

The Journal

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The Journal OF AT-RISK ISSUES

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The Journal of At-Risk Issues

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Research reports describe original studies that have applied applications. Group designs, single-subject designs, qualitative methods, mixed methods design, and other appropriate strategies are welcome. Review articles provide qualitative and/or quantitative syntheses of published and unpublished research and other

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Submit Manuscripts to:

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

Kim Fitzgerald, Teandra Gordon, Antoinette Canty, Ruth E. Stitt,
Anthony J. Onwuegbuzie, and Rebecca K. Frels

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 coun-

selor 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 (Stillwell, 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			
	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range
Small (<i>n</i> = 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 (<i>n</i> = 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* (<i>n</i> = 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			
	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range
Small (<i>n</i> = 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 (<i>n</i> = 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* (<i>n</i> = 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			
	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Range
Small (<i>n</i> = 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 (<i>n</i> = 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* (<i>n</i> = 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 & Duesberry, 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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Adult and Middle School Girls' Perceptions of Risk-Taking Behavior: Implications for School Practitioners

Brett Johnson Solomon and Mark Garibaldi

Abstract: *There is an overwhelming disconnect between young adolescent girls and adults, in relationship to perceptions of middle school girl risk taking. This mixed-methods study investigates the differences between adult practitioners and middle school girls' perceptions of risk taking, understanding of consequences, and needs among middle school girls. Understanding such cohort differences is critical to providing adult practitioners with a blueprint for best supporting middle school girls. Four-hundred and nine middle school girls, and 226 adult practitioners, who worked with middle school girls in a variety of contexts, anonymously responded to five open-ended questions relating to their risk taking, understanding of consequences, and needs. The results highlight an overwhelming disconnect between the two cohorts. Most significantly, the findings reveal the risks and needs that are salient to middle school girls and underscoring the misinterpretation of their risk taking and needs among adult practitioners. Implications for school practitioners are discussed including strategies for effectively connecting with middle school girls.*

"When we (girls) do take risks, pressure and stress always leads us to do so. Or it might just be our heart telling us to follow it."

-Eighth-grade girl

Middle school girls, like most young adolescents, are often challenged with the transition from childhood to adolescence as their peers, rather than their parents, become a more salient source of social support and intimacy. With this shift comes an increase in risk taking (Steinberg, 2004, 2008), such as substance use (Raboteg-Saric, Rijavec, Brajsa-Zganec, 2001; Wang, Peterson, & Morphy, 2007), sexual experimentation (Little & Rankin, 2001; Van den Akker, 2001), illegal activity (Solomon, 2006, 2007), and an increased probability of dropping out of school (Rumberger & Lim, 2008). Because risk taking among middle school girls is unique to their developmental stage, finding the best way to support them is often a challenge, particularly for adult practitioners (e.g., middle school teachers, counselors, social workers, and psychologists) who interact with middle school girls on a consistent basis. Hence, it is important for adults in these roles to have an accurate understanding of young adolescent risk taking in order to establish best practices for effective social and emotional support. Further, it is particularly important that this understanding be tailored to middle school girls who, as a population and compared to boys, are underreported in the risk-taking literature.

With the range of risk-taking behaviors related to school dropout growing broader from increasing violent crimes committed by adolescent girls (Office of Juvenile Justice and Delinquency Prevention,

2008) to trends in cyber-bullying (e.g., "sexting;" Greiner, 2011), understanding how they perceive risk taking and related consequences is crucial. Furthermore, if school practitioners are to provide middle school girls with preventative or "promoting" support, understanding how adults perceive risk taking among this population can inform the opportunities and processes through which support is implemented in schools (Powers, Bower, Webber, & Martinson, 2010).

The following mixed-methods study investigates perceptions of risk taking among middle school girls from the adult professional and middle school girl perspectives. For the purposes of this paper, middle school girl risk taking involves engaging in behaviors that yield a potential for harm or opportunity for reward (Lejuez, et al. 2002). Though risk taking has been identified as a typical part of adolescent development (e.g., breaking curfew), those who take risks often place value on the positive outcome of a risk rather than on the harmful consequences (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993). There is minimal qualitative evidence that reflects nuanced accounts and contextual explanations of adults' and girls' perceptions of risk taking among middle school-aged girls. This type of research is important because it provides personal perspectives of risk taking, and also highlights differences in perceptions between adults and girls. Hence, the literature review and subsequent study are built upon three bodies of research: (a) the risks that adolescents and middle school girls take, (b) influences on risk taking, and (c) the needs of middle school girls.

Background

Adolescent Risk Taking

Adult perceptions of adolescent risk taking. Most of the adult perception literature that focuses on adolescent risk taking is centered on parent perceptions of their own adolescents' behavior. This literature generally reflects a disconnect between how adolescents and parents perceive specific risk behaviors such as sexual involvement (Downing-Matibag, 2009; Ivey, 1999), concealment (Finkenauer, Frijns, Engels, & Kerkhof, 2005), substance use (Downing-Matibag, 2009), aggression, antisocial or undercontrolled behaviors (Seiffge-Krenke & Kollmar, 1998), and general risk taking (Cottrell et al., 2006). Most of this disconnect can be attributed to the typical phase in adolescent development relating to an adolescent's drive towards autonomy (Steinberg, 1988).

Though parents typically have the most interaction with adolescents, school practitioners perhaps have a wider breadth of exposure to adolescents. As a result, school practitioners are in a unique position to gauge risk-taking trends among the populations with whom they work. Vander Jagt, Shen, and Hsieh (2001) investigated elementary and secondary school principals' perceptions of risk-taking behaviors such as truancy, violence, delinquent behavior, drug and alcohol use, which they identified as school problems. Through survey responses, these authors found that risk-taking problems were most severe in larger, urban and rural schools, and also increased with age.

Hines and Pearson (2006) used self-report assessments to determine if teachers and parents differed in their views of adolescent storm and stress. These authors write that teachers "exposure to a diverse group of adolescents is most likely to create stereotypic views" (p. 600), and that years of working with adolescents may intensify these views. As such, stereotypic views or perceptions may seemingly hinder teachers' understanding of typical adolescent development, and obstruct ideal practices for supporting them.

Moyer and Sullivan (2008) surveyed middle school and high school counselors on student risk-taking behavior to determine when they felt it appropriate to break confidentiality. These authors found that counselors perceived it more ethical to break confidentiality when a younger student (middle school aged) was involved in risk-taking activities such as sex, smoking, and alcohol use, as opposed to when older, high school students were involved.

The above studies are noteworthy in that they report school practitioner perceptions of adolescent risk taking, a construct that is underreported in comparison to parent perception research. If there is something to be learned from the parent perception literature, it is that adults often underestimate the type and amount of risk taking that adolescents actually engage in.

Middle school girl risk taking. Though the research that reflects risk taking among middle school girls (ages 11-14) is limited, the literature that does exist provides a foundation for better understanding such behavior. Four major types of risk taking emerge from this literature that are also factors related to dropout (Battin-Pearson et al., 2000; Newcomb et al., 2002; Rumberger & Lim, 2008) included sexual experimentation, substance experimentation/use, social media engagement, and illegal activities.

Sexual experimentation. The 2009 National Youth Risk Behavior Surveillance System reports that 6% of high school students first

had sexual intercourse before the age of 13 (Centers for Disease Control and Prevention, 2010). Specifically, 3.1% of girls reported to have sexual intercourse before the age of 13, with more prevalence among Black (5.6%) and Hispanic (3.7%) girls, than White (2.2%) girls. O'Donnell et al. (2008) found that sixth-grade girls from urban communities were more likely than others to initiate sexual involvement close to the same time that they first used alcohol.

Substance use. McIntosh, MacDonald, and McKeganey (2006) reported that virtually no research exists on decisions to use drugs, and the factors that influence them, among young adolescents (11-14), bringing to question why youth experiment with illegal drugs. Through semistructured interviews, these authors found that drug experimentation and use increased during the late preteen and early teenage years, and that 64% of the participants (ages 10-12) reported peer-related factors for initiation and use. Their research also revealed that as this cohort aged, the influence of peers on drug experimentation decreased considerably (McIntosh et al., 2006). Though no gender specifications were indicated, these authors report that the onset of substance use occurs in early adolescence which generally coincides with the desire for more autonomy (McIntosh et al., 2006).

Social media. The increase in the use of electronic technologies and social media has also accounted for recent risk taking among middle school girls. Kowalski and Limber (2007) found that when compared to boys, middle school-aged girls were overrepresented among electronic bullying victims (those victimized by bullies) and bully-victims (those victimized by bullies and who are also bullies). These findings indicate that social media is a salient avenue for risk taking, particularly social aggression, among middle school girls.

Illegal activity. The Office of Juvenile Justice and Delinquency Prevention (2004) reported that 29% of juvenile crimes in 2002 were committed by females. In reference to the type of crimes committed by adolescent girls, Solomon (2006) found that 41% of adolescent female offenders studied were detained for crimes against a person, followed by property offenses (37%), drug-related crimes (18%), or public order (4%).

Though the research on risk taking among middle school girls is limited, the evidence suggests that this population is taking risks that in fact garner a multitude of harmful consequences. The evidence underscores the need to understand their perceptions of risk taking contextually, and to also understand adult practitioner perceptions, in an effort to best support this population.

Influences on Risk Taking

Historical context of adolescent risk-taking perceptions. Initial findings surrounding adolescent perceptions of risky behaviors indicate that they possess unrealistic beliefs about their own invulnerability (Elkind, 1967; Weinstein, 1980). For instance, middle school-aged adolescents (ages 11-14) in comparison to older adolescent and adult cohorts, more often viewed smoking as less of a personal health risk, while simultaneously possessing a belief that smoking has a positive psychological benefit (Chassin, Presson, Rose, & Sherman, 2001). Further, adolescents were more likely than adults to mention social consequences as either costs or benefits in relation to risky behaviors, (Beyth-Marom et al., 1993; Quadrel, Fischhoff, & Davis, 1993) which is consistent with notions of adolescent sensitivity to peer influence (Brown, Clasen, & Eicher, 1986).

Peer influence has been found to have both direct and indirect effects on adolescents' judgment (Steinberg & Scott, 2003). Steinberg and Scott (2003) report that peer pressure accounts for the direct influence, while fear of rejection or disapproval may account for an indirect influence. Steinberg and Monahan (2007) suggested that young adolescents (ages 10-14) often strive for emotional autonomy which coincides with a susceptibility to peer influence. The authors posited that this susceptibility generally decreases in middle to late adolescence (ages 14-18), as individuals mature.

Understanding Needs

Risk taking among middle school girls certainly cannot be explored without addressing the needs among this age group. Sullivan (1953) believed that the need for intimacy among preadolescents is their primary and preoccupying concern, and this age group depends on friends to address their social needs. Buhrmester (1996) found that girls' friendships often focus on meeting communal needs and the need for certain forms of social input are integral to psychological health and happiness. Further, when individuals do not attain such social input, they experience personal distress and maladjustment (Buhrmester, 1996). The risk-taking literature has established that adolescents value positive social outcomes as a result of risky behaviors, view social consequences as either a cost or a benefit to risky behavior, and are impacted by the direct and indirect influence that peers have on their judgment (Steinberg & Scott, 2003). Thus, making the connection between needs and risk taking may be as simple as understanding that adolescent girls may take risks in order to establish or maintain communal needs in an effort to avoid distress and maladjustment.

The Current Study

The current study investigates adult practitioner and middle school girl perspectives of risk taking for two reasons. First, the literature reflects a disconnect between adult and adolescent perspectives of risk taking. In order to best support middle school girls in making appropriate decisions relating to school, for instance, it's crucial to understand the perceptions that adult practitioners have about their risk taking, as well as to provide them with a qualitative understanding of girls' perceptions. Second, compared to boys, girls, as a population, are underrepresented in the risk-taking literature. Hence, the following study is the first of its kind to investigate risk-taking perceptions of middle school aged girls among adult practitioners and middle school girls.

Further, if adult practitioners, specifically, are to establish ideal practices for supporting middle, and ultimately high-school girls, they must first understand the risks that they take. Hence, the first question guiding this study asks: Is there a difference between what adults and middle school girls perceive to be risky? It is also important to understand the causes or influences of risk taking among middle school girls, as well as how they perceive consequences. Thus, the second research question asks: Are there differences between what adults and girls perceive as the antecedents to middle school girls' risk taking? And how do they perceive consequences? Third, and arguably the most important, adult practitioners can benefit from strategies for meeting the needs of middle school girls in an effort

to reduce their risk taking. Thus, the third research question asks: Is there a difference between adult practitioners and middle school girls in the perception of the girls' needs, as well as how adults can meet those needs?

Method

Participants

Middle school girls. Four-hundred and nine (409) young adolescent girls, ages 11 to 15 ($M = 13$) participated in this study. All participants attended one ethnically diverse, urban middle school in Santa Clara County, California, and included Hispanic American (32%), Asian American (22%), European American, (16%), African-American (4%), and Multiracial (16%) girls. Ten percent of the participants declined to state their ethnicities. Approximately two thirds of the students attending this school qualified for the free or reduced lunch program. Once passive parental consent was obtained, participants were recruited during their sixth-, seventh-, and eighth-grade science classes.

Adults. Two-hundred and twenty-six (226) adults participated in this study (53% women, 47% men). They worked with young adolescent girls in a variety of community-based settings, in Santa Clara County, California, as after-school program counselors, school teachers, school administrators, social and recreational staff, probation officers, and social workers. Adult data were collected at the start of a symposium that focused on middle school girls and their development. Adult participants worked primarily in Northern California and their ethnicities included: Hispanic American (57%), European American (20%), Asian American (10%), African American (8%), and Other (5%). Though they came from the same or similar communities as the middle school girls, they were not associated with the school that the girls attended.

Instrumentation questionnaire. In an effort to generate qualitative data for understanding the perceptions of risk taking among middle school girls, the authors developed a five-item, open-ended questionnaire (see Table 1 for questions asked to girls and adults). In addition, girls reported their age, grade, and ethnicity. Adult ethnicities and occupations were obtained at each symposium.

Procedure

Girls were asked to complete the five-item questionnaire (which took approximately 10 minutes) individually and anonymously during their science class. Adults participated in one of two symposia led by the first author, who asked them to complete the five-item questionnaire at the beginning of each meeting. Each adult participant individually and anonymously answered the questions, which also took approximately 10 minutes. Not all adults answered every question, and frequency of responses varied. To ensure participants understood the contents of the questionnaire and individual responses, the first or second author oversaw the administering of the questionnaire.

Content analysis. The analysis of the participants' responses was conducted to quantify and analyze thematic trends in their written responses and make inferences about these trends (Krippendorff, 2004). This process was based on the theoretical framework established by Miles & Huberman (1994), and encompassed: (1) inductively searching for themes in participant responses, and

(2) organizing these themes into categories and subcategories. For instance, question one (“what are some risky things that girls your age do?”) initially yielded several themes, but responses were subsequently shaped into five general categories that connect to related empirical evidence: (a) age inappropriate activities (O’Donnell et al., 2008), (b) illegal activities (Solomon, 2006, 2007), (c) inappropriate social activities (Kowlawski & Limber, 2007), (d) making bad decisions in general (Cottrell et al., 2006), (e) self-harm, and (f) ambiguous. The authors incorporated these categories into a coding book for each survey question, which included codes for each category, as well as corresponding code definitions and examples. Subthemes were also identified and refined into subcategories, such as the five subcategories comprising the general category for “illegal activities” (i.e., crimes against a person, property, or public order, and drug-related crimes). In some cases, if the number of participants who identified with a subcategory was very small, such as self-harm ($n = 7$), these responses were dropped from further analysis. Several responses were identified as “ambiguous” and dropped from further analysis because these responses did not fit within the established theoretical framework (see Table 1 for initial and final coding categories, as well as category criteria and representative quotes).

Coding. To facilitate the coding process, two undergraduate research assistants were iteratively trained to independently code the participant responses until agreement was achieved (among the co-authors and RAs) with Cronbach’s Alpha for inter-rater reliability at .80. Frequencies of emergent themes were calculated to gauge the magnitude of the response. All responses were coded, yet only first responses were included for the data analysis. Once codes were assigned to responses, chi-squares were used to determine relationships between response categories (individual questions) and cohorts (adults and middle school girls).

Results

The results are organized by the three questions that guided this research, and show differences between adult practitioner and middle school girl perceptions of risk-taking behavior, consequences, and needs. In most cases, both cohorts identified the same categories in response to each question, but varied in their perceptions of the degree of involvement. Table 2 shows the distribution of adult practitioner and middle school girl group totals by response category for each question, as well as significant chi-squares and p -values.

To establish a foundation for supportive and ideal practices, the second half of the results reflect different response patterns made by middle school girls only, as well as examples of their compelling statements, which provide an understanding of their risk-taking behavior. Table 3 shows the distribution of middle school girl responses by grade for each question, as well as significant chi-squares and p -values.

Perceptions of Middle School Girl Risk-Taking Behavior

Adult practitioners and middle school girls established that middle school girls engaged in age-inappropriate activities, illegal activities, socially inappropriate activities, and making bad decisions in general. The results of the chi-square analysis show that both adolescents and adults equally perceived age-inappropriate activities, “such as

smoking,” “having sex,” and “going out with older guys” to occur among middle school girls. However, adults perceived illegal activities, such as “stealing money from a store” or “doing drugs” to occur more often than the girls perceived them. Further, adults perceived inappropriate social activities, such as “starting rumors online” or “meeting perverts online” to occur less often than middle school girls did. Further, there was a tendency for middle school girls to perceive girls their age to make bad decisions, such as “walking home alone” or “going somewhere they don’t know by themselves” more often than adults perceived them to. The difference between adult practitioner and middle school girl perceptions of risky things that middle school girls do was highly significant, $\chi^2(3) = 23.57, p < .001$. Similar developmental differences emerged among the girls. The youngest girls of the sample (6th graders) significantly perceived girls their age to engage in more socially inappropriate interactions, compared to 7th and 8th graders, $\chi^2(6) = 54.22, p < .001$.

Influences on Risk-Taking Behavior

Adult practitioners and middle school girls identified peer pressure, boyfriends, the self, and general social pressures as contributors to risk taking among middle school girls. Both cohorts equally perceived that general social pressure, such as “impressing others” or “being popular,” was a contributor to risk taking. However, the girls identified boyfriends as a contributing factor much more often than adults, who did not indicate the significant role of boyfriends in middle school girls’ lives. In addition, adults underestimated peer pressure, relative to middle school girls. Adult practitioners did perceive self-related factors, such as “curiosity,” “stupidity,” or “boredom,” to be more salient to risk taking among middle school girls than girls did. The difference between adult practitioners and middle school girls’ perceptions of influences on risk-taking behavior was highly significant, $\chi^2(3) = 86.35, p < .001$.

Among the girls there were minimal developmental differences, as peer pressure, family, and self-related factors consistently stood out as salient influences on risk-taking behavior. One sixth-grade girl stated, “I think it depends on your friends, because if you have bad friends, you are going to make bad decisions, but if your friends are nice, you are not going to do bad stuff.” Self-related factors are also influences to risk-taking behavior. A seventh grader simply wrote “not having happiness or feeling left out from a group or parents.” However, eighth graders more often than sixth and seventh graders perceived that peer influences within a romantic context (i.e., boyfriend) led girls to take risks, $\chi^2(6) = 16.06, p < .05$.

Understanding the Consequences of Risk-Taking Behavior

Adult practitioners perceived middle school girls to understand the consequences of their actions much less than middle school girls did, $\chi^2(2) = 94.63, p < .001$. Eighth-grade girls reported that girls their age do not understand the consequences of their actions, which significantly differed from what the sixth and seventh grade girls report, $\chi^2(4) = 11.31, p < .05$. An eighth grade girl states, “Most girls don’t think about their actions as they are doing them. They don’t think about the consequences of their actions. They know they are doing wrong and don’t care.” Sixth grade girls, however, were more likely

Table 1

Open-Ended Questions and Response Coding Categories: Initial (Step 1) and Collapsed (Step 2)

Question/Step 1 Coding				Category Criteria		Select Middle-School Girl Representative Quotes	
Question/Step 1 Coding	N	Step 2 Coding	N	Category Criteria		Select Middle-School Girl Representative Quotes	
1. What are risky things that middle-school girls do?	409		367				
Age-Inappropriate Activities	124	Age-Inappropriate Activities	124	Activities that would not be considered age-inappropriate if engaged in by an adult including: dating an older guy, drinking, smoking, driving, and having sex		"Start smoking cigarettes." "Have sex." "Go out with scary older guys."	
Illegal Activities	78	Illegal Activities	78	Drugs, person, property or public order crimes		"Steal money from a store." "Do drugs."	
Inappropriate Social Activities	136	Inappropriate Social Activities	136	Challenging authority, social aggression, having a boyfriend, chatting with or meeting strangers online, cyber-bullying, and "sexting"		"Meeting perverts on MySpace." "Gossip and tease." "Dating boys behind parents' back." "Start rumors online." "Send dirty pictures."	
Make bad decisions (in general)	29	Make bad decisions	29	Making the wrong choices, doing things that result in trouble or not thinking before doing something risky		"Walk home alone." "Going somewhere they don't know by themselves." "Make bad decisions they will regret later."	
Self Harm ^a	7		-	Cutting, anorexia, bulimia, attempting suicide		"Cut themselves." "Hang there self." "Don't eat."	
Ambiguous ^a	35		-	Ambiguous (answered question but out of context), and don't know		"Have a period when you get one." "Mostly about everything."	
2. What are some things that lead middle-school girls to take risks?	409		379				
Social	328	General Social	139	Peers, friends, social valence, peer modeled behavior, peer rejection, and family		"Impressing others." "Being popular." "Friends." "Annoying people who don't leave you alone." "Bullies."	
		Peer Pressure	115	Direct responses indicating peer pressure		"Peer pressure." "They might get pressured by friends"	
		Boyfriends	74	Direct responses indicating boyfriends, boys or guys		"Their boyfriends." "Boys." "Cute guys lead girls into doing stupid things."	
Self	51	Self	51	Thoughts, feelings and self-beliefs including esteem, attitude, degree of confidence, maturity, and efficacy		"Curiosity." "All of the things that surround us and the feelings inside." "Depression." "Stupidity." "When they are pushed to their limit." "Rage." "Boredom."	
Lack of guidance ^a	9		-	Lack of guidance, support or attention from adults		"They want attention from their parents." "Parents not giving you much advice."	
Ambiguous ^a	21		-	Ambiguous (answered question but out of context), and don't know		"To have fun or to just waste time." "Never give up."	

Table 1 (Continued)

Question/Step 1 Coding	Step 2 Coding	N	Category Criteria	Select Middle-School Girl Representative Quotes
3. Do middle-school girls understand what will happen as a result of their actions?	409	409		
Yes	131	131	Direct responses indicating "yes"	"Yes, they do. But they seem to ignore the aftermath."
No	104	104	Direct responses indicating "no"	"No, that's why they do it."
Sometimes	174	174	Sometimes, don't know, not always, yes and no	"Not always, some girls think before they act, others don't."
4. Middle-school girls are in greatest need of?	409	378		
Support	204	204	Attention, guidance, parenting, understanding, being present, not judging	"Support from adults." "Attention." "Their parents." "Parents that learn and understand before they punish."
Social Connections	75	75	Friends, boyfriends, acceptance from others	"Friends." "Being accepted." "Boys." "A reputation."
Self-efficacy	75	75	Self-confidence, maturity, personal value, self-worth, strong sense of self	"Maturity." "Self-respect." "Happiness."
Education/Programs	24	24	Responses relating to schooling, education, counseling or programmatic services	"School." "Counseling." "Program that helps with mostly everything because girls go through a lot." "Education."
Privacy ^a	14	-	To be left alone or directly stated privacy	"Their own space." "Privacy."
Love ^a	10	-	Direct responses indicating love	"Love."
Ambiguous ^a	7	-	Ambiguous (answered question but out of context), and don't know	"A good work." "Pregnancy, cancer, chance of death." "?"
5. How can adults help middle-school girls meet their needs?	409	409		
Communicate	192	192	Direct responses relating to communication, listening, or talking	"Say why it is bad to date older boys." "By sitting and talking with them."
Support	146	146	Attention, guidance, being there, not judging	"They can be our friends." "Learn to understand girls."
Education/Programs	18	18	Schooling, education, counseling or programmatic services	"Activities that help them think about their future."
They Can't/Don't Know	53	53	Adults can't help girls, or respondent does not know how adults can help girls	"They can't." "Adults can't help us." "I don't know."

^aDropped from further analysis due to small n or "ambiguous" response

Table 2

Percentage Comparisons of Middle School Girls to Adult Practitioners and Chi-square

	Respondents		χ^2
	Middle School Girls (n = 367)	Adults (n = 221)	
What are risky things that middle school girls do?			
Age-Inappropriate Activities	34	32	
Illegal Activities	21	34	
Inappropriate Social Activities	37	21	
Bad Decisions	8	13	23.57***
What are some things that lead middle school girls to take risks?	Middle School Girls (n = 379)	Adults (n = 198)	χ^2
General Social	37	43	
Peer Pressure	30	11	
Boyfriends	20	1	
Self	13	30	86.35***
Do middle school girls understand what will happen as a result of their actions?	Middle School Girls (n = 409)	Adults (n = 226)	χ^2
Yes	32	19	
No	25	68	
Sometimes	43	13	94.63***
Middle school girls are in greatest need of . . .	Middle School Girls (n = 378)	Adults (n = 145)	χ^2
Support	54	55	
Social Connections	20	0	
Self-Efficacy	20	15	
Education/Programs	6	30	77.31***
How can adults help middle school girls meet their needs?	Middle School Girls (n = 409)	Adults (n = 141)	χ^2
Communicate	47	40	
Support	36	21	
Education/Programs	4	39	
They Can't/Don't Know	13	0	120.91*

*** $p < .001$. * $p < .05$.

Table 3

Percentages of Middle School Girl Total Group, Grade, and Chi-squares

What are risky things that middle school girls do?	Total	<u>6th</u>	<u>7th</u>	<u>8th</u>	χ^2
Age-Inappropriate Activities	34	20	32	48	
Illegal Activities	21	12	21	30	
Inappropriate Social Activities	37	57	40	16	
Bad Decisions	8	11	7	6	54.22***
What are some things that lead middle school girls to take risks?	Total	<u>6th</u>	<u>7th</u>	<u>8th</u>	χ^2
General Social	37	42	43	26	
Peer Pressure	30	33	27	31	
Boyfriends	20	14	17	27	
Self	13	11	16	16	16.06*
Do middle school girls understand what will happen as a result of their actions?	Total	<u>6th</u>	<u>7th</u>	<u>8th</u>	χ^2
Yes	32	32	31	33	
No	25	19	24	34	
Sometimes	43	49	45	33	11.31*
Middle school girls are in greatest need of...	Total	<u>6th</u>	<u>7th</u>	<u>8th</u>	χ^2
Support	54	51	58	54	
Social Connections	20	21	26	12	
Self-Efficacy	20	17	12	30	
Education/Programs	6	11	4	4	25.08***
How can adults help middle school girls meet their needs?	Total	<u>6th</u>	<u>7th</u>	<u>8th</u>	χ^2
Communicate	47	42	52	47	
Support	36	33	31	43	
Education/Programs	4	7	5	1	
They Can't/Don't Know	13	18	12	9	12.77*

*** $p < .001$. * $p < .05$

than others, to not be sure about whether girls their age understood what will happen as a result of their actions. One sixth-grade girl stated "I do, but some people might not," while another sixth-grade girl wrote "some do, if their parents tell them."

Needs of Middle School Girls

Both adult practitioners and girls perceived middle school girls to need support, self-efficacy, and education or programs. In addition, girls perceived the importance of social connections, whereas adults did not identify social connections as a need at all. Rather, adult practitioners perceived girls to need education and programs more so than girls did. The difference between adult and middle school perceptions of needs was highly significant, $\chi^2(3) = 77.31, p < .001$.

All grades similarly reported that girls their age most need support, but sixth and seventh graders significantly reported that girls their age need social connections, as a seventh grader reported that girls her age needed "firm, strict, open, loving, trusting, mothers to tell them what's going on." However, eighth graders more often than the others reported that girls their age need self-factors (e.g., efficacy or esteem), as one eighth grader highlights "maturity and some confidence, and a sense of not having to be jealous over every girl who talks to their crushes," while sixth graders most often reported that middle school girls need more educational opportunities and programmatic experiences, $\chi^2(6) = 25.08, p < .001$.

How adults can help meet girls' needs. Adult practitioners and middle school girls identified communication, support, and education/programs as ways in which adults can help middle school girls. However, responses from girls led to establishing an "adults can't help girls" category, a notion that was not identified by the adult participants. The chi-square analysis shows that compared to middle school girls, adult practitioners underestimated the need for communication and support for girls. Conversely, adult practitioners mentioned education and programs as a means of meeting middle school girls' needs much more often than middle school girls did. The difference between the two cohorts is significant, $\chi^2(3) = 120.91, p < .001$.

When middle school girls were asked how adults can help to meet the needs of girls their age, all grades of participants reported that girls their age need adults to support and communicate with them, as one eighth grader wrote "Give them more of a friend than an adult/parent. Let them (girls) know that they can come to you." However, sixth graders were significantly more likely than seventh and eighth graders to perceive adults as not being able to help girls their age, $\chi^2(6) = 12.77, p < .05$. Interestingly, the category "adults can't help girls" emerged from this question. Middle school girls made statements such as "They almost can't help because girls feel adults don't understand them," and "I think they shouldn't help, it's going to make it worse."

Discussion

This study was the first of its kind to investigate risk-taking perceptions among middle school girls and adult practitioners. The findings underscore the issues surrounding risk taking and needs that are important to middle school girls, and also provide adult practitioners with a foundation for how to best support them. The findings also highlight the overwhelming disconnect between middle school girls

and adult practitioners in relationship to perceptions of risk taking and needs.

Risk Taking

In relationship to the type of risks that middle school girls take, the adult practitioners' underestimation of girls' involvement in inappropriate social activities highlights a social and perhaps technological disconnect between the cohorts. This disconnect may be attributed to activities that occur "under the radar" of adults; such as online communications, which consequently may perpetuate great personal implications for the girls. Knowledge of such risk taking puts adult practitioners in a unique position to not only understand the disconnect, but to also build a bridge between themselves and the girls.

There are personal and legal implications associated with adults not understanding and building such a bridge. In reference to inappropriate social activities, girls face psychological (depression, anxiety, conduct disorder) and/or physical (early sexual involvement, sexual assault, self-harm) implications as a result of engaging in inappropriate social activities. Legal implications relate to long-term effects of engaging in illegal activities and the impact on academic and professional attainment, as well as child rearing (Colman, Kim, Mitchell-Herzfeld, & Shady, 2008). Research indicates that nearly one-third of the adult women incarcerated in Santa Clara County, California, first committed crimes during adolescence, and nearly half of the adult women incarcerated in Santa Clara County reported being in jail five or more times (County of Santa Clara Office of Women's Policy, 2008). Such outcomes are not desired for the participants in this study or for any young woman.

Having an understanding of the types of risks that middle school girls take, and why they take such risks is a start to supporting them and to eliminating the personal and legal implications that they may face in the future. Specifically, if middle school girls are disconnected from parents and adult practitioners, then to whom can they (or do they) turn?

Antecedents and Consequences

Adult practitioners seemingly perceive girls' understanding of consequences in a dualistic fashion, such that middle school girls either do or do not understand consequences. Conversely, the middle school girls in this study seemed to be more complex in their perceptions of consequences, often times providing responses that consider the social implications of risk taking. Consistent with O'Donnell and Stueve (2008) who revealed significant underestimations (by adults) of young adolescent girls' risk-taking behaviors, the adult practitioners in this study underestimated the challenging social implications that girls often confront when making a risky decision. Hence, if a bridge is to be built, adult practitioners need to lay the foundation, starting with listening to what middle school girls really have to say.

Needs

The adult practitioners in this study indicated an interest in the development of middle school girls, as they attended a symposium that focused on middle school girl development at the time that the data was collected. Yet understanding needs revealed different and distinct perspectives between adult practitioners and middle school

girls. Although both populations agreed that girls needed support and self-factors, adults did not recognize the saliency of social connections for girls. Presumably, from an adult perspective, identifying the needs of young adolescent girls would not yield a need for social connections. More specifically, while adult practitioners perceived middle school girls to need support, their responses indicated that “support” meant the provision of education or programs. In contrast, for middle school girls, “support” predominantly related to social connections (including connections with adults), which is consistent with past research suggesting that young adolescents want to spend more time with adults such as their parents (Wang et al., 2007).

Implications for Adult Practitioners

The middle school girls who participated in this study are experts relating to risk-taking behaviors and needs among their cohort. The adult practitioners who participated in this study have misinterpreted their risk-taking behaviors and needs. The findings crucially inform effective practice for dropout prevention, by allowing adult practitioners to hear from middle school girls, understand their perceived risk-taking behaviors and needs, and establish a foundation for building solid connections between themselves and middle school girls.

Though adult practitioners can best meet the needs of middle school girls in an effort to circumvent risk-taking behaviors by influencing the resources available to them, the findings of this study reveal that resources available to middle school girls may not always be in line with their needs. Programs are typically the “ideal” solution to risk prevention as educators and policymakers have traditionally propagated efforts to encourage adolescent girls’ appropriate and healthy decisions. However, as Steinberg (2007) highlights, even the “best” health education programs (e.g., D.A.R.E., abstinence education, or driver education) can enhance knowledge without actually modifying adolescents’ risk-taking behavior.

To increase knowledge and mitigate risk-taking behaviors among middle school girls, adult practitioners can consider an approach that supports both positive relationships and knowledge acquisition. Traditional programs are noted to predominantly improve knowledge, but not behavior, so the true focus of resources needs to be on improving behavior through personally supportive relationships. Consistent with the middle school girls’ need for adult support, “supportive relationships” that manifest in a mentoring context have been known to contribute to the mitigation of school dropout with the reduction of problem behaviors (Mentoring Resource Center, 2005; Tierney & Grossman, 2000) and risk taking (Public/Private Ventures, 2000), positively influence social and emotional development (e.g., youth’s understanding, expression and regulation of emotions; Rhodes, 2002), and improve academic success (Blum, 2005) among adolescents. Further, Wentzel (1998) found that teacher support was a positive predictor of class and school-related interests as well as social responsibility goal pursuit among sixth grade students.

Distinct from “role models” (Merton, 1968), a mentor denotes direct interaction and value-laden modeling, as well as skill modeling from an unrelated adult (e.g., teacher, counselor, or coach; Darling, Hamilton, & Shaver, 2003). Although it has been assumed that early adolescents tend to be more influenced by peers as they navigate the behavioral and emotional challenges associated with early ado-

lescence (Angold & Rutter, 1992; Fleming, Boyle, & Offord, 1993), research indicates that mentors (somewhere between parents and peers) preeminently support positive developmental transitions from early to late adolescence (Lengua, 2006).

Further, the differences found between adult practitioners and middle school girls and within participants (sixth-, seventh-, and eighth-grade girls) reflect implications for *how* positive mentoring relationships can support knowledge and cultivate learning experiences. As such, mentors should differentiate learning experiences between sixth-, seventh-, and eighth-grade girls. Specifically, mentors of sixth-grade girls may aim to support social development, more so than with eighth-grade girls who might benefit from mentoring that emphasizes instrumental factors such as helping individuals reach particular goals (Bogat, & Liang, 2005; Darling, Bogat, Cavell, Murphy, & Sanchez, 2006; Darling, Hamilton, & Shaver, 2003).

Rhodes (2002) suggests that a key mediator between mentoring and successful outcomes is “meaningful conversation.” This suggestion is consistent with the findings from this study, which reflect both adult practitioners’ perceptions that educational programs are sufficient and girls who commonly report the need for “someone to talk to.” Further, matching girls with mentors of the same gender or similar interests is optimal for enhancing the quality of relationships (e.g., Herrera, Sipe, McClanahan, 2000; Rhodes, Lowe, Litchfield, & Walsh-Samp, 2008).

Limitations and Future Directions

Though the findings from this study provide a foundation for understanding risk taking and needs among middle school girls, a limitation is that data were collected at one diverse school. Future research may consider investigating perceptions of middle school students and practitioners from more than one school or program in order to strengthen generalizability. Similarly, the adult practitioners were not connected to the same school or program. Future research may consider streamlining the participants, which may yield a more specific understanding of risk-taking perceptions of middle school girls and also assist with individualized support.

Lastly, future research may include middle school girl, adult practitioner, and parent perceptions of risk taking and needs in an effort to capture varied perspectives of each cohort, and specifically inform authentic support.

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Assessment of Risk Factors for Truancy of Children in Grades K-12 Using Survival Analysis

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Abstract: Truancy is an important issue facing U.S. school systems as it is known that students who are truant are more likely to participate in criminal activity later in life (Baker, Sigmon & Nugent, 2001; Henry & Thornberry, 2010). This study examines recent data from students at 21 schools within a large mid-western school district. Survival analysis is used to quantitatively assess risk factors for truancy. Findings indicated that students having lower socioeconomic statuses are at greater risk for truancy. Both age and special education status also impact truancy risk. Students who transfer to a different school, even within the same district, show increased risk of truancy as well. Implications of these risk factors are discussed and suggestions for the direction of future research are offered.

Introduction

Although truancy is defined differently from state to state, it is nationally recognized as one of the most important issues facing schools today (Bye, 2010; Dougherty, 1999, Huck, 2011; Kronholz, 2011). Reid (2010) summarizes that students who do not attend school consistently perform lower on all academic measures and have lower self-esteem and career ambitions. These factors translate into lower “quality and economic status in adult life” (Reid, 2010, p. 3). Truancy is such a serious concern as it relates to risk for criminal activity that the Office of Juvenile Justice and Delinquency Prevention (OJJDP) named truancy prevention as a national priority in 2003. According to the U.S Department of Justice Bulletin, “truancy has been clearly identified as one of the early warnings signs that youth are headed for potential delinquent activity, social isolation, and/or educational failure” (Office of Juvenile Justice and Delinquency Prevention, 2005). Decades of research have also identified a link between truancy and later violence, job problems, and incarceration (Baker et al., 2001; Kearney, 2009; Skola & Williamson, 2012).

In most states the law requires all students to attend school daily; school districts record any absences as excused or unexcused (e.g., Kronholz, 2011; National Conference of State Legislatures, 2012). Individual state laws also determine the age at which a child is required to begin attending school, the age at which a child may legally drop out of school, and the number of unexcused absences at which a student is considered legally truant. Definitions for “excused absence,” “unexcused absence,” and “truancy” vary by state and even sometimes among school districts within the same state.

While truancy is defined in most states by law, it has not been so clearly defined by educators or researchers (Southwell, 2006). Epstein and Sheldon (2002) note much of the current literature focuses on students who leave school prior to graduation rather than focusing on daily student attendance. A focus on daily student attendance is important because the teaching and learning process builds upon itself. Each lesson presented to students is based on lessons that preceded it. Students who attend school regularly are more likely to be successful than those who do not (National Center for Education Statistics [NCES], 1996). For this study, the definition of truancy is taken from Kentucky School Law (KRS 159.150). Kentucky law states that:

Any child who has attained the age of six years but has not reached his or her eighteenth birthday, who has been absent without a valid excuse for three or more days, or [who has been] tardy without a valid excuse on three or more days is truant. Any student enrolled in a public school who has attained the age of eighteen years but has not reached his or her twenty-first birthday, who has been absent from school without a valid excuse for three or more days, or [who has been] tardy on three or more days is truant (Title XIII –Education, Ky. Rev. Stat. Ann., 2011, Chapter 159 Item .150).

Risk Factors for Truancy

The risk factors for truancy include multiple factors focused primarily on the student, the student’s family, community involvement, and the school (Dimmick, Correa, Liazis & McMichael, 2011; Gandy & Schultz, 2007, Gullat & Lemoine, 1997). Preliminary findings from OJJDP’s evaluation of the

Truancy Reduction Demonstration Program (TRDP) confirm that truancy is correlated to family and school factors, economic influences, and student variables such as mental health (OJJDP, 2005). Among the most significant predictors of truancy are parental education, availability of large amounts of unsupervised time after school, drug use, and school disengagement variables such as poor grades, low educational aspirations, daily attendance, and disinterest (Henry, 2007). Being the target of bullying has also been found to be associated with increased risk of frequent absence (Gastic, 2008). Shelley-Tremblay, O'Brien, and Langhinrichsen-Rohling (2007) argued that there are numerous reasons for truancy regardless of age or grade level.

Truancy may also be influenced by particular events such as changing schools, an atmosphere of dislike, an incident with a teacher, or suspension from school. It may also be influenced by events over time such as becoming increasingly disillusioned by the atmosphere of the school or by relationships with teachers. Some students may be particularly vulnerable due to family or social reasons or because of less positive attitudes towards schooling (Attwood & Croll, 2006; Skola & Williamson, 2012).

"Truants often perceive the world around them as unstable and confusing" with many truant students coming from dysfunctional, unstable, and insecure homes (Capps, 2003, p. 34). Students who are truant have fewer opportunities to learn and lower achievement potential. Student success has been shown to be directly related to the amount of time spent in the classroom (NCES, 1996). Older students are most likely to be truant than younger students (Henry & Thornberry, 2010). Truants often show little interest in schoolwork, have behavioral difficulties at school, associate with antisocial peers, and attempt to hide their truancy from their parents (Elliot, 1999). They are at risk for negative behaviors such as alcohol and drug abuse, teenage pregnancy, and delinquency. Truants can also have a negative effect on other students. They require extra time from teachers which takes away time from regularly attending students when they must focus on make-up work for the truants (Bye, 2010).

According to a study by Lehr, Sinclair, & Christenson (2004), students at risk of truancy can be identified retrospectively based on their attendance patterns, academic performance, and behavior. Their study also found the factor of special education status as a risk factor for truancy. This is supported by research from Spencer (2009). She found high frequencies of truancy beginning in elementary grades and continuing into the middle school years for students who were identified for retention, special education services, and those with limited English proficiency. Immigration status can be a risk factor for truancy because immigrant students are confronted with greater demands due to their different languages and culture (Ogden, Sorlie, & Hagen, 2007). Such difficulties with school are the major reasons for truancy (Epstein & Sheldon, 2002). Furthermore, school dropout is a major concern for students with disabilities. The U.S. Department of Education (2009) found that 31.1 % of students with disabilities drop out of school.

A student's socioeconomic status (SES) can also have an impact on their likelihood to be truant. Few students from high SES families are truant whereas substantially more students from low- and medium SES families are truant (Attwood & Croll, 2006). Parents of students from high-SES families tend to be more involved in their children's education and this involvement assists in reducing the probability of truancy (Epstein & Sheldon, 2002).

Few studies explore approaches schools can take to increase and maintain students' daily attendance or to educate how schools, communities, and families can build partnerships to reduce truancy (National Center for School Engagement, 2006). "Despite the long history of concern over student attendance, the issue has received relatively little attention from educational researchers" (Corville-Smith, Ryan, Adams, & Dalicandro, 1998, p. 629). Researchers have focused primarily on students who drop out of high school rather than focusing on daily attendance of all students. Through developing an understanding of these school, family, community, and student factors that affect students' risk of becoming truant, schools can more effectively allocate resources to high-risk groups, taking necessary measures to lessen truancy rates which may in turn improve later quality of life.

Purpose

This study seeks to quantitatively evaluate potential risk factors for truancy in an effort to identify those demographics that are at greatest risk. The primary research question is: What is the effect of socioeconomic status, as it is measurable via data typically collected by schools, on truancy? The impacts of age, special education status, Limited English Proficiency (LEP), and movement within the school system will also be assessed, with the ultimate goal of providing school administrators information that may assist in efficient allocation of funding for attendance-related interventions.

Method

Data Collection

This study examines 2009-2010 school year data from a large Midwestern school district. The sample consists of 16,418 eligible students from a total of 21 schools within that district including 12 elementary, five middle, and four high schools. Forty-eight students were excluded due to missing start dates and/or truancy dates. A summary of demographic information for students in the sampled district is found in Table 1.

Data were obtained from Infinite Campus (2012), the student information system used by the school district for both storage and retrieval of student data. This system is a "user-rights" based system, meaning that while many people throughout the district have access to this system; data entry and editing is restricted based upon the position and duties of the user. Only staff in appropriate positions have the ability to enter data. Data verification is performed at both district and state levels through queries and error checks.

Data entered into the Infinite Campus (2012) database are obtained from a variety of different sources. Demographic information is obtained via a survey typically filled out by the parent(s) or legal guardian(s) of each student. Student record information (e.g., attendance) is recorded by school employees. Both lunch status (i.e., free, reduced price, or fully paid) and special education status (i.e., active, inactive, or none) are based on parental application followed by district evaluation under appropriate law (Federal child nutrition programs, 2010). LEP status is based on parental survey followed by district evaluation. Homelessness may be self-reported or evaluated by the district based on an implementation of federal guidelines (National Center for Homeless Education, 2008). "Children and youth who 'lack a fixed, regular, and adequate nighttime residence' are

Table 1

Demographic Information for All Students in the Sample

Ethnicity	N	%
White/Caucasian	14,489	88.3 %
Black/African American	515	3.1 %
Hispanic	740	4.5 %
Asian	379	2.3 %
Other	294	1.8 %
Gender		
Male	8,587	52.3 %
Female	7,831	47.7 %
Socioeconomic Status		
Paid Lunch	11,150	67.9 %
Reduced Lunch	4,160	25.3 %
Free Lunch	935	5.7 %
Homeless	173	1.1 %
LEP Status	919	5.6 %
Special Education Status		
Active	2,720	16.6 %
Inactive	1,246	7.6 %
None	12,452	75.8 %

considered homeless” (Federal child nutrition programs, 2010). As some of the variables (e.g. special education status and LEP status) can change throughout the school year, for the purpose of this study all students were classified by their most extreme status within the school year. For example, if a student began the year having active special education status, they are classified as active for this study even though they may have switched to inactive at some point during the school year. Additionally, the number of school changes record only includes school changes within the district. A student moving outside the district results in censored data (loss of the ability to follow the student after that point in time).

Lunch status and homelessness were combined into single ordinal variable describing SES. We treated homelessness as the most extreme (lowest) SES so that homeless students were classified as homeless regardless of their lunch status. The remaining levels of this variable in order of increasing SES consisted of free lunch status, reduced lunch status, and paid lunch status based on federal definitions:

Children from families with incomes at or below 130 % of the poverty level [\$28,665 for a family of four]; are eligible for free meals. Those with incomes between 130 % and 185 % of the poverty level [\$40,793] are eligible for reduced-price meals, for which students can be charged no more than 40 cents (Federal child nutrition programs, 2010, p. 292).

Ultimately we defined SES as an ordinal variable having four levels: homeless, free, reduced, and paid.

Statistical Analysis

In this study, students are followed over time and numerous students are “censored,” meaning that at some point during the school year they are lost to follow-up. Primary reasons for censoring include relocation outside of the district, change to an alternative program such as home-schooling, and dropping out of school. The presence of time-to-event measurements and censoring makes survival analysis the appropriate statistical method for assessing risk in this study. While survival analysis is commonly associated to studies of terminal illness, it is widely applicable to behavioral studies as well. Examples range from studies of drug use (Henry & Huizinga, 2007; Perron et al., 2009) to violence (Yoshihama & Horrocks, 2003) to studies of child welfare (Lewandowski & Pierce, 2004). The approach allows for both identification of high-risk groups as well as comparison of associated risks with other groups. In particular, Cox’s Proportional Hazard models (Machin, Cheung, & Parmar, 2006) were used to examine differences in hazard rates while also accounting for covariates. All analyses were conducted using SAS/STAT software, version 9.2 (SAS Institute Inc., 2008).

The use of survival analysis requires definitions for *start date*, *end date*, and *censoring status*. For each student, the start date is defined as the student’s first day of school within the district. The end date is defined as the day the student either becomes truant or the day on which the student is censored. Students are considered censored if they move to another school district, begin an alternative program (e.g., home-schooling), drop out of school, or when they finish the school year without becoming truant. The survival time is measured as the total number of days from the start date to the end date.

The Cox model provides hazard ratios, which comprise the ratio of the comparative hazard to the reference hazard. Confidence intervals on the hazard ratios will be used to determine a specific group’s risk of truancy when compared to a reference group. While one may also consider *p*-values to assess statistical significance of differences, confidence intervals allow estimation of the size of effect, which is more useful for practical interpretation (Gardner & Altman, 1986). In particular, a hazard ratio equal to 1 means that the hazard for the comparative group does not differ from the reference group. Therefore if the confidence interval for a hazard ratio includes 1.00, there is no evidence of differences between the hazards being compared. Conversely, if the interval lies bigger than 1.00, the comparative hazard is concluded to be greater than the reference. If the entire interval lies smaller than 1.00, the comparative hazard may be concluded to be smaller than the reference.

Results

At the end of the 2009-2010 school year, there were 1,728 students (10.53 %) who became truant within the observed district. Single predictor models indicated that age of student, number of school changes, special education status, economic status, and school were significant at the $\alpha = 0.05$ level. Results are summarized in Table 2. LEP status did not test significant. The “unadjusted” column of Table 2 provides 95 % confidence intervals on the hazard ratios using separate models for each individual predictor.

As confounding is certainly possible, the Cox Proportional Hazards model was used to simultaneously consider all predictors. The proportional hazards assumption was examined using Schoenfeld residuals (Machin et al., 2006), which produced no evidence to suggest that any of the potential variables violated the proportional hazards assumption. Results for this model are found in the “adjusted” column of Table 2.

Table 2

Hazard Ratio Estimates for Single Factor (Unadjusted) and Multifactor (Adjusted) Models

Predictor	95% Confidence Estimate of Hazard Ratio (Unadjusted)	95% Confidence Estimate of Hazard Ratio (Adjusted)
Economic Status		
Paid	Reference Group	Reference Group
Reduced	1.51 to 2.23**	1.55 to 2.30**
Free	2.76 to 3.36**	3.11 to 3.82**
Homeless	3.71 to 6.72**	4.91 to 9.00**
School Change		
No	Reference Group	Reference Group
Yes	1.49 to 2.57**	1.04 to 1.81 *
Special Ed Status		
None	Reference Group	Reference Group
Inactive	0.87 to 1.24	0.84 to 1.20
Active	1.06 to 1.35**	1.04 to 1.33**
LEP Status		
No	Reference Group	Reference Group
Yes	0.89 to 1.33	0.75 to 1.13
Age		
Per annum*	1.14 to 1.78**	1.17 to 1.21**

*Significant at the 0.05 level; **Significant at the 0.01 level; †Age is considered a quantitative variable with yearly increments.

Results for economic status indicate that with 95% confidence, as compared to students paying for their lunch, students who have a reduced lunch status are 1.55 to 2.30 times as likely to become truant; students who have a free lunch status are 3.11 to 3.82 times as likely to become truant; and homeless students are 4.91 to 9.00 times as likely to become truant. Students who change schools are between 4% and 81% more likely to become truant; students having active special education status are between 4% and 33% more likely to become truant; and as age increases, the risk of truancy increases between 14% and 78% for every additional year.

Additionally, a statistically significant interaction between economic status and age was observed using the Cox model ($p < 0.0015$). To be clear, the interaction is quite small compared to the main effects. That is to say that we clearly note increased chance of truancy associated to increased age (independent of SES) as well as increased chance of truancy associated to lower SES (independent of age). The meaning of the interaction is this: there are slight differences in the constant of proportionality between SES groups based on age. These relationships are depicted visually in Figure 1; hazard rates over time are shown for each SES group by age.

It is of interest that the confidence intervals in Table 2 do not change all that much as one considers the differences between adjusted and unadjusted models. This suggests that confounding among the variables in the model is not a particular issue and lends some credence to the assertion that each factor may be used alone or in a combination to assess truancy risk for particular students, with SES and age appearing to be the factors of greatest importance.

Limitations

There are some known limitations of the economic status variable. First, lunch and homeless status was utilized as there is no available parent income data paired with each student. Second, in order to qualify for reduced or free lunch, a parent or guardian must apply in order for their child to receive it (Federal child nutrition programs, 2010). Shah (2011) reported that one third of students could fail to receive free or reduced lunch because their parents refused to report their income in the 2008-2009 school year, and additionally that 20% of the applications had errors that could change the status of lunch offering. There are also issues with accurate estimates of the extent of truancy because of inconsistent reporting and tracking practices of schools (Henry, 2007; Reid, 2002). Due to these issues it is likely some students belong in a different classification. For example, students who were categorized as paid lunch may have qualified for free lunch status. It is also probable that the homeless population is severely under-reported (Winship, 2001). There is a serious lack of population studies concerning the prevalence of child and family homelessness; consequently, there is no benchmarking data available for comparison (Coker et al., 2009; Larson & Meehan, 2011).

In addition, there may be limitations evolved from variability in data entry. While the Infinite Campus system is based on “user-rights,” there are still many different people across the school system that are entering and checking the data entered.

Discussion

It is easy to get lost in the numbers of the results section, or to gloss over those numbers and to quickly check the p -values and move on. However, quantifying the amount of risk is really what is important. Risk is essentially probability. Certain students will naturally be more (or less) likely to become truant than others.

It is quite clear that those of lower socioeconomic status (SES) are at a much greater risk for truancy. Based on the numbers this would seem to be the most important factor investigated in this study. Homeless students are at least five times more likely to become truant. Those who are not homeless, but receive free lunch are at

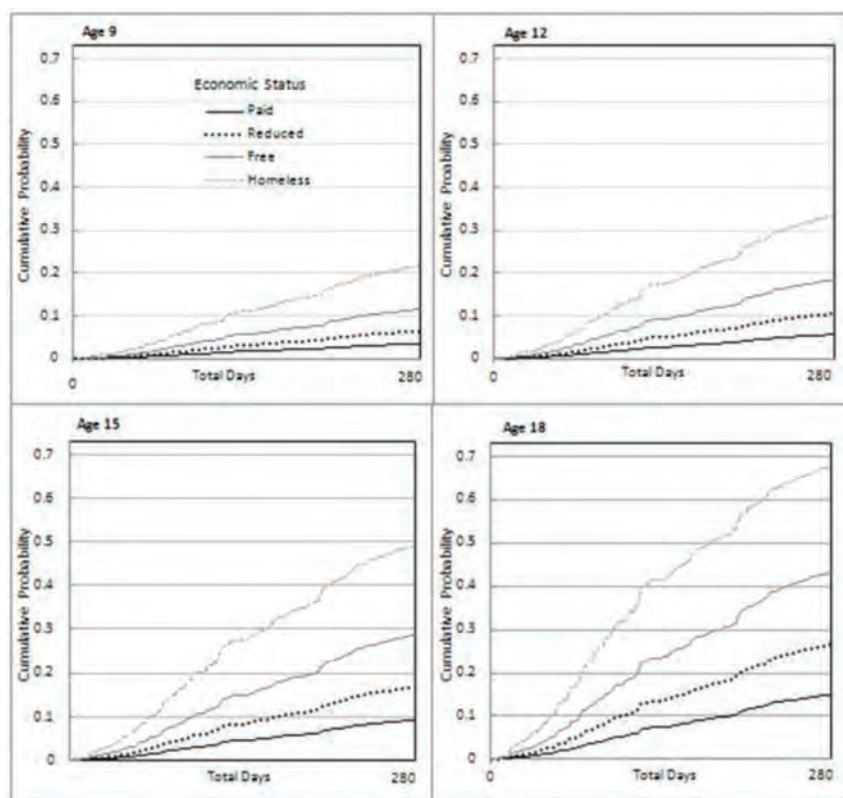


Figure 1. Probability of truancy over time grouped by SES and age.

least three times more likely to become truant. These students may be targeted with programs designed to promote attendance such as mentorships, incentive programs, increased family communication, personalized outreach, and tailored programmatic responses (e.g., Campbell-Whately, Obiakor, & Algozzine, 1997; Harte, 1995; Sheldon, 2007). Additionally, one of the key provisions of the McKinney-Vento Act allows children who are homeless to retain the continuity of their home school (National Center for Homeless Education, 2008). Stabilizing the school even when the child may not have adequate housing is a huge step forward and may well assist in decreasing issues with attendance.

Another key finding confirms what one might expect—namely that as age increases, the risk of truancy increases between 14% and 78% for every additional year. Another way to look at this is a student is now 1.14 to 1.78 times as likely to become truant next year, as he or she would be this year. For example, consider a student who has 5% chance to be truant this year. Next year, it will be between 5.7% and 8.9% chance of truancy. Then the following year it would go up by an additional similar factor. Fully understanding this requires recognizing that this is a compounding yearly effect. Suppose the true amount of increased risk is really 40% (again we estimate that it is somewhere between 14% and 78%). Then in going from the fifth to tenth grade (five years), students would become more than five times as likely to become truant. Given this data, it is imperative

that educators continue to build and test models leading to truancy reduction that span the entire educational spectrum from P-12 (e.g., Marvul, 2012; Munoz, 2001; Thomas, Lemieux, Rhodes, & Vlosky, 2011)

The next key indicator is that if children change schools, even within the same district, their risk for truancy increases significantly. However it is unclear from this data whether the increased risk is substantial. It may be that there is minimal increased risk, or it may also be the case that students changing schools are nearly twice as likely to become truant. If children can remain in the same school, this may substantially lower their risk of truancy. A social worker within the school district noted that some parents and caregivers “beat the system” by simply calling the transportation hub and asking that their child be picked up from a different address for a short time (S. Lazenby, personal communication, March 20, 2012). This information is not necessarily communicated as an official address change to the school system, and in such a case the child is not forced to change schools due to arbitrary district lines.

Although we applaud the steps parents or caregivers are willing to go to provide stability for their children, it is time to begin to examine school policy in light of these truancy findings. Moving students definitely has an individual cost—that of increased truancy—however, it also

could be argued to have a cost within the individual schools. When a student misses class or “disappears” from the roster, that has an impact on the milieu of the individual classroom and, in terms of test scores, an impact on the entire school. It is not uncommon for schools in the examined district, particularly in lower SES areas, to have well under 50% of their students who begin in first grade to stay until fifth or sixth grade (K. Reutman, personal communication, April 23, 2012). Even elementary school principals having the best teachers and support available would still find it extraordinarily difficult to keep students at grade level and proficient in test results when the school composition changes dramatically each year.

Additional results indicated special education students having active status are at a slightly higher risk of becoming truant than students with no status. This risk is minimal; at worst they are 1.33 times as likely to become truant (and there was no evidence in a difference in risk for students having an inactive status). Southwell (2006) contends that the reason for truancy is that the educational institution does not meet the needs of the student, and instead blames the student and his or her family. This may be particularly relevant for students identified as needing “special education.” It is beyond the scope of this article to determine the myriad of factors that lead to this designation; however, educators should be particularly attuned to the challenges students may face.

Implications and Future Research

Truancy is a serious issue that goes beyond academic failure. Truancy has been identified as an early warning sign of negative and criminal behavior. If truancy rates are not lessened, how can society expect crime to lessen? It is imperative that children attend school daily and get the education that every child deserves. Good attendees are likely to have attributes that promote attainment such as motivation, self-discipline, and persistence (Sheppard, 2005). This research indicated that socioeconomic status and age are key predictors of risk for truancy. School administrators nationwide may be able to use this knowledge to help identify students at high risk for truancy and then provide differentiated programs and services for these students designed to mitigate the problem. Truancy, school dropout, unemployment, and underemployment are all correlated to failure in schools. It is critical to have educational facilities with competent, caring teachers working with parents and the community (Stephens, 2010). Furthermore, research by Attwood and Croll (2006) confirms that attention to personal relationships and an orderly environment in school may be more helpful in reducing truancy than changes in curriculum and other aspects of the academic practices of schooling.

Future research is needed to understand how and why special education status increases the risk for truancy. Specifically, researchers must consider specific special education classifications to determine if certain behavioral or learning issues put students at greater risk of truancy. Alternately, the researchers may find teaching methods or school policy concerning students with that classification need to be amended.

Policies that are most likely to keep students in the same school are in need of research. The McKinney Vento Act on the federal level allows children who are classified as homeless to remain in their school regardless of current living arrangement (see National Center for Homeless Education, 2008). Examination of the impact of this policy may have implications for children who are not homeless but are forced to change schools for a variety of reasons. Finally, the research and development of programs specially targeting students at risk for truancy should be tested, funded, and implemented.

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The Relationship Between Grade Configuration and Standardized Science Test Scores of Fifth-Grade Students: What School Administrators Should Know

Delonda Johnson, Lisa Jones, Felix Simieou, Kathryn Matthew, and Bryan Morgan

Abstract: This study utilized a causal comparative (*ex post facto*) design to determine if a consistent relationship existed between fifth-grade students' success on the Science Texas Assessment of Knowledge and Skills (TAKS) at the elementary (K-5) level in comparison to fifth-grade students' success on the science TAKS at the intermediate (5-6) level. The data were collected by obtaining reports from the Texas Education Agency's Academic Excellence Indicator System (AEIS) and TAKS Summary Reports. The *z* test for two independent proportions yielded a significant result ($z = 9.01, p < .0001$), which indicated an 18% difference in science achievement among the fifth-grade students who attended the elementary school configuration during the 2007-2009 testing years when compared to the students who attended intermediate school configuration. To estimate the effect size, Cohen's *d* was calculated ($d = 0.38$).

Introduction

Schools in the United States must emphasize excellence in elementary science education in order to become economic leaders in the global market of the 21st century (United States Department of Education [USDOE], 2004). In response to the launching of Sputnik in 1957, the United States began to heavily fund programs, which focused on improving teaching and learning practices in science education. One part of this effort was the Curriculum Developmental Projects supported by the National Science Foundation (NSF) and the subsequent preparation of teachers to use the new materials (Harms & Yager, 1980). The 1980s triggered national reports which included *A Nation at Risk* (National Commission on Excellence in Education, 1983) that highlighted the need for educational reforms to improve student achievement. Other national reform efforts have stemmed from the publication of the *Benchmarks for Science Literacy* (American Association for the Advancement of Science [AAAS], 1993) and the *National Science Education Standards* (National Research Council [NRC], 1996). Current policies in education in the United States are influenced by the No Child Left Behind Act of 2001, and the focus on improving student achievement through stronger accountability measures (Owens, 2009). While the initial purpose of reconstructing science education stemmed from the competitive nature of the United States to retain military superiority, the current reforms are aimed at improving student achievement, building science literacy, and ensuring that educators are preparing students as they contend with others for acceptance at institutions of higher learning and as they enter into the workforce.

Student Achievement in Science

Concerns regarding science achievement internationally, nationwide, and at state and local levels continue due to increased demands which have been influenced by the No Child Left Behind Act of 2001 (Owens, 2009). Since the National Commission on Excellence in Education (1983) published *A Nation at Risk*, national agencies have had the goal of improving student achievement in science (Von Secker & Lissitz, 1999). Student achievement in science is defined nationally by the National Assessment of Educational Progress (NAEP) in three levels of achievement: basic, proficient, and advanced (Loomis & Bourque, 2001). At the basic level of achievement students demonstrate partial mastery of the concepts. Students who reach proficiency have exhibited competence in challenging subject matter. Students at the advanced level have demonstrated superior performance on the science assessment (Grigg, Lauko, & Brockway, 2006). The goal for increased student performance in science is to ensure that students are meeting the proficient level of achievement.

During the 2007-2008 academic school year the implementation of science assessments was mandated by the NCLB Act of 2001 (USDOE, 2004). This mandate resulted in stronger accountability at the state level, as states were required to implement and administer science assessments once in each of grades 3-5, 6-9, and 10-12 (USDOE, 2004). At the state level, student achievement in science is defined as a threshold of performance on the state science assessment (Owens, 2009). In Texas, the assessment that is used to measure student achievement in science, as well as reading, mathematics, and social studies, is the Texas

Assessment of Knowledge and Skills (TAKS). While states have flexibility in developing assessments and proficiency standards, the data is used to determine if schools and school districts are meeting the established achievement goals.

Grade-Level Configuration

Grade span or grade-level configuration is a controversial topic in education and has been the subject of debate for more than 80 years (Jenkins & McEwin, 1992). Grade-level configuration is defined as “the range of grades that a school comprises” (Coladarci & Hancock, 2002, p. 2). Grade span also refers to the number and range of grade levels offered within an individual school (Cullen & Robles-Piña, 2009). There are a number of grade configurations across the United States, which includes elementary models of K-5, K-4, K-3; middle school models of 5-8, 6-8, 7-8, and 7-9; and high school models, which include 9-12 and 10-12. There are also a number of unique configurations which may include early childhood centers, stand-alone ninth-grade centers, intermediate campuses which span fifth to sixth grade, or “elemiddle” schools K-8, which are inclusive of elementary and middle grades structured in one campus setting (Hough, 1995). The dominant configuration in the 21st century includes the traditional setting which consists of PreK-5, 6-8, and 9-12 (DeJong & Craig, 2002). Because of the limitless possibilities available for structuring the learning environment, it is critical that policymakers note the importance of the potential benefits and potential challenges of each configuration, and make conscious decisions in an effort to meet the needs of all students.

Potential Benefits of Grade-Level Configurations

White (2008) explored the impact of grade-level configuration on student achievement, determining that the K-8 configuration resulted in significant increases in achievement when compared to other configurations including 6-8, 7-8, and 7-12. It is important to note that she also found other variables impacted student achievement including gender, the students’ perceptions of their feeder school climate, and the grade configuration of their feeder school. Connolly, Yakimowski-Srebnick, and Russo (2002) followed two subgroups of a student cohort in the Baltimore City Public School System. Students attending the K-8 school had significantly higher pass rates on the Maryland Functional Testing Program including mathematics, writing, and reading, than students attending the K-5 and then the 6-8 schools. Wren (2004) concluded, “As grade span configuration increases so does achievement. The more grade levels that a school services, the better the student performs. The more transitions a student makes, the worse the student performs” (p. 9).

Potential Challenges of Grade-Level Configurations

When school districts make decisions about grade-level configurations for housing middle school students, they must also consider the number of transitions from one school to another. Cullen and Robles-Piña (2009) define school transitions as a process in which a student changes from one school to another because they have completed all of the grades available in the school. Cullen and Robles-Piña (2009) examined research studies that reported on the impact of transitions as students move from elementary to secondary schools and concluded

that the research is inconclusive. According to Howley (2002) some of the consequences of transitioning from one campus to another include a disruption in the social structure and lower academic achievement. Alspaugh (1999) found statistically significant achievement loss associated with the transition from elementary to middle school in sixth grade, in comparison to K-8 schools. Alspaugh (1999) concluded that high school dropout rates were higher for districts utilizing the 6-8 configurations than for districts implementing the K-8 model. In addition, Paglin and Fager (1997) also found negative results each time students made transitions from one school to another. Recognizing the negative impact that transitioning from one to school another can have on adolescents, Dillon (2008) recommends organized transition programs that use peers to provide support.

Erb (2006) cautions that just reducing the number of transitions in order to impact improvements in students’ learning may be somewhat effective but that this change will have a greater impact when combined with a successful middle school reform model. Research on effective, impactful educational reforms for middle school students goes beyond a checklist approach to the implementation of structural changes, such as the implementation of learning communities (Ferner & Jackson, 1997). They contend that to be successful, the reforms must be implemented with a high degree of fidelity, which takes time and money. Reforms cannot be implemented quickly or cheaply.

Purpose of the Study

Research on the impact of grade-level configuration on students’ achievement is inconclusive and students’ declining scores in science need to be further examined. Additionally, research on the appropriate grade-level configuration for fifth-grade students is lacking. Hence, the purpose of this study was to examine grade-level configuration and student achievement in science, specifically the potential relationship between the placement of fifth-grade students and their achievement of the “met standard,” a score of 2100, on the fifth-grade Science Texas Assessment of Knowledge and Skills (TAKS).

Research Question and Hypothesis

The following research question guided the study: Are grade-level configuration and student achievement in science related? The hypothesis was that school grade-level configuration and the “met standard” on the fifth-grade Science TAKS are related.

Method

This study examined the performance on the Science TAKS by fifth-grade students in two different school configurations in one school district over a three-year period. A causal comparative (ex post facto) design was utilized. Data were collected by obtaining reports for the Texas Education Agency’s Academic Excellence Indicator System (AEIS) and TAKS Summary Reports.

Setting and Access

The school district in this study encompasses 35 square miles and serves 45,130 students. There are currently 44 campuses which include 21 elementary (PK-4), three elementary (PK-5), six intermediate campuses (5-6), one middle school (6-8), five middle schools (7-8),

two ninth-grade centers, two high schools (10-12), two high schools (9-12), and two alternative learning centers.

Participants

The three elementary schools and six intermediate schools comprised the convenience sample for the study. The three elementary schools were assigned letters A through C as identifiers. These schools consisted of PreK to fifth-grade students. The six intermediate schools were assigned letters AA through FF. These schools consisted of students in fifth and sixth grade. The 2009 population of the schools consisted of 3,388 fifth-grade students, all of who took the fifth-grade Science TAKS in April 2009. During the 2008-2009 school year, the student population was primarily Hispanic (49%) and African American (34.8%). The remaining student population was comprised of Asian (12.5%), White (3.6%), and Native American (10%). Two independent groups from two different campus configurations formed the population for the study. The first group (A, B, C) was comprised of fifth-grade students on three elementary (PK-5) campuses, who could potentially remain on the same campus from PK to fifth grade. The second group (AA, BB, CC, DD, EE, FF) was comprised of fifth-grade students on six intermediate (5-6) campuses, who after successfully completing fourth grade, made a school-to-school transition when they entered fifth grade.

Instrumentation

The Texas Education Agency (TEA, 2010) describes TAKS as an assessment which is designed to measure what students have learned and are able to apply according to the knowledge and skills in each grade level tested. The Science TAKS is categorized into four objectives which include The Nature of Science, Life Sciences, Physical Sciences, and Earth Sciences. Within the context of the current study, student achievement in science is described as students who achieve the “met standard” on the Science TAKS. Because of the grade spans identified in the NCLB Act of 2001 (3-5, 6-8, and 10-12), TEA determined that science would be assessed in grades five, eight, ten, and exit level. The TAKS assesses student achievement of the Texas Essential Knowledge and Skills (TEKS), which are the student expectations for each grade level and content area tested. The TEKS were aligned with *The National Science Education Standards* and the *Benchmarks for Science Literacy* (TEA, 2004).

The TEA formed advisory committees consisting of educators from districts across the state as content experts from each content area, who determined the content validity of test items. Current reliability estimates used the Kuder-Richardson formula (KR20) and the KR20 reliability of the Science TAKS ranges from .81 to .93 (TEA, 2008). The TEA established concurrent validity by determining that the TAKS scale score met the standard performance level predicted by ACT and SAT 1 (TEA, 2008).

Data Collection

Archival TAKS data that spanned the 2007-2009 academic school years were obtained from the Texas Education Agency’s Academic Excellence Indicator System (AEIS) containing the fifth-grade Science TAKS scores from the elementary and intermediate campuses selected

for this study. TAKS Summary Reports were also collected from the district data management system. Once all of the TAKS data were collected, the campus names were converted to letter identifiers, and sorted by elementary and intermediate groups.

Analysis

In order to make a determination regarding the data, the z test for two independent proportions to evaluate the hypotheses for the two possible configurations for fifth-grade students was utilized. The z test for two independent proportions uses sample data to assess the hypotheses about the values of *p* and *q* for a 2 x 2 contingency table (Sheskin, 2007). The two categories utilized in the current study were the pass-fail proportions for the elementary fifth-grade students and the pass-fail proportions for the intermediate fifth-grade students. Because the sample size is large, the z-test for proportions was appropriate in this study. Because student achievement on the fifth-grade Science TAKS was determined by those students who achieve a minimum scale score of 2100, further analysis of the data was conducted. Summary data were collected and disaggregated which included pass-fail numerical and percentage data, mean score data, disaggregated percentage score data, scale scores by campus, and pass-fail distribution data.

Results

This study investigated the relationship between grade-level configuration and standardized science scores of fifth-grade students in elementary and intermediate settings. A causal comparative design, which employed the use of the z test for two independent proportions was used to evaluate the hypotheses for the two configurations. A 2 x 2 contingency table was created which included pass/fail percentages for fifth-grade composite Science TAKS scores for students in three elementary schools and six intermediate schools (see Table 1). The z test for two independent proportions was used to test the null hypothesis. A significant difference was found (*z* = 9.01, *p* < .0001). To estimate the effect size, Cohen’s *d* was calculated (*d* = 0.38). These indicate that there was a strong reason to reject the null hypothesis and that there was a sufficient effect size to consider the estimated difference in proportions to be meaningful.

Table 1
Pass-Fail Rate for Elementary and Intermediate Schools (2007 – 2009)

Campus Configuration	Course Results		
	Pass	Fail	Total
Elementary	508 (85 %)	87 (15 %)	595
Intermediate	5,502 (67 %)	2,710 (33 %)	8,212
Totals	6,010 (68 %)	2,797 (32 %)	8,807

Additional Analyses

While the aggregated data revealed a significant difference in achievement in the elementary schools in comparison to the intermediate schools, further analysis of the data was provided to put the results into context. The additional data analysis was critical to understanding and interpreting the results. The aggregated results indicated higher pass rates in the elementary schools in each of the corresponding tables and figures. The summary data were useful in examining the differences in student achievement in science in the elementary and the intermediate configurations (see Table 2).

Table 2

Fifth-Grade TAKS Pass-Fail Percentage Data (2007-2009)

School	2007		2008		2009	
	Met	Not Met	Met	Not Met	Met	Not Met
A	69 %	31 %	81 %	19 %	89 %	11 %
B	72 %	28 %	89 %	11 %	83 %	17 %
C	82 %	18 %	94 %	6 %	93 %	7 %
AA	59 %	41 %	68 %	32 %	75 %	25 %
BB	57 %	43 %	65 %	35 %	69 %	31 %
CC	62 %	38 %	73 %	27 %	81 %	19 %
DD	60 %	40 %	70 %	30 %	73 %	27 %
EE	52 %	48 %	61 %	39 %	68 %	32 %
FF	68 %	32 %	71 %	29 %	76 %	24 %

These data display an increase in passing percentage of elementary students in all three schools during the 2007 and 2008 school years. However, for 2009 only elementary school A showed an increase, while Schools B and C showed decreases. School B showed a 6% decrease and School C showed a 1% decrease. Table 2 also presents data showing that from 2007 to 2009 all of the intermediate schools (AA through FF) showed increases. Additionally, the data show that between 2007 and 2008, each of the elementary schools increased the passing percentage by more than 10%. Even though two of the three elementary campuses showed decreases for 2009, the elementary schools maintained higher pass rates than the intermediate schools for each of the three testing years. However, there was only a 2% difference in pass rates between school B (83%) and school CC (81%) in 2009.

Table 3 presents an average of the pass-fail percentages for the elementary and intermediate schools for the three years of the study.

The overall percentage of elementary and intermediate students who achieved the met standard score of 2100, during this time period ranged from 59% to 90%. The greatest increase in passing percentage (23%) occurred between 2007 and 2008 in the elementary configuration. Elementary students remained at the 90% pass rate between 2008 and 2009; whereas, intermediate students passing percentages increased from 68% to 74% between 2008 and 2009. The percentage of elementary students who met the passing standard increased by 13% from 2007 to 2009, in comparison to the percentage of intermediate students who met the passing standard with an increase of 15% during the same period.

Table 3

Fifth-Grade TAKS Pass-Fail Percentages for Elementary and Intermediate Schools (2007-2009)

Configuration	2007		2008		2009	
	Met	Not Met	Met	Not Met	Met	Not Met
Elementary	77 %	23 %	90 %	10 %	90 %	10 %
Intermediate	59 %	41 %	68 %	32 %	74 %	26 %

Figure 1 demonstrates and compares the changes in pass rates for the elementary and intermediate campuses for three years 2007-2009. The graphical representation of the pass rates shows an increase at the elementary level from 77% to 90% from 2007 to 2008. The pass rates at the elementary level remained steady from 2008 to 2009. The graph also demonstrates that while the percentage of intermediate fifth-grade students who met the passing standard increased from 59% to 74%, there was a 16-point difference in the elementary and intermediate pass rates in 2009.

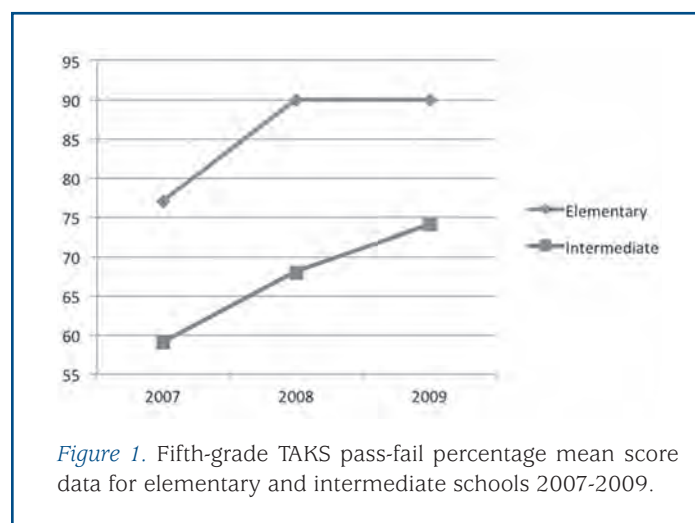
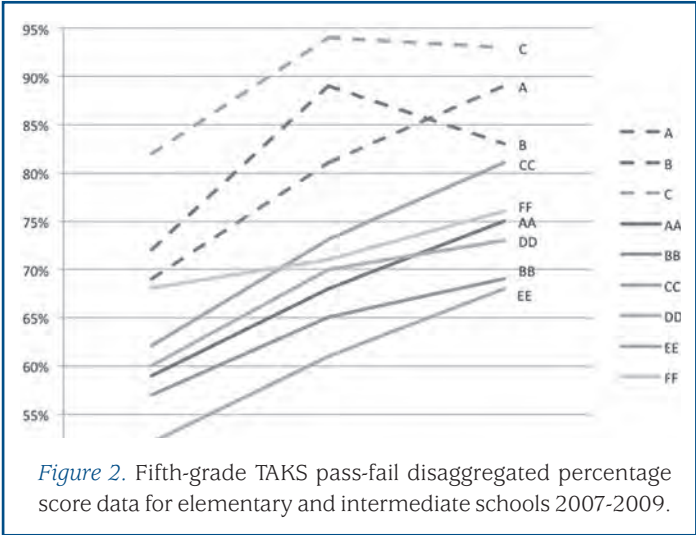


Figure 1. Fifth-grade TAKS pass-fail percentage mean score data for elementary and intermediate schools 2007-2009.

Figure 2 is a graphical representation of the pass-fail percentage data and it clearly demonstrates the differences in achievement between the elementary and the intermediate campuses. The data show that the elementary schools have maintained higher passing rates for the three-year testing period than the intermediate schools. Figure 2 also demonstrates an anomaly existed within the elementary campuses as the scores in School B and School C show a decrease in students who met the passing standard during the 2009 test administration. School C maintained the highest passing percentage for each of the three years, from 82 % in 2007 to 93 % in 2009. School A demonstrated continuous improvement as the scores increased from 69 % in 2007 to 89 % in 2009. The intermediate schools also demonstrated a continuous increase in pass rates; however, there were not any intermediate schools, which reached the passing percentage of the elementary schools.



Analysis of the Means Aggregated by School Type and by Year

Because the z test for two independent proportions is based on pass-fail proportions, which is based on a minimum scale score of 2100, it was important to further analyze the mean scores in each configuration. In 2007, the TEA defined the scale score as a statistic that is used to determine if a student achieved the standard or com-mended performance. The average scale scores are the means of the individual student scale scores and are useful in comparing the achievement of all the schools within this study.

The data in Table 4 presents data on the average TAKS scale scores for each school during the three-year period. This table shows that Schools B and C scored higher than the other schools for each of the years reported. From 2007 to 2009 Schools B and C remained in the same range and scored higher than all other schools, while the scores reported by school A were intermingled with the intermediate schools.

Table 4

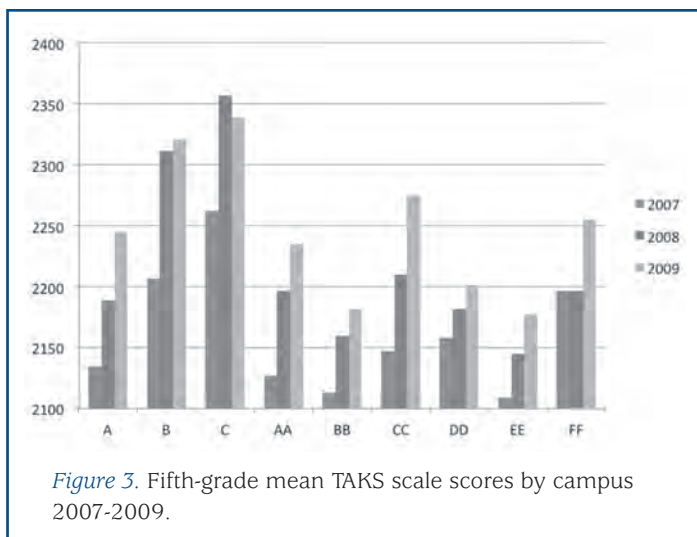
Average TAKS Scale Scores by Campus (2007-2009)

School	2007	2008	2009
A	2135	2189	2245
B	2207	2312	2321
C	2262	2357	2339
AA	2127	2197	2235
BB	2113	2160	2182
CC	2147	2210	2275
DD	2158	2182	2201
EE	2109	2145	2177
FF	2197	2197	2255

Figure 3 demonstrates increases in passing rates for elementary and intermediate campuses for the three testing years. The graph shows that although School CC demonstrated the greatest amount of growth from 2007 to 2009 by an increase in the average scale score from 2147 to 2275, Schools B and C maintained a greater percentage of students who scored higher than all of the other schools.

The graph also demonstrates a significant increase in the average scale score from School A from 2135 to 2245, which indicated an increase of 110 points. The school that demonstrated the least amount of growth over the three-year period was School DD. The average TAKS scale scores from School DD increased from 2158 to 2201. The average scale scores of School FF remained stagnant from 2007 to 2008, and then increased in 2009 by 58 points.

A statistically significant difference was found ($z = 9.01, p < .0001$) between school grade-level configuration and the “met stan-dard” rate on the fifth-grade Science TAKS. To estimate the effect size Cohen’s d was calculated ($d = 0.38$) which indicated that there was sufficient effect size to consider the estimated difference in proportions to be meaningful. The archival TAKS data provided an opportunity to analyze the number of fifth-grade students who were successful in meeting the standards set forth by the state of Texas, to compare the passing percentage of fifth-grade students in elementary settings to those in intermediate settings, and to analyze other relevant scores in an effort to identify the similarities that existed between the success rate in both configurations. The data also revealed that more students demonstrated success on the fifth-grade Science TAKS in the elementary configurations.



Discussion

This study included an analysis of the fifth-grade Science TAKS data from two different school level configurations, to determine if grade-level configuration and student achievement in science is related. In order to review students' achievement over a period of time, archival TAKS data, which spanned a period of three years, was utilized. The following research question guided the study: Are grade-level configuration and student achievement in science related?

Fifth-Grade TAKS Pass-Fail Percentage Data

The data presented in Table 4 show the pass-fail rates as percentages to facilitate understanding and comparing the individual elementary schools and the intermediate schools. The percentage data showed that elementary campuses continued to maintain higher passing rates than the intermediate campuses from 2007 to 2009. The number of fifth-grade students in the elementary campus configurations ranged from a minimum of 51 students to a maximum of 126 students. The elementary schools contain a wider range of grades than the intermediate schools and the student population is smaller in the elementary schools. Howley (2002) suggests that educational quality and student achievement is negatively impacted when schools have limited grade ranges, as reflected in the intermediate schools configurations.

These results support research indicating that students who transition from fourth grade at one campus to fifth grade at another may be at a disadvantage when compared to the students who make the transition within the same school. For example, Wihry, Coladarci, and Meadow (1992) found that the best placement for eighth graders was in a K-8 school and they suggest that one reason may be that the students made fewer transitions from one school to another. Also, Connolly et al. (2002) found that students who remain in a K-8 school scored higher on a standardized test in both mathematics and language arts than students who made the transition from an elementary school to a middle school.

Fifth-Grade Average Percentage Data for Elementary and Intermediate Schools

Table 2 presents the average of the pass-fail percentages of the students who met the scale score during 2007 to 2009. The data indicates that the average percentage of passing students was higher for the elementary students than for the intermediate students. The range of students meeting the minimum threshold at the elementary level was 77 % to 90 % and the range of students meeting the minimum threshold at the intermediate level was 59 % to 74 %. Although there was 15 % increase in the pass rate at the intermediate level, those scores did not reach the minimum standard of achievement of 77 %, which was demonstrated at the elementary level.

Table 2 also demonstrates that the elementary schools may have reached their peak in student performance. The average pass rate from 2008 to 2009 remained the same while the intermediate campus continued to increase in the percentage of passing students. Although the pass rates at the intermediate level continued to increase, there was an apparent gap in student achievement from the intermediate to the elementary level. Table 2 provided further support for the research hypothesis. School grade-level configuration and the "met standard" rate on the fifth-grade Science TAKS are related.

Fifth-Grade TAKS Pass-Fail Percentage Data

Figure 1 provides a graphical representation of the pass-fail percentage data and was a clear indication that the students at the elementary level continuously scored well above the students at the intermediate level. Figure 1 demonstrates a gap in student achievement, which existed between the elementary and intermediate configurations. The largest gap in student achievement was demonstrated in 2008. While 90 % of the elementary students met the passing standard, 68 % of the intermediate students met the passing standard. This represents a 22 % difference in student achievement on the fifth-grade Science TAKS. Although the scores at the elementary level seemed to have reached a peak, the scores at the intermediate level were 16 % lower than those at the elementary level.

The literature revealed the benefits of the K-8 configuration in meeting the needs of early adolescent learners while also attending to the academic needs of middle level students. The findings of this study supported research (Anfara & Buehler, 2005; Connolly et al., 2002; George, 2005; Hough, 1995; Mizell, 2005) which included fifth-grade students in the elementary setting. Similar to the K-8 configuration, the elementary K-5 configuration demonstrated increased test scores and required fewer transitions from one building to another. This study confirms research by Wren (2004) and Connolly et al. (2002), which indicated that fewer school-to-school transitions resulted in greater student achievement. The students who attended the elementary schools were not required to make any school-to-school transitions, in comparison to the fifth-grade intermediate students who transitioned from the elementary (K-4) level and were required to make a transition from one school to another. However, as Erb (2006) cautioned, just reducing the number of transitions students make is only somewhat effective and a greater impact could be made by also making sure the schools are following a successful middle school reform model.

Fifth-Grade TAKS Pass-Fail Disaggregated Percentage Data

Figure 2 provided an extensive look at each of the schools within the study and highlighted that the pass rates at the elementary schools remained at the top of the chart, while scores at the intermediate schools were consistently lower. The data further indicate that a difference in student achievement exists amongst the intermediate schools. The results showed that School CC reached an average of 81 % in 2009, in comparison to School EE, which had a passing rate of 68 %. The disaggregated data also presented a discrepancy in the wide range in student achievement from the elementary level to the intermediate level. The maximum passing percentage at the elementary level in 2009 was 93 %, while the lowest pass rate at the intermediate level was 68 %. This demonstrated a difference of 25 % in student achievement from the elementary level to the intermediate level. These findings show that when examining the impact of grade-level configuration on students' achievement it is also important to look at other variables including the structure of the school, instructional expenditures, pupil-staff ratio, and teacher attributes.

Average TAKS Scale Scores by Campus

The analysis of the scale score data provided further insight into the analyses of the campuses. Table 4 shows that if the schools were placed in rank order, Schools B and C would have maintained the highest rank for each of the three years reported. Schools B and C also remained within the same range. The average scale scores of schools B and C were above 2200 in 2007 and surpassed 2300 in the two subsequent testing years. In ranking the schools, School CC would have followed closely behind School B in 2008 and 2009.

When the data are averaged, School A was placed within the top three highest achieving schools on pass rate. Through careful examination of the data, it must be noted that the scores of School A rank in the middle of the broader scale score data. The data in Table 4 revealed School A reported lower scores than at least two of the intermediate schools during the 2007 – 2009 testing years. The scores of School A were behind three of the intermediate schools in 2007 and 2008. The scores of School A were lower than two intermediate schools in 2009. This was an important finding which demonstrated an anomaly within the elementary configurations and again supports the importance of looking at other variables characteristic of the schools.

Fifth-Grade Average TAKS Scale Scores by Campus

Figure 3 demonstrated growth in student achievement over the three-year period. The graph in Figure 3 supplemented the findings in Table 4, while providing a clear picture of the growth over time. The graph indicates growth in student achievement at the elementary and intermediate level. However, as a result of the number of students exceeding the minimum standards at the elementary level, the average TAKS scale scores are significantly higher at the elementary level in Schools B and C. The graph in Figure 3 demonstrates that the scores in School CC were the closest to the scores of School B.

The data presented in Figure 3 further demonstrates the anomaly that existed within the elementary campuses. The scores of School A are intermingled with the scores of Schools AA and FF. During

the 2009 testing period, the scores of Schools A, AA, and FF were within ten points of each other. Although the average scale scores of School A were not as high as Schools B and C, and seemed to be intermingled with AA and FF, the average scale scores increased more than any of the other intermediate schools from 2007 – 2009 with the exception of School CC.

Conclusion and Implications for Practice

The findings of the numerical and percentage data revealed that the elementary configuration yielded higher results for each of the three test administrations. Data from this study provide a broader implication that can focus educators on a more thorough review of elementary and intermediate structures and the potential benefits for students' achievement in science. Although the results of this study show an overall statistically significant higher achievement rate amongst fifth-grade students in the elementary setting than in the intermediate setting, the disaggregated data presented enough variations to suggest caution when considering acting upon these findings. Regardless of the manner in which the grades are structured, primary emphasis should be placed on the academic and developmental needs of the students. District leaders need careful data analysis and current information regarding sound instructional practices for meeting the needs of adolescents in order to make knowledge-based decisions regarding grade-level configuration.

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