in the 2008-2009 and 2010-2011 school years, both African American and Hispanic students secured their highest completion rates in medium schools. Also, in the 2009-2010 school year, Hispanic students secured their highest completion rates in medium-sized schools, whereas African American students had similarly high completion rates in medium schools and large schools. These relatively high completion rates for African American and Hispanic students in medium-sized schools suggest that for these minority students, medium–sized schools offer the optimum balance of personal engagement and curricular and extracurricular diversity that allow them to thrive and to graduate. It would be worthwhile to study further how medium-sized schools might play a role in increasing completion rates among minority students.

Although the African American and Hispanic students attained lower completion rates than did White students, this does not imply that the African American and Hispanic students have innate academic deficits that are immutable. In fact, the ethnic differences identified in the present study likely stem from the marginal resources of public schools attended by the majority of minority students, coupled with the racialized politics and practices of federal, state, and local governments (see, for e.g., Donovan & Cross, 2002; Hacker, 1992; Kozol, 2005; Kunjufu, 1990, 1997; Moore et al., 2010). Further, researchers have documented that African American and Hispanic students are frequently tracked in less rigorous courses and often are taught by the least qualified teachers (Contreras, 2005; Darling-Hammond, 2004a), both of which might negatively impact completion rates. As such, current educational policies in Texas need to be re-examined, especially as they affect completion rates of high school students.

As noted by Moore et al. (2010),

Comparing the academic performance levels of African American and Hispanic high school students to White students or students of other ethnicities does not represent inappropriate practice per se, as long as findings are interpreted responsibly and ethically. Such studies of between-group differences can yield useful information. (p. 15)

Notwithstanding, studies also are needed that examine within-group differences. For example, a potentially fruitful avenue for research would be to compare the completion rates of Hispanic males and females and African American males and females within the same family because gender and ethnicity have been found to interact for many educational outcomes (Heath, 1992). Indeed, useful information can be obtained regarding the educational experiences of minority students by examining within-ethnic differences (cf. Casteel, 1995; Onwuegbuzie, 1997), which then can be used to inform intervention strategies to increase the completion rates of minority students.

Limitations

The findings from the study have important implications for educators and school officials. We assumed that the data were accurate and that all students were accounted for, because all schools are required to provide statistics for AEIS. However, some limitations and delimitations are noted. One limitation to the study was related to confidentiality and the protection of human participants. According to the FERPA, certain values of the AEIS must be masked if individual students could potentially be identified within the data; this eliminated a number of schools from our analysis (FERPA, 2010). Another limitation in this type of study relates to the challenge of measuring and interpreting individual characteristics that impact student success (Stewart, 2009). Thus, some caution should be used in the interpretation of findings from this causal-comparative research design because one or more confounding variables might have contributed to the effect sizes, and there is no ability to control the independent variable when studying archival data. As with any educational research, there are sampling errors and interaction effects that might threaten the validity of results.

For the purpose of this research study, charter schools and small schools with a population of fewer than 100 students were omitted from the sample, potentially affecting the population validity and ecological validity of the findings. Another limitation of the study was that it included only African American, Hispanic, and White students. Thus, future research should include the examination of other ethnic groups. Further, because factors such as socioeconomic background, accessibility to mentorship, peer influence, parental support, and motivation can play unique roles in an individual's desire to succeed in and to complete school, the roles that these factors play in determining completion rates is worthy of future investigation. Nevertheless, because of the fact that statewide data were used, the present findings are noteworthy.

Recommendations

The focus of our research was the influence of school size on the completion of high school by students of various ethnicities. This research adds to the current discourse related to grade span configurations and completion rates. Previous research indicated that school success is not determined by school size alone, but on factors such as accessibility to resources in the community and at home (Stewart, 2009). Factors such as socioeconomic background, accessibility to mentorship, peer influence, parental support, and motivation can interact and uniquely impact an individual's motivation to succeed in school (Stewart, 2009).

Further, it would be useful to study the concept of stereotype threat in the experiences of high school students. Stereotype threat represents "being at risk of confirming, as self-characteristic, a negative stereotype about one's group" (Steele & Aronson, 1995, p. 1). In addition, future research studies could expand the current theoretical frameworks related to the interactions among the many variables related to school size, ethnicity, and high school completion. Recommendations for future research include using qualitative research techniques to examine the experiences of select students across different ethnicities in small, medium, and large high schools. Mixed research techniques (i.e., utilizing both quantitative and qualitative data collection and analysis techniques within the same framework;

Johnson & Onwuegbuzie, 2004) also could play an important role in increasing our understanding of how and why disproportionate numbers of African American and Hispanic students do not complete high school.

In the meantime, school leaders can take steps to increase the completion rates of all high school students in general and minority high school students in particular via teacher professional development and special program implementation. In particular, teachers in large schools need to receive professional development in instructional strategies that help them increase the completion rates of high school students. Training might focus on teaching strategies that provide students with attainable educational goals so that they can experience success at some level. In addition, improved instructional resources must be made available for teachers in large schools. Programs and support services must be in place to assist students who are at risk for noncompletion so that these students can receive the extra help they need. Whatever interventions are used, their efficacy should be continuously assessed. As Tierney (2004) surmised, students' cultural backgrounds should be considered when designing instructional programs, and these programs should be developed for a sustained and articulated delivery over the course of the students' education.

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