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Advanced Placement Math Scores from 2000 to 2010: Does Gender Still Matter?

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Abstract

The relationship between gender and student performance on the Advanced Placement Calculus AB, Calculus BC, and Statistics exams for the spring 2000, 2005, and 2010 exam administrations were analyzed. Using College Board data for all students (*n*s > 100,000) in the United States for all three exams in each of the three years, statistically significant relationships were yielded between gender and performance on Advanced Placement math exams. In each of the three exams a higher percentage of boys earned a score of 3 or better than the percentage of girls earning scores of 3 or higher. The performance of boys and girls on these three Advanced Placement exams from 2000 to 2010 was relatively unchanged. Implications of the findings are discussed and suggestions for further research are made.

Keywords: Advanced Placement, gender, student achievement

INTRODUCTION

Over the past 40 years, an examination of the differences between the mathematical performance of boys and girls has yielded conflicting results. Maccoby and Jacklin (1974) asserted that the superior mathematical ability of boys was one of the four noted gender differences that generally developed between the ages of 12 and 13. Fennema (1974) reported that no discernable difference was present in mathematical ability in the early elementary years. However, a difference was noted during the high school years with boys outperforming girls in higher level cognitive tasks and girls outperforming boys on tests that measured lower level cognitive abilities (Fennema & Carpenter, 1981).

In their meta-analysis, Hyde, Fennema, and Lamon (1990) documented that a small, statistically significant difference did exist between the performance of boys and girls on mathematical tests and concluded that (a) little support was present for the universal assumption that boys were better at math than girls, (b) girls outperformed boys in computation, (c) no gender differences were apparent in the understanding of mathematical concepts, and

(d) boys outperformed girls in problem solving in high school. Differences reported by Hyde, Fennema, and Lamon (1990) occurred in important areas because problem solving skills are needed for many math-related careers and gender differences may contribute to the lower percentage of females pursuing these types of careers. More recently, Hyde, Lindberg, Linn, Ellis, and Williams (2008) suggested that the gender difference on math tests between boys and girls, though still present, had decreased.

Else-Quest, Hyde, and Linn (2010) concluded from their meta-analysis that if any gender differences existed, they were small in size. According to Else-Quest, Hyde, and Linn (2010), achievement on math tests for boys and girls was similar, however, boys reported higher confidence levels and lower anxiety than girls. Other factors may contribute to the observed differences. Else-Quest, Hyde, and Linn (2010) suggested that girls will perform comparably to boys "when they are encouraged to succeed, are given the necessary educational tools, and have visible female role models excelling in mathematics" (p. 125).

Most of the differences that have been observed in mathematical performance have occurred during the high school years. Because over 12,500 high schools in the United States participate in the Advanced Placement (AP) program, examining the gender differences on the three math tests given by the College Board (i.e., Calculus AB, Calculus BC, and Statistics) may provide useful information. The AP program was originally designed to provide advanced students the opportunity to earn college credit while enrolled in high school (Hertberg-Davis, Callahan, & Kyburg, 2006). Motivated and academically prepared high school students study a rigorous curriculum and are able to demonstrate their proficiency at college level courses (Dixon, 2006). In recent years, the College Board (2010a) has encouraged schools to recruit and prepare students for enrollment in AP classes. Schools are encouraged to provide PreAP classes that will better prepare students for the rigor of AP coursework than students who do not take PreAP classes (College Board, 2010b).

The College Board offered over 35 AP courses in 2009 and 26.5% of the 2009 high school graduates completed at least one AP course during high school. Almost 16% of the 2009 graduating class received a score of 3 or better and were potentially eligible to receive college credit (College Board, 2010a). Because the same AP exam is administered each year to all students in a subject area, the AP program provides an external standard to evaluate the mastery of content by students (Robinson, 2003). Van Tassel-Baska (2005) stated that the AP program was one way to measure the quality of secondary student learning and collaboration between secondary education and higher education.

From 2004 until 2009, the number of students taking AP exams increased from 548,733 to 798,629 (College Board, 2010a). Callahan (2003) attributed the rapid growth of the AP program to the need for challenging courses for high school students. Hertburg-Davis, Callahan, and Kyburg (2006) listed reasons that might explain the increase in the number of students enrolling in AP courses: (a) readily available materials, (b) lack of other rigorous options for students, (c) governmental and financial support, (d) need to decrease the time taken to earn a college degree, (e) belief that AP courses give students an advantage in college admissions, (f) courses are recommended in literature, (g) quality of the AP programs, and (h) AP program is seen as an indicator of school quality (Hertberg-Davis, Callahan, & Kyburg, 2006). Another reported advantage that may partially explain the growth of the AP program is for students passing AP exams the cost of college is often reduced because students enroll in fewer college courses to complete their bachelor's degree (College Board, 2010b; Robinson, 2003).

The AP exams are scored on a scale of 1 (*no recommendation*) to 5 (*extremely well qualified*) (College Board, 2010b). A recommendation by the American Council of Education is that students earning a 3 or better on an AP exam should receive college credit (Ewing, 2006). However, colleges and universities set their own standard and many institutions require a score of 4 or 5 for a student to earn college credit (Ewing, 2006). Over 3,600 colleges and universities receive an annual AP Exam Report and about 90% of four-year colleges and universities offer either credit or advancement for students who pass an AP exam (College Board, 2010b). Van Tassel-Baska (2005) contended that students without some evidence of advanced work (e.g., AP, IB, or dual-enrollment) in high school are less likely to be accepted to the top 300 colleges in the United States than students who completed advanced course work. Moore and Slate (2008) reported that a higher percentage of girls (17%) enrolled in AP courses than the percentage of boys (13%) who enrolled in AP courses, but that the proportion of boys who scored a 3 or higher was slightly higher than the proportion of girls who scored 3 or better.

In her examination of existing research, Ewing (2006) cited several researchers (e.g., Burnham & Hewitt, 1971; Dodd, Fitzpatrick, De Ayala, & Jennings, 2002; Morgan & Crone, 1993; Morgan & Ramist, 1998) who indicated a positive outcome when students enrolled in a more advanced college course instead of an introductory college course based of their successful performance on an AP exam. Hargrove, Godin, and Dodd (2008) reported strong evidence of a greater number of college credits earned, higher college GPA, and increased graduation rate for students who participated in the AP Program. Dougherty, Mellor, and Jian (2006) documented that students who passed at least one AP exam were more likely to graduate from college in five or fewer years than students who completed an AP course but either did not take the AP exam or

did not pass the AP exam. Colangelo, Assouline, and Gross (2004) determined that 59% of students who completed at least one AP course earned a bachelor's degree compared to 33% for students who did not complete any AP courses in high school. Students who completed two or more AP courses had a 76% chance of completing a bachelor's degree. Approximately 40% of all high school graduates earn a master's degree by the age of 33. However, 76% of students who successfully completed at least one AP course were able to complete a master's degree by age 33 (Colangelo, Assouline, and Gross, 2004).

In this study, modern expectancy-value theory was used to understand how gender might impact performance AP exams. Eccles, Adler, Futterman, Goff, Kaczala, Meece, and Midgley (1983) proposed that the performance and choice of task could be predicted by the expectation of success in completing the task and the value placed on the task by the student. As such, motivation is directly related to the individual's expectation of success (Wigfield & Eccles, 2000). If a person expects to succeed, then he or she will be more motivated to work to achieve success than if the person does not expect to succeed. Application of this theory suggests that boys might develop different expectations for academic success or failure than girls and therefore be more motivated to succeed at mathematical tasks. The extent to which gender is related to student performance on AP math exams is unclear. Therefore, the purpose of this study was to determine the extent to which gender was related to student performance on three AP math exams over time.

The following research questions were addressed in this study: (a) What is the effect of gender on the performance of students on the 2000 AP Calculus AB test?; (b) What is the effect of gender on the performance of students on the 2000 AP Calculus BC test?; and (c) What is the effect of gender on the performance of students on the 2000 AP Statistics test? These three questions were repeated for the years 2005 and 2010.

METHOD

Data from the May 2000, May 2005, and May 2010 administration of the Advanced Placement exams for Calculus AB, Calculus BC, and Statistics for students across the United States were used for the purposes of this investigation. Calculus AB includes differential and integral calculus typically covered in the first semester of a college calculus class. Calculus BC includes all the topics from Calculus AB plus other single variable calculus content from the second semester of college calculus. Statistics addresses topics related to collecting, analyzing, and interpreting data. Excel files containing student scores for each of the three exams for the years 2000, 2005, and 2010 were downloaded from the College Board website (College Board, 2000, 2005, 2010c). Each file contained data separated by gender. For the purposes of this study,

performance on the three math exams for boys and girls were compared. The number of students whose exams scores were analyzed differed by course and year. Exact number of participants for each year and exam can be obtained by adding the columns in each table.

Archival data were obtained from the College Board website for each of the three years. The excel file downloaded from the website contained student enrollment in AP courses as well as student performance separated by gender for the Calculus AB, Calculus BC, and Statistics exam. The national summary report was used for this investigation. The College Board does not release information concerning the validity and reliability of the exams.

FINDINGS AND COMMENTS

A Pearson chi-square analysis was conducted to examine whether a difference was present between gender and student performance on the Calculus AB, Calculus BC, and Statistics exams for the years 2000, 2005, and 2010. Chi-square was the appropriate statistical procedure to use because all variables were categorical, involved frequency counts, and the expected value per cell was greater than five. Therefore, the assumptions for using a chi-square were met.

The chi-square test for the relationship between gender and student performance for the 2000 AP Calculus AB exam indicated a statistically significant result, $\chi^2(4) = 2297.40$, $p < .001$. The effect size for this result, Cramer's V, was small, .13 (Cohen, 1988). As can be seen in Table 1, only 12.75% of girls earned the highest score, compared with 21.91% of boys. For those students who did not achieve a passing score, 31.94% of boys were in this category compared to 44.45% of girls.

Table 1: Frequencies and Percentages of 2000 AP Calculus AB Scores by Gender

AP Exam Scores	Boys *n* and %age of Total	Girls *n* and %age of Total
5	21.91% (*n* = 15,877)	12.75% (*n* = 8,291)
4	23.59% (*n* = 17,096)	24.28% (*n* = 15,791)
3	22.56% (*n* = 16,352)	23.13% (*n* = 15,041)
2	17.69% (*n* =12,825)	25.40% (*n* = 16,522)
1	14.25% (*n* =10,329)	19.05% (*n* = 12,392)

The relationship between gender and student performance on the Calculus BC test was examined next and the result was statistically significant, $\chi^2(4) = 367.59$, $p < .001$. The effect size for this result, Cramer's V, was small, .10 (Cohen, 1988). Whereas 42.05% of boys were awarded the highest score, only 32.36% of the girls were in this category. A higher percentage of boys (81.71%) earned a passing score (i.e., 3 or higher) than girls (75.02%). Table 2 depicts the percentages and frequencies for the 2000 Calculus BC test scores.

Table 2 Frequencies and Percentages of 2000 AP Calculus BC Scores by Gender

AP Exam Scores	Boys *n* and %age of Total	Girls *n* and %age of Total
5	42.05% (*n* = 8,733)	32.36% (*n* = 4,174)
4	16.68% (*n* = 3,465)	17.32% (*n* = 3,324)
3	22.08% (*n* = 4,585)	25.33% (*n* = 3,267)
2	8.93% (*n* = 1,854)	10.73% (*n* = 1,384)
1	10.27% (*n* = 2,132)	14.27% (*n* = 1,840)

Focused upon in the third research question was the relationship between gender and student performance for the 2000 AP Statistics. The chi-square test indicated a statistically significant result, $\chi^2(4) = 660.72$, $p < .001$, Cramer's V was .14, or small (Cohen, 1988). As delineated in Table 3, 6.34% of girls earned the highest score, compared with 12.91% of boys. For those students who did not achieve a passing score, 41.35% of boys were in this category compared to 51.58% of girls.

Table 3 Frequencies and Percentages of 2000 AP Statistics Scores by Gender

AP Exam Score	Boys *n* and %age of Total	Girls *n* and %age of Total
5	12.91% (*n* = 2,219)	6.34% (*n* = 1,044)
4	23.78% (*n* = 4,087)	19.08% (*n* = 3,141)
3	21.96% (*n* = 3,774)	23.00% (*n* = 3,786)
2	18.75% (*n* = 3,223)	22.36% (*n* = 3,680)
1	22.60% (*n* = 3,884)	29.22% (*n* = 4,811)

Focused on in the fourth research question was the relationship between gender and student performance for the 2005 AP Calculus AB exam and yielded a statistically significant result, $\chi^2(4) = 1893.30$, $p < .001$. The effect size for this result, Cramer's V, was small, .10 (Cohen, 1988). Present in Table 4, 23.13% of boys earned the highest score, compared with 17.08% of girls. For those students who did not achieve a passing score, 43.79% of boys were in this category compared to 47.33% of girls.

Table 4 Frequencies and Percentages of 2005 AP Calculus AB Scores by Gender

AP Exam Scores	Boys *n* and %age of Total	Girls *n* and %age of Total
5	23.13% (*n* = 21,752)	17.08% (*n* = 14,967)
4	20.68% (*n* = 19,445)	18.00% (*n* = 15,773)
3	17.84% (*n* = 16,781)	17.17% (*n* = 15,045)
2	16.07% (*n* = 15,117)	18.67% (*n* = 16,354)
1	22.28% (*n* = 20,955)	28.66% (*n* = 25,112)

Examined in the fifth research question was the relationship between gender and student performance on the 2005 Calculus BC test. The result was statistically significant, $\chi^2(4) = 604.78$, $p < .001$. The effect size for this result, Cramer's V, was small, 0.11 (Cohen, 1988). Whereas 47.62% of boys were awarded the highest score, only 37.83% of the girls were in this category. A higher percentage of boys (83.26%) earned a passing score (i.e., 3 or higher) than girls (67.14%). Table 5 depicts the percentages and frequencies for the 2005 Calculus BC test scores.

Table 5 Frequencies and Percentages of 2005 AP Calculus BC Scores by Gender

AP Exam Scores	Boys *n* and %age of Total	Girls *n* and %age of Total
5	47.62% (*n* = 15,047)	37.83% (*n* = 8,231)
4	16.83% (*n* = 5,319)	17.28% (*n* = 3,759)
3	18.81% (*n* = 5,942)	22.04% (*n* = 4,796)
2	6.06% (*n* = 1,916)	7.98% (*n* = 1,736)
1	10.68% (*n* = 3,373)	14.88% (*n* = 3,238)

As for the 2005 Statistics exam, the chi-square test indicated a statistically significant result, $\chi^2(4) = 1162.20$, $p < .001$. The effect size for this result, Cramer's V, was small, .12 (Cohen, 1988). As shown in Table 6, 9.55% of girls earned the highest score, compared with 15.46% of boys. For those students who did not achieve a passing score, 34.52% of boys were in this category compared to 44.25% of girls.

Table 6 Frequencies and Percentages of 2005 AP Statistics Scores by Gender

AP Exam Score	Boys *n* and %age of Total	Girls *n* and %age of Total
5	15.46% (*n* = 5,788)	9.55% (*n* = 3,651)
4	24.98% (*n* = 9,348)	20.63% (*n* = 7,891)
3	25.04% (*n* = 9,373)	25.57% (*n* = 9,779)
2	17.35% (*n* = 6,492)	21.10% (*n* = 8,067)
1	17.17% (*n* = 6,427)	23.15% (*n* = 8,852)

For the seventh research question, in which the relationship between gender and student performance for the 2010 AP Calculus AB was analyzed, the chi-square test yielded a statistically significant result, $\chi^2(4) = 3563.00$, $p < .001$. The effect size for this result, Cramer's V, was small, .12 (Cohen, 1988). As documented in Table 7, 16.18% of girls earned the highest score, compared with 24.81% of boys. For those students who did not achieve a passing score, 40.23% of boys were in this category compared to 49.88% of girls.

Table 7 Frequencies and Percentages of 2010 AP Calculus AB Scores by Gender

AP Exam Scores	Boys *n* and %age of Total	Girls *n* and %age of Total
5	24.81% (*n* = 30,145)	16.18% (*n* = 18,607)
4	17.26% (*n* = 20,971)	15.45% (*n* = 17,765)
3	17.70% (*n* = 21,512)	18.49% (*n* = 21,264)
2	10.62% (*n* = 12,906)	12.07% (*n* = 13,875)
1	29.61% (*n* = 35,979)	37.81% (*n* = 43,478)

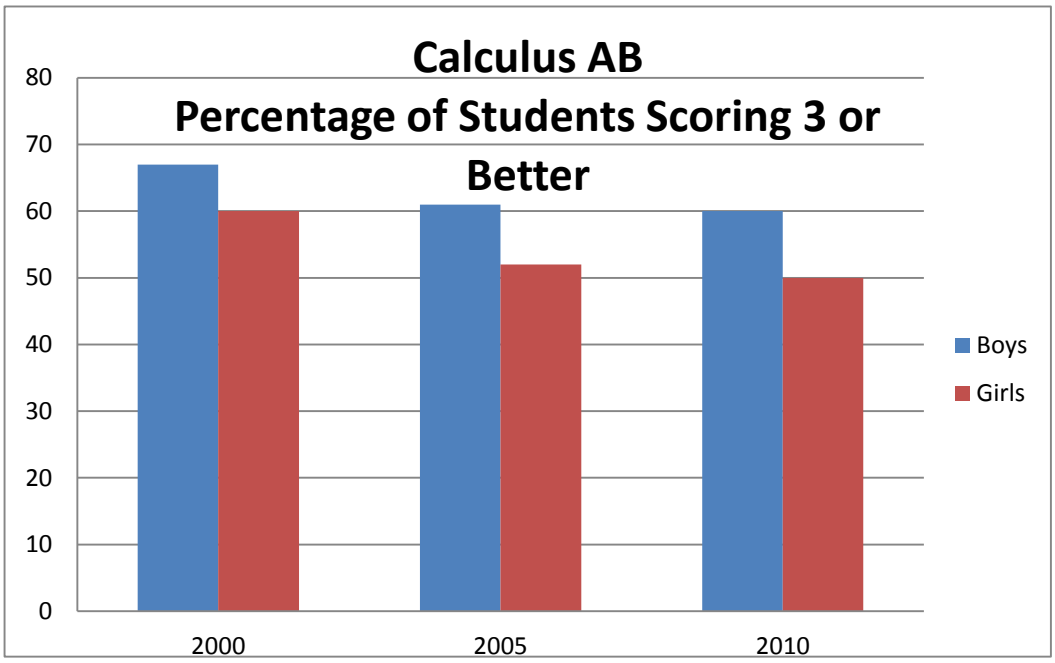

Figure 1. Percent of boys and girls earning a 3 or better on the AP Calculus AB exam for the 2000, 2005, and 2010 exam administrations

Focused upon in the eighth research question was the relationship between gender and student performance on the 2010 Calculus BC test. The result was statistically significant, $\chi^2(4) = 1099.80$, $p < .001$. The effect size for this result, Cramer's V, was small, 0.12 (Cohen, 1988). Whereas 53.36% of boys were awarded the highest score, only 41.86% of the girls were in this category. A higher percentage of boys (84.85%) earned a passing score (i.e., 3 or higher) than girls (79.28%). Table 8 depicts the percentages and frequencies for the 2010 Calculus BC test scores.

Table 8 Frequencies and Percentages of 2010 AP Calculus BC Scores by Gender

AP Exam Scores	Boys *n* and %age of Total	Girls *n* and %age of Total
5	53.36% (*n* = 23,808)	41.86% (*n* = 12,767)
4	14.85% (*n* = 6,627)	16.64% (*n* = 5,076)
3	16.64% (*n* = 7,423)	20.78% (*n* = 6,337)
2	5.48% (*n* = 2,446)	6.56% (*n* = 2,001)
1	9.68% (*n* = 4,317)	14.53% (*n* = 4,431)

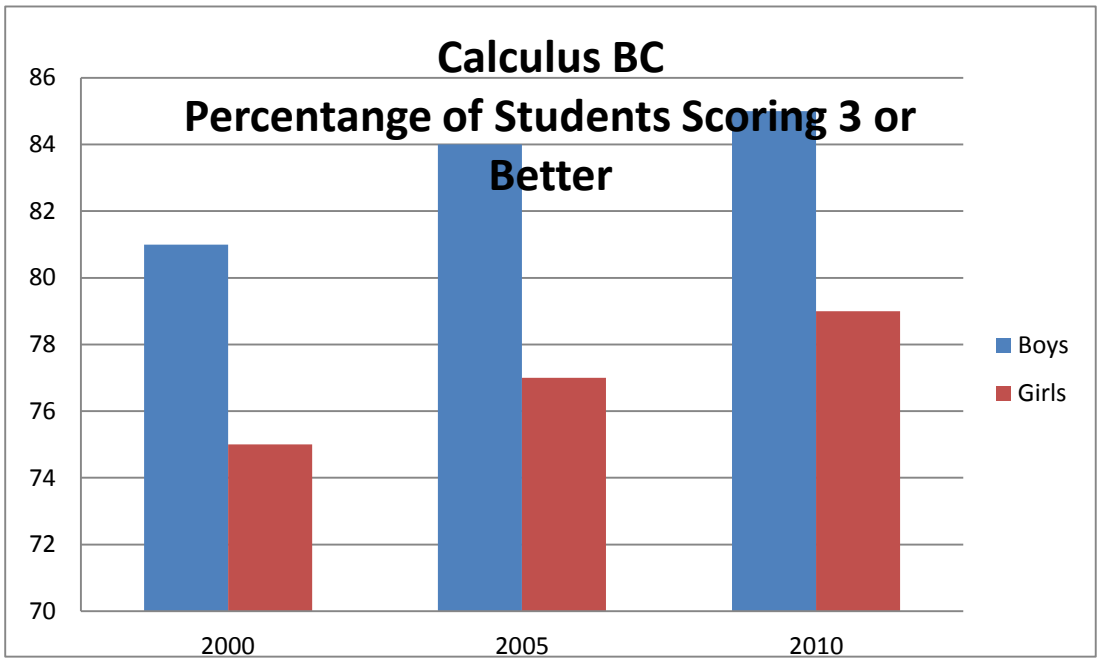

Figure 2. Percent of boys and girls earning a 3 or better on the AP Calculus BC exam for the 2000, 2005, and 2010 exam administrations

The chi-square test for the gender differences for the 2010 Statistics exam indicated a statistically significant result, $\chi^2(4) = 1992.90$, $p < .001$. The effect size for this result, Cramer's V, was small, .12 (Cohen, 1988). Present in Table 9, 9.36% of girls earned the highest score, compared with 15.68% of boys. For those students who did not achieve a passing score, 36.95% of boys were in this category compared to 46.20% of girls. Readers are provided with three figures that depict the relationship of gender with AP exam performance across the three years of data analyzed.

Table 9 Frequencies and Percentages of 2010 AP Statistics Scores by Gender

AP Exam Score	Boys *n* and %age of Total	Girls *n* and %age of Total
5	15.68% (*n* = 9,846)	9.36% (*n* = 6,010)
4	24.48% (*n* = 15,371)	20.31% (*n* = 13,038)
3	22.89% (*n* = 14,367)	24.14% (*n* = 15,496)
2	16.92% (*n* = 10,619)	19.64% (*n* = 12,609)
1	20.03% (*n* = 12,576)	26.56% (*n* = 17,051)

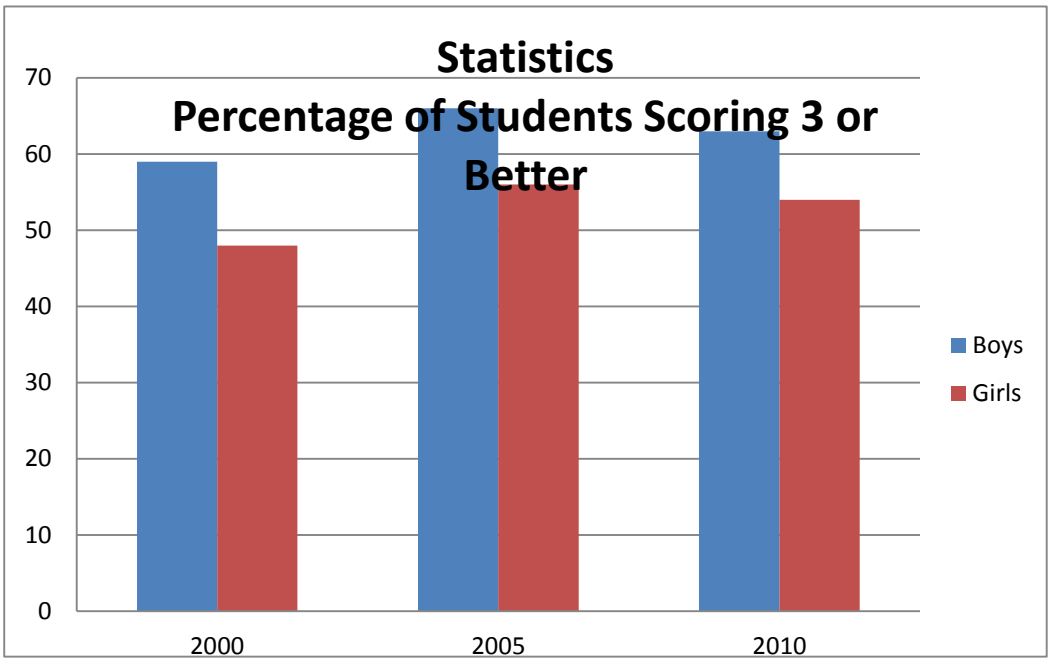

Figure 3. Percent of boys and girls earning a 3 or better on the AP Statistics exam for the 2000, 2005, and 2010 exam administrations

Considering the Calculus AB test for the three years of data analyzed, the percentage of girls earning the lowest score increased from 19.05% in 2000 to 38.81% in 2010. The percentage of boys earning the lowest score showed a similar trend, increasing from 14.25% in 2000 to 29.61% in 2010. The reasons for this increase were not examined in this study, but may be partially explained by the attempt by the College Board to increase the number of students taking AP classes and exams. Whereas AP exams were once viewed as reserved for the more advanced students, the College Board has worked with schools over the last decade to broaden the scope of AP to include all students who are motivated to attempt the course (College Board, 2010a).

The percentage of both boys and girls earning the lowest score on the Calculus BC exam remained stable over the same time period and the percentages for the lowest scores for boys and girls on the Statistics exam decreased over the 10-year period. As documented in Figure 2, the largest difference in the percentage of boys and girls earning a score of 3 or better was on the Calculus BC test. Indicated in the bar graphs were that a larger percentage of boys earned a score of 3 or better on all tests for all years than the percentage of girls who earned a score of 3 or better. These results differed from many of the studies discussed previously (e.g., Else-Quest, Hyde, and Linn, 2010; Fennema, 1974; Hyde, Fennema, and Lamon, 1990) in which little, if any, difference was present between the performance of boys and girls on mathematical tests. However, Moore and Slate (2008) reported similar results

in their study of AP performance and enrollment in Texas, indicating that a higher percentage of boys scored a 3 or better than the percentage of girls who scored a 3 or better. Although the effect sizes for all tests were small, the number of students impacted and the pattern that developed indicated the need for further study into gender differences on the AP math tests.

CONCLUSIONS AND RECOMMENDATIONS

The focus of this study was the relationship between gender and performance on the AP math exams for the years 2000, 2005, and 2010. The number of students taking each exam increased each year, with more students taking Calculus AB than the other two exams. More boys took Calculus BC exams than did girls. Although the number of students taking the Calculus BC and Statistics exams was similar in 2000, the number of students taking Statistics exams increased more rapidly than the number of students taking Calculus BC exams.

No attempt was made to determine the reasons for the gender differences on AP math exams in this study. Important questions remain that need to be addressed in future research studies: (a) What social or cultural influences impact student performance on these tests? and (b) Furthermore, few multiyear studies have been conducted to determine the relationship between gender and performance on AP exams. As such, little information is known about the effect of gender on the performance on AP exams. Results from this study and other studies could be used to inform practice and make curriculum decisions regarding AP courses. Educational leaders must insure that learning is occurring in AP classrooms based on student performance on AP exams (Van Tassel-Baska, 2001). School leaders may benefit from an analysis of gender differences and performance on math AP exams as the AP program continues to grow. Given the importance of providing students with a high quality education, more research is needed to determine if programs such as AP are the best method of educating all students.

Modern expectancy-value theory was used to understand the manner in which gender might affect performance on AP math exams. The application of this theory suggests that girls might have different expectations of success on mathematical tasks than boys and therefore be less motivated to succeed at such tasks. The results from this study indicate that statistically significant differences were present between boys and girls. During the years of data analyzed, boys outperformed girls on all three AP tests. Thus, it is possible that because boys expect to be more successful on mathematical tasks, they are more motivated and achieve higher scores on the AP tests than girls. These hypotheses merit further examination.

Lest readers overgeneralize from the findings of this study, several caveats are in order. First, this study is limited to students in the United States who completed AP exams. Second, only students who completed AP exams were included in this study. As such, these results may not be generalizable to all students in high schools. Third, because students enrolled in AP courses are not required to take the AP exam, the sample of students taking the AP exam is self-selected and may not be representative of all students. Thus, our results may not be generalizable to students who enroll in AP courses. Finally, the issue of differential attrition may also be a threat to validity, because not all students may complete the AP courses at the same rate. Therefore, readers are urged to exercise caution when generalizing the results of this study.

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2000'DEN 2010'A İLERİ MATEMATİK YERLEŞTİRME SONUÇLARI: CİNSİYET HALA ÖNEMLİ Mİ?

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Genişletilmiş Özet

Problem: Bu çalışmanın amacı üç gelişmiş matematik yerleştirme sınavında (yani, AB Matematik, Matematik M.Ö. ve İstatistik) öğrenci performansının cinsiyete ne ölçüde bağlı olduğunu zamana göre saptamaktır. Modern Beklenti-Değer Teorisi erkeklerin kızlara göre akademik başarı ya da başarısızlık için farklı beklentiler geliştirebileceğini ve bu nedenle matematiksel görevlerde başarılı olmak için daha fazla motive olabileceklerini ileri sürmektedir. Geleneksel bilgilere göre erkekler kızlara göre matematikte daha başarılıdır fakat bu fikrin doğru olmayabileceğini ortaya koyan araştırmalar da mevcuttur.

Yöntem: Bir nicel ve nedensel-karşılaştırmalı araştırma tasarımı, ABD'deki "College Board Advanced Placement" verilerindeki, Mayıs 2000, Mayıs 2005 ve Mayıs 2010 uygulamalarındaki istatistiklere göre gerçekleştirildi. Bu sınavlardaki veriler içinden özellikle, AP (İleri Yerleştirme Sınavı) sınavlarını Calculus AB, Calculus BC olarak tamamlayan tüm öğrenciler analize dâhil edildi. Veriler College Board Web sitesinden bir Excel dosyasına yüklendi ve Pearson Ki Kare istatistiksel yöntemi kullanılarak analiz edildi. AP sınavlarındaki puanlar College Board tarafından 5, 4, 3, 2 veya 1 puan alan öğrencilerin sayısı ve yüzdeleriyle sağlandı. Bazı veriler cinsiyet ve etnik mensubiyet için ayrı ayrı raporlandı.

Bulgular: Üç AP matematik sınavında (Yani calculus AB, Calculus BC ve İstatistik) ve üç dönemdeki her bir sınavda (2000, 2005 ve 2010) test uygulamalarında performanslarının kız ve erkek olmalarına bağlı olarak farklılaştığı ortaya çıktı. İstatistiksel olarak, her durumda (yıllara ve puanlara göre) erkeklerin kızlardan daha yüksek AP puanları aldığı görüldü. Kızların girdiğinden daha fazla erkeğin Calculus BC sınavlarına girdiği ve Calculus BC ve İstatistik sınavlarına giren kız ve erkek öğrencilerin sayısının 2000 yılında yakın olmasına rağmen, istatistik sınavlarını alan erkek öğrencilerin sayısı Calculus BC sınavlarını alan kız öğrencilerin sayısından daha hızlı bir şekilde arttı.

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Öneriler: Neden kızların daha az başarılı olduğuna dönük çalışmalar yapılabilir. Bu çalışmada cinsiyet üzerine AP matematik sınavlarındaki farklılıkların nedenlerini belirlemek için hiçbir girişimde bulunulmadı. Gelecekteki araştırmalar içinde ele alınması gereken önemli bir sorular vardır:(a) matematik derslerinde kız ve erkekler için farklı öğretmen beklentileri var mıdır?;(b) hangi sosyal ya da kültürel etkenler bu testlerde öğrenci performansını etkiler?; ve(c) öğretmenler için hangi profesyonel gelişime ihtiyaç vardır? Ayrıca, cinsiyet ve AP sınavları performans arasındaki ilişkiyi belirlemek için birkaç tüm yıl devam edecek çalışmalar da yapılabilir.

Anahtar kelimeler: Sınav, İleri yerleştirme sınavı, cinsiyet, öğrenci başarısı