Gender Differences in Placement, Support, and Participation in Early School Programs for Urban Hispanic Students in Advanced Placement Courses

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Abstract

This study investigated differences between males and females of 352 urban, predominately U.S.-born Hispanic students enrolled in advanced placement (AP) courses. The gender composition was 131 (37.2%) male and 221 (68.2%) female and the majority of students was enrolled in 11th and 12th grades. Our findings indicated that (a) more females than males were enrolled in AP courses, (b) females perceived school support as more important than males, and (c) participation in elementary and middle school programs, such as gifted and talented programs and magnet schools were important for participation in high school AP courses. Implications for school policy are noted.

Key words: Gender difference, school, Hispanic students, woman

Introduction

One of the best predictors for short-term as well as long-term academic progress for students is participation in Advanced Placement (AP) courses (Burdman, 2000; College Board, 2007; Fitzsimmons, 2005; Planty, Provasnik, & Daniel, 2007). Given this importance and the prediction of Hispanic students as the largest growing student population (U.S. Bureau of the Census, 2000), it becomes critical that strategies for inclusion of Hispanic students in AP courses be addressed. Further, it becomes necessary to study the strategies from a gender perspective, since females tend to place a higher value on academic achievement than do males (Okagaki, 2001). Thus, the purpose of our preliminary study is to describe the differences between Hispanic males and females in high school AP courses. Specifically, participation in elementary, middle, and high schools programs will be investigated to determine the educational trajectory of Hispanic students enrolled in a Calculus AP course in high school. Potentially, the findings from this study can be used to provide educators with information on the specific elementary, middle, and high school programs that can provide the necessary support for students’ future participation in AP courses. Further, an investigation of gender differences can lead to development of different strategies to use in advising of Hispanic females to enroll in science, math, and engineering programs at the university level.

Historical Account of Academic Discrepancies

Historically, the plight of the achievement gap between Hispanic, African American and White and Asian American students has been studied. The earliest studies defined the achievement gap and established policies for its reduction. For example, in 1996, the President’s Advisory Committee on Educational Excellence for Hispanic Americans released its first comprehensive report titled Our Nation on the Fault Line: Hispanic American Education (President’s Advisory commission on Educational Excellence for Hispanic Americans, 2000). Reaction to these policies led to the formation of committees and a series of scholarly papers. One such paper was that of Lockwood and Secada (1999) who supported the President’s Advisory Committee Hispanic Dropout Project. This was followed by a report known as the No More Excuses (Secada et al, 1998) including a comprehensive set of articles on successful practices in the education of Hispanic students. Other reports such as the Report on the White House Strategy Session on Improving Hispanic Student Achievement (U.S. Department of Education, Office of Civil Rights, 2000) and Our Nation on the Fault Line: Hispanic American Education and No More Excuses (Secada et al, 1998) were the basis for the creation of the Hispanic Education Action Plan (HEAP) and other initiatives (U.S. Department of Education Hispanic Dropout Project, 1998).

HEAP was responsible for the formation of five national goals for Hispanic education (U.S. Department of Education, Office of Civil Rights, 2000). The goals were produced in a series of meetings between advocacy groups, non-profit organizations, educators, members of Congress, and the President’s Advisory Commission on Educational Excellence for Hispanic Americans. The five goals included: (a) providing access to quality early childhood education, (b) ensuring English proficiency, (c) closing the achievement gap on assessments of academic performance, (d) increasing the rate of high school completion, and (e) doubling the rate of postsecondary degree attainment.
These national goals were specifically designed to help support increased academic achievement for Hispanic students, including the provision of “high quality education with appropriate resources and support to ensure equal opportunity for all students to eliminate the achievement gap between Hispanic students and other students on appropriate state assessments and other indicators by 2010” (U.S. Department of Education, Office of Civil Rights, 2000, p. 17). The U.S. Department of Education, Office of Civil Rights (2000) noted that “closing the achievement gap necessitates action on a number of fronts, starting with a focus on improving access to and quality of early childhood education and opportunity and English language acquisition” (p. 17). More specifically, the strategies the U.S. Department of Education, Office of Civil Rights (2000) recognized the importance in closing the achievement gaps included ensuring that all students are pursuing a rigorous curriculum such as found in AP courses, allocating resources effectively to address the learning needs of Hispanic students, ensuring quality teaching, and involving parents in their child’s education.

In spite of these initiatives, the achievement gap for Hispanic students is still very much an issue:

School efforts to close the gap in academic achievement between ethnic and racial minority students and White students have been largely unsuccessful to date; differences in educational performance persist at all achievement levels, with the gap greatest between students of color and immigrants and their White and Asian American peers at high achievement levels. (Schwartz, 1999, p. 10)

This achievement gap is apparent through a number of critical measures. For example, Hispanic students are outperformed by White students on the National Assessment of Educational Progress (NAEP) tests (Nevarez, 2001). Additionally, White and Asian students, on average, have higher grade point averages in school than Hispanic students (Orfield, Losen, Wald, & Swanson, 2004). Although the disparity between Hispanic student achievement and that of White and Asian students has been an area of concern for both policy makers and educators for a number of years, the improvement in this area has been minimal (Weiher, Hughes, Kaplan, & Howard, 2006).

**AP Courses – A Current Strategy**

In keeping with the goals of doubling the rate of postsecondary degree attainment (U.S. Department of Education, Office of Civil Rights, 2000), some research has investigated the achievement gap by studying the participation of underrepresented groups in AP courses. The number of high school students participating in the College Board’s Advanced Placement Program has increased more than 140% in the last 10 years (Planty et al., 2007). This program, established and run by the College Board, allows high school students to take advanced coursework in high school and earn, through rigorous end of course exams, college level credit in various subject areas. There are currently 37 AP examinations in 22 subject areas, including two new tests offered for the first time in 2006-07. In 2006, the Advanced Placement Program was offered in more than 15,000 schools worldwide. More than 1.3 million students took 2.3
million AP examinations in 2006, numbers that continue to increase every year (Planty, et al., 2007).

The importance of performing well and even simply participating in AP courses should not be underestimated. In a study involving 21 colleges, Burdman (2000) concluded that students who had been enrolled in at least one AP course in high school significantly outperformed their peers who had not taken an AP course, but who had the college-level prerequisite course. William Fitzsimmons (2005), Dean of Admissions and Financial Aid at Harvard University said, “One of the best standard predictors of academic success at Harvard is the performance on AP examinations” (p. 1). Thus, Advanced Placement participation is not just important for the success of high school students, but it directly impacts future academic success of all students as well.

As the popularity of AP courses continues to rise and programs expand throughout the world, the College Board has explicitly stated its commitment to the achievement and academic success of all students, especially those that have historically been underrepresented in advanced or college level work. In fact, the College Board specifically addresses the achievement of underrepresented groups in the Advanced Placement Program in its Access and Equity Initiative, first established in 2002.

The College Board and the Advanced Placement Program encourage teachers, AP Coordinators, and school administrators to make equitable access a guiding principle for their AP programs. Further, the Board encourages the elimination of barriers that restrict access to AP courses for students from ethnic, racial, and socioeconomic groups that have been traditionally under-represented in the AP program. Schools should make every effort to ensure that their AP classes reflect the diversity of their student population (College Board, 2007).

School Support for Hispanic Students in AP Courses

Studying the participation of Hispanic students must go beyond investigating ethnic and gender group differences and examine the school context and school program support for Hispanic students enrolled in AP courses (Gánadara, 2005; Jodry, Robles-Piña, & Nichter, 2004; Ndura, Robinson, & Ochs, 2003; Tapia & Lanius, 2000). The rationale for examining the achievement gap from this perspective is to investigate how students who are faced with adverse circumstances, such as low socioeconomic status and low parent educational attainment are able to overcome obstacles if they are placed in schools programs that prepare them for the demands of AP courses. It is important to determine what types of school, community, and parental support are needed to engage in rigorous academic courses (Epstein et al., 2002).

There have been a couple of qualitative studies investigating support in Hispanic student participation in AP courses. One such study was Jodry’s (2001), who interviewed six Hispanic students enrolled in an AP calculus program in a large urban high school. Through interviews, Jodry found that students perceived home support when (a) parents were interested in school work, (b) good role models at home provided structure for learning, (c) there was a safe home environment, and (d) language and culture were valued. Students perceived school support when (a) teachers advocated on the students’ behalf about information regarding courses, college
scholarships, and financial assistance, and (b) teachers valued students’ language and culture by allowing students to speak with them about personal matters. Students perceived community support when (a) information about dual enrollment in high school and college was provided, (b) work opportunities for students and parents were provided, and (c) language and culture were valued, such as when the community provided services to students and parents in ways that did not demean them.

A second study by The National Research Center on the Gifted and Talented involving interviews with 12 Hispanic students was conducted to investigate the home, school, community connection (Kloosterman, 1999). It was found that supportive environments had the following characteristics: (a) a strong maternal role, (b) Hispanic legacy, (c) maintenance of the Spanish language, (d) a safe school environment, (e) flexible grouping, and (f) English support (Speakers of Other Languages) (ESOL) students. Additionally, Kloosterman found a series of conflicting issues related to the characteristics, values, and perspectives of the home and school cultures. These conflicting issues between the home and school cultures included a difference in the level of support schools gave to bilingualism, family involvement in education, and knowledge of curriculum and instructional methodologies used.

Other studies based on quantitative methodology have indicated high achieving Hispanics’ student participation in AP classes. A first study conducted by Gánadara (2005) examined two national databases and found that (a) Hispanic students were more likely than White students to have parents with very low educational levels, (b) Hispanic students benefit more from early grade interventions than do White students, and (c) schools have a greater influence on the academic success of Hispanics than on White students.

A second study was conducted in eight high schools in a large, diverse school district. Ndura et al. (2003) found that with the exception of Asian students, minority students are underrepresented in AP courses and that their parents’ educational status, profession, and income are positively related to student enrollment in AP courses. A third study investigating a large school district in California indicated that even in districts where there is a large representation of Hispanic students, participation in AP courses for Hispanic students is low (Solarzano & Ornelas, 2004). A fourth quantitative study indicated that students enrolled in AP courses are more likely to have mothers who had earned at least a bachelor’s degree (Robles-Piña & Hinojosa, 2007). In general, studies investigating enrollment of Hispanic students in AP courses have been limited to quantitative studies describing enrollment figures and qualitative studies interviewing a small number of students.

**Gender Differences**

Along with the increase of students taking AP courses and exams, the number of women and minority students taking these challenging academic endeavors has also increased. For example, from 1992-2002, the number of female students who took the AP History exam increased 124% (College Board, 2007). During this same time frame, the number of Hispanic AP test-takers increased an astounding 266%; Chicano/Mexican American female participation increased 308% (ERIC Development Team, 2001). Further, increases in numbers for Hispanic and female students are likely to continue to rise (Venkateswaran, 2004).
Despite the growth in the participation of women and minorities in AP coursework and testing, recent research still recognizes that the Advanced Placement Program demonstrates performance differences between female and minority students and White males (Buck, Kostin, & Morgan, 2002). For example, long-term results have shown that female and minority students achieve better results on the essay portion of the examinations and achieve poorer results on the multiple choice sections (Venkateswaran, 2004). Because there is research that demonstrates that males have better visual, numerical, and computational abilities while females have stronger verbal skills (Cole, 1997), this gap between the performance of males and the performance of females and minorities on the multiple choice sections is not surprising. Still, with the importance of the AP exams on future success and the increase of students taking these exams, this gap, however small, can be critical. “Concerns about gender equity and diversity have transformed the AP exam over the last decade, even as issues of gender, race, and ethnicity have had a major impact on the ways in which we teach” (Venkateswaran, p. 510).

Our study goes beyond describing statistics and interviews of a few students to investigating variables heretofore not researched, gender and support through school program participation. Information from this study on gender differences in enrollment of AP courses is important. First, the information can be used to share with school districts about how to provide support for males and females on the enrollment of AP courses. Second, the information can be shared with students so that they can be made aware of the differences between males and females. Third, the information can be used in professional development courses with math instructors so that they can know how to support and what type of support to offer both males and females in math-related AP courses. Fourth, the information from this study can help to support placement of Hispanic students, a group known to be under-performing in math-related courses. The following questions guided our investigation: (a) Are there gender differences in the enrollment of urban Hispanic students in AP Calculus courses? (b) Are there gender differences in the type of school program support received by urban Hispanic students in AP Calculus courses?

Method

Participants

Participants were selected from a large urban school district in the southeastern part of the U.S. From the 29 high schools available, 10 were selected for participation due to similar demographics, such as students at-risk (determined by those students in free and reduced lunch programs), and high percentage of Hispanic students taking advanced placement (AP) pre-calculus and calculus courses. From these 10 schools, four (A, B, C, D) were randomly selected to participate. School A had 12% Honors classes, 96% Hispanic population, 84% at-risk, and 68 students enrolled in pre- and AP calculus courses. School B had 20% Honors classes, 88% Hispanic population, 78% at-risk, and 98 students enrolled in pre- and AP calculus courses. School C had 67% Honors classes, 27% Hispanic population, 11% at-risk, and 186 students enrolled in pre- and AP calculus courses. Lastly, school D had 29% Honors classes, 29% Hispanic population and 121 students enrolled in pre- and AP calculus courses.
The ethnic composition of this group was 248 (57%) Hispanic, 87 (20%) African American, 62 (14.3%) Asian/Pacific Islander, 20 (4.6%) White, 15 (3.5%) Other, and 2 (.5%) did not respond to this question. The gender composition was male 171 (39.4%), female 262 (60.4%) and missing 1 (.2%). Not all students responded to all of the questions regarding program participation, thus, only complete questionnaires were used and those amounted to the 352 analyzed in this study.

Instrument

The HY-SUCCESS (Jodry & Hinojosa, 2003) instrument was developed to collect data on the degree of school, family, and community support Hispanic students perceived when enrolled in AP courses. The HY-SUCCESS instrument consists of two parts. The first part contains 20 questions related to demographic items (enrollment in special courses, educational history, post secondary aspirations, grade point average, number of siblings in the family, educational background of each parent, mother’s heritage, father’s heritage, family history in the United States, and family configuration).

The second part contains a 62-item questionnaire. The information was collected on a Likert-type scale with four possible response options: (a) 1 = strongly disagree, (b) 2 = disagree, (c) 3 = agree, and (d) 4 = strongly agree. The scores were based on the following three sub-tests: (a) home, (b) school, and (c) community. The items making up each of the three sub-tests were 19 questions regarding the home; 25 questions regarding the school; and 14 questions regarding the community. An example of a question related to home support was “My parents or relatives have proudly taught me our family traditions and family culture.” An example of a question related to school support was “There have been adults at school who have cared about how I am doing academically.” Finally, an example of a question related to community support was “Members of the community have high expectations for my academic achievement.”

Evidence for content validity was established in three ways. First, the items for the HY-SUCCESS were taken from the literature reviewed. Second, the instrument was pilot-tested on five persons who had similar characteristics as those in our sample. Third, the instrument was sent to five experts in the school district who taught AP courses. Feedback was used to revise the instrument and subsequently reliability was established. A Cronbach’s alpha coefficient of .92 was obtained and considered reliable; thus the HY-SUCCESS was deemed psychometrically sound enough to be used in the collection of the data.

Results

The purpose of our study was to investigate the gender differences in the enrollment of urban Hispanic students in AP Calculus courses and the type of school program support received in elementary, middle, and high school and several differences were noted. First, more females (221; 62.8%) than males (131; 37.2%) enrolled in AP courses. Second, there were statistically significant gender differences found for school support ($t, 351 = 4.55, p < .01$) with females perceiving higher school support ($M = 75.35, SD = 9.71$) than males ($M = 70.64, SD = 9.59$). Questions on the HY-SUCCESS related to school support were summed up to make up the dependent variable – school support. Third, individual questions related to program participation
in elementary, middle, and high school were investigated and the following were noted in descending order. Both males and females reported that when they were in elementary school, they had participated in the following programs: (a) gifted and talented programs, (b) magnet school, (c) bilingual education, and (d) English as a second language, with female participation higher in all groups. Both males and females reported that when they were in middle school, they had participated in the following programs: (a) magnet schools, (b) gifted and talented, and (c) English as a second language, with female participation higher in all groups. Further, both males and females reported that when they were in high school, they had participated in the following programs: (a) AP courses, (b) magnet schools, (c) dual credit courses, and (d) English as a second language, with female participation higher in all groups.

In summary, more Hispanic females than Hispanic males participated in AP courses in this urban school district in Texas. Further, there was a statistically significant difference between males and females on perceived school support with females perceiving more school support. Moreover, participants ranked participation in elementary and middle schools’ magnet schools and gifted and talented programs higher than other school programs.

Discussion

The implications of the findings of this study will be discussed using the following framework: (a) limitations, (b) referencing supporting literature, (c) impact on research and school policy. There were a couple of limitations to this study. First, the results of this study can only be generalized to urban Hispanic students with the demographic characteristics of this study. We hope that this will initiate a dialogue about examining gender group differences, because it may be the case that problems and solutions are defined differently by gender as they were in this study. Second, in it may be the case that programs in this particular sample located in an urban school district might not be available at other school districts.

If indeed enrollment in AP courses is a great predictor for academic success (College Board, 2007), then the findings from our study might assist in knowing more about what Weiher et al (2006) noted with Hispanics being one of the most under-represented groups in AP courses. Our findings concur with statistics that indicate that the number of Hispanic females taking AP courses has increased (College Board, 2007). Gender differences found in our study support the notion that females tend to place a higher value on academic achievement than males (Okagaki, 2001). Some studies have investigated ethnic group differences in the achievement gap and enrollment in AP courses by examining performance on (a) visual, numerical, computational skills (Cole, 1997), (b) differential responses to essay questions (Venkateswaran, 2004), and (c) differential responses to multiple choice tests (Venkateswaran, 2004). Other studies have recognized the need to examine systems that support enrollment in AP courses for minority students (Gánadara, 2005; Jodry et. al., 2004; Ndura et al., 2003; Tapia & Lanius, 2000). In particular, Jodry et al. indicated that students wanted teachers who would advise them on the type of courses to take. Our finding in this study that indicated that school support is considered more important is consistent with Jodry’s work; however, our finding suggests that school support is more important for females than males.
The findings of our study indicated that participation in particular courses early on in school (Gifted and Talented, Magnet Schools) was a precursor to enrollment in AP courses in high school and supports Jodry’s findings that teacher input on early course placement is necessary for later participation in AP courses. Further, the findings of our study support Gánadara’s research that stated that Hispanics benefit from early school interventions and that school support has a greater influence on the academic success of Hispanics.

Finally, our study brings us one step closer to the goals once proposed by the President’s Advisory Commission on Educational Excellence for advancement of Hispanic Americans that included: (a) providing access to quality early childhood education, (b) ensuring English proficiency, (c) closing the achievement gap on assessments of academic performance, (d) increasing the rate of high school completion, and (e) doubling the rate of postsecondary degree attainment (U.S. Department of Education, Office of Civil Rights, 2000).

There are several implications of the findings on research and school policy. It is important to note that differences to interventions between gender are almost always found. This means that when conducting research disaggregation of data for these groups is important to avoid making general and specific statements about how programs and interventions affect groups differently. Moreover, for school policies it means that norms have to also consider gender group differences. In particular the findings of our study indicate the need to further investigate the relationship between early program participation and future enrollment in AP courses. Regarding policy, it would be prudent for school district personnel to use this information in assuring early placement of female students who show potential in Gifted and Talented courses and Magnet Schools to prepare them for participation in AP courses that are known to be variables influencing placement in AP courses and predictors of future academic success.
References


Biographies

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