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Abstract: Differences in math achievement between Hispanic eighth grade students who participated in school sponsored extracurricular activities and Hispanic eighth grade students who did not participate in school sponsored extracurricular activities at an inner-city campus in the State of Texas were examined for the 2008-2009 academic year. The Texas Assessment of Knowledge and Skills (TAKS) Math exam served as the measure of student achievement. Hispanic eighth grade students who were involved in extracurricular activities had statistically significantly higher scores as well as higher passing percentages than did Hispanic eighth grade students who were not involved in extracurricular activities on the TAKS Math exam. Implications are presented and recommendations for future research are made.

Introduction

Hispanic students are the largest and fastest growing ethnic group attending public schools in the United States today (Salazar, et al., 2008). "The term, Hispanic, is widely used by social scientists to refer to a very diverse group of people who share a history of Spanish colonialism in the American continent" (Arbona, 1995, p. 37). In addition, more than two-thirds (69%) of Hispanic students attending public schools are of Mexican origin (Fry & Gonzales, 2008). Hispanics, as a group, tend to have the lowest levels of educational attainment and the highest dropout rate in the nation (Ream & Rumberger, 2008; U.S. Department of Education, National Center for Education Statistics, 2005). Furthermore, Hispanic students' academic struggles have resulted in an achievement gap with White and Asian American students that persists year after year (Austin, Hanson, Bono, & Cheng, 2007).

Because Hispanic students are being outperformed by their Non-Hispanic counterparts (Austin et al., 2007), state policymakers and education practitioners may rely on research studies to learn about effective programs or interventions to increase academic achievement among Hispanic students. For example, researchers have confirmed the value and benefits of participation in extracurricular activities with respect to higher academic achievement as well as

other factors that contribute to school success such as good behavior and an increased sense of school connectedness (Brown & Evans, 2002; Stephen & Schaben, 2002). Researchers, however, have not thoroughly examined these relationships among Hispanic students. Thus, the current study was conducted to add to the limited research on the effect that school sponsored extracurricular activities have on Hispanic eighth grade students' math achievement.

Review of Related Literature

Numerous studies have been conducted with respect to the relationship between extracurricular activities and academic achievement. An analysis of middle school students revealed statistically significant differences in academic performance between students who participated in extracurricular activities and students who did not participate in extracurricular activities (Caskey, 2006). In another study, Stephen and Schaben (2002) asserted that boy and girl athletes had statistically significantly higher California Achievement Test (CAT) math scores as well as higher math grades than nonathletes of the same sex. An analysis of covariance was used in yet another study to examine the connections between participation in eighth grade extracurricular activities and academic achievement. An association was demonstrated between extracurricular activities and higher grades, school value (i.e., greater emphasis placed on college), self-esteem, resiliency, positive friendships, and lower levels of risky behavior (Fredricks & Eccles, 2008). In addition, Broh (2002) used National Educational Longitudinal Study (NELS) data to demonstrate that participation in sports positively affected students' math achievement scores, college attendance, and educational aspirations. Thus, researchers have argued that involvement in school sponsored extracurricular activities provides students with numerous noteworthy benefits (Broh, 2002; Brown & Evans, 2002; Fredricks & Eccles, 2008; Stephen & Schaben, 2002).

Researchers have particularly studied the relationship between extracurricular activities and academic performance in adolescents. Darling, Caldwell, and Smith (2005) conducted a longitudinal study concerning extracurricular activities and their effect on academic performance. Hence, students were provided with a survey containing a list of 20 different extracurricular activities and asked to indicate in which extracurricular activities they participated that year. Students were also queried about their academic goals and their grade point average. Darling, et al. (2005) reported that adolescents who participated in school-based extracurricular activities had higher grades, higher academic aspirations, and more positive attitudes toward school than the students who were not involved in any extracurricular activities.

Researchers also determined that adolescents who were involved in extracurricular activities had less encounters with drug use (Mahoney, 2000; Zaff et al., 2003). An environment with positive peer and adult influences strengthens the adolescents' commitment to school and decreases their probability of drug use. Ream and Rumberger (2008) also studied the effects of participation in extracurricular activities on Mexican American students and documented that the students who participated in such activities were more likely to stay in school and be academically successful than were students who had not participated in extracurricular activities. Adolescents' sense of connectedness to their school has been attributed by several researchers as an important predictor of school success (Brown & Evans, 2002; Caskey, 2006). Researchers have also concluded that European American students were statistically significantly more involved in extracurricular activities than were Hispanic students, but regardless of ethnicity, all students who participated in extracurricular activities had greater

levels of school connectedness than students who did not participate in such activities (Brown & Evans, 2002).

Due to the amount of time spent in school, many researchers consider schools to be primarily responsible for helping students achieve success not only academically but socially as well (Bulach, Lunenburg, & Potter, 2008; Fredricks & Eccles, 2008; Lunenburg & Ornstein, 2008). Hence, several researchers have examined the effects of extracurricular activities on the cognitive, behavioral, and social outcomes of children and adolescents, which lead to academic achievement (Brown & Evans, 2002; Fredricks & Eccles, 2008; Stephen & Schaben, 2002). Conclusions in these studies have led them to suggest that involvement in extracurricular activities has a positive impact on students' academic outcomes.

In addition, researchers have investigated the impact that involvement in extracurricular activities has on students' motivational orientation (Brown & Evans, 2002). Maslow developed a model of motivation based on needs, stemming from the most basic physiological needs, through emotional needs, and finishing with the need to develop one's innate potential (Huitt, 2004). The model is often displayed as a pyramid, with the basic needs at the bottom and the aesthetic needs at the top. Maslow's theory emphasizes our survival needs must be satisfied first (Huitt, 2004). Due to struggles with low economic status and low self-esteem, Hispanic students may be preoccupied with meeting basic needs of food, shelter, and belongingness than with striving for academic excellence. Previous researchers have reported that involvement in extracurricular activities is associated with higher levels of school connection, school satisfaction, educational expectations, and occupational expectations that contribute to the academic achievement of secondary students (Brown & Evans, 2002; Davalos, Chavez, & Guardiola, 1999; Fredricks & Eccles, 2008; Stephen & Schaben, 2002). Thus, a primary focus of the present research is to develop an integrated understanding of the influence school sponsored extracurricular activities have on Hispanic students' math academic achievement.

Statement of the Problem

Even though the number of Hispanic students meeting the passing standards on the TAKS Math test has increased over the years, they continue to perform below the state average (TEA, online, http://www.tea.state.tx.us/perfreport/aeis/about.aeis.html). Specifically, for the 2008-2009 academic year, 77% of Hispanic students in eighth grade passed the first administration of the TAKS Math test in the State of Texas, which improved from 73% for the year 2007-2008. However, the passing rate for eighth graders in the State of Texas on the same exam for the years 2008-2009 and 2007-2008 were 82% and 79%, respectively. Thus, a need exists to implement research-based interventions that have been documented to be effective in assisting and motivating Hispanic students to become academically successful and in turn close the existing achievement gap.

Significance of the Study

The findings of this study may add to the limited body of research that seeks to investigate how involvement in school sponsored extracurricular activities is related to the academic achievement of Hispanic secondary students. In addition, policymakers, educational leaders, and communities may use these findings as a means to promote and ensure more involvement in school sponsored extracurricular activities among Hispanic students by modifying campus improvement plans or hiring additional personnel to promote academic success.

Purpose of the Study

The purpose of this study was to determine the extent to which a relationship existed between school sponsored extracurricular activities and academic achievement. Therefore, differences were examined in math achievement between Hispanic students in eighth grade who participated in school sponsored extracurricular activities and the Hispanic students in eighth grade who did not participate in school sponsored extracurricular activities for the 2008-2009 academic year. Moreover, the percentage of students who met the passing standard on the TAKS Math test was also compared between the two groups of interest.

Research Questions

In this study, the following research questions were addressed:

a) What is the difference in math achievement between Hispanic eighth grade students who participated in school sponsored extracurricular activities and Hispanic eighth grade students who did not participate in school sponsored extracurricular activities? and

b) What is the difference in the percentages of students who met the passing standard on the TAKS Math test (i.e. TAKS Math scale score = 2100) between Hispanic eighth grade students who participated in school sponsored extracurricular activities and Hispanic eighth grade students who did not participate in school sponsored extracurricular activities?

Method

Participants

Data from the May 2009 administration of the TAKS Math exam for 317 Hispanic eighth grade students were obtained for this study. The students were enrolled in an inner-city middle school in the State of Texas. In the 2008-2009 academic year, this campus earned an Academically Acceptable TEA Rating and had a student enrollment of 1,065 students (i.e., 90.5% Hispanic; 7.4% African American; 1.9% White; 0.2% Asian/Pacific Islander). To examine the relationship between school sponsored extracurricular activities and math achievement among Hispanic eighth grade students, TAKS Math exam scores were analyzed for 110 Hispanic eighth graders who participated in school sponsored extracurricular activities and 207 Hispanic eighth graders who did not participate in school sponsored extracurricular activities. School sponsored extracurricular activities were generally defined as sports (e.g., basketball, baseball, football, and soccer) and clubs (e.g., karate, cheerleading, band, and mariachi) that took place before school, after school, and/or weekends.

Instrumentation

The TAKS Math test administered during the 2008-2009 academic year served as the measure of the Hispanic eighth grade students' math achievement in this study. The TAKS Math test is an intact instrument developed by committees that consisted of teachers from school districts across the state, test development specialists, and Texas Education Agency (TEA) staff members. The content validity of the TAKS test is directly related to the statewide curriculum. To obtain the highest level of content validity, committees were formed to align the content of the TAKS test systematically to the Texas Education Knowledge and Skills (TEKS). Items were developed and reviewed in numerous stages by Texas educators, which provided supportive strong evidence of content validity of the TAKS tests. Furthermore, the input from many different people with different backgrounds reduced the likelihood that the test items would be written from bias by a single author (Texas Education Agency, 2008).

In addition, a contrasting-groups study was conducted to examine the construct validity of TAKS test as well. Through the TAKS Higher Education Readiness Component, TEA collected and compared performance data for the exit level mathematics and English language arts tests for a sample of college students at two-year and four-year colleges in the state and high school students (TEA, 2008). Evidence for criterion-related validity for the TAKS was also provided as part of the TAKS Higher Education Readiness Component. This concurrent validity study was conducted in 2003-2004 to examine the correlation of students' performance on exit level TAKS with their performance on national testing programs (TEA, 2008).

Test reliability refers to how accurately an assessment measures student learning. Thus, the following internal consistency procedures were used to determine test reliability for the TAKS tests: Kuder-Richardson Formula 20 (KR20) for tests involving multiple-choice items and the stratified coefficient alpha for tests involving short-answer and extended response items (TEA, 2008). The internal consistency reliabilities for the TAKS tests range from .87 to .90.

Procedures

The study was conducted by selecting the year of interest, the corresponding campus files (i.e., participation in school sponsored extracurricular activities and TAKS Math test scale scores) for the year of interest, and the variable to be examined (i.e., math achievement). The TAKS Math scores for the Hispanic eighth grade students enrolled at an inner-city middle school campus for the 2008-2009 academic year were acquired from a TEA campus performance report. This report, which listed the eighth grade students' names, identification numbers, and TAKS test performance results, served as the master file. In addition, campus staff in charge of school sponsored extracurricular activities were each provided with a separate file of all the eighth grade students enrolled for the year 2008-2009 listed by name, identification number, gender, and ethnicity. The campus sponsors reported data in reference to student participation in school sponsored extracurricular activities by specifying which activity, if any, the students participated in next to their names. Only the Hispanic eighth grade students' data (i.e., participation in school sponsored extracurricular activity, gender, and ethnicity) were obtained from this file and transferred to the master file, whereas Non-Hispanic students' data were omitted from the master file. Lastly, all of the data were converted into a database suitable for analysis by the Statistical Package for the Social Sciences (SPSS) – PC Version 17.0. The database included the students' identification numbers, TAKS Math scale scores, involvement in school sponsored extracurricular activities (1 = Participate; 2 = Did Not Participate), gender (1 = Boys; 2 = Girls), grade (1 = eighth grade), and ethnicity (1 = Hispanic). The participants' confidentiality and privacy were ensured by the omission of their names on the SPSS file.

Results

Table 1 presents descriptive statistics for Hispanic eighth grade students' TAKS Math scale scores as a function of participation in school sponsored extracurricular activities. A check for assumption of normality was conducted, and the assumption was met. Specifically, for the Hispanic eighth grade students who participated in school sponsored extracurricular activities, the standardized skewness coefficient (i.e., the skewness value divided by the standard error of skewness) of 1.22 and the standardized kurtosis coefficient (i.e., the kurtosis value divided by the standard error or kurtosis) of 2.32 fell within the normal acceptable parametric ranges of -3.00 and +3.00, which indicated no serious departure from normality (Onwuegbuzie & Daniel, 2002). Similarly, for the Hispanic eighth grade students who did not participate in school sponsored extracurricular activities, the standardized skewness coefficient of 1.66 and standardized kurtosis coefficient of -0.25 were within the limits of normality. Thus, a

parametric analysis was conducted with the use of an independent samples *t*-test to compare math achievement between Hispanic eighth grade students who participated in school sponsored extracurricular activities and Hispanic eighth grade students who did not participate in school sponsored extracurricular activities. Independent samples *t*-tests are the appropriate statistical procedures to use when the independent variable is a categorical or grouping variable (i.e., participation in school sponsored extracurricular activities) and the dependent variable is a continuous variable (i.e., TAKS Math scale scores) that is normally distributed.

Table 1

Descriptive Statistics for Students' TAKS Math Scale Scores as a Function of Participation in School Sponsored Extracurricular Activities

Participation in School Sponsored Extracurricular Activities	*n*	*M*	*SD*
Participate	110	2201.94	176.84
Did Not Participate	207	2129.87	180.82

The independent samples *t*-test indicated a statistically significant difference was present between Hispanic eighth grade students who participated in school sponsored extracurricular activities and Hispanic eighth grade students who did not participate in school sponsored extracurricular activities, $t(226.74) = 3.43$, $p = .001$. Specifically, Hispanic eighth grade students who participated in school sponsored extracurricular activities had higher scale scores on the TAKS Math test than the Hispanic eighth grade students who did not participate in school sponsored extracurricular activities. The effect size for this difference was small, 0.40 (Cohen, 1988).

Table 2 presents a frequency distribution of TAKS Math scale scores of 110 students who participated in school sponsored extracurricular activities and 207 students who did not participate in school sponsored extracurricular activities. The passing standard for students on the TAKS Math exam is reported with a scale score of 2100. Specifically, for Hispanic eighth grade students who participated in school sponsored extracurricular activities, the percentage of students meeting or exceeding the passing standard was 79.1%, whereas for Hispanic eighth grade students who did not participate in school sponsored extracurricular activities, the percentage of students meeting or exceeding the passing standard was 64.7%. Thus, an analysis of frequency tables demonstrates a pattern of difference between groups.

Table 2

Frequency and Percentages of TAKS Math Scale Scores for Students Who Participated in School Sponsored Extracurricular Activities and Students Who Did Not Participate in School Sponsored Extracurricular Activities

TAKS Math Scale Scores	Participate *n* and Percentage of Total	Did Not Participate *n* and Percentage of Total
000 - 419	0 (0.00%)	0 (0.00%)
420 - 839	0 (0.00%)	0 (0.00%)
840 - 1259	0 (0.00%)	0 (0.00%)
1260 - 1679	0 (0.00%)	0 (0.00%)
1680 - 2099	23 (20.9%)	73 (35.3%)
2100 - 2519	80 (72.7%)	128 (61.8%)
2520 - 2939	7 (6.4%)	6 (2.9%)

Discussion

In this study, the effect of school sponsored extracurricular activities on math achievement was analyzed. The overall TAKS Math scale scores of students who participated in school sponsored extracurricular activities were statistically significantly higher than students who did not participate in school sponsored extracurricular activities. The mean TAKS Math scale score of students who participated was 2202, whereas the mean TAKS Math scale score of students who did not participate was 2130. Thus, the results of this study are consistent with the results in the review of literature. Several investigators (e.g., Broh, 2002; Brown & Evans, 2002; Caskey, 2006; Darling, Caldwell, & Smith, 2005; Davalos, Chavez, & Guardiola, 1999; Fredricks & Eccles, 2008; Mahoney, 2000; Stephen & Schaben, 2002; Zaff et al., 2003) determined positive correlations between participation in school sponsored extracurricular activities and academic achievement as well as other factors that contribute to school success such as behavior and feelings of school connectedness. Education practitioners and school leaders are encouraged to seek out ways to involve students in school sponsored extracurricular activities. The benefits that extracurricular activities offer students in secondary schools have been established by previous researchers and have been supported in the current study.

In any study of school sponsored extracurricular activities, the issue of self-selection must be addressed. Self-selection might be the result of student choice or institutional selection. Over half (i.e., 207 of 317) of the Hispanic eighth graders enrolled during the 2008-2009 academic year at an inner-city middle school campus with a predominantly Hispanic student population did not participate in school sponsored extracurricular activities. The questions that must be asked by a researcher are, "Why do students choose not to participate?" and "What cultural or socioeconomic influences may play a part in these findings?" In some cases, more students participate in school sponsored extracurricular activities in a smaller campus than in a bigger campus. Thus, researchers should also examine whether the size of the campus may be a

contributing factor for nonparticipation. The reasons for non-participation comprise an area that needs to be investigated further, especially if benefits exist for students who choose to participate in extracurricular activities.

The researcher placed several limitations on this study by not investigating middle school students from other grade levels (e.g., sixth or seventh grades) or from other ethnic groups. Thus, the sample consisting only of Hispanic eighth grade students limits generalizability. Furthermore, the data collected in this study constituted only one year of TAKS Math test data. Therefore, it is unknown whether the findings of the current study would be similar to studies in which TAKS Math test data for Hispanic eighth grade students were analyzed across multiple years. Another limitation of the study was the selection of non-random groups that differed only on their participation in school sponsored extracurricular activities. Hence, further research can include control procedures to ameliorate the effect of an external variable such as students' socioeconomic status and teachers' years of teaching experience that may influence the significance of the study. Lastly, analysis by specific school sponsored extracurricular activity (e.g., sports, band, karate, cheerleading, or mariachi) was not conducted in this study. A future study could undertake this endeavor as well. Until support from additional studies is available, readers are cautioned with respect to making generalizations pertaining to findings from the current study.

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