

MEASURING THE IMPACT OF ADVANCED PLACEMENT FAILURE ON STUDENTS'  
ACADEMIC ACHIEVEMENT AND RETENTION IN COLLEGE

---

A Dissertation

Submitted to

The Temple University Graduate Board

---

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

---

by

Wendy Kutchner

May, 2012

Sponsoring Committee Members:

Chair-        Dr. Joseph DuCette  
                  Dr. Joan Shapiro  
                  Dr. Steven Gross  
                  Dr. James Davis  
                  Dr. Janice Laurence

## **ABSTRACT**

Measuring the Impact of Advanced Placement Failure on Student's Academic Achievement and Retention in College

Wendy Kutchner

Doctor of Education

Temple University, 2012

Joseph DuCette, Ph.D.

This quantitative study examined the impact that Advanced Placement (AP) coursework had on students attending college with specific emphasis on those who failed the exam. The study comprised four years of entering freshmen students between the academic years 2006-2009. The study was comprehensive in that it revealed all AP attempts regardless of score and student's desire to submit results to Temple University and the universities' acceptance of the same for college credit. For consistency, college success was determined based on data in the first two academic years of study. Students' grade point average (GPA) and retention were analyzed as the two primary assessments defining college access.

The sample consisted of 16,731 students over four years of entering first-time freshmen to Temple University. The results indicated that AP score had a significant effect on both GPA and retention, although the effects for GPA were much stronger than for retention. Essentially, the results showed that the GPA of students decreases linearly from those who obtained an average AP score of "5", through "4", "3" and "2". Students whose average AP score was "1", however, performed at a lower level than students who had taken no AP course at all. Moreover, when various pre-college factors (specifically, SAT scores, high school GPA, mothers' and fathers' educational level and family income) were used as covariates, the effect for AP performance was markedly reduced. As such, it became evident that the real issue in evaluating

the impact of AP performance is not whether students who take and pass AP courses do better in college. The real issue is whether AP performance provides an advantage over and above the advantages that students already possess. This study also revealed a threshold at which AP exposure correlated to college success when studying the AP failures with a score of '1'. The study findings contribute to emerging literature examining the relationship that AP failures have on students and colleges.

## ACKNOWLEDGMENTS

I would like to extend a heartfelt thank you to my educational and personal support system. It would have been extremely difficult to complete this journey without those two support systems and ongoing encouragement.

Thank you to the members of my dissertation committee: Dr. Joseph DuCette, Dr. Joan Shapiro, Dr. Steven Gross, Dr. James Earl Davis, and Dr. Janice Laurence. Your support, critical analysis, and passion for to educate made this an enjoyable yet academically demanding dissertation process. I am especially grateful to Dr. DuCette for all of his time, guidance, and ability to challenge me to find new and insightful ways to review my research. In addition, I am ever thankful for Dr. Shapiro's mentorship and strong words of encouragement throughout the program.

Pete, Rachel, and Nicholas, thank you for everything. Your ongoing support and reminders of how proud you are of me were always comforting. I am forever grateful for the love and support that my family and friends provided me throughout this process.

## TABLE OF CONTENTS

<b>ABSTRACT</b> .....	ii
<b>ACKNOWLEDGEMENTS</b> .....	iv
<b>LIST OF FIGURES</b> .....	viii
<b>LIST OF TABLES</b> .....	ix
 <b>CHAPTER 1</b>	
<b>STATEMENT OF THE PROBLEM</b> .....	1
Study Significance .....	6
Research Questions.....	8
Definitions of Terms .....	10
Delimitations and Limitations.....	13
 <b>CHAPTER 2</b>	
<b>LITERATURE REVIEW</b> .....	14
What is Advanced Placement and how is it used?	
High School Setting .....	15
College Admissions Process .....	19
Economic Factors that Influence Higher Education .....	21
Race and the Influence of Standardized Tests .....	23
Increased Demand for Social Justice in Higher Education.....	28
Financial Pressure to Expand AP Programs .....	29
Core Issue: How do AP courses actually affect college success? .....	31
Social Justice as it Relates to the AP Program .....	35

The Williams’ Study .....	41
Contribution of my Study .....	43
<b>CHAPTER 3</b>	
<b>METHODOLOGY .....</b>	<b>44</b>
Population and Sample .....	44
Data Collection Procedures.....	53
Ethical Issues .....	54
<b>CHAPTER 4</b>	
<b>RESULTS .....</b>	<b>55</b>
Analyses Relevant to the Major Research Questions .....	55
Major Research Question #1 .....	56
Major Research Question #2.....	63
Secondary Analyses .....	69
Summary .....	78
<b>CHAPTER 5</b>	
<b>DISCUSSION AND IMPLICATIONS .....</b>	<b>80</b>
Summary of Study Results:	
Major Research Question #1 .....	80
Major Research Question #2.....	83
Implications for Practice in High Schools .....	84
Implications for Practice in Colleges .....	87
Limitations .....	90

Future Research .....	91
Future High School Research .....	92
Future College Research.....	94
Future Policy Research .....	95
Study Conclusion.....	98
<b>REFERENCES CITED .....</b>	<b>99</b>

**APPENDIX**

<b>A DISTRIBUTION OF AP STATE SUPPORT .....</b>	<b>113</b>
<b>B AP PARTICIPATION FOR UNDERSERVED STUDENT GROUPS.....</b>	<b>115</b>
<b>C DISTRIBUTION OF BLACK/AFRICAN AMERICAN .....</b>	<b>117</b>
<b>D DISTRIBUTION OF HISPANIC &amp; AMERICAN INDIAN.....</b>	<b>119</b>
<b>E NEW STUDENT QUESTIONNAIRE SAMPLE.....</b>	<b>121</b>

## LIST OF FIGURES

Figure 1:	Retention as a Function of AP Group .....	5
Figure 2:	GPA's for AP and Non-AP Students .....	41
Figure 3:	Retention for AP and Non-AP Students .....	42
Figure 4.1:	GPA's by AP Group across the First Four Semesters at Temple .....	56
Figure 4.2:	GPA's for the AP Groups Across Semesters with SATs, GPA's, Family Income, and Parental Education Removed .....	58
Figure 4.3:	Retention Across Semesters by AP .....	60
Figure 4.4:	Retention Across Semesters by AP Group with SATs, High School GPA, and Background Variables Covaried .....	62

## LIST OF TABLES

Table 3.1:	Gender and Ethnicity by Admission Year .....	43
Table 3.2:	Father’s and Mother’s Education by Admission Year .....	43
Table 3.3:	Ethnic Distribution for Study Data Set at Temple University Compared to High School Graduates Taking the AP Exam From the State of Pennsylvania in 2009.....	44
Table 3.4:	SATs, High School GPA, and Financial Aid by Admission Year .....	44
Table 3.5:	Financial Aid Application by Admission Year .....	45
Table 3.6:	Students Removed from College Success Analysis.....	48
Table 3.7:	AP Test Performance Data by Admission Year .....	48
Table 4.1:	Means and Standard Deviations of GPA by AP Group .....	53
Table 4.2:	Retention by AP Group .....	57
Table 4.3:	Demographic Data (By Average AP Score) .....	62
Table 4.4:	Demographic Data (By No AP Versus Some AP) .....	65
Table 4.5:	AP Group Distribution by High School Attended .....	67
Table 4.6:	Means for NSQ Motivational Questions by AP Group .....	69
Table 4.7:	Step-wise Multiple Regression on Cumulative GPA .....	70
Table 4.8:	Comparison of Students With “1” Versus All Others on SATs and High School GPA .....	71
Table 4.9:	SATs and GPAs by Students With “1” Versus All Others with AP.....	72
Table 4.10:	Percent of Each Ethnic Group Obtaining a “1” (Using All Students) .....	72
Table 4.11:	Percent of each Ethnic Group Obtaining a “1” (Using Only Students With AP) .....	73
Table 4.12:	Motivational Variables .....	74
Table 4.13:	Percentages of Students Graduating in Six Years by AP Group .....	75

## CHAPTER 1

### STATEMENT OF THE PROBLEM

Since the inception of the Advanced Placement (AP) program in the 1950's, there has always been an interest from academically elite high school students with high academic aspirations to take the exam (College Board, "Fact Sheet"; Elwell, 1967). The program was created due to the influx of students taking advantage of the GI Bill and the Veterans' Readjustment Assistance Act that encouraged talented students to move through higher education at a faster pace and to help these students save money on educational costs (Lacy, 2007). In 1955 there were 104 high schools and 1,229 students taking the exam; 104 colleges were engaged in the AP acceptance process with 2,199 exams processed during that year (Elwell, 1967). In 2010, these numbers had grown to 12,705 public high schools, 853,314 students taking the exam, 3,213,225 exams processed, and 3,855 colleges engaged in the acceptance process (College Board, 2011b). The College Board on its home website reports that "in 2011 there were 3.4 million exams taken by nearly 2 million students at over 18,000 high schools". This increase in participation in the AP program reflects a significant increase in student motivation and matriculation into college (Howe & Strauss, 2007). The influx of AP participants can furthermore be contributed to increased federal and local financial resources distributed to secondary educational environments (College Board, 2010).

Over the past decade, the AP credit phenomenon has gained national recognition as it has become another assessment tool to measure educational outcomes and excellence at the secondary level. Such new means of measuring success are influential as competition to college admission is taking on new characteristics in higher education as enrollment increases (Zemsky,

Wegner, & Massey, 2005). Selective admissions matters more because those criteria are the gateway to higher status institutions, which in turn opens doors to white-collar occupations. Historically, institutions with selective admission practices have traditionally utilized standardized test scores in general, and the SAT in particular, to assist in their admission decisions (Soares, 2012). Bowen and Bok (1998) estimated that out of the more than 2,700 four-year bachelor degree colleges in the United States, “about 20 to 30 percent are in the selective category” (p.15).

Expanded access to the AP program has become part of the national educational reform movement and was heavily endorsed by the U.S. secretary of education, Arne Duncan, at the July 2010 AP Annual conference in Washington, D.C. Using performance on AP tests to define academic rigor appeals to politicians for concerns such as: educational curriculum alignment between the secondary and post-secondary institutions; a means to clarify and simplify the admissions process to encourage more first-generation students to apply to college; and increased access to college for minority and lower economic status students (College Board:2009a). As educational reform looks to increase a college-ready pathway to degree attainment, many governmental and non-governmental agencies are recommending the expansion of more AP courses for students in the high school setting under the reasonable, but largely unproven, assumption that AP courses facilitate college success.

The College Board is the non-profit organization that generates and administers the AP exams, and that oversees the scoring of the exams. Exams are scored by content experts who are recruited by the College Board from high schools and universities across the country. These

experts grade the exams using rubrics provided by the College Board and assign each exam a score from “1” to “5”, where scores of “3” and above are considered passing. There are currently 34 areas covered by the AP exam, ranging from the traditional subjects such as American History and Calculus, to subjects such as Chinese, Art History, and Psychology.

Among the assertions of the College Board is the following:

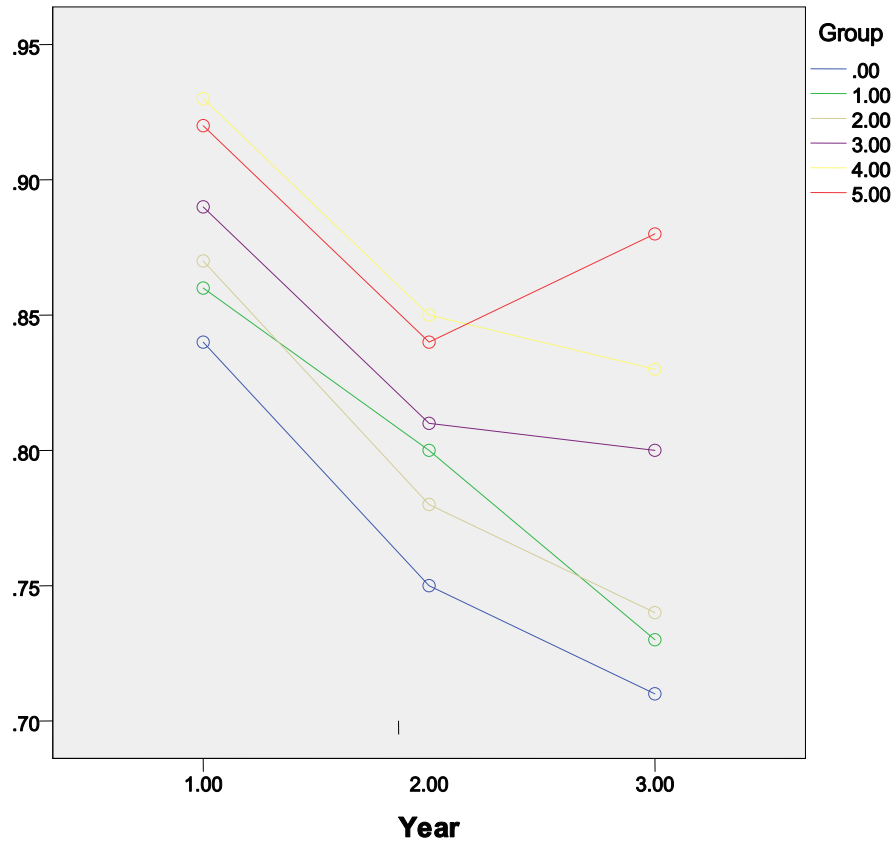
Performing well on an AP Exam means more than just mastering the material in a particular subject: it is a pathway to success in college. Research consistently shows that students who score a “3” or higher on AP Exams typically experience greater academic success in college and are more likely to graduate on time than otherwise comparable non-AP peers. (College Board, 2011a)

Although the College Board has consistently maintained that taking and passing the AP exam is beneficial to the student, the research supporting this claim is not as compelling as the College Board would have the public believe. While there are published studies that assert that students who obtain a score of “3” or above on AP exams have better retention and obtain higher GPAs in college, a careful review of these studies shows that many of these claims are based more on testimonials than on hard data. Even more problematic is the claim made by the College Board that students who take AP courses in high school, even if they do not pass the AP exam (that is, they receive a score of “1” or “2”), demonstrate better performance in college simply by having participated in the AP experience. There is essentially no research that could be found that supports this claim. Thus, the benefit of the AP experience, both for those who successfully pass the AP exam and for those who participate but do not pass the exam, is somewhat questionable.

The current study used as its starting point a previous dissertation conducted at the institution where the current study was performed (Williams, 2009). Williams compared four

groups of students on retention and GPA: students who obtained AP credit; students who obtained Dual Enrollment credit; students who had both AP and Dual Enrollment credit; and students who had neither AP nor Dual Enrollment credit. The finding that is most relevant to the current study was that no benefit was found for students who obtained AP credit. Specifically, Williams found that students who obtained AP credit did not demonstrate higher GPAs or obtain better retention rates than students who did not obtain AP credit. That study, however, did not disaggregate the AP group according to their actual scores, nor did that study look at students who had taken AP courses but who did not pass the test.

One of the major purposes of this study is to expand and elaborate the research conducted by Williams. An example of how this can increase understanding of the impact of the AP experience is demonstrated in Figure 1. The data portrayed in Figure 1 present the retention rate of students in one of the cohort years (2006) that was investigated in the present study. The data demonstrate retention across the first three years of college attendance by AP score performance. Data are also presented for students who did not take any AP course in high school.



**Figure 1: Retention as a Function of AP Group**

As demonstrated in Figure 1, students who obtained a score of “3”, “4” or “5” on the AP exam have higher retention rates across all semesters as compared to students who obtained a score of “1” or “2”. Interestingly, students who obtained the two lowest scores were retained at a somewhat higher rate than students who did not take any AP exam. As such, these data help to clarify and expand the Williams’ data by disaggregating the AP and non-AP groups. It is also

evident from Figure 1 that that these data do not replicate Williams' results, since the combined "3", "4" and "5" groups are retained at a higher level than the combined "0", "1" and "2" groups (which is the comparison that Williams made).

The research presented in this dissertation expanded the sample to Temple University entering classes of 2006, 2007, 2008, and 2009. In addition, raw test scores ranging from 1 – 5 along with the exam discipline provided an in-depth analysis of the impact of AP performance on first year academic data at Temple University. Multi-level disaggregation provided a framework to fully analyze the impact of participating in the AP educational environment prior to college and its effect on college performance and retention. Given the complexity and lack of standardization with Dual Enrollment programs, this research specifically focused only on AP credit. Specific attention was placed on students at the low end of the AP experience scoring "1" or "2" in an effort to evaluate the College Board's assertion that participation in AP courses, even unsuccessfully, has a positive effect in college.

### **Study Significance**

Success in post-secondary institutions is most often numerically determined by grade point average and graduation rates. To measure these outputs, this research assessed persistence and performance by studying the first four semesters of attendance at Temple University: (1) by

subsequent academically completed semesters for first-time, full-time freshmen students; and, (2) by student grade point average. Motivation factors were incorporated into the study by utilizing the institution's New Student Questionnaire survey results.

The level to which a student engages with different components of a college or university plays a critical role in cognitive and affective development (Kuh, Douglas, Lund, & Ramin-Gyurnek, 1994). The collegiate experiences shape the extent to which a student successfully adjusts to college (e.g., Cabrera, Nora, & Castaneda, 1992; Nora, Cabrera, Hagedorn, & Pascarella, 1996; Pascarella & Terenzini, 1990). Institutions of higher education spend a substantial amount of resources to address these concerns and increase student retention through a variety of academic and social settings. No two students enter college with the same preparation and the majority of students who leave college do so during the first year (Pascarella & Terenzini, 2005; Plucker, Chien, & Zaman, 2006; Tinto, 1987). Adjustment to a college culture and academic preparation are paramount elements for college success. The K-12 educational scaffolding experience varies between school districts which in turn influences student motivation and success. There are those who argue that the influx of AP resources throughout the nation's high school environment has created a unique opportunity to impose standardized measurements as well as increase access to college rigor regardless of district resources. One of the reasons for this research is to attempt to ascertain if this belief has merit.

## Research Questions

There are two major research questions that are answered in this dissertation. Each of these questions will expand and elaborate the previously studied AP research from Temple University that was conducted by Williams.

Question 1: Does a student's experience with and performance in AP courses affect the student's first year retention and GPA?

Several specific sub-questions will be tested within the framework of this larger question.

Among these are the following:

- (a) Do students who take AP courses in high school but fail the AP exam (that is, obtain a score of "1" or "2") perform better than students who do not take AP courses in high school?
- (b) Do students who take and pass AP courses in high school (that is, obtain a score of "3", "4" or "5") perform better than students who take but do not pass the AP exam?
- (c) Within the passing and failing groups in terms of AP performance, does the level of exam performance affect retention and GPA? Specifically, do students who obtain a score of "2" perform better and stay longer than students who obtain a score of "1", and do students who obtain "4" and "5" perform better and stay longer than students who obtain a score of "3"?

Question 2: Are there any characteristic differences between students who take AP courses in high school versus those who do not take AP courses?

- (a) Are students who take AP courses demographically different than students who do not take AP courses? The demographic variables include gender, ethnicity, age, type of high school and family income.
- (b) Are students who take AP courses motivationally different than students who do not take AP courses? The motivational variables will be driven from Temple's New Student Questionnaire.

### **Definition of Terms**

*Advanced Placement (AP) Program* - Advanced placement is a college-level curricular program administered to high school level students. Coursework is taught by high school faculty following curricula guidelines developed by the College Board organization in coordination with secondary and post-secondary educators.

*Advanced Placement (AP) Course/Discipline* - AP coursework can be taken in high school or via a home school program. The style of education focuses on intense discussions, collaborative problem solving, and learning to write clearly and persuasively. As of 2012, there are 34 course topics:

Art History, Biology, Calculus AB & BC, Chemistry, Chinese Lang & Culture, Computer Science A, Macroeconomics, Microeconomics, English Language, English Literature, Environmental Science, European History, French Lang & Culture, German Lang & Culture, Comp Gov & Politics, U.S. Gov & Politics, Human Geography, Italian Lang & Culture, Japanese Lang & Culture, Latin: Vergil, Music Theory, Physics B & C, Spanish Language, Spanish Literature, Statistics, Studio Art, U.S. History, World History

According to the College Board's website: "AP courses can help you acquire the skills and habits you'll need to be successful in college. Lessons focus on improving writing skills, sharpen problem-solving abilities, and developing time management skills, discipline, and study habits".

*AP Exam* - Students must complete AP coursework in order to register for an AP exam. Exams are proctored and administered at local schools. As of 2012, each exam fee is \$87 which is due during the spring semester. Exams are given at the close of the school year in May and June. Score results are released to students and colleges in mid-July.

*AP Credit* – Colleges and universities in the United States and in more than 60 other countries give students college credit, advanced placement or both on the basis of a passed AP Exam score of 3, 4 or 5 as determined by the individual college. By entering college with AP credits, some students are also moved into upper level courses.

*AP Teacher* - School districts are responsible to set the criteria for a teacher to be eligible to be an AP instructor. Teaching experience varies among school districts as does teacher resources and compensation. The College Board recommends that teachers have a background in the AP subject and attend AP teacher training through their organization.

*AP Classroom* – AP coursework is taught in the high school or through home schooling. The College Board recommends that high school class size have 20 or fewer students. Smaller classrooms maximize time spent on rigorous coursework and complex materials. Additional

resources may be required for coursework (books, technology, etc.) which should be covered by the operational budget of the school district.

*AP Admission/Entrance for High School Students* - Entrance into AP coursework is determined by the individual school district. College Board research published in 1998 and 2006 shows strong correlations between students' PSAT/NMSQT scores and AP Exam results. These studies show that PSAT/NMSQT scores are strong predictors of students' AP Exam scores, and when used in conjunction with the more traditional signposts such as high school grades, grades in previous same-discipline course work, and the number of same-discipline courses a student has taken, can serve to provide reliable guidance in identifying additional students who may be ready for the rigor of AP.

*International Baccalaureate (IB)* - Specific coursework taken during the high school years which are standardized for internationally acceptable university admissions qualification suitable for the growing mobile population of young people whose parents were part of the world of diplomacy, international and multi-national organizations. Commonly referred to advanced course work or high-academic rigor.

*SAT Exam* - The SAT (Scholastic Aptitude Test) is a standardized exam created by the College Board that is globally recognized as a college admission test that informs colleges what a student knows and how well he or she can apply that knowledge. The exam tests knowledge of reading, writing and math — subjects that are taught every day in high school classrooms. Most students

take the SAT during their junior or senior year of high school, and almost all colleges and universities use the SAT to make admission decisions.

### **Delimitations and Limitations**

This study has boundaries worth noting. The research will focus on a sample set of data collected from one post secondary institution. The population of students being studied will include first time freshmen entering the University during the 2006, 2007, 2008, and 2009 academic year. These years were determined based on available data and recent cultural changes for AP programs in high schools. The academic performance of these students was measured until the conclusion of the fall semester in 2010, thus permitting a four year time frame to track success through a traditional four year education for the 2006 cohort. Students in the remaining academic years had three, two, and one year of academic data to be measured. These data do not study the impact AP failures have on students who did not seek enrollment at Temple University nor do they study those who choose not to enter college after high school. Research results used in the literature review focused on AP exam success as there is limited public access to AP failures. The aforementioned variables would provide a solid base for future research.

AP exam success was standardized in the study to include a score of “3” or higher. This is important to mention since AP acceptance scores vary based on subject matter from institution to institution. Furthermore, this study will categorize a passing score as “3”, “4”, and “5” which do not correlate to all acceptance and or passing standards throughout the various academic programs at Temple University.

## **CHAPTER 2**

### **LITERATURE REVIEW**

The literature review provides in-depth analysis of Advanced Placement utilization and functionality in higher education by examining the relevant areas of research and recent incentives associated with the educational reform for AP programs in the high school educational system. Social justice is the primary field in which the assessment is examined with significant emphasis on access, race, social-economic status and college retention. The first section introduces the facets of Advanced Placement and how that program relates to processes within high school and college environments. The second section introduces the financial costs associated with college for the student and society. Minority obstacles with the AP program will be discussed next with specific emphasis on standardized testing. Social Justice is the theoretical lens that will be used to analyze the influence that the AP Program has from an equity and resource perspective. The literature will deconstruct increased demands for accountability from society as it relates to the AP program notwithstanding student outcomes. The core issue will continue the theme of Social Justice with a focus on AP influence during the college years. The literature review will conclude with the prior Temple University study that served as a springboard to this study.

#### **What is Advanced Placement and How is it Used? High School Setting**

Advanced Placement is a standardized form of education in which a high school student can earn college level credit prior to entering college. The College Board administers exams each May for more than 30 AP course subjects that are aligned with comparable college level

courses. Each AP exam score represents a test taker's qualification and expected level of performance in a corresponding college level course (College Board, 2009b). The most common method to earn AP credit is by taking an AP level course in high school that concludes with the AP standardized exam from the College Board; however, AP credit is also available through home schooling and via independent study in some school districts. Regardless of AP setting, the AP course content is designed to differ from traditional high school course content and rigor. The Advanced Placement Program falls into the category of advanced high school course work along with Honors and the International Baccalaureate (IB) Program. In a recent study, Sadler (2010) analyzed the difference between AP courses, International Baccalaureate (IB), honors, and regular course work and stated that:

AP students spend more time teaching each other and twice as much time preparing for standardized exams. Quantitative problem-solving is more centralized in honors and AP courses, as are exams with open-ended questions and students having to draw graphs by hand or computer. AP students spend more time on homework, reading the textbooks, and studying outside of class than do honors or regular students. (p.58)

Advanced coursework is commonly offered in more affluent communities, whose students generally perform better in college (Geiser & Santelices, 2004; Klopfenstein & Thomas, 2005). However, AP course availability and access in high schools are changing as state mandates and federal programs offset resource barriers (Adelman, 1999; Schneider, Kirst, & Hess, 2003). Entrance requirements into AP courses for students vary among school districts: some schools have used standardized tests to qualify students for the advanced course level while other schools have open enrollment policies.

In 2000, the National Center for Education Statistics reported that the average AP classroom size was small ( $M = 16.9$ ;  $S.D. = 8.8$ ). This is in marked contrast to regular class size

in most comprehensive high schools. For example, Gruber et al. (2003) found that the average class size in traditional secondary public schools with departmentalized instruction was twenty-three students per class. Milewski and Gillie (2002) found that AP classroom characteristics revealed that students in this program enjoyed having a smaller class size. Such results are not surprising as the reduced class sizes help teachers move through rich course content in a limited amount of time. Herr (1992) found that classroom size tends to be smaller in AP courses with few classroom management issues and that AP classes receive more administrative support due to special funding from the district or state.

When surveyed by the College Board, AP teachers expressed the need for training on how to manage time allotted to cover the breadth of AP coursework, preparing their students for the AP exam, and methods for teaching difficult materials (Milewski & Gillie, 2002). This same study reported that 81% of AP teachers are certified in their subject area and most are within twelve years of retirement, giving them a possible edge due to experience. In contrast to these positive aspects of AP coursework, Williams (2009) asserts that there is actually no quality control over AP curricula in high schools which may explain the need for standardization. Additional research indicates that AP teacher selection is nonrandom, with the most experienced teachers disproportionately working with advanced students while those with less experience are teaching classes with at-risk student populations (Clotfelter, Ladd, & Vigdor, 2006; Hanushek, Kain, & Rivkin, 2004). More specific evidence of AP teacher and class assignment based on general education teaching success has been identified (Clotfelter et al., 2006; Oaks, 1985). Teaching experience aside, Herr (1992) found that teachers received extra compensation if their students passed the AP exam. Furthermore, Gruber, Wiley, Broughman, Strizek, & Burian-

Fitzgerald (2003) note that AP teachers traditionally have substantial control in determining what textbooks to use (63%), what supplementary materials to use (86%), and what content to teach (89%). However, this professional freedom is limited since AP exams focus on specific curricular content. Most AP teachers utilize multiple choice exams and free response to cover course content and prepare students for the exam (Paek, Braun, Ponte, Trapani, & Powers, 2010). Critics question the over use of multiple choice exams as this appears that faculty are “teaching toward the test” and students are not retaining the concepts thus putting them at a disadvantage when the encounter the material in future course work.

High school students may enroll in AP coursework and elect not to take the standardized examination while some schools require the examination as part of the entrance requirements. When researching AP coursework in Biology, Paek, Braun, Ponte, Trapani, & Powers (2010) found that:

...41 percent of teachers noted that in their schools all students who took the AP course were required to take the exam, while 38 percent of teachers reported that all students who took the course were encouraged to take the exam. As a result of these policies, the most common scenario is that 75% or more of the students in a class take the AP exam. (p. 73)

AP standardized examinations are administered in May, at the conclusion of the academic year. Portfolio courses are evaluated in June in various formats depending on the discipline (College Board, 2010). All evaluations are calculated using a five point scale. The score descriptions from descending order are: “5” for extremely well qualified or A level; “4” for well qualified or mid-level A to mid-level B; “3” for qualified or mid-level B to mid-level C; “2” for possibly qualified or below mid-level C; and “1” for no recommendation or no expectation

(College Board, 2009b; Paek, Braun, Ponte, Trapani, & Powers, 2010). High school graduates can use AP qualifying scores of “3” or higher to earn college credit and/or advanced placement status at more than 90% of the nation’s colleges and universities and at colleges and universities in more than 30 countries (DiYanni, 2008).

The rigor of AP courses has been widely accepted by over 4,001 colleges and universities as of 2011 (College Board, 2011b). Institutions of higher education traditionally award college credit for AP exam scores of “3”, “4”, or “5”. Morgan and Ramist (1998) assert that exam credibility is the fundamental importance of the AP program. Curriculum surveys, comparability studies, and longitudinal studies are used for ongoing test assessment and improvement for the College Board exam with collaboration from faculty at the secondary and post-secondary levels (Ewing, 2006; Hargrove, Godin, & Dodd, 2008). Extensive research, test development, and psychometric work are conducted annually to support and maintain the large and diverse set of AP courses and exams (Ewing, Huff, Kaliski, 2010). AP exam score validations continue to support the college credit issuance and reliability (Burnham & Hewitt, 1971; Dodd, Fitzgerald, De Ayala, & Jennings, 2002; Morgan & Crone, 1993; Morgan & Ramist, 1998; Morgan & Klaric, 2007).

### **What is Advanced Placement and How is it Used? College Admissions Process**

Advanced placement course work and exam scores are reviewed during the college admission stage. Some colleges use advance standing courses as an indicator to indentify the quality of the applicant’s high school (Stevens, 2007). The variety of AP courses and the quantity of exams in each high school can provide colleges with a gauge to differentiate school

districts and students. Categorizing and identifying academic rigor can be challenging for colleges as there is no uniformity in how high schools calculate high school grade point averages (HSGPA) (Congnard, 1996; Dillon, 1986).

It is commonly thought that AP course work attracts only the top high school students and that normal range grading does not reflect the extraordinary effort that students put into their AP, Honors, or International Baccalaureate (IB) courses in high school (Attewell, 2001; Capasso, 1995). AP exam scores are not part of the high school transcript; however, it is important to note that some high schools add bonus points for advanced coursework such as AP, thereby increasing the course grade for each AP course (Hawkins & Clinedinst, 2006). Given the variation in formulas used to calculate HSGPA on the high school transcripts, most colleges and universities re-compute this measure from the transcript, giving special status to advanced courses (Hawkins & Clinedinst, 2006). Similarly, Geiser and Santelices (2006) indicate that some colleges recalculate an applicant's high school GPA to give "bonus points" for approved AP and honors course work. Another practice by colleges is to use high school GPA on the applicants' transcripts, thus implicitly accepting the school or district weighting of AP and Honors coursework (Congnard, 1996; Dillon, 1986; NACAC, 2004).

Including AP and Honors course work as part of the high school transcript is the admission practice for Temple University, the institution used in this study. The average entering freshmen class at Temple University exceeds 4,000 students with an application size double the entering class. The volume of applications requires the admission process to use a quantitative review process for undergraduate applicants. Applicants are primarily weighted on

high school GPA and SAT scores with a small margin for discretionary points that could be utilized during the review. Advanced Placement (AP), International Baccalaureate (IB), and Honors courses would fall into the discretionary category at Temple University; however, such points would have little effect on the acceptance percentage. Using the numerical approach to applicant review is a fairly common practice for large universities such as Temple. Conversely, smaller and more specialized schools tend to review AP/Honors course work by comparing the records of applicants from the same school by the extent to which the applicant took advantage of curricular opportunities (Stevens, 2007).

Once a student is formally admitted to Temple University, the AP examination scores of “3”, “4”, or “5” are assessed for college credit. The acceptance practice for exam scores vary by subject content and institutional faculty approval policies. The acceptance policy of AP credit at Temple University and for this study is as follows:

1. Temple awards college credits to students who in high school participated in the Advanced Placement program sponsored by the College Examination Board as follows:

Minimum score of 3 - Studio Art, Biology, Chinese Language, Computer Science A, Computer Science AB, Macroeconomics, Microeconomics, Environmental Science, French Language, French Literature, German Language, Human Geography, Italian Language and Culture, Japanese Language and Culture, Latin: Catullus-Horace, Calculus AB, Calculus BC, Psychology, Spanish Language, Spanish Literature, Statistics

2. Students must receive a minimum score of 4 to receive credit for all other examinations.
3. Students who receive the minimum score in the English Advanced Placement test will receive English elective credit, not composition credit.
4. Limitations on credit earned through Advanced Placement, International Baccalaureate and other forms of Credit for Prior Learning are as follows: (1) the credit must be useful in a student's program of study; (2) duplicate credit in the same course is not awarded in any case; (3) credit is only awarded in academic subjects with a corresponding Temple department.

(Temple University, 2011)

## **Economic Factors That Influence Higher Education**

Increasingly, paying for a college education has grown beyond the financial capacity of many Americans as tuition has increased and as federal funding for education has dwindled. The College Board (2006) states that the average four year private post-secondary tuition rose four percent faster than inflation every year from 1980 to 2006. In general, financial constraints on federal and state budgets have limited revenues to meet other social needs. One of the consequences of this is that there is reduced public readiness to consider higher education a private good with a consequent reduction in public funding for higher education (Altbach, Berdahl, & Gumport, 2005). Alternatively, under the No Child Left Behind Act (2001), there have been a growing number of Advanced Placement Incentive Program Grants from the U.S. Department of Education. Competitive grants have also been introduced as incentives for school districts to expand access to low-income students with the intention to decrease the racial performance gap (College Board, 2010). Additional moneys have also filtered in through private corporations and philanthropists with local school districts.

Financial asceticism has compelled legislators and various educational boards to scrutinize the role of higher education and its availability and means to deliver effective programs within a reasonable operational cost. Unlike K-12 schools, post-secondary institutions are relatively independent of federal authorization. The majority of the federal influence prohibits discrimination in the admission of students and requires that financial aid and grant programs be used to support social equity. States and local government agencies are becoming more critical of what they perceive institutions are doing, and more vocal in expressing their

criticisms and desire (Schmidt & Berdahl, 2005). Institutions of higher education can no longer avoid defending what they do or do not do with the increase of information available to the public. Federal and State agencies, media, and online information have elevated the level of awareness and competition for post-secondary institutions. Howe and Strauss (2007) suggest that:

The next two decades may well become one of those eras when the rise of a new generation coincides with a mode of global urgency and public action. This can elevate the role of higher education in preparing the nation's "best and brightest" and in laying out the blueprint for a better future. The last comparable era was the 1930's and 1940's when the collegiate pecking order was reshuffled. It was through war-winning collegians of those years that the enduring reputations of many of today's elite institutions were forged. (Howe & Strauss, 2007, p.4)

Increased exposure to college access, curricula, and finances has made the public aware of the social and financial benefits of the AP program. The national standardization of the course work and examination provides a neutral approach to education. In theory, school district or student wealth should not be part of the AP program obstacles; however, such factors are difficult to eliminate. Tangentially, the College Board offers AP exams to students that are home-schooled as well as those whose high schools do not offer specific AP courses. Thus, these AP exams theoretically offer a way to provide accountability across all regions of the county and all socio-economic levels. While the exams have not, as yet, been used in exactly this way, it is not difficult to see how this could happen in the near future. Therefore, while not designed as an accountability mechanism, the AP program could provide such a mechanism. What is even more attractive to some about this possibility is that such accountability would be free of governmental control and would be based solely in the private sector (or so the College Board might argue). In a time when the country seems to be moving in a conservative direction, the AP program seems ideally designed to fit the prevailing ethic.

## **Race and the Influence of Standardized Tests**

AP is a form of standardized testing that is appealing in that it is nationally reviewed and assessed. “The majority of the AP exams are mixed-format; that is, they are comprised of a multiple choice question section and a free response question section” (Ewing, Huff, & Kaliski, 2010, p. 90). As previously noted, the one size fits all curriculum is appealing in that it brings equity to secondary education and with increased access to the program, students of minority and low-income background will, in theory, increase their ability to attend college. One downside to the AP exam and other standardized tests is that they display large differences in subgroup performance that typically disadvantage minority students when these tests are used to make admissions decisions (Sackett, Schmitt, Ellingson, & Kabin, 2001; Wilds & Wilson, 1998). Additional research reveals varying positions as to whether scores for members of underrepresented minority groups are over-predicted or under-predicted when focusing on SATs and similar related tests (Bowen & Bok, 2000; Camara & Schmidt, 1999; Rowe, 2005; Rushton & Jensen, 2005; Sternberg, Grigorenko, & Kidd, 2005).

The College Board has reported that performance on AP exams correlates with college success, primarily focusing on grade point average during the student’s first year in college (College Board, 2010). Additional research has consistently shown that standardized test scores such as the SAT and ACT have a strong correlation to predicting college success (College Board, 2011a; Morgan & Crone, 1993; Morgan & Maneckshanna, 2000) which is why it is used during the college admission process. Knowing that standardized tests can disadvantage minority populations, college admissions offices tend to use additional criteria when accepting students.

Non-cognitive variables can arguably be used to predict student success and failure (Camara & Kimmel, 2005; Sedlacek, 2004; Stern & The Rainbow Project Collaborators, 2006). Reviewing non-cognitive variables would include but are not limited to interviews, essays, and extracurricular activities which can be a daunting and impossible task depending on the applicant size and admission staffing. Limitations to applicant review and the ability to benchmark admitted students explains the aspiration for a standardized method to assess students.

Standardized tests in and of themselves are not without flaws in predicting educational success. Many variables can influence academic success; however, research has shown that predicting academic performance in college is most often correlated to high school GPA and standardized test scores such as the SAT or ACT (Duffy, 2010). Several studies have further stated that high school grades are the strongest predictor of college degree completion and that they correlate with college grades twice as strongly as aptitude tests (Austin, 2001; Noble & Sawyer, 2004; Pantages & Creedon, 1978; Tinto, 1993). The simple and obvious fact is that high schools that offer more rigorous courses graduate students who are successful in college (Bassiri & Schultz, 2003; Long, 1997).

SAT and ACT scores have also been found to have a strong predictive value relative to grades during the first year in college; however, that finding does not override the significance of overall student adjustment to college, academic engagement in the classroom, retention rates, or graduation rates (Bailey & Karp, 2003; Bowen, Kurzwell, & Tobin, 2005; Curry, MacDonald, & Morgan, 1999; Nora, 1993; Pascarella & Terenzini, 1990). When analyzing race, Tinto (1987, 1993) argued that the overall differences in persistence rates between African Americans and

non-minorities were primarily due to differences in their academic preparedness rather than differences in their socio-economic backgrounds. College size, location, and student demographic variables are a few of the non-academic attributes that influence student retention. Clearly, a student's socioeconomic background (for example, family income, mother's and father's education and similar factors) is a significant factor affecting retention.

In addition to the socio-economic gap in college enrollment, there is a clear race gap from minority groups (African Americans, Hispanics, and Native Americans) who are less likely to enroll in college than their non-minority peers (Bowen, Kurzwell, & Tobin, 2005). The same theme can be seen in the AP program. The College Board's fifth annual report to the nation states that, African American students were still far less likely to have passed, or to have even taken an AP exam than whites, Hispanics or Asian students. Participation in AP continues to grow; however, it is not spread evenly across the nation. A copy of the state support for AP participation is included in (College Board 2011a, Appendix A). Mississippi and Louisiana reported that fewer than 4% of high school graduates passed the AP exam in 2008 while more than 23% of the high schools in Maryland and New York passed (College Board, 2010).

The pattern of reduced access for minorities can be viewed with the more recent graduating high school class of 2010 (College Board, 2011a). In the 7<sup>th</sup> Annual AP Report to the Nation, the College Board illustrated ongoing disparities of AP access and success within demographic groups they classify as traditionally underserved student populations (College Board 2011a, Appendix B). In this research, The College Board measured how states are increasing AP equity and excellence by measuring the underrepresented student population with

the demographic of the successful AP student population. More specifically, the data matrix measures equity and excellence by taking the percentage of overall graduating students and dividing that by the number of students who passed the exam with a score of “3” or higher. The results of the 2010 analysis showed that the U.S. national average for Black/African American students was 26.7% toward equity and excellence (14.6% of total graduating Black/African American students divided by the 3.9% of Black/African American successful AP exams). A copy of the relevant data from College Board is included in Appendix C. The individual state results reported Pennsylvania as being the lowest state for Black/African American students at 14.4% (13.9% in the graduating class divided by 2.0% who passed). Surprisingly, the Hispanic/Latino and American Indian/Alaska Native population showed significant national improvement in equity and excellence as the Hispanic/Latino student population ranked at 86.9% and the American Indian/Alaska Native student population at 36.4% (Appendix D). Pennsylvania still shows as one of the lower states for improvement with Hispanic/Latino students, however, the American Indian/Alaska Native population showed a surprising 100% increase toward excellence (College Board, 2011a, Appendix D). At this time it is unknown why there is a difference among the underserved populations and further work is required to gain a more complete understanding of the anomalies.

African Americans and their white and Asian Pacific American counterparts require more than a discussion about intractable racial barriers. This discussion must also consider other related factors such as chronic underemployment, malnutrition, environmental hazards, inner city crime, inadequate health care, economic downgrading of labor, and so on. The persistent educational gaps between racial groups, whether measured by test scores, grades, graduation

rates, or degree aspiration, are now being considered and theorized in more complex ways that seek solutions that account for racial discrimination and other related factors (Altbach, Berdahl, & Gumpert, 2005). Part of the racial gap in test scores can be explained by socio-economic differences between minorities and non-minorities, but only in part. When including more robust measures of family circumstances including characteristics such as the grandparent's education, the quality of the mother's schooling, and house-hold size, two-thirds of the gap in test scores is explained (Bowen, Kurzwell, & Tobin, 2005). Regardless of the reason for educational barriers, society seeks a level playing field for the underserved; therefore, debate will continue over standardized tests such as AP when considering access and equity.

### **Increased Demand for Social Justice in Higher Education**

Over the past decade, AP coursework in the secondary educational setting has increasingly become a critical pathway for school districts of any status to introduce social mobility for minorities and low-income students (Lee & Burkman, 2002). The notion of standardized education with a portable capacity has taken on the highest endorsement throughout government agencies as an avenue to support educational equity. In 2010, the U.S. Secretary of Education, Arne Duncan, announced that the enrollment of AP test takers and passing scores have risen throughout the nation. The 6<sup>th</sup> Annual Report to the Nation reported that 15.9% of the public schools' graduating class of 2009 had access to an AP experience that resulted in a score of "3" or higher. The results represent a significant improvement from the class of 2004 that averaged 12.4% resulting in a passing score. In addition, low-income student access has increased from 13.7% in 2004 to 18.9% in 2009.

Overall, the majority of analyses on the consequences of AP access have been done on students who passed the exam. While such data support the claims of the College Board these data do not validate the claim that exposure to AP coursework will increase the likelihood of college success regardless of the score a student obtains (College Board, 2001a). In addition, research on AP success is limited in that it does not distinguish the success rate of non-traditional college bound students (Delicath, 1999; Rothchild, 1999; Viadaro, 2000). Interestingly, Viadaro (2000) points out that the percentage of students failing AP exams has increased dramatically since an increasing percentage of students are taking the exams due to the nation-wide exposure and financial incentive programs. More research will be needed to track student motivation and the influence that stereotype threat may create to hinder the initiative for minorities and low-income students. In addition, research is lacking on the negative influence that the increased initiative of the AP Program has had on students who fail the exam that would not traditionally seek this rigor.

Entrance to AP Programs should support academic and emotional growth. In theory, high school college preparatory courses are designed to provide students with the opportunity to learn advanced material with the scaffolding necessary to build the skills and habits of mind necessary for success in college, including communication skills, reading for comprehension, organizational habits, and study skills; however, that concept is fairly inconsistent. Klopfenstein and Thomas (2005) state that AP courses are college courses; therefore, placing a high school student into such an environment would be equivalent to throwing a child into the deep end of a pool in preparation for swimming.

## **Financial Pressure to Expand AP Programs**

Increased competition into college has raised the standards for many high school graduates. As a result, the AP exam has become a growing factor in the college acceptance process whether or not the exam is being used toward a college degree. The concept of competition in the workforce has increased student attendance in college and as a result a college degree has become a prerequisite for the increasing occupations in modern societies and economies (Altbach, Berdahl, & Gumport, 2005; Eckstein & Noah, 1989). Earning a college degree is known to produce greater gains in occupational prestige (Lin & Vogt, 1996) and economical returns (Leslie & Brinkman, 1986) as compared to simply attaining a high school diploma.

The financial cost of higher education is an obstacle for access. Alexander and Ehrenberg (2003) assert that the declining state funding along with government or market limits on tuition will widen the gap between the haves and the have-nots. Rising tuition costs absent adequate financial support will challenge low-income students' ability to enter college or complete a degree. Perna's research (2000) indicates that parental involvement in school activities is a strong predictor of whether a student would enroll in college following high school graduation. Low-income student high school seniors uncertain of whether their parents approve of their post-secondary plans are less likely to aspire to attend college (King, 1996).

Altbach, Berndahl, and Gumport (2005) compared the U.S. higher educational system to Western Europe and concluded that it is relatively open regardless of social class because of a

highly differential higher education system and government sponsored loan and grant programs that address racial, ethnic, and underrepresented student populations. Despite this optimistic assessment of the U.S. educational higher education system, Altbach, Berdahl, & Gumport (2005) contend that further tuition increases will affect student access and success in higher education unless sufficient need-based financial aid is provided for low-income and historically underrepresented ethnic groups.

In 2005, the National Governors Association for Best Practices (NGA Center), in collaboration with the College Board, launched the Expansion project to foster AP success for traditionally underserved students. Fifty-one pilot schools in Alabama, Georgia, Kentucky, Maine, Nevada, and Wisconsin received funding to expand AP courses to allow more minorities and low-income students to participate in the educational experience. Since that time this program has blossomed to more states and school districts. While this increase in itself is not a problem, what might become a problem is that this increased exposure is not necessarily being supported by the necessary resources to make the program work. Simply offering more AP courses will not affect student achievement if the teachers are not given adequate support to produce true AP quality work. Moreover, students who might already be having trouble with regular coursework are not necessarily helped by simply increasing the rigor of the course without the necessary support system in place to assist these students. Thus, despite the increase in student exposure, many of these students will still not receive adequate preparation in high school for the rigors of college level coursework.

## **The Core Issue: How do AP Courses Actually Affect College Success?**

The College Board (2005) declares that: “students who take AP courses and exams are more likely than their peers to complete a bachelor’s degree in four years or less”. Any assertion of this type is likely to produce criticism, and this has clearly happened in the recent reviews of the AP experience. Higher education researchers would argue that we do not know from existing studies whether the AP experience in and of itself results in a more rapid graduation rate or whether it is simply associated with other student characteristics that cause students to graduate more quickly (Bailey & Karp, 2003; Klopfenstein & Thomas, 2005). The basis for this criticism is clear: it is well known that high schools in more affluent neighborhoods provide a broader and better array of resources for students (Altbach, Berdahl, & Gumport, 2005; Golden, 2006; Lee & Burkham, 2002; Marshall & Gerstl-Pepin, 2005). Among these resources is the opportunity to take various AP courses. It is also widely known that students from higher socio-economic strata do better in college (Bowen, Kurzwell, & Tobin, 2005; Hossler, Schmidt, & Vesper, 1999; King, 1996). Simply showing, therefore, that students with AP experience do better in college does not automatically mean that it is the AP experience that is the critical cause of this success. The College Board tacitly acknowledges this by talking about AP students as contrasted to their “comparable, non-AP peers”. But what is a comparable, non-AP peer? Critics of the AP program argue that this question has never been adequately answered.

There are other contextual issues that question the proposed value of AP courses. For example, several studies have shown that students with grades of “4” or “5” on the AP exam are traditionally high academic achievers who often place out of introductory courses in college (Curry, MacDonald, & Morgan, 1999). What these authors point out is that these introductory

courses are often the ones where students perform more poorly since they are uninteresting and unrelated to the student's major interest. As such, students who are required to take introductory courses may do more poorly in their initial semesters in college. In general, this criticism of the AP program is essentially a version of the classic "third variable" issue in correlation research. That is, the relationship of two variables might actually be caused by an unknown third variable or variables. In this specific case the third variable is socio-economic status. That is, students who are from higher economic levels attend better high schools, take more AP courses and do better in College. Simply showing, therefore, that taking AP courses and doing better in college correlate, does not mean that the taking AP courses is the cause and college success is the effect. Overall, there is some research that supports the contention of the College Board that AP passing exam scores of "3", "4", and "5" correlate to enhanced college performance (Morgan & Klaric, 2007), but less consensus about why this occurs.

Existing research indicates that advanced placement students receiving a passing score of "3" or higher in high school do exceed academically in college compared to those without the advanced experience in high school (College Board, 2010; Hargrove, Govin, & Dodd, 2008; Keng & Dodd, 2008). Geiser and Santelices (2004) and Duffy (2010) found that AP courses taken in high school had minimal or no relation to college success and similar findings were found by Klopfenstein and Thomas (2005) when controlling for pre-entry attributes. Findings continue to vary as the data attempt to tease out the casual effect that the AP experience influences academic performance above and beyond existing potential. Additional research reveals characteristics of students with advanced credit background reflect those of traditional high achievers, such as, above average ACT/SAT scores, high school GPA, and high school rank

(Delicath, 1999; Lord Fairfax Community College, 1995; Nelson, 1997; Rothschild, 1999; Viadaro, 2000; Willingham & Morris, 1986; Windham, 1997).

The extent to which AP course work impacts college success can be debated as there are endless variables that contribute to a students' ability to graduate from college. Social adjustments toward college are a contributing factor on the first year retention rate (Nora, 1993). Other persistence studies point to lingering academic effects of poor first year performance for first-time college students (Brandburn 2002; Maack 2002; Ishitani & DesJardins 2002; Tinto 1987). The academic performance of students during their first semester of college also has a cascading effect on subsequent academic performance and persistence, specifically for minority students (Nora & Cabrera, 1996). This problem is compounded because two-year colleges have a high proportion of minority students from low-incomes who are at a higher rate of dropping out of college in year two of their college experience if their first year GPA is below a 2.0 (Ishitani & DesJardins, 2002).

It is not surprising that students with high academic grade point averages in high school and who have parents that encourage college attendance are more likely to complete a college degree than those without. Encouragement is a critical factor with college motivation. The development of degree aspiration has been tracked back as early as eighth grade. Securing high school adjustment qualifications, applying for college and successful adjustment to college are related to the extent to which students receive encouragement from parents, high school personnel, and friends (Cabrera & La Nasa 2000, 2001; Cabrera, Nora, & Castaneda 1992; Flint 1992; Hossler, Schmitt, & Vesper 1999).

Student characteristics are by far the most reliable attributes to determine student success (Pascarella & Terenzini, 2005; Tinto, 1993). Additional studies on student persistence (Bean 1980; Bean & Metzner 1985; Braxton & Lien 2000; Nora 1993, 2004; Pascarella & Terenzini 1979, 1990) indicate that successful degree completion occurs for students that socially integrate into their environment. A review of the persistence literature informs us that low-income students are already handicapped by a variety of adverse factors while attending college such as but not limited to: enrolling on a part-time basis; delayed enrollment after high school completion; working full-time; dropping, withdrawing from or not completing college credits; and being a parent (Terenzini, Cabrera, & Bernal, 2001). Overcoming these socio-economic (SES) barriers to college are key influencers in determining college selection. As a result, low-income students are more likely to enroll in two-year institutions than are their economically better off peers (e.g., Blecher, Michael, & Hagedorn 2002; Hagedorn, Moon, Cypers, Maxwell, & Lester 2003; McPherson & Shapiro, 1998). College selection and attendance statistics support the claim of inequity of educational opportunities based on one's socio-economic background (Karabel, 1972; 1986). The educational divide increases as a socioeconomic factor as few students who attend two-year colleges actually transfer to four-year institutions (Tinto 1987).

### **Social Justice as it Relates to the Advanced Placement Program**

“Equality of opportunity for all students to attend public higher education in their state, without regard to their background or preparation, is a foundational principle of higher education policy making in the United States” (Bastedo & Gumport, 2003, p.341). Creating equal and equitable access to attend college is an ongoing global concern for the nation. Over the years

there have been cultural, social, and legal changes to improve opportunities to attend college. Despite these attempts, research indicates that educational disparities are still prevalent and continue to prevent many from attending college (Altback, Berdahl, & Gumport, 2005; Astin & Oseguera, 2004; Bowen, Kurzwell, & Tobin, 2005; College Board, 2011a; Golden, 2006; Hossler, Schmidt, & Vesper, 1999; Johnstone, 1999; King, 1996; Lee & Burkham, 2002; Marshall & Gerstl-Pepin, 2005; Nora, 2004; Valencia & Kirst, 2005).

The recent 2010 College Board figures indicated that only 1,679 low-income students from the graduating class of 2009 took at least one AP exam during high school and 679 of those students earned a “3” score or higher in at least one AP exam (College Board, 2010). Despite strides to increase AP access, data indicate that underserved minorities are not always receiving adequate preparation for the rigors of the AP coursework (College Board, 2011a; Plucker, Chien, & Zaman, 2006; Sack, 2007; St. John, 2007; Terenzini, Cabrera, Bernal, 2001).

In 2011, The College Board released the 7<sup>th</sup> Annual Report to the Nation which included statistical data on students eligible for the college admissions process who took the Advanced Placement (AP) exam. These data indicated that:

There were over 3 million graduating seniors in the class of 2010 in the United States. Of that population, there were 441,946 Black/African American seniors of which only 73,270 students took an AP exam in high school and 19,675 passed with a “3” or higher on the exam. The Hispanic/Latino population had 505,777 seniors with 136,717 AP exam takers and only 74,479 that passed with a “3” or higher. The same pattern held with the American Indian/Alaska Native population that had 34,481 seniors with only 4,891 AP exam takers and 2,195 that passed with a “3” or higher. (College Board 2011a)

These data are important to note as they highlight that AP participation does not mirror the demographics of the nation’s population. Minority students continue to remain

underrepresented in the AP Classroom in addition to low-income students (College Board, 2010). Continued educational inequity in the AP program will impede equitable student access and opportunity. This reality is troubling given that social mobility in the United States has a direct association to college degree attainment (Altbach, Berdahl, & Gumport, 2005; Bastedo & Gumport, 2003; Gastwirth, 2007). The current harsh economical climate further raises public concern over who has access to college via educational preparation and financial resources. Over the past decade, enrollment numbers have steadily increased in college, yet the increase in equal access is debatable (College Board, 2010).

Ellwood and Kane (2000) state that “the role of family background in determining post-secondary training choices [and especially enrollment in 4-year colleges] seems to have increased over time (our emphasis), causing a widening in the low income-high income enrollment gap” (p.283). Families with higher income and higher levels of education can provide greater ease and advantage for their children to reinforce college preparation. Educational inequities can be measured by school district resources (Geiser & Santelices, 2004). Students in affluent school districts are encouraged and motivated by their parents to think about college and take standardized tests to apply to college such as AP coursework. As Carneiro and Heckman note (2003):

Children whose parents have higher incomes have access to better-quality primary and secondary schools. Children’s taste for education and their expectations about their life chances are shaped by those of their parents. Educated parents are better able to develop scholastic aptitude in their children by assisting and directing their studies. (p.100)

Low-income communities suffer in many ways. The lack of proper education deters the availability for social mobility. Those that argue for equity rationalize that achieving equity

would have high costs, but that the taxpayers have a moral obligation to pay these costs (St. John, 2003). Increasing college access alone does not negate the inequity in the secondary educational system that has the greatest impact on college success. By increasing college access without addressing the educational gap between secondary education and post-secondary education creates an influx of underprepared students. There are 75% of the nation's high school graduates who enter college and roughly one half of those freshmen are required to take one or more remedial courses (College Board, 2009a). Remedial course work at the college level is expensive and time consuming. Graves (2008) states that only one-third of the students who are required to take remedial courses upon entry to college remains in college and earns a four-year degree.

The inequity of educational readiness is a growing burden for post secondary education. To combat this uncertainty, some suggest that credit-based college preparatory programs such as AP have the potential to consistently expand rigor from high achieving students to a much wider range of students, especially those from minority and low-income groups (Bailey, Hughes, & Karp, 2002; College Board, 2011a). At this time, AP courses are not available in many high schools thus creating further disadvantage for minority and low-income students applying to colleges that ascribe added value to completing AP courses in the admissions process (Sadler, 2010). This is one of the many reasons that AP programs are growing in popularity for parents, school districts, and government agencies. Furthermore, AP coursework rigor has also been viewed as a way to bridge the educational expectations between high school and college. With this in mind, it is important to recall that raising standards and increasing requirements have

contradictory effects and not all policies and initiatives can help all students. St. John (2007)

states that:

Just because policies cause some students to take advanced courses, it doesn't mean these policies help all children. These policies could apparently discourage some children from completing high school. At the very least, they induce dropouts. This imbalance in K-12 policy is important because the espoused intention of NCLB is to "leave no child behind," which means to enable more children to graduate high school. The sad irony is that even though the new policies essentially restrict the percentage of children who graduate from high school, they do not increase the percentage of high school graduates who go on to college. If one of the goals of school more reform is to improve the preparation of high school graduates for college, then there is still more reason to question the current direction of K-12 reform. (p. 76)

Liu and Von Secker (2010) reported that of the students who attended Montgomery County Public Schools from 2001 to 2004 who earned AP exam scores of "3" or higher, 84% earned SAT scores of 1100 or higher and were unlikely to need remediation upon entry to college. "In comparison, 36 percent of students with AP exams scores below 3 and 14 percent of students with no AP exam scores, respectively, earned SAT scores of 1100 or higher and were unlikely to remediate upon entry to college" (Liu & Von Secker, 2010, p. 3). The study further suggests that the correlation of college success can be attributed to preparing students for a rigorous academic environment through AP course work in high school.

Another obstacle to college access is the escalating cost of higher education as federal and state funding is cut. Many institutions are tuition driven; therefore, the financial aid allocation is seeing a shift from need-based financial aid to merit based financial aid (Heller, 2001; Johnston, 1999). Merit-based aid is awarded to students with high academic accomplishments whereas need-based aid is dependent on family inability to pay tuition. If institutions decrease aid to those in need, that will reduce access opportunities for low-income students. Kiro (2002) and Pulley (2002) report that, under economically tight operational

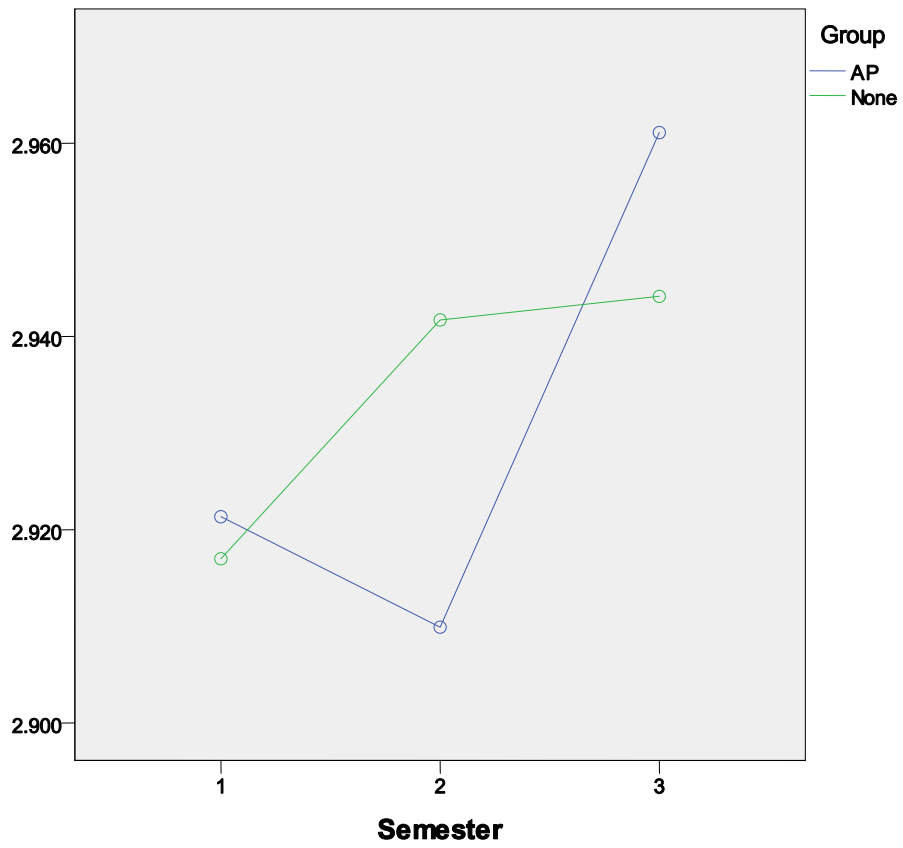
budgets, many private institutions are abandoning need-blind admissions and using ability to pay as a consideration to the admissions decision. The shift in who a college takes due to ability to pay reintroduces previous access initiatives of the past. A change in access practices will once again eliminate or drastically reduce attendance to elite colleges for those with limited resources.

The cascading effect will trickle into employment opportunities as it is well known that the most sought-after employers and most graduate and professional schools favor graduates from prestigious institutions (Henson, 1980). Astin and Oseguera (2004) have reported that:

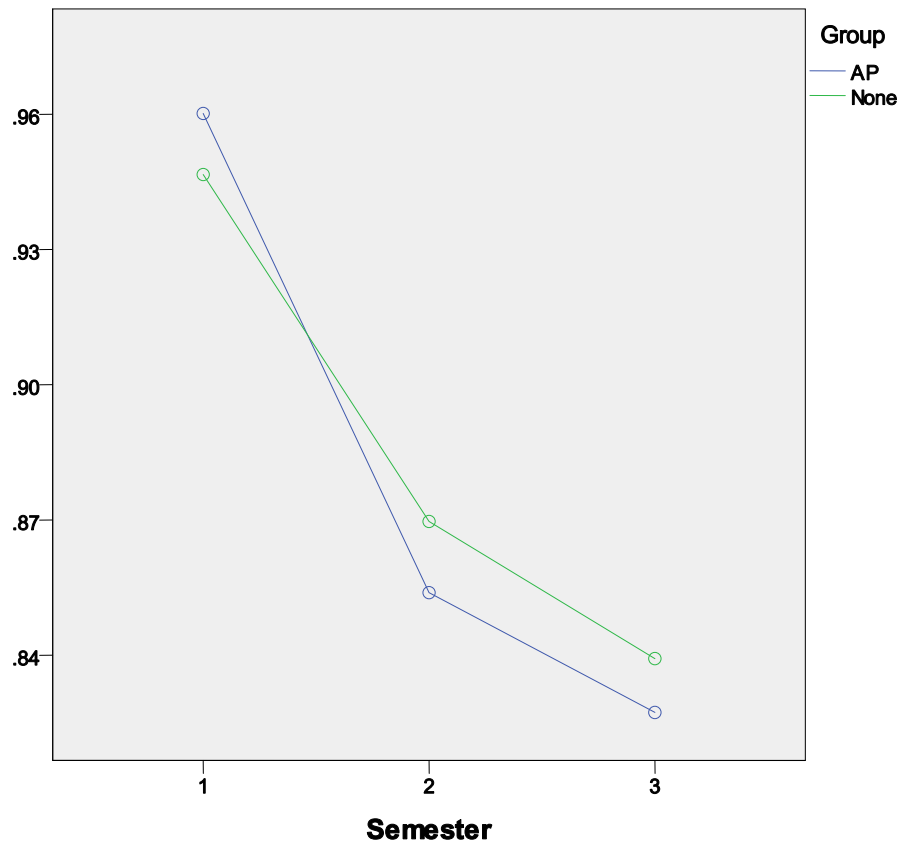
American higher education now appears to be even more stratified, when it comes to SES, than it was 30 years ago. Students of highly educated parents now account for more than 60 percent of entering freshmen classes at the most selective institutions, about one third of the students at middle selectivity institutions, and only 18 percent of the students in the least selective institutions. At the same time, students whose parents' education falls in the middle ranges are increasingly being displaced from highly selective institutions (17 percent decline) into the least selective institutions (9 percent increase). (p. 334)

### **The Williams' Study**

As mentioned previously, the study that directly led to the current study is Williams' dissertation which looked at the GPAs and retention of students as a function of whether or not they had attained AP credit. Since this study is pivotal as the starting point for the proposed research, a brief review of these data may be illuminating. Williams followed one cohort of entering freshman (the 2007 entering freshman class) through the first three semesters of their experience in college. His results for GPA are presented in Figure 2 and the data on retention are portrayed in Figure 3.



**Figure 2: GPAs for AP and Non-AP Students**



**Figure 3: Retention for AP and Non-AP Students**

Analysis of the data indicated that there were no differences in either GPA or retention between the AP and non-AP groups. There was, however, a marginally significant interaction for retention ( $p = .048$ ). As shown in Figure 3, AP students started out with a slightly higher retention rate at the end of the first semester, but ended with a slightly lower rate by the end of the third semester. Essentially, however, the data from Temple University show that there were no differences between students with AP credits versus those without. As such, the Williams’ study provided no support for the hypothesized benefits of AP success. As also mentioned above,

the Williams' study was not able to disaggregate the AP group nor was he able to differentiate between those without AP credit. Both of these are ways that the current study will extend and hopefully clarify the previous research.

### **Contribution of Study**

This study contributes to the current body of literature assessing the influence that the standardized curriculum in the Advanced Placement Program has on students attending college. The outcomes presented will expand the previous research conducted on the AP student population of Temple University students by Jermaine Williams (2009). This study is valuable to the educational community as it reveals and discusses data previously absent in previous research: 1) students entering college with AP failures, 2) AP raw score outcomes regardless of AP acceptance at the University, and 3) delineation between students who attempted the AP exam in high school and failed versus those that took the exam and passed.

## **CHAPTER 3**

### **METHODOLOGY**

The study focused on student academic results within the past decade. Age of the data plays a key role to analyze how effective the increased initiatives in the secondary educational setting have been toward college access. The vast academic caliber of the students at Temple University and the institutional mission to serve the community will complement the research sample size. Four years of entering cohorts were the foundation of the analysis. The sample across the various entering years was divided into groupings that included students who: 1) entered as freshmen with no AP credit attempts; 2) attempted AP credit and passed and, 3) attempted AP credit and failed. The second group was further divided into students who passed with a score of “3”, “4” or “5”. The final group was divided into those who obtained a score of “1” versus those who obtained a score of “2”.

#### **Sample**

The sample consisted of four cohorts of students who matriculated at Temple University: the freshmen classes of 2006, 2007, 2008, and 2009. In total, this consisted of 16,731 students. Various demographic data on these students are presented in Tables 3.1 and 3.2.

**Table 3.1: Gender and Ethnicity by Admission Year**

	<b>2006</b> (N = 3984)	<b>2007</b> (N = 4409)	<b>2008</b> (N = 4137)	<b>2009</b> (N = 4201)	<b>TOTAL</b> (N = 16731)
<b>Gender:</b>					
Male	1813 (45.5%)	1825 (41.4%)	1882 (45.5%)	1877 (44.7%)	7397 (44.2%)
Female	2171 (54.5%)	2402 (54.5%)	2253 (54.5%)	2324 (55.3%)	9150 (54.7%)
Missing	0	182 (4.1%)	2 (.0%)	0	184 (1.1%)
<b>Ethnicity:</b>					
Native Am	6 (.2%)	13 (.3%)	17 (.4%)	9 (.2%)	45 (.3%)
African Am	691 (17.3%)	710 (16.1%)	575 (13.9%)	585 (13.9%)	2561 (15.3%)
Asian	429 (10.8%)	452 (10.3%)	446 (10.8%)	463 (11.0%)	1790 (10.7%)
Hispanic	152 (3.8%)	148 (3.4%)	176 (4.3%)	149 (3.5%)	625 (3.7%)
White	2303 (57.8%)	2618 (59.4%)	2482 (60.0%)	2526 (60.1%)	9929 (59.3%)
Other	403 (10.1%)	468 (10.6%)	441 (10.7%)	469 (11.2%)	1781 (10.6%)

**Table 3.2: Father's and Mother's Education by Admission Year**

	<b>2006</b> (N = 3984)	<b>2007</b> (N = 4409)	<b>2008</b> (N = 4137)	<b>2009</b> (N = 4201)	<b>TOTAL</b> (N = 16731)
<b>Father's Ed:</b>					
Non HS Grad	281 (7.1%)	258 (5.9%)	271 (6.6%)	275 (6.5%)	1085 (6.5%)
HS Grad	1156 (29.0%)	1278 (29.0%)	1169 (28.3%)	1174 (27.9%)	4777 (28.6%)
Some College	678 (17.0%)	733 (16.6%)	690 (16.7%)	741 (17.6%)	2842 (17.0%)
College Grad	1052 (26.4%)	1221 (27.7%)	1154 (27.9%)	1153 (27.4%)	4580 (27.4%)
Postgrad	688 (17.3%)	753 (17.1%)	732 (17.7%)	776 (18.5%)	2949 (17.6%)
Missing	129 (3.2%)	166 (3.8%)	121 (2.9%)	82 (2.0%)	498 (3.0%)
<b>Mother's Ed:</b>					
Non HS Grad	221 (5.5%)	194 (4.4%)	208 (5.0%)	251 (6.0%)	874 (5.2%)
HS Grad	998 (25.1%)	1055 (23.9%)	973 (23.5%)	991 (23.6%)	4017 (24.0%)
Some College	828 (20.8%)	877 (19.9%)	848 (20.5%)	855 (20.4%)	3408 (20.4%)
College Grad	1199 (30.1%)	1409 (32.0%)	1320 (31.9%)	1385 (33.0%)	5313 (31.8%)
Postgrad	663 (16.6%)	750 (17.0%)	705 (17.0%)	664 (15.8%)	2782 (16.6%)
Missing	75 (1.9%)	124 (2.8%)	83 (2.0%)	55 (1.3%)	337 (2.0%)

It is evident from Tables 3.1 and 3.2 that that sample of students is diverse in a number of ways.

For example, these students are more ethnically diverse than the population of students who graduate from Pennsylvania high schools. This is demonstrated in Table 3.3.

**Table 3.3: Ethnic Distribution for Study Data Set at Temple University Compared to High School Graduates Taking the AP Exam From the State of Pennsylvania in 2009**

(College Board: The 6<sup>th</sup> Annual Report to the Nation, Feb. 2010)

	Temple 2006-09 (N=16731)	PA HS AP Class of 2009 (N=23,538)
Am Indian	.26%	.2%
Black	15.30%	6.1%
Asian	10.06%	6.2%
Hispanic	3.73%	3.1%
White	59.34%	80.1%
Unknown	10.64%	-

Data on the SAT scores and high school GPA are presented in Table 3.4.

**Table 3.4: SATs, High School GPA, and Financial Aid by Admission Year**

	<b>2006</b> (N = 3984)	<b>2007</b> (N = 4409)	<b>2008</b> (N = 4137)	<b>2009</b> (N = 4201)	<b>TOTAL</b> (N = 16731)
SAT Q:					
Mean	547.30	547.21	559.20	560.90	553.63
Range	290 – 800	290 – 800	330 – 800	270 – 800	270 – 800
SAT V:					
Mean	541.31	540.26	548.22	548.89	544.64
Range	280 – 800	280 – 800	200 – 800	200 – 800	200 – 800
SAT W:					
Mean	533.56	533.20	542.95	548.84	540.16
Range	240 – 800	250 – 800	200 – 800	200 – 800	200 – 800
HS GPA					
Mean	3.26	3.35	3.37	3.41	3.35
Range	1.96 – 4.00	1.87 – 4.00	1.55 – 4	1.77 – 4.00	(1.55 – 4.00)

Financial aid data are presented in Table 3.5.

**Table 3.5: Financial Aid Application by Admission Year**

	2006 (N = 3984)	2007 (N = 4409)	2008 (N = 4137)	2009 (N = 4201)	TOTAL (N = 16731)
Financial Aid:					
Yes-Received	2367 (59.4%)	2600 (59.0%)	2591 (62.6%)	2874 (68.4%)	10432 (62.4%)
Yes-Not Rec	360 (9.0%)	392 (8.9%)	355 (8.6%)	340 (8.1%)	1447 (8.6%)
Ye – Waiting	386 (9.7%)	429 (9.7%)	288 (7.0%)	300 (7.1%)	1403 (8.4%)
No- Intend	294 (7.4%)	294 (6.7%)	293 (7.1%)	188 (4.5%)	1069 (6.4%)
No-No Need	443 (11.1%)	509 (11.5%)	460 (11.1%)	402 (9.6%)	1814 (10.8%)
Missing	134 (3.4%)	185 (4.2%)	150 (3.6%)	97 (2.3%)	566 (3.4%)

There are several aspects of the data presented in Tables 3.1 through 3.5 that are worth noting:

- The largest entering class of students is from the class of 2007 with 4,409.
- The majority, 54.7%, of the students in this study are female. The gender distribution remains essentially constant across the four years.
- Diversity was noted throughout all the years. The highest overall percentage of students, 59.3% ,were White followed by 15.3% African American, 10.7% Asian, 10.6% Other or Unidentified, 3.7% Hispanic and .3% Native American/Alaskan Eskimo. It should be noted that the diversity of the student body is decreasing somewhat across the four years as the percentage of students who are white increases from 57.4% in 2006 to 60.1% in 2009.
- “High School Graduate” was the most common educational attainment for fathers throughout all four years. Mother’s education also remained relatively constant throughout all four years; however, the modal educational level was “College

Graduate” at an overall average of 31.8%. In general, the mothers of Temple students are slightly better educated than the fathers.

- Increased university admissions standards can be viewed through the gradual SAT score improvement from 2006’s average SAT Quantitative Score of 547.30, SAT Verbal of 541.31, SAT Writing of 533.56 to 2009’s average SAT Quantitative Score of 560.90, SAT Verbal of 548.89, and SAT Writing of 548.84.
- The majority of students received financial aid with a 62.4% average. Consistent with some of the other variables, the percentage of students receiving financial aid has been increasing across the four years represented in the data.

### **Data Relevant to AP Test Performance**

One of the decisions that had to be made before any analysis of the data could be attempted involved the way multiple AP tests would be recorded in the data set. As shown in Table 3.7, many students attempted multiple AP tests. An issue arose, therefore, about what score to give a student who attempted more than one test and who received different scores. After a variety of analyses were attempted, it was decided to categorize students according to the following metric.

- (1) If a student attempted only one AP test, the student was placed into the group designated by that score (that is, Group “1”, Group “2”, etc.).

(2) If a student attempted more than one AP test, the average of those tests was computed. The student was then placed into a group according to the following:

Average scores of 1 to 1.50 were coded as “1”

Average scores of 1.51 to 2.50 were coded as “2”

Average scores of 2.51 to 3.50 were coded as “3”

Average scores of 3.51 to 4.5 were coded as “4”

Average scores of 4.51 to 5 were coded as “5”

After the above averages were computed, each student’s range of scores was examined and the following additional rules were applied:

- If a student was coded as either “1” or “2”, but the student had at least one score in the 3-5 range, the student was eliminated; and
- If a student was coded as “3”, “4” or “5”, but the student had at least one score of “1” or “2”, the student was eliminated.

In this way, students coded as failing (that is, had scores of “1” or “2”) had only failing scores, and students coded as passing (“3”, “4” or “5”) had only passing scores. Overall, the total number of students removed from the college success analysis was 176 out of 16,731. Subjects removed from analysis are presented in Table 3.6.

**Table 3.6: Students Removed from College Success Analysis**

	Original Sample	Sample with Subjects Removed(a)	Number Removed
No Ap	9734	9734	0
Group 1 (1 – 1.50)	1571	1532	39
Group 2 (1.51 – 2.50)	2095	2012	83
Group 3 (2.51 – 3.50)	2044	2004	40
Group 4 (3.51 – 4.50)	1034	1020	14
Group 5 (4.51 – 5)	235	235	0

**Table 3.7: AP Test Performance Data by Admission Year**

	2006 (N = 3984)	2007 (N = 4409)	2008 (N = 4137)	2009 (N = 4201)	TOTAL (N = 16731)
AP Score:					
None	2524 (63.4%)	2694 (61.1%)	2353 (56.9%)	2163 (51.5%)	9734 (58.2%)
1	330 (8.3%)	402 (9.1%)	395 (9.5%)	444 (10.6%)	1571 (9.4%)
2	476 (11.9%)	523 (11.9%)	541 (13.1%)	555 (13.2%)	2095 (12.5%)
3	420 (10.5%)	510 (11.6%)	494 (11.9%)	620 (14.8%)	2044 (12.2%)
4	202 (5.1%)	231 (5.2%)	280 (6.8%)	321 (7.6%)	1034 (6.2%)
5	29 (.7%)	47 (1.1%)	69 (1.7%)	90 (2.1%)	235 (1.4%)
Number AP Tests Taken					
1	715	828	797	852	3192
2	352	430	398	468	1648
3	177	226	254	308	965
4	111	121	159	203	594
5	60	63	82	92	297
6	26	22	47	58	153
7	15	14	25	32	86
8	1	8	7	15	31
9	0	3	5	5	13
10	2	1	2	2	7
11	1	0	4	3	8
12	0	0	0	0	0
13	0	0	1	0	1

In terms of the AP descriptive data in Table 3.7:

- A little less than half the students, 42%, entering Temple University from 2006-2009 have attempted at least one AP exam. It is interesting that the percentage of students with some AP experience increases linearly across the four years (36.6% in 2006 to 48.5% in 2009).
- Of those who took any AP exam, the most common score was “2” (29.9% of those with some AP data), followed by those with a score of “3” (29.2%), “1” (22.5%), “4” (14.8%) and “5” (3%).
- The number of tests attempted range from one attempt to 13. The mode is “1” but the average is slightly over 2. Consistent with the previous data, the average number of AP exams taken per student increases across the four years.

It is important to note that AP results had little or no influence on the students’ admission status and that all students were held to the same general admission standards. The three groups of primary interest in this research are categorized as AP credit, no AP attempts, and AP failures. The AP credit cohort includes students who received a score of “3” or higher on their exam. The majority of students who pass the AP exam will be granted AP credit on the students’ college academic record; however, the credit applying toward degree work will depend on the students’ academic program (as described in Chapter 2). Students with no AP attempts are identified due to the lack of registration and test attempt through the AP testing system (College Board). AP failure students are identified as receiving a “1” or “2” on an AP exam. The failure results are kept with the College Board and are shared with post-secondary institutions if research is desired and if the student is attending the institution.

The final set of variables was derived from The Temple New Student Questionnaire (NSQ). These data are self reported by all incoming freshmen the summer prior to their first semester. The information is stored in the Institutional Research Office and is not part of the student's academic record. Overall, the NSQ contains 81 questions. There are various sub-sections in this survey. The data utilized in this research focused on the 15 items that estimate student participation in various aspects of college life and eight items that assess motivation. The questions are intended to measure a variety of constructs: self confidence; number of hours spent on academic work; intended number of hours working outside the university, etc. A copy of the relevant questions from the NSQ is included in Appendix E.

### **Data Collection Procedures**

The data used for this research were pulled from the Institutional Research (IR) department at Temple University. The study was reviewed and approved by the Senior Vice-Provost of Enrollment. Student names were removed from the data set to meet the IRB regulations for anonymity. All of the AP data were collected from the College Board. Typically, AP scores of "3", "4", and "5" are forwarded to the institution as students seek admission into the university. The exam results are reviewed and recorded as credit (CR) on a students' academic record in the student information software. The numerical score of the exam is kept on the exam report and imaged in the Admissions Office. Failure reports are not traditionally forwarded to the institution by the students seeking admission nor would they be stored by the Admission's staff. For this research, however, special authorization to access all AP data on Temple students became possible due to a partnership with College Board over the past four

years to analyze a variety of academic testing initiatives. Temple is characterized as a Designated Institution (DI) for current student data. Being labeled a DI affords the institution access to raw data on AP exam information. Since the students being studied have matriculated at the institution, the data on AP attempts are complete and fully intact within the IR office at Temple. These data include number of AP attempts by student, type of exam content, score, and date of exam.

The final snapshot of college success data was taken after the May 2010 graduation cycle. At that time, members of the 2006 cohort had the opportunity to complete their undergraduate degree within four years.

### **Ethical Issues**

At the onset of the request for the data there were several ethical concerns regarding student privacy. It was decided that personal information (e.g. name, social security number, and place of residence) would not be shared with the researcher. My current position as university registrar affords me the opportunity to access the student information via the student database; however, the complicated nature of the data requires me to obtain the sample set directly from Institution Research Department (IR) due to the intricate nature of the AP data kept outside of the student database. The student survey data are also housed and stored by the IR department and are not something I would have access to in my employment status. Lastly, the removal of personal identifying information from IR would make it impossible to match student data with an actual student at the institution.

## CHAPTER 4

### RESULTS

This chapter includes a comprehensive report of results of this study which examined the impact that Advanced Placement (AP) coursework had on first year retention and grade point average (GPA) and the characteristic differences of students taking AP coursework. The first section of the chapter presents the analyses relevant to the major research questions. Section II will present the results for a series of additional questions that are included to extend and elaborate the results from the major research questions.

#### **I: Analyses Relevant to the Major Research Questions**

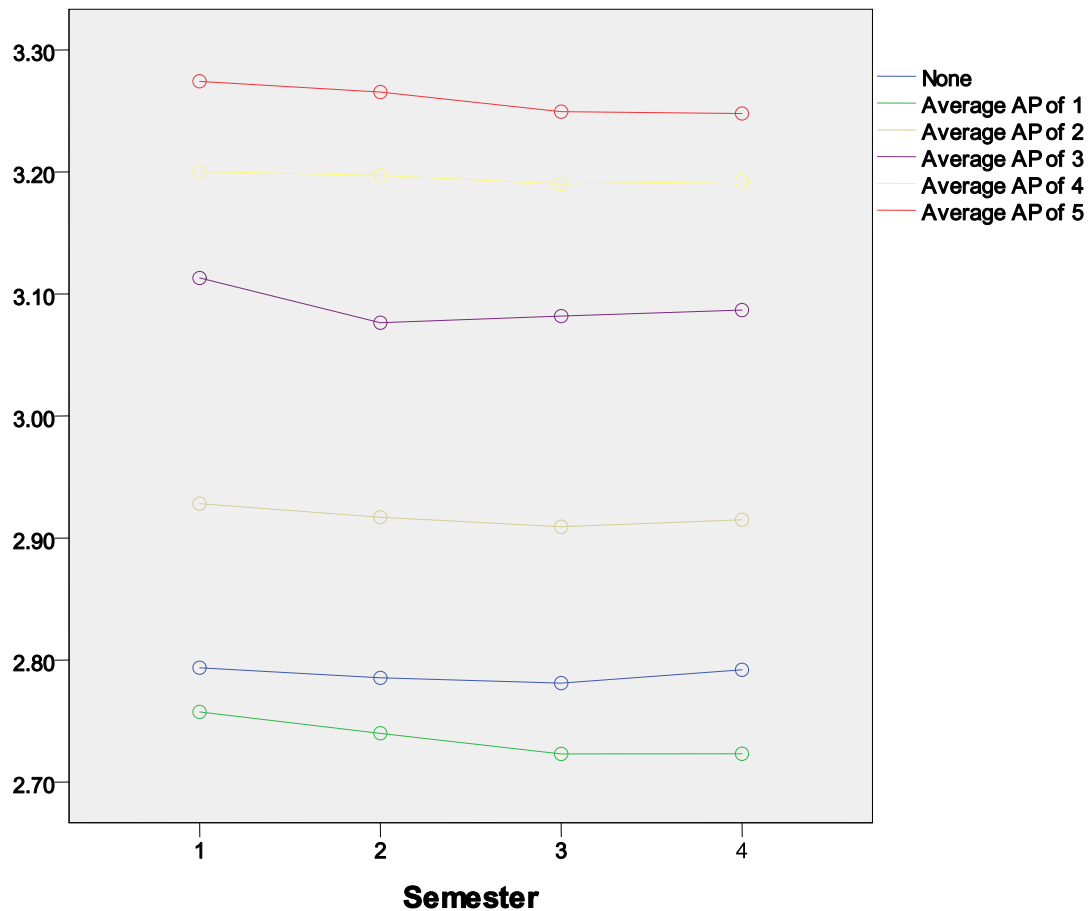
Before specific statistical analyses are presented, a comment should be made about the interpretation of results with a sample size as large as the one used in this study. Since the sample size for all of the analyses that will be reported is large, it is important to point out that the issue of statistical significance is largely moot since almost everything will be statistically significant. With a sample exceeding 16,000 subjects, the power of any statistical test to detect even extremely small effects is almost 100%. The critical issue, therefore, will seldom be whether the result of the statistical analysis exceeds the conventional .05 level, but rather, given that this level is achieved, how meaningful is the result? In empirical analyses, this is called the effect size (Cohen, 1969) and it will be a critical component of all the analyses presented. In current usage, the most commonly reported measure of effect size for ANOVA-based statistical analyses is termed “partial eta squared”. This, essentially, is a measure of the amount of the variance accounted for by a statistical result. The most commonly accepted standard is that partial eta squared should equal .10 or more, since this corresponds to what Cohen calls a medium to large effect size.

## Major Research Question # 1

The first major research question is: does a student's experience with and performance in AP courses affect the student's GPA and retention? The analyses of GPA and retention were conducted on the first four semesters due to the academic time frame. The means and standard deviations for GPA by semester for all cohorts are presented in Table 4.1. The non-AP cohort is represented by .00 followed by those with AP score results. A graph of these data is presented in Figure 4.1

**Table 4.1: Means and Standard Deviations of GPA by AP Group**

	AP Group	Mean	Std. Deviation
GPA1	.00	2.7937	.80343
	1.00	2.7575	.79439
	2.00	2.9282	.74979
	3.00	3.1131	.71095
	4.00	3.2004	.74692
	5.00	3.2743	.70755
GPA2	.00	2.7854	.76311
	1.00	2.7400	.74160
	2.00	2.9171	.71007
	3.00	3.0765	.69388
	4.00	3.1972	.71011
	5.00	3.2655	.69802
GPA3	.00	2.7811	.75409
	1.00	2.7231	.73733
	2.00	2.9093	.70017
	3.00	3.0819	.68129
	4.00	3.1902	.71487
	5.00	3.2494	.69756
GPA4	.00	2.7921	.75195
	1.00	2.7232	.74153
	2.00	2.9150	.69763
	3.00	3.0868	.67983
	4.00	3.1923	.71498
	5.00	3.2479	.70518

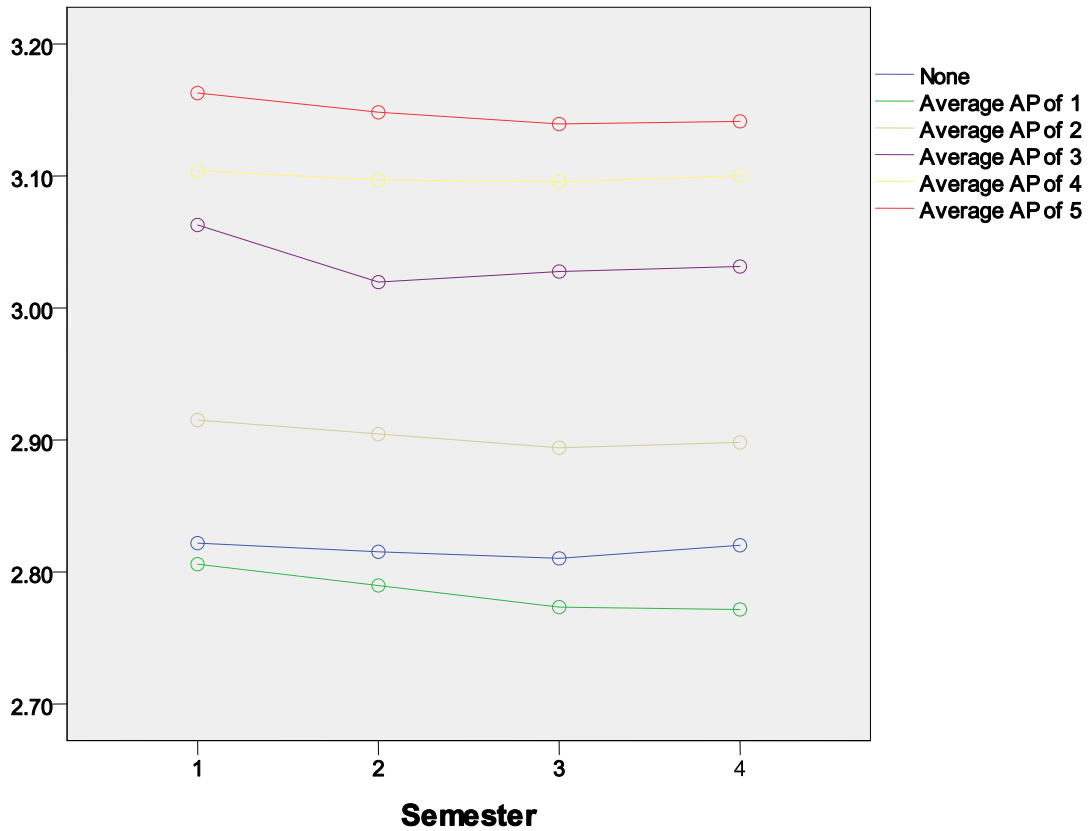


**Figure 4.1: GPAs by AP Group across the First Four Semesters at Temple**

To determine if there was a significant difference in GPA as a function of AP group, a repeated measures ANOVA was computed (AP Group by Semester). This produced a significant main effect for semester ( $F_{3,49851} = 10.65$ ,  $p = .000$ , partial eta squared = .001), a significant main effect for group ( $F_{5,16617} = 129.5$ ,  $p = .000$ , partial eta squared = .073), and a significant interaction ( $F_{3,49851} = 2.468$ ,  $p = .000$ , partial eta squared = .001). Since the main effect for semester and the interaction both produced partial eta squares that are less than 1% these effects are considered trivial. The main effect for group, however, accounts for 7.3% of the variance which, although not quite at the 10% level considered completely adequate for a meaningful

result, would still be considered a medium effect. The pattern of the results shown in Figure 4.1 is clear and rather dramatic: the group with an average score of “5” is doing better than the group with an average of “4”, which is doing better than group with “3”, which is doing better than the group with “2”, which is doing better than the group with no AP or the group whose average score was “1”. Interestingly, the students with no AP are actually doing better than the students with an average score of “1”.

As mentioned in Chapter 2, the core issue in an analysis of the potential benefits of AP is not simply whether students who take AP courses and pass the AP test perform better academically compared to students who do not take AP courses. The real issue is whether AP creates advantages for these students over and above other advantages that these students already possess (which will be explicitly demonstrated later in this chapter). To attempt to address this issue, the previous repeated measures ANOVA was re-run but this time using SAT Math, SAT Verbal, SAT Writing, High School GPA, family income, and mother’s and father’s education as covariates. These variables were chosen since they all represent factors that are known to positively affect academic performance. The question this analysis attempts to answer is how much of the variance in GPA is accounted for by these variables, over and above the variance accounted for by AP experience. The pattern of the results is presented in Figure 4.2.



**Figure 4.2: GPAs for the AP Groups Across Semesters with SATs, GPAs, Family Income, and Parental Education Removed**

As shown in Figure 4.2, the pattern of the data remains essentially the same as depicted in Figure 4.1. Again, as before, all three terms in the ANOVA (the two main effects and the interaction) were significant at beyond the .01 level. The difference in this analysis, however, is that amount of the variance for the main effect for group has been reduced from 7.3% to .053% which represents a substantial reduction. The interpretation of this result is that most of the advantage resulting from taking AP courses is largely (but not entirely) accounted for by cognitive and familial variables. Thus, it appears that AP does advantage students over and above their other advantages, but only to a very small extent. That is, most of the advantage that AP provides is

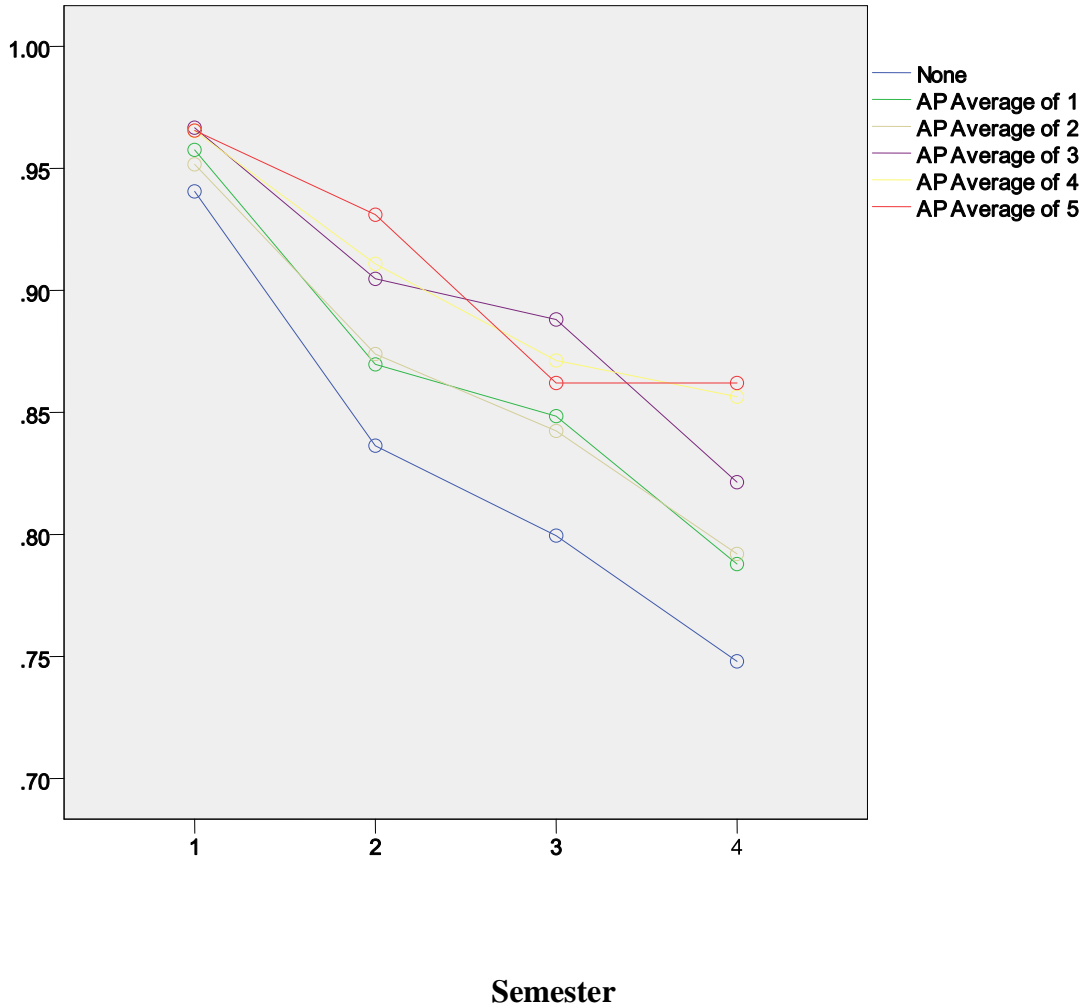
simply reflected in the fact that students who do well on AP are doing well academically already and have a more impactful support system (reflected by their higher family income and parents with higher levels of education). The means and standard deviations for retention are presented by order of semesters attended in Table 4.2

**Table 4.2: Retention by AP Group**

Group3		Mean	Std. Deviation
RET1	None	.94	.236
	AP Average of 1	.96	.202
	AP Average of 2	.95	.215
	AP Average of 3	.97	.180
	AP Average of 4	.97	.183
	AP Average of 5	.97	.186
	Total	.95	.223
RET2	None	.84	.370
	AP Average of 1	.87	.337
	AP Average of 2	.87	.332
	AP Average of 3	.90	.294
	AP Average of 4	.91	.286
	AP Average of 5	.93	.258
	Total	.86	.352
RET3	None	.80	.400
	AP Average of 1	.85	.359
	AP Average of 2	.84	.365
	AP Average of 3	.89	.316
	AP Average of 4	.87	.336
	AP Average of 5	.86	.351
	Total	.82	.382
RET4	None	.75	.434
	AP Average of 1	.79	.409
	AP Average of 2	.79	.406
	AP Average of 3	.82	.383
	AP Average of 4	.86	.352
	AP Average of 5	.86	.351
	Total	.77	.420

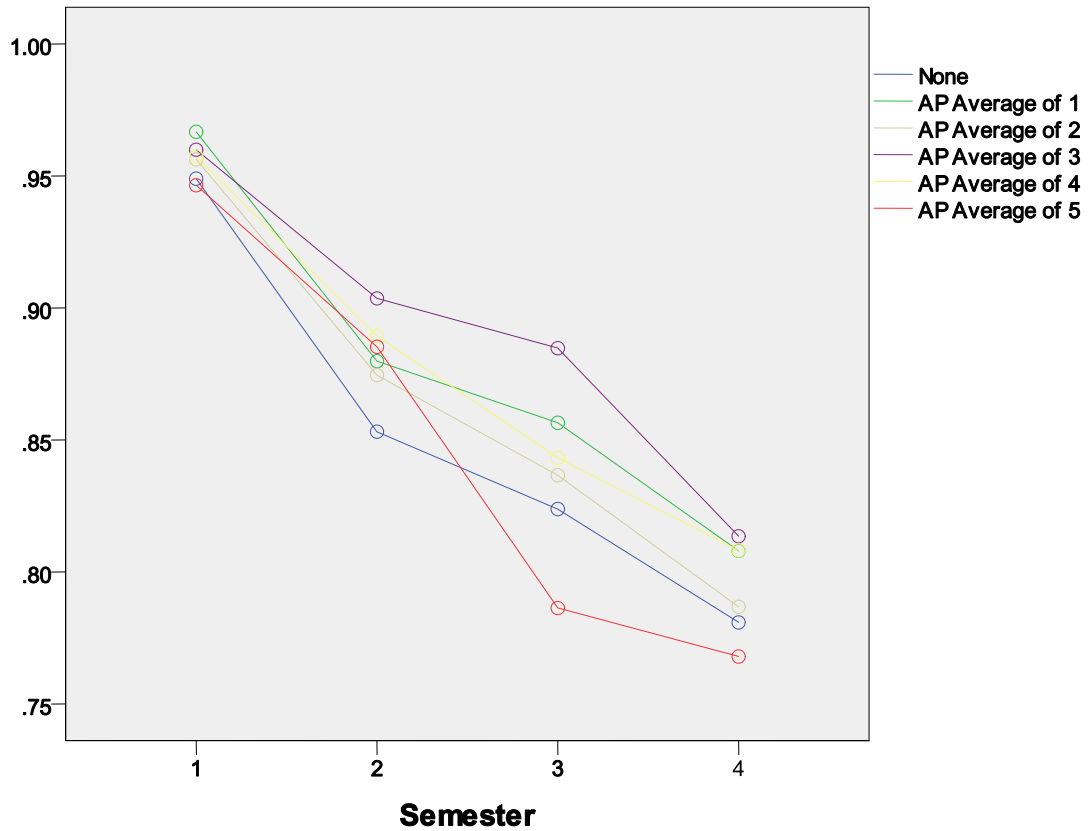
These data are scored as a dichotomy where “1” indicates that the student was retained, while “0” indicates that the student was not retained. As such, the means in Table 4.2 are the percentage retained for each group at each semester.

**Group**



**Figure 4.3: Retention Across Semesters by AP**

As before, all of the terms from the repeated measures ANOVA are significant: the main effect for semester ( $F_{3,49840} = 235.67$ ,  $p = .000$ , partial eta squared = .087); the main effect for Group ( $F_{5,16405} = 26.144$ ,  $p = .000$ , partial eta squared = .053); and the interaction ( $F_{3, 49840} = 2.144$ ,  $p = .000$ , partial eta squared = .003). In this case, the main effect for semester accounts for the most variance (8.7%) since, as shown in Figure 4.3, retention drops across semesters as is commonly known. It is also evident from Figure 4.3 that the data are more supportive of AP as the group with no AP having the lowest level of retention. Groups 3, 4 and 5 have the highest level, while Groups 1 and 2 are in the middle. In this case, AP group accounts for 5.3% of the variance. As before, the retention analysis was repeated using the same variables as described above as covariates. The plot of these results is presented in Figure 4.4.



**Figure 4.4: Retention Across Semesters by AP Group with SATs, High School GPA, and Background Variables Covaried**

As before, all of the terms from the ANOVA are significant. In this case, however, the difference between the groups has been essentially removed ( $F_{5,16400} = 2.34, p = .000$ , partial eta squared = .002). Specifically, the percentage of the variance accounted for by AP group has been decreased from 5.7% of .2%). Essentially, that means that almost all of the difference in retention is due to the cognitive and family variables.

Overall, the results relevant to the first research question are that students who take and pass AP exams have a slight advantage in terms of grade point average over students who do not take such exams, but essentially no advantage in terms of retention.

## **Major Research Question # 2**

The second research question asks if there are any characteristic differences between students who take AP courses in high school versus those who do not take AP courses.

Descriptive data on the total sample by AP Group are contained in Table 4.3.

**Table 4.3 Demographic Data (By Average AP Score)**

	<b>None</b> N = 9,734	<b>1</b> N = 1,571	<b>2</b> N = 2095	<b>3</b> N = 2044	<b>4</b> N = 1034	<b>5</b> N = 235
<b>Gender:</b>						
Male	4402 (45.2%)	750 (47.7%)	1018 (48.6%)	988 (48.3%)	484 (46.8%)	108 (46.0%)
Female	5194 (53.4%)	810 (51.6%)	1061 (50.6%)	1040 (50.9%)	547 (52.9%)	127 (54.0%)
Missing	138 (1.4%)	11 (.7%)	16 (.8%)	16 (.8%)	3 (.3%)	0
<b>Ethnicity:</b>						
Native Am	25 (.3%)	5 (.3%)	8 (.4%)	3 (.1%)	4 (.4%)	0
African Am	1471 (15.1%)	441 (28.1%)	411 (19.6%)	188 (9.2%)	41 (4.0%)	7 (3.0%)
Asian	868 (8.9%)	296 (18.8%)	261 (12.5%)	221 (10.8%)	118 (11.4%)	24 (10.4%)
Hispanic	348 (3.6%)	58 (3.7%)	93 (4.4%)	71 (3.5%)	42 (4.1%)	11 (4.7%)
White	6003 (61.7%)	584 (37.2%)	1121 (53.5%)	1351 (66.1%)	703 (68.0%)	160 (68.1%)
Other	1019 (10.5%)	187 (11.9%)	201 (9.6%)	210 (10.3%)	126 (12.2%)	33 (14.0%)
<b>Father's Ed:</b>						
Did not Grad HS	594 (6.1%)	185 (11.8%)	150 (7.2%)	104 (5.1%)	43(4.2%)	9 (3.8%)
HS Grad	2898 (30.7%)	536 (34.1%)	570 (27.2%)	438 (21.4%)	204 (19.7%)	36 (15.3%)
Some College	1616 (16.6%)	266 (16.9%)	390 (18.6%)	368 (18.0%)	156 (15.1%)	40 (17.0%)
College Grad	2685 (27.6%)	323 (20.6%)	558 (26.6%)	605 (29.6%)	316 (30.6%)	88 (37.4%)
Postgrad	1540 (15.8%)	190 (12.1%)	371 (17.7%)	484 (23.7%)	299 (28.9%)	62 (26.4%)
Missing	310 (3.2%)	71 (4.5%)	56 (2.7%)	45 (2.2%)	16 (1.5%)	0
<b>Mother's Ed:</b>						
Did not Grad HS	479 (4.9%)	167 (10.6%)	122 (5.8%)	60 (2.9%)	32 (3.1%)	13 (5.5%)
HS Grad	2496 (25.6%)	456 (29.0%)	456 (21.8%)	398 (19.5%)	165 (16.0%)	42 (17.9%)
Some College	1986 (20.4%)	332 (21.1%)	461 (22.0%)	387 (18.9%)	197 (19.1%)	42 (17.9%)
College Grad	3113 (32.0%)	373 (23.7%)	637 (30.4%)	719 (35.2%)	379 (36.7%)	86 (36.6%)
Postgrad	1447 (14.9%)	202 (12.9%)	384 (18.3%)	447 (21.9%)	247 (23.9%)	51 (21.7%)
Missing	213 (2.2%)	41 (2.6%)	35 (1.7%)	33 (1.6%)	14 (1.4%)	1 (.4%)
<b>SAT Q:</b>						
Mean	540.08	529.57	556.07	556.77	620.3	636.7
Range	290 – 800	330 – 800	270 – 800	370 – 800	370 – 800	440 – 800
<b>SAT V:</b>						
Mean	528.98	500.5	550.89	594.27	627.33	627.35
Range	200 – 800	270 – 750	270 – 800	340 – 800	330 – 800	340 – 800
<b>SAT W:</b>						
Mean	522.61	501.94	550.89	590.89	615.25	618.78
Range	200 – 800	270 – 700	280 – 800	350 – 800	340 – 800	290 – 800
<b>HS GPA</b>						
Mean	3.32	3.37	3.37	3.39	3.42	3.4
Range	1.55 – 4.0	2.01 – 4.00	1.97 – 4.00	1.93 – 4.00	1.86 – 4.00	2.17 – 4.00
<b>Financial Aid:</b>						
Yes-Received	5752 (59.1%)	1109 (70.6%)	1436 (68.5%)	1319 (64.5%)	658 (63.6%)	146 (62.1%)
Yes- Not Rec	833 (8.6%)	110 (7.0%)	188 (9.0%)	197 (9.6%)	94 (9.1%)	24 (10.2%)
Yes – Waiting	917 (9.4%)	126 (8.0%)	149 (7.1%)	134 (6.6%)	61 (5.9%)	15 (6.4%)
No- Intend	713 (7.3%)	91 (5.8%)	92 (4.4%)	114 (5.6%)	47 (4.5%)	12 (5.15)
No-No Need	1157 (11.9%)	99 (6.3%)	169 (8.1%)	218 (10.7%)	139 (13.4%)	28 (11.9%)
Missing	362 (3.7%)	36 (2.3%)	61 (2.9%)	62 (3.0%)	35 (3.4%)	10 (4.3%)

All of the variables in Table 4.3 were analyzed to determine if there are significant differences between the six groups. The analyses were either chi squares (for the nominal variables) or a MANOVA followed by univariate ANOVAs for the continuous variables. Since the “5” group was so small compared to the other groups, Groups “4” and “5” were combined. These analyses found the following:

- Gender: There was a marginally significant effect for gender (chi square = 11.93,  $p = .024$ , Cramer’s  $V = .024$ ). (Note: Cramer’s  $V$  is the effect size measure for chi square. A value of 0 - .2 is considered a “negligible” effect to use Cramer’s terminology.)
- Ethnicity: There was a significant difference in ethnicity among the five groups (chi square = 684.27,  $p = .000$ , Cramer’s  $V = .202$ - a “slight” effect in Cramer’s terms). While a chi square this complex is somewhat hard to interpret, it appears that the largest difference among the groups is that African Americans and Asians are over-represented in the “1” and “2” groups as compared to the other ethnicities.
- Father’s Education: The chi square = 417.90,  $p = .000$ , Cramer’s  $V = .080$ ). As before, this effect is very small. The data, therefore, demonstrate a slight tendency for students with lower AP scores to have fathers with lower levels of education.
- Mother’s Education: The chi square = 360.09,  $p = .000$ , Cramer’s  $V = .076$ . Similar to the effect for father’s education, students with lower AP scores have mothers with slightly lower levels of education.

- Financial Aid: The chi square = 143.83,  $p = .000$ , Cramer's  $V = .056$ . This is again a negligible effect, but to the extent that there are differences, it appears that students with scores of "4" and "5" more typically did not required financial aid to attend college.
- SAT Scores and High School GPAs: A five group MANOVA was conducted to analyze the SAT scores and High School GPAs. The overall MANOVA was highly significant (Wilks Lambda = .758,  $p = .000$ , partial eta squared = .067). The univariate tests found that the five groups differed on all three of the SAT Scores and on high school GPA. However, the effect size for High School GPA was very small (.004). For SATs, however, the effect sizes were all large (SAT Verbal = .188; SAT Quantitative = .126; SAT Writing = .179). The pattern for all of the SAT scores was the same: The group with an average scores of "1" was always lowest, followed by the group with no AP, followed by "2", "3", and "4/5". In other words, the pattern for SAT scores exactly duplicates the pattern for GPA presented in Figure 4.1.

### **Comparing the Group with No AP to All Others**

As another way of analyzing the data to answer the second major research question, the students were re-grouped so that the group with no AP could be compared to students with any AP, including those who obtained a failing score of "1" or "2". The descriptive data are presented in Table 4.4.

**Table 4.4: Demographic Data (By No AP Versus Some AP)**

	None N = 9,734	Some AP N = 6997
Gender:		
Male	4402 (45.2%)	3353 (48.2%)
Female	5194 (53.4%)	3598 (51.8%)
Missing	138 (1.4%)	46 (.6%)
Ethnicity:		
Native Am	25 (.3%)	20 (.3%)
African Am	1471 (15.1%)	1090 (15.6%)
Asian	868 (8.9%)	922 (13.2%)
Hispanic	348 (3.6%)	277 (4.0%)
White	6003 (61.7%)	3926 (56.1%)
Other	1019 (10.5%)	762 (10.9%)
Father's Ed:		
Did not Grad HS	594 (6.1%)	491 (7.0%)
HS Grad	2898 (30.7%)	1788 (25.6%)
Some College	1616 (16.6%)	1226 (17.5%)
College Grad	2685 (27.6%)	1895 (27.1%)
Postgrad	1540 (15.8%)	1409 (20.1%)
Missing	310 (3.2%)	188 (2.7%)
Mother's Ed:		
Did not Grad HS	479 (4.9%)	395 (5.6%)
HS Grad	2496 (25.6%)	1521 (21.7%)
Some College	1986 (20.4%)	1422 (20.3%)
College Grad	3113 (32.0%)	2200 (31.4%)
Postgrad	1447 (14.9%)	1335 (19.1%)
Missing	213 (2.2%)	124 (1.8%)
SAT Q:		
Mean	540.08	572.22
Range	290 – 800	270 – 800
SAT V:		
Mean	528.98	566.14
Range	200 – 800	270 – 750
SAT W:		
Mean	522.61	563.67
Range	200 – 800	270 – 700
HS GPA		
Mean	3.32	3.39
Range	1.55 – 4.0	1.86 – 4.00
Financial Aid:		
Yes-Received	5752 (59.1%)	4680 (66.9%)
Yes- Not Rec	833 (8.6%)	614 (8.8%)
Yes – Waiting	917 (9.4%)	486 (6.9%)
No- Intend	713 (7.3%)	356 (5.1%)
No-No Need	1157 (11.9%)	657 (9.4%)
Missing	362 (3.7%)	204 (2.9%)

As before, each of the variables in Table 4.4 was analyzed. The results are:

- Gender: There was a marginally significant effect for gender (chi square = 9.05,  $p = .003$ , Cramer's  $V = .023$ ). The results show that female students are slightly more likely to have taken some AP course as compared to male students.

- Ethnicity: There was a significant difference in ethnicity among the two groups (chi square = 93.25,  $p = .000$ , Cramer's  $V = .075$ ). The difference here seems to be that white students are somewhat less likely to have taken AP courses.
- Father's Education: The chi square = 88.36,  $p = .000$ , Cramer's  $V = .074$ ). The data, demonstrate a slight tendency for students with some AP to have fathers with higher of education.
- Mother's Education: The chi square = 73.67,  $p = .000$ , Cramer's  $V = .67$ . Similar to the effect for father's education, students with some AP have mothers with slightly lower levels of education.
- Financial Aid: The chi square = 124.46,  $p = .000$ , Cramer's  $V = .088$ . This is again a negligible effect, but to the extent that there are differences, it appears that students with some AP have a somewhat higher tendency to obtain financial aid.
- SAT Scores and High School GPAs: A two group MANOVA was conducted to analyze the SAT scores and High School GPAs. The results for this analysis are almost identical to the results for the five groups presented above. Specifically, the overall MANOVA was highly significant (Wilks Lambda = .916,  $p = .000$ , partial eta squared = .084). The univariate tests found that the two groups differed on all three of the SAT Scores and on high school GPA. However, the effect size for High School GPA was very small (.003). For SATs, however, the effect sizes were all medium (SAT Verbal = .056; SAT Quantitative = .046; SAT Writing = .067). The pattern for all of the SAT scores was the same: The group with some AP had higher scores than the group without AP.

## II. Secondary Analyses

Several additional analyses were conducted to extend and clarify the results presented above. Each of these is presented below. The material presented includes the research question that is being asked, followed by the statistical analyses used to answer the question.

### **Secondary Research Question # 1: Does the high school the student attended affect the student’s performance on the AP Exam? Specifically, do students who attend a Philadelphia High School perform at the same level as students from Non-Philadelphia High Schools?**

For this analysis, the students were divided into two groups: those who attended any Philadelphia High School and those who attended a high school not in the School District of Philadelphia. No distinction was made about the level of Philadelphia High School (that is, the Magnet schools like Central and Girls were included with all other high schools in the Philadelphia School District). There were 1298 students in the group from Philadelphia. The distribution of these students by AP group is presented in Table 4.5.

**Table 4.5: AP Group Distribution by High School Attended**

	No AP	“1”	“2”	“3”	“4”	“5”
Philadelphia	577 (44.5%)	369 (28.4%)	196 (15.1%)	108 (8.3%)	34 (2.6%)	14 (1.1%)
All Others	9157 (59.4%)	1202 (7.8%)	1869 (12.3%)	1936 (12.6%)	1034 (6.2%)	221 (1.4%)

The chi square was highly significant (Chi square = 643.03,  $p = .000$ . Cramer's  $V = .144$ ). As shown in Table 4.5, there are a higher percentage of students from Philadelphia who had taken an AP test. However, the percentage of the students who took an AP test but who obtained a score of "1" is clearly higher than students from all other high schools. Score of '2' is slightly higher for Philadelphia School District students yet their "3","4", "5" score totals are slightly lower.

**Secondary Research Question # 2: Are students who take AP courses motivationally different from students who do not take such courses?**

Survey data from the New Student Questionnaire (NSQ) were used to search for motivational trends regarding student academic performance with AP coursework and college level courses. The last eight questions on the NSQ are designed to tap a student's motivation to succeed in college.

**Sub-Question 1: Do the students in the six AP groups differ on these constructs?**

As before, groups "4" and "5" were combined to answer this question. The means for the eight motivational questions by AP group are contained in Table 4.6.

**Table 4.6: Means for NSQ Motivational Questions by AP Group**

NSQ Question	No AP	“1”	“2”	“3”	“4” and “5”
74. Most of my teachers considered my one of the harder workers in their class.	4.13	4.26	4.32	4.38	4.44
75. I find it difficult to keep a plan of action in my school work.	2.54	2.39	2.40	2.43	2.42
76. I enjoy studying and reading about things on which I am working	3.85	3.94	3.95	4.04	4.08
77. I know how to manage my time well.	3.73	3.77	3.73	3.67	3.70
78. I am self confident.	4.36	4.32	4.29	4.17	4.11
79. My plans have frequently seemed so full of difficulties that I have had to give them up.	2.20	2.13	2.09	2.12	2.12
80. I am organized and have good studying habits.	3.61	3.75	3.68	3.63	3.60
81. I prefer to be independent of others in deciding what I want to do.	4.04	4.05	4.09	4.11	4.12

There were two patterns in the data. The first pattern focuses on Questions 74 and 76: “I enjoy studying” (#76) and “My teachers considered me one of the harder workers” (#74). Basically, the pattern of these questions follows the pattern of the AP Group exactly, that is, Group 5 has the highest mean, followed by 4, then, 3, then 2, then none, then 1. So, the better a student does on AP, the more the student likes studying and the more the student was considered a hard worker up to the score of “1”. The second pattern focuses on Question 78: “I am self confident”. Here the pattern is the exact opposite. That is, the lowest means are in groups 5, 4 and 3, with the highest means in group’s no-AP, 1 and 2. So, for some reason, students who either did not take AP, or who took an AP course but failed the exam, are expressing a higher level of self confidence.

**Sub-Question 2: Do motivational variables contribute to a prediction of GPA?**

To answer this question, a step-wise multiple regression was run using cumulative GPA as the criterion variable. The predictors included the standard predictors (SAT scores, High School GPA), family variables (income and parental education) and then the motivational variables (the last 8 questions on the New Student Questionnaire). The results of this analysis are contained in Table 4.7.

**Table 4.7: Step-wise Multiple Regression on Cumulative GPA**

Step	Variable Entered	R <sup>2</sup> at this Step
1	High School GPA	.038
2	SAT Writing	.063
3	Q74: Most of my teachers considered me a hard worker	.067
4	SAT Quantitative	.071
5	Q80: I am organized and have good study habits	.073
6	SAT Verbal	.075
7	Q 78: I am self confident (Negative beta)	.076
8	Father's Education	.077
9	Q75: I find it difficult to keep a plan of action in my school work	.077
10	Family Income	.077

Most of the variables above are rather typical of prediction studies. That is, high school GPA is almost always the best predictor, followed by the SAT Writing test. It is interesting that some of the motivational questions enter. Also, as before, the self confidence question actually works in a reverse way than would be expected. That is, the more a student says he or she is self confident, the lower the GPA. Therefore, the data in this study indicate that students with higher GPAs: had higher GPAs in high school, have higher SAT writing scores, were considered harder

workers by their high school teachers, have higher SAT quantitative scores, consider themselves to be organized, have higher SAT verbal scores, express a lower level of self confidence, have fathers with higher levels of education, do not find it difficult to keep a plan of action in school work, and come from families with higher incomes.

**Secondary Research Question # 3: Which variables distinguish the students who obtain a score of “1” on AP tests?**

To answer this question the students who obtained a score of “1” were compared to two different comparison groups: first, to all other students, and, second to only those students with AP scores. The variables used in these analyses included the demographic and motivational variables along with the usual prediction variables (High School GPA; SAT’s, etc.). The results for the academic variables are presented in Table 4.8, while the results for the demographic variables are presented in Table 4.9

**Table 4.8: Comparison of Students With “1” Versus All Others on SATs and High School GPA**

	Mean of the “1” Group (n =1571)	Mean of All others (n = 1413)	F	p	Partial Eta Squared
SAT Verbal	500.50	549.27	491.82	.000	.032
SAT Math	529.57	556.15	162.42	.000	.011
SAT Writing	501.94	544.22	375.32	.000	.025
High School GPA	3.37	3.35	1.14	NS	-

The students who obtained a score of “1” have significantly lower SAT Verbal, SAT Math and SAT Writing scores, but do not differ in High School GPA.

**Table 4.9: SATs and GPAs by Students With “1” Versus All Others with AP**

	Mean of the “1” Group (n = 1413)	Mean of All others with AP (n = 16731)	F	p	Partial Eta Squared
SAT Verbal	501.80	585.86	1348.32	.000	.137
SAT Math	530.85	586.29	583.25	.000	.085
SAT Writing	502.28	581.48	1237.70	.000	.164
High School GPA	3.37	3.39	2.94	NS	-

The pattern in Table 4.9 is identical to the pattern in Table 4.8, with the only difference being that the effect sizes are larger.

An additional set of analyses were computed on the demographic variables. These results are presented in Tables 4.10 and 4.11.

**B. Demographic Variables**

**(1) Ethnicity**

**Table 4.10: Percent of Each Ethnic Group Obtaining a “1” (Using All Students)**

Ethnic Group	% of Group Obtaining a Score of 1
African American	17.2%
Asian	16.5%
Hispanic	9.3%
White	5.9%
All Others	10.5%

A chi square computed on the above data was highly significant (Chi Square = 438.36,  $p = .000$ ,  $V = .143$ ). As shown in Table 4.10, African American and Asian students have significantly higher percentages of students obtaining a score of “1”.

**Table 4.11: Percent of each Ethnic Group obtaining a “1” (Using only students with AP)**

Ethnic Group	% of Group Obtaining a Score of 1
African American	40.5%
Asian	32.2%
Hispanic	21.1%
White	14.9%
All Others	24.7%

The pattern of the data in Table 4.11 is similar to the pattern in Table 4.10

**C. Gender**

A comparison of the male to the female students indicated that there was no difference between them in relation to the percentage of each group obtaining a score of “1”.

**D. Motivation Variables**

This means for Items 74 through 81 on the New Student Questionnaire for the “1” students versus the two comparison groups are contained in Table 4.12.

**Table 4.12: Motivational Variables**

	Mean for Students with “1”	Mean of all other students	Mean for all other AP students
74. Most of my teachers considered my one of the harder workers in their class	4.34	4.18**	4.28*
75. I find it difficult to keep a plan of action in my school work.	2.39	2.49**	2.41
76. I enjoy studying and reading about things.	3.94	3.91	4.02
77. I know how to manage my time well.	3.77	3.72	3.70
78. I am self confident.	4.34	4.19**	4.17**
79. My plans have frequently seemed so full of difficulties that I have had to give them up.	2.13	2.17	2.11
80. I am organized and have good study habits.	3.75	3.62**	3.64**
81. I prefer to be independent of others in deciding what I want to do.	4.05	4.06	4.10

\*Difference is significant at the .05 level; \*\* Difference is significant at the .01 level.

Summarizing the above, students who obtained a score of “1”, as compared to other students:

- Report that their teachers considered them hard workers
- Report that they find it less difficult to keep a plan of action
- Are more self confident
- Report that they are more organized

**Secondary Research Question # 4: Is there a relationship between AP and Graduation?**

The data that are presented here are taken only from the 2006 cohort since that is the only cohort eligible to complete their degree requirements at the time the data were extracted. The percentage who graduated in six years for the AP groups are presented in Table 4.13.

**Table 4.13: Percentages of Students Graduating in Six Years by AP Group**

	No AP	AP of "1"	AP of "2"	AP of "3"	AP of "4"	AP of "5"
Graduated	32.3%	29.7%	41.4%	50.5%	51.0%	72.4%
Did Not Graduate	67.7%	70.3%	58.6%	49.5%	49.0%	27.6%

The chi square computed on these data was highly significantly (chi square = 100.78,  $p = .000$ , Cramer's  $V = .159$ ). The data show that as the AP score increases, the percentage graduating within 6 years increases, again up to the score of "2". As before, those scoring "1" fall below those with no AP credit. Since all cohorts were not available, this analysis cannot be replicated; however, the findings of AP success toward degree completion are interesting to observe none the less.

**Secondary Research Question # 5: Do the Motivational Variables Relate to Retention?**

After analyzing the data, there are no strong relationships between retention and the motivational variables from the New Student Questionnaire. This is not to say that motivation is not a factor in college success; however, this research requires other quantitative or qualitative questions and or variable for further clarity.

## Summary

In conclusion, the data show that students with stronger AP performance achieve at higher levels in college through their first two years. As shown in almost all of the analyses, however, students who score “1” perform at a lower level than students who have no AP experience. However, when covariates reflecting a student’s socioeconomic status are removed, the relationship drastically decreases. That is, most of the advantage that AP provides is simply reflected in the fact that students who do well on AP are doing well academically already and have a more impactful support system as reflected by their higher family income and parents with higher levels of education. The outcome of those receiving AP score ‘1’ having a lower college GPA is worthy of further research.

Retention drops across each semester regardless of cohort which is fairly common in higher education. Students with AP credit did, however, show a stronger retention percentage the higher their AP score, “5’s” stayed longer than “4’s” and so on. One anomaly, again, was that the “1’s” had a lower retention percentage than the Non AP cohort. This outcome may be contributed to the covariates. After taking out SAT, high school GPA and family variables, there was no longer a significant effect for group.

Motivation influence was similar to previous studies in that students doing well on AP coursework are more likely to study often and be considered as “hard working students”. Conversely, those doing best on the AP exam had the lowest self confidence. Teachers considering the student as a harder worker, being organized with good study habits, self-

confident, and finding it difficult to keep a plan of action in school work were motivational characteristics that correlate to the top ten college success predictors.

## CHAPTER 5

### DISCUSSION AND IMPLICATIONS

This culminating chapter further discusses the results of this study and introduces major implications of the study results. The first section reintroduces the major findings of the study and discusses these key findings along with the implications and impacts of Advanced Placement (AP) coursework on college success. The second component of this chapter discusses the limitations of the study and the influence these limitations could have on the outcomes. Section three utilizes the study results to identify and elaborate upon implications for practice. The fourth section presents ideas and implications for future research.

#### Summary of Study Results

**Major Research Question # 1: Does a student’s experience with and performance in AP courses affect the student’s retention and GPA in college?**

In reference to the first major research question, this study found a significant correlation between AP coursework and college success. Specifically, the results indicate that students who took AP coursework, and who received a score of “2” or higher on their AP test(s), had higher college GPAs than students who did not take AP coursework in high school. This result was based on the first two years (four semesters) of academic history for each cohort. The only exception to the advantage demonstrated by students who took AP courses in high school was

the finding that students who received a score of ‘1’ on the AP exam had lower GPAs in college than those who did not take AP coursework.

The second set of analyses for the first research question focused on retention. For comparison and consistency, the same set of semester data were utilized as were used for GPA. The data revealed that AP coursework had a significant but very small impact on the first two years of retention. Specifically, students with higher AP scores demonstrated a somewhat higher rate of retention during their first two years at Temple. These retention data were supplemented by reviewing the six-year graduation rate for the students in the 2006 cohort. Consistent with the previous data, students in the 2006 cohort who obtained a score of “2” or higher on the AP test(s) graduated at a somewhat higher rate than students who did not take AP courses in high school. Again consistent with the previous results, students who took AP courses but who obtained a score of “1” graduated at a lower rate than any other group.

Taken together, the results relevant to the first major research question replicate several previous studies that focused on the impact of AP coursework (Hargrove, Godin, & Dodd, 2008; Keng & Dodd, 2008, Morgan & Manackshana, 1998; Willingham & Morris, 1986). Where the present study differs from most of the previous research is that the analyses went beyond simply comparing students with AP experience to those without. Specifically, all of the analyses were conducted where the effect of several background variables were controlled through the analysis of covariance. These analyses demonstrated that when such variables are controlled (SAT Math, SAT Verbal, SAT Writing, High School GPA, family income, and parent’s educational level) the difference between AP students and non-AP students in college persistence and performance was

drastically decreased. This finding is similar to the results reported by Klopfenstein and Thomas (2005) who also demonstrated that these background variables significantly reduced the impact of AP experience. As mentioned previously in this dissertation, it is reasonable to argue that the correlation between AP performance and college success might be due largely to the impact of socio-economic status on both variables. Specifically, students from poor and less educated families tend to perform less well in college than students from more highly resourced backgrounds. In addition, these students are more likely to attend high schools where AP courses either do not exist, or where these courses are taught poorly. As such, the correlation between AP success and college success is largely due to their joint correlation with SES, an argument made by several other authors (Fleming, 1990; Valencia & Aburto, 1991; Walpole et al., 2001). In fact, the results from this study indicate that the advantage resulting from AP coursework is largely accounted for by cognitive and familial variables. In light of this argument, it seems that the first research question might have been stated in a different way. The question is not simply whether students who take AP courses perform better than students who do not take such courses. The real issue is whether AP coursework provides advantages over and above the advantages that students with the opportunity to experience quality AP work in high school already possess.

**Major Research Question # 2: Are there any characteristic differences between students who take AP courses in high school versus those who do not take AP courses?**

The second major research question asked if there were any characteristic differences between students who took AP coursework in high school versus those who did not. The results for this question are more complex and more ambiguous than the results relevant to the first research question. Perhaps the simplest summary of the results would be that the data for this research question are similar in many ways to the results for Question # 1. Specifically, the data seem to indicate that the pattern for variables such as high school GPA and SAT scores duplicates the GPA data. That is, the group with an average score of “1” is typically the lowest, followed by the group without AP experience, followed, in order, by groups “2”, “3”, “4” and “5”. As such, exactly the same comment could be made here as was made above. That is, there are differences between students who take AP courses and those who do not take such courses, but almost all of these differences are due to the effect of background variables.

The major contextual issue that has to be addressed in answering the second research question is the differing effect of the high school experience. It is to explore this issue that the analyses were presented that focused on students who obtained scores of “1” and “2” on the exam, and also why the data on students from the Philadelphia School District (PSD) were presented. The data indicated that Philadelphia School District students who enter Temple University have taken AP courses at a higher rate than students from other high schools (55.4% of PSD students have some AP experience versus 40.6% of students from all other high schools

combined) but, having taken such coursework, receive a failing score (28.4% of PSD students obtain a score of “1” versus 7.8% of students from all other high schools).

The other set of analyses relevant to the second research question focused on the data from the New Student Questionnaire, especially the questions relating to motivation. One aspect of these data is fairly easy to interpret: students with AP experience, especially those who do well on the AP tests (that, receive a score of “3”, “4” or “5”) perceive themselves to be good problem solvers, have good study and work skills, and are perceived by their teachers the same way. Interestingly, however, these same students indicate that their level of self confidence is lower.

### **Implications for Practice in High Schools**

Similar to Dougherty and Mellor (2010), this research suggests that resources might be better used in high schools by enhancing all academic preparation rather than specific concentration on AP coursework. Furthermore, the data in this study indicate that AP coursework takes some students to college level work prior to completion of the appropriate educational scaffolding in high school. Some educators would say that by encouraging students to take courses they do not have the skill set for “dooms these students to failure or, at best, a superficial understanding instead of the subject mastery” (Nelson, 2007, p.73). Conversely, Gastwirth (2007) states that students experience positive behavior changes when they think about and plan to pursue college education and take steps to put themselves on that path. Both

concerns focus on promoting educational opportunities and reducing the educational gap between high school and college.

The implications of this research introduce four main ideas of foci for high school districts as follows: 1) identify and assess the AP admissions standards in the various school districts; 2) assess the disparity of AP teacher preparation; 3) devote more qualitative research on the systems to support motivation and exposure to college expectations; and, 4) analyze how curricula are assessed and interact with AP coursework. By focusing on these four implications, school districts will be able to strategically redistribute resources and grant funding to more effectively impact the district community as a whole.

The implementation of AP coursework entrance standards will help target students who can gain the most from this educational opportunity. The rigor of AP coursework should be matched with students who have excelled academically and/or socially within their high school setting. This study indicated that students with the appropriate background and educational foundation who could score at least a “2” benefited from the experience. Those receiving a “1” performed lower than non-AP students, indicating that they should be excluded from the program. These data would also be helpful to determine the number of AP exam instances a student would be permitted to attempt.

This study was unable to address the concern found in other studies about the Advanced Placement program for how teacher preparation in the coursework influences student results. Sadler (2010) reports that AP courses are often taught by more experienced teachers with greater

subject matter knowledge and teaching ability. He also found that AP class sizes are often smaller than regular class sizes thus decreasing the school districts' ability to maximize the student-to-teacher ratio. This is a great concern as AP enrollment continues to increase and schools encounter a teacher resource issue for the rest of their student population. Specific allocations of the "seasoned faculty" earmarked for those students seeking college entrance will hinder the educational ability for non-college preparatory students. Future studies in this area should involve qualitative data with focus groups within the district to gather the culture, incentives and written procedures and practice.

This study and previous research have proven that student motivation is an influential factor with student success in college. Motivation comes in many forms and opportunities, both on the school and home environment. Exposure to college readiness should include behavioral change goals: aspiration, academic preparation, availability, and application (Kanoy & Watt, 2005). Family educational attainment has a measurable impact on student attendance in college; therefore, exposure to college requirements within the high school setting is paramount to first generational college seeking students. High schools are often the first time many students learn about college and find a resourceful path to best fit the individual student. Codifying motivational influences could be done through family surveys, high school programs, and student interviews. Students should then be tracked through their high school experience and introduction to the college application process.

This study specifically focused on student performance over the past five to six years. The data revealed a large volume of students taking multiple AP exams; however, it is unknown how the curricula choices influenced AP success. Each institution faces different challenges to best serve their students and it is incumbent for them to assess the strategies that are employed for maximum desired effect. Whether a school district faces a shortage of seasoned educators or if their facilities limit class size, each characteristic influences student ability to learn. AP course subject matter and exam scores should be carefully weighed for future course offering as well as compared to similar work done in non-AP environment coursework.

### **Implications for Practice in College**

The increase in federal funding toward AP programs in high school and growing student enrollment is a reality that higher education needs to address during the next decade. The influx of students with AP credits has brought a different perspective on expectations and higher education must be savvy to the growing demands of accountability and the assumptions of how that influences admission and time to graduation. In light of the results, this study introduces several implications for the college level. The implications of this research introduce four main ideas of foci as follows: 1) the need to perform re-evaluation of the current acceptance scores at the college level; 2) incorporating AP failure information on high school transcripts so colleges can use these data as an “at-risk” indicator; 3) devote more research to how the highest AP scored students are motivated for advanced college incentive programs; and, 4) collaborate with feeder high school districts on student outcomes as a means of assessment.

The College Board website (2011) reports that “more than 90 percent of the nation’s four-year colleges and universities have an AP policy that grants incoming student credit, placement or both for qualifying AP Exam scores and more than 3,800 colleges and universities accepted qualifying AP Exam scores for credit and/or placement”. The impact of wide-spread acceptance of college credit has brought into question the practice of AP acceptance for each individual institution. Historically, AP review is taken on at the time the course is initially approved and is rarely part of on-going assessment similar to college accreditation or curriculum review. Since the AP program is external to the institution, many colleges have grown comfortable with the one time, historic review process. As a result, the lack of AP program review at the college level has introduced conflict as students receive AP and college credit yet fail placement exams or future coursework. Despite extensive validity testing and assessment from the College Board, it is incumbent upon the individual colleges to assess the correlation that the AP score has with the post-secondary institution learning expectations.

The second implication from this study is for colleges to utilize the AP failure information as an “at-risk for not completing college” indicator to provide their admitted students remedial and tutorial resources to promote college success. Currently, AP failure information is not reported to colleges as part of the AP score results from the College Board; however, that is not to say this should not change in the future with increased discussion between post-secondary institutions and the College Board. The results of this study clearly identified students with an AP score of ‘1’ to have more difficulty in college than those without taking AP coursework. While this finding might be unique to the region, it is still significant data that

could be used in a proactive manner to assist student learning. Until that time, college admissions should collect and record any AP failure data from high school transcripts if reported.

This study and several others have validated the College Board affirmation that students who successfully earn AP credit (that is, obtain a score of “3”, “4”, or “5”) are successful in college. The greatest impact of success can be seen with those at the top end scoring a “5”. As these students show a trajectory for academic accomplishments, it is the social responsibility of colleges to recognize the potential and mentor these students into honors programs as continued motivation. With intentional recognition, students with AP credit may be able to meet the growing expectations of increased time to degree or complete more rigorous degree programs. Until such initiatives exist, AP students will be limited to the benefits of college admission and first year academic accomplishments. Qualitative research should be conducted to ascertain how students are best motivated and how those actions could be incorporated into standard institutional practices.

The last consideration for colleges is to review their student data with the feeder high schools. Ongoing assessment is also mentioned within the high school implications for continuing adjustments; however, a collaborative review from the college perspective can be used to guide high schools to offer more impactful AP courses so that these courses actually facilitate success in college. In addition, colleges could also use this opportunity to build consortium agreements that would reduce the college general education enrollment in standard courses by redirecting AP students into honors-based courses thus off-setting additional post-secondary costs by reducing the need for additional courses.

## **Limitations**

This study was limited to one university with the largest pool of admitted students coming from the local city school district. The findings of this study revealed a large percentage of students receiving an AP score of “1” to be less successful in college than those who did not take AP coursework in high school. This finding was largely skewed due to the local school district and may not be common for other school districts in other sectors. Those same school district resources toward the AP program were not available for this study and it is unknown how that influenced the findings.

The large sample size of academic information was helpful to find significant results that emulate pre-existing studies from a quantitative perspective; however, the data relevant to student motivation would have been more meaningful from a planned survey instead of extracting questions from the context of the New Student Questionnaire (NSQ). In addition, motivation questions would be enhanced with a mixed method approach to introduce qualitative responses. Lastly, the ability to track retention was limited to the first two academic years given the cohort of students being studied. Further research on the same cohort would provide for an interesting longitudinal perspective.

## **Future Research**

This study replicates many findings of previous studies (Casserly, 1986; Koch, Fitzpatrick, Triscari, Mahoney, & Cope, 1988; Morgan & Crone, 1993; Morgan & Maneckshanna, 2000;

Morgan & Ramist, 1998) in that AP coursework positively influences college success for those with passing scores. Most importantly, this study introduces the limitation to student success when analyzing those who attempt but fail the AP exam. This study has gathered and revealed an enormous amount of data that should be utilized for further research. Since AP programs impact many areas, there should be specific emphasis or in-depth review from the high school, college, and policy or federal and state perspective. There are three major categories for future implications that will be discussed in this section. These following categories are broken down as follows:

- 1) High school perspective:
  - Resources
  - Faculty experience
  - Curriculum content
  - Student motivation & behavior
- 2) College perspective:
  - AP acceptance practice for college credit
  - Admission practices
  - Student Services
  - Collaborative data
- 3) Policy perspective:
  - Funding
  - Impact on students
  - College access

### **Future High School Research**

As there is an increased emphasis in state governments to require that all high schools provide AP course work and exams in high school, many districts are having a difficult time finding the appropriate resources to meet that mandate. While these policies are introduced to

expand the AP program to traditionally underrepresented student populations, they can have unintended and negative consequences. Finding qualified faculty to teach AP coursework can produce a drain on district resources as these teachers tend to be those of greater experience and seniority. Allocating advanced teachers to the more rigorous courses creates an adverse impact on those students of regular or lower-level courses. One could also argue that the lower level classes are paying the steepest price as those students require the greatest amount of skilled educators. Some districts have tried to avoid the segregation of experienced teachers in AP courses. Without proper preparation, inexperienced teachers found the AP curriculum plan overwhelming and their student failure rate increased. Another unintended result of inadequate teaching is when faculty “teach toward the test.” This negative result may not become obvious until the student goes to college and fails the placement exam or subsequent college level course. To study the cause and effect impact of AP teachers, further quantitative data need to be studied to assess the influence which years of teaching experience, degree specialization, and how monetary influences impact the AP and non-AP culture has within the high school setting.

In addition to studying the teacher credentials, further research should be done on high school curriculum planning and the role that AP coursework plays. Specifically, high school administrators should use the AP outcomes to gage the level of preparation their other courses play into student success and which courses are most critical to college. Notwithstanding colleges that take a wide array of AP course scores at or above ‘3’, many of those subjects are used to fulfill elective requirements. Subsequently, students are in fact not taking courses to help fulfill their degree requirements. The less traditional AP courses should be reduced in high schools for maximum student benefit. In order to strategize AP course offerings, qualitative

research needs to be conducted to determine how AP course offerings are introduced (e.g., student interest, faculty interest, etc.). Those data should be combined with college data to move forward with data driven decision making for future AP curriculum offerings.

Student behavior is an interesting topic to explore when considering the AP program in high school. As the AP program moves away from the traditional college track students, it is important to monitor the emotional influence it may play on students not ready for that level of work or how that could influence their social setting with peers. While this study was limited to only those enrolling in college, it is important for future research to track the influence that open AP course work in high school has on students who pass and fail. The data from this study show that an increasing number of students are taking AP courses, but that an increasing percentage of these students are failing. At the current time, it is unknown if the increased failure rates prevent students from applying and attending college. Do underprepared students become disinterested in college due to the AP failure experience? Is AP failure beneficial because it introduces students to the college environment they never considered? Is open enrollment helpful because it motivates students to more rigorous work they would never consider? The motivation factors from the student and high school teacher perspective are still unknown and should be studied at greater detail.

### **Future College Research**

As of 2011, there are over 30 AP courses being offered across multiple subject areas. Acceptance of AP course work at the college level has been happening for the past fifty years. The majority of college acceptance assessment is outdated as it has not been reviewed since it

was first available. The review of AP acceptance policy and individual discipline scores are in need of significant review at the college level given the increase of students using this method to earn college credit. This research should take into account the college placement test results and how those may contradict or support prior AP exam scores along with the assignment of college credit.

The increased AP participation is a good reason why college admission practices should be researched to see how they may or may not be influencing the acceptance practice. High school transcript data are not uniform throughout the nation; therefore, exploring the weight value to what is calculated and counted on the high school transcript toward college admission becomes a significant finding. Furthermore, analyzing high school AP interest might be another avenue for colleges to foster the college going culture and create another recruitment avenue. In addition, it would be worthy of note to see if the increased AP participation is affecting acceptance rates at any specific type of institutions.

Once students are admitted to college the course selection process often becomes varied. In general, course selection and availability tends to be restricted for freshmen. By nature, AP students have already earned college credit and should be placed into higher level courses; however, it is unclear as to whether this becomes an advantage or disadvantage based on course availability. Are these students encouraged to attend honors courses or programs? Future research should track college behavior and services for those with AP credit to see if the advanced students are encouraged to continue their education at an accelerated rate or if their advancement stops at the high school level.

Summary results of AP student progress in college should be shared with high schools as a means of outcomes assessment. Collaboration between educational levels is highly desirable yet difficult given data access restrictions and confidentiality regulations. Some states are working to collect and centralize these data in light of the obstacles; however, it is unclear what data are being collected or how they are being used.

### **Future Policy Research**

Several subsequent studies are needed to address the social justice aspects of federal and state initiatives to support increased AP funding and course offering mandates for secondary education. There is substantial social concern if this is a well grounded initiative and how resources are being dispersed. Additional data will provide the ability to measure the desired goals as the predicted trajectory continues to rise. Significant attention should be taken into account for school district resources as this study revealed a large disproportion of AP failures coming from the local large urban school district. At this time, it is unknown if the failure rate can be attributed to the resources available at the school district, the student population, or a unique result of the region being studied. It is suggested that future studies should compare urban education outcomes to suburban schools. An in-depth assessment of school district AP needs would help guide the funding allocations and how those changes could better serve their unique student populations.

Access to education is at the groundwork of the AP initiative from the federal and state level. When studying the topic and mandate, it is important to consider what students will be receiving access to. “While members of underrepresented groups of low-income people in general have more access to higher education today than was the case 40 years ago, policy makers have paid little attention to a relatively hidden aspect of the equity question: the hierarchical arrangement of American higher educational institutions and the distribution of students within that institutional system” (Austin & Oseguera, 2004, p. 322).

The data in this research and from the College Board indicate that more underrepresented students are taking advantage of the increased access to AP course work. This study does not reveal the college selection choices of the students in this study. Additional research should analyze if the increased access to AP work has increased student motivation to apply or attend college at a larger percentage rate. In turn, college data should check to see if the selection process has been influenced by the influx of AP exams. If the AP initiative has created a new source of admission competition, further analyzes would be needed to study scholarship distribution and aid programs for low-income students.

Although it is never explicitly stated by the College Board, there is a growing sense in much of the literature created by this organization that the AP program can serve as a form of a national curriculum. The argument seems to be as follows: there is growing evidence that colleges and other stakeholders in the educational process cannot trust high schools to provide quality evidence that students have met high rigorous standards. Specifically, high school grades

are almost completely meaningless since what might represent an “A” in one school might represent something far different in another. Moreover, there is ample evidence that the mere existence of AP courses in a specific school or school district is also meaningless since in some schools AP courses are truly at a college level, while in others they are simply alternate versions of the same low-level educational experience. Given all of these problems, what alternatives are there? What the College Board could be viewed as saying is that their program is the clear way out of this dilemma. Whatever other criticisms might be leveled at the AP program, no one is criticizing the psychometric properties of the AP exams. Since these exams are not dependent on specific school district curricula, and since the creation and scoring of these exams is accomplished by an independent agency (i.e., the College Board), might not these exams serve as the basis for a high-level, national curriculum? Taken to a logical conclusion, the argument could be made that passing the AP exam should serve as the basis for high school graduation.

Whether this is really intended by the College Board is not clear. Nor is it clear whether this outcome, should it occur, would be good or bad. What is clear is that if something of this nature might happen, the education community as a whole should openly discuss it and make an explicit decision one way or the other about its implementation.

### **Conclusion**

The discussion and implications of this chapter present how the findings from this study relate to current literature. In addition, this chapter introduces how the results could be utilized to impact high school, college, and federal and state policy. The outcomes of this study

introduce new data which might prove useful for the increased attention to and movement toward AP courses at the high school level. What is clear is that the AP landscape has changed within the past decade as many states have started to utilize the AP program as an aspect of educational reform to reduce the achievement gap between secondary and post secondary education (Klopfenstein & Thomas, 2010, pg.182). Federal programs such as the Access to High Standards Act of the No Child left Behind Act of 2001 and the American Recovery and Reinvestment Act of 2009 provide funds to school districts to help implement more rigorous academic programs for low-income students. These initiatives support the social justice concept of access and equity for educational mobility. Much like this study, research is required to measure the success of such programs to support subsidies and/or legislation. Further studies should be viewed in the context of equity as well as the efficiency and cost associated to the initiative to validate the current initiatives and serve as new direction or policy.

## REFERENCES

- Alexander, F.K., & Ehrenberg, R.G. (2003). *Maximizing revenue in higher education*. San-Francisco: Jossey-Bass.
- Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment*. Document No. PLLI 1999-8021. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvements.
- Altbach, P., Berdahl, R., Gumpert, P. (2005) *American Higher Education in the Twenty-First Century: Social, Political, and Economic Challenges*. Johns Hopkins University Press, Baltimore and London.
- Astin, A.W., & Oseguera, L. (2004). *The Declining "Equity" of American Higher Education*. *The Review of Higher Education*. Vol 27, No. 3, pp.321-341.
- Attewell, P.(2001). The winner-take-all high school: Organizational adaptations to educational stratification. *Sociology of Education*, 74(4), 267-295.
- Austin, A.W.(2001). *What matter in college? Four critical years revisited*. San Francisco Jossey-Bass.
- Bailey, T. & Karp, M. (2003) *Promoting college access and success: A review of credit-based transition programs*. Washington, DC: U.S. Department of Education, Office of Adult and Vocational Education.
- Bardach, E. (1978). *The implementation game: What happens after a bill becomes a law*. Cambridge, MA: M.I.T. Press.
- Bassiri,D., & Schultz,E. (2003). *Constructing a universal scale of high school course difficulty* (ACT Research Report 2003-4). Iowa City, IA:ACT.
- Bastedo, M.N., & Gumpert, P.J. (2003) *Access to What? Mission differentiation and academic stratification in U.S. public higher education*. *Higher Education*, 46, 341-359.
- Bean, J. (1980). Dropouts and turnover: The synthesis and test of a casual model of student attrition. *Research in Higher Education* 12: 155-187.
- Bean, J., & Metzner, B. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research*, 55, 485-540.
- Blecher, L., Michael, W., & Hagedorn, L. (2002). Factors related to the "system" persistence of students seeking the bachelor's degree at four-year institutions. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

- Bonney, C.R., Gabora, L., Sternberg, R.J., & Merrifield, M. (2012). WICS: A Model for College and University Admission, *Educational Psychologist*, 47:1, 30-41.
- Bowen, W., & Bok, D. (1998). *The Shape of the River*. Princeton, NJ: Princeton University Press.
- Bowen, W.G., Kurzwell, M.A., & Tobin, E.M. (2005). *Equity and Excellence in American Higher Education*. Charlotte, VA: University of Virginia Press.
- Bradburn, E.M. (2002). Short-term enrollment in post-secondary education: student background and institutional differences in reasons for early departure, 1996-98. Post-secondary Education Descriptive Analysis Reports. National Center for Education Statistics, Publication No. NCES-2003-153.
- Braxton, J.M., & Lien, L.A. (2000). The viability of academic integration as a central construct in Tinto's interactionalist theory of college student departure. In *Reworking the student departure puzzle*, ed. J. Braxton, 11-28. Nashville: Vanderbilt University Press.
- Bridgemann, B., & Lewis, C. (1996). Gender differences in college mathematics grades and SAT-M scores: A reanalysis of Wainer and Steinberg. *Journal of Educational Measurement*, 33(3), 257-270.
- Bridgemann, B., & Wendler, C. (1991). Gender differences in predictors of college mathematics performance in college mathematics course grades. *Journal of Educational Psychology*, 83(2), 275-284.
- Burnham, P.S., & Hewitt, B.A. (1971). Advanced Placement scores: Their predictive validity. *Educational and Psychological Measurement*, 31(4), 939-945.
- Cabrera, A.E., & La Nasa, S.M. (2000). Understanding the college choice of disadvantaged students. *New directions for institutional research*. San Francisco: Jossey-Bass.
- Cabrera, A.F., Nora, A., & Castaneda, M.B. (1992). The role of finances in the persistence process: A structural model. *Research in Higher Education* 33 (5): 571-593.
- Camara, W.J. (1997). *The relationship of PSAT/NMSQT scores and AP examination grades (RN-02)*. New York: College Board.
- Camara, W.J., & Millsap, R. (1998). *Using the PSAT/NMSQT and course grades in predicting success in the Advanced Placement Program* (College Board Report No. 98-4). New York: College Board.
- Camara, W.J., & Schmidt, A.E. (1999). Group differences in standardized testing and social stratification (College Board Research Rep. No. 99-5). New York, NY: The College Board.

- Carrera, A.E., & La Nasa, S.M. (2001). On the path to college: Three critical tasks facing America's disadvantaged. *Research in Higher Education* 42(2): 119-150.
- Capasso, J.C.(1995). Grade weighting: Solution to disparity, or creator of despair? *NASSP Bulletin*, 79(568), 100-103.
- Carneiro, P. & Heckman, J.J. (2003). *Human Capital Policy*. In *Inequality in America: What Role for Human Capital Policies?*, Heckman, J.J. & Krueger, A.B., p. 100. Cambridge, Mass: MIT Press.
- Casserly, P.L. (1986). *Advanced Placement revisited* (College Board Report 86-6). New York: College Entrance Examination Board.
- Cognard, A.(1996). *The case for weighting grades and waiving classes for gifted and talented high school students*. Storrs: National Research Center on the Gifted and Talented, University of Connecticut.
- Clotfelter, C.T., Ladd, H.F., & Vigdor, J.L.(2006). Teacher-student matching and the assessment of teacher effectiveness. *Journal of Human Resources*, 41(4), 778-820.
- Cohen, J. (1969). *Statistical power analysis for the behavioral sciences*. San Diego, CA: Academic Press.
- College Board. (n.d.). College Board history. Retrieved from: <http://www.collegeboard.com/about/association/history.html>.
- College Board. (n.d.). Fact Sheet. Retrieved from: [http://www.collegeboard.com/about/news\\_info/sat/factsheet.html](http://www.collegeboard.com/about/news_info/sat/factsheet.html).
- College Board (2009a). The 5<sup>th</sup> Annual AP Report to the Nation. New York: Author. Retrieved from: <http://professionals.collegeboard.com/profdownload/5th-annual-ap-report-to-the-nation-2009.pdf>.
- College Board. (2009b). What an AP grade means. New York: Author. Retrieved from: <http://apcentral.collegeboard.com/apc/public/courses/1994.html>.
- College Board (2010). The 6<sup>th</sup> Annual AP Report to the Nation. New York: Author. Retrieved from: <http://professionals.collegeboard.com/profdownload/6th-annual-ap-report-to-the-nation-2009.pdf>.
- College Board (2011a). The 7<sup>th</sup> Annual AP Report to the Nation. New York: Author. Retrieved from: [http://apreport.collegeboard.org/sites/default/files/downloads/pdfs/AP\\_RTN\\_2011.pdf](http://apreport.collegeboard.org/sites/default/files/downloads/pdfs/AP_RTN_2011.pdf).

- College Board. (2011b). Annual AP Program Participation 1956-2011. Retrieved from: <http://professionals.collegeboard.com/profdownload/AP-Annual-Participation.pdf>
- Curry, W., MacDonald, W., & Morgan, R. (1999). The advanced placement program: Access to excellence. *Journal of Secondary Gifted Education*, 11, 17-22.
- Delicath, T.A. (1999). *The influence of advanced college credit on college student integration and goal attainment: A longitudinal study*. Unpublished doctoral dissertation, Saint Louis University, 1998.
- Dillon, D.(1986, Fall). The advanced placement factor. *Journal of College Admission*, 113, 14-17.
- DiYanni, R. (2008). *The history of the AP Program*. New York: The College Board.
- Dodd, B.G., Fitzgerald, S.J., De Ayala, R.J., & Jennings, J.A. (2002). *An investigation of validity of AP grades of 3 and comparison of AP and non-AP student groups* (College Board Research Report No. 2002-9). New York: College Board.
- Dougherty, C., & Mellor, L., (2010). *Preparing Students for Advanced Placement: It's a Pre K-12 Issue* (219-232). In *AP: A critical examination of the advanced placement program*, ed. Sandler, P., Sonnet, G., Tai, R., & Klopenstein, K., Cambridge, MA: Harvard Education Press.
- Dougherty, C., Mellor, L., & Jian, S. (2006). *Orange juice or orange drink? Ensuring that "advanced courses" live up to their labels*. Austin, TX: National Center for Educational Accountability.
- Dupuis, J. (1999). California lawsuit notes unequal access to AP courses. *Rethinking Schools Online*, 14(1). Retrieved from: [https://www.rethinkingschools.org/archive/14\\_01/caap141.html](https://www.rethinkingschools.org/archive/14_01/caap141.html).
- Edgar, A. & Sedgwick, P. (Eds.) (2003). *Cultural Theory: The Key Concepts*. New York: Routledge.
- Elwell, D.B. (1967). *A history of Advanced Placement Program of the College Entrance Examination Board*. Unpublished doctoral dissertation, Columbia Teachers College.
- Ellwood, D.T. & Kane, T.J. (2000). *Who is getting a college education? Family background and the growing gaps in enrollment*, in *Securing the Future: Investing in Children from Birth to College*, ed. Danziger, S. & Waldfogel, J. New York: Russell Sage Foundation.
- Ewing, M., Huff, K., Kaliski, P. (2010). *Validating AP Exam Scores (85-105)*. In *AP: A critical examination of the advanced placement program*, ed. Sandler, P., Sonnet, G., Tai, R., & Klopenstein, K., Cambridge, MA: Harvard Education Press.

- Fleming, J. (1990). Standardized test scores and the black college environment. In K. Lomotey (Ed.), *Going to school: The African-American experience*. New York: State University of New York Press.
- Flint, T.A. (1992). Parental and planning influences on the formation of student college choice sets. *Research in Higher Education* 33(6) : 689-708.
- Fowler, F. (2004). *Policy Studies for Educational Leaders: An Introduction*. Upper Saddle River (NJ): Pearson Education, Inc.
- Fraser, N. (1990). *Rethinking the Public Sphere: Contribution to the Critique of Actually Existing Democracy*. Social Texts, 25/26, pp. 56-80. Retrieved from: <http://www.jstor.org/stable/466240>
- Freire, P. (1970) *Pedagogy of the Oppressed*. New York: Herder and Herder.
- Freire, P. (1973) *Education for Critical Consciousness*, 1988 Edition. New York: The Continuum Publishing Company.
- Gallager,A., T Kaufman,J.(2005). *Gender differences in mathematics: An integrative psychologist approach*. Cambridge: Cambridge University Press.
- Gastwirth, D. (2007). *Getting connected: College access marketing's next frontier*. NEBHE Working Paper. Retrieved from: [www.collegereadyne.org/practices/whitepapercamjournal.pdf](http://www.collegereadyne.org/practices/whitepapercamjournal.pdf).
- Geiser, S., & Santelices, V. (2004). The role of advanced placement and honors courses in college admissions. Berkeley: University of California. Retrieved from: <http://ishi.lib.berkeley.edu/cshe>.
- Golden, D. (2006). *The price of admission: How America's ruling class buys its way into elite colleges and who gets left outside of the gates*. New York, NY: Three Rivers Press.
- Graves, L. (2008). The gap in graduation rates. *U.S. News and World Report*. Retrieved from: <http://www.usnews.com/articles/education/>.
- Gruber, K.J., Wiley, S.D., Broughman, S.P., Strizek,G.A., & Burian-Fitzgerald,M.(2003). Schools and staffing survey, 1999-2000: Overview of the data for public, private, charters, and Bureau of Indian Affairs elementary and secondary schools. *Education Statistics Quarterly*, 4(3).
- Hagedorn, L.S., Moon, S.H., Cypers, S., Maxwell, W.E., & Lester, J.(2003). *Transfer between community colleges and four-year colleges: The American game*. Paper presented at the annual meeting of the Association for the Study of Higher Education, Portland, OR.

- Hargrove, L., Godin, D., & Dodd, B. (2008). *College outcomes comparisons by AP and non-AP high school experiences* (College Board Research Report 2008-3). New York: College Board.
- Hanushek, E., Kain, J.F., & Rivkin, S.G.(2004). Why public schools lose teachers. *Journal of Human Resources*, 39(2), 326-354.
- Hawkins, D., & Clinedinst, M.(2006). *State of College Admission 2006*. Alexandria, VA: National Association of College Admission Counseling.
- Heller, D. (2001). *The states and public higher education policy*. Baltimore, MD: John Hopkins University Press.
- Herr, N. (1991). Perspectives and policies regarding advanced placement and honors Course work. *College and University*, 62 (2), 47-54.
- Herr, N. (1991). The influence of program format on the professional development of science teachers: A with-subjects analysis of perceptions of teachers who have taught AP and honors science to comparable student populations. *Science Education*, 75 (6), 619-621.
- Henson, J.W. (1980). *Institutional excellence and student achievement: A study of college quality and its impact on educational and career achievement*. Unpublished doctoral dissertation, School of Education, UCLA.
- Hoover, E. (2010) *Colleges Explore Shades of Gray in Making Entrance Tests Optional*. The Chronicle of Higher Education. Retrieved from: <http://chronicle.com/article/College-Explore-Shades-of/64758/>
- Hossler, D., Schmidt, j., & Vesper, N. (1999). *Going to college: How social, economic, and educational factors influence the decisions students make*. Baltimore: Johns Hopkins University Press.
- Howe, N., & Strauss, W. (2007) *Millennials go to college*. Great Falls (VA): Life Course Associates.
- Ishitani, T.T., & DesJardins, S.L. (2002, June). *A longitudinal investigation of dropouts from college in the United States*. Paper presented at symposium conducted at the AIR 42<sup>nd</sup> Annual Forum, Toronto, Canada.
- Johnstone, D.B. (1999). *Financing higher education: Who should pay?* In Altbach, P.G., Berndahl, R.O., & Gumport, P.J., (eds.), *American higher education in the twenty-first century: Social, political, and economic challenges*. Baltimore, MD: The John Hopkins University Press.

- Kanoy, R.C., & Watts, T.J. (2005). *Increasing Access to Higher Education: Success from Integrating Web-based Tools with Public Policy*. Retrieved from: [www.collegeaccessmarketing.org/workarea/downloadasset.aspx?id=II387](http://www.collegeaccessmarketing.org/workarea/downloadasset.aspx?id=II387).
- Karabel, J. (1972). Community college and social stratification. *Harvard Educational Review* 42: 521-562.
- Karabel, J. (1986). Community college and social stratification in the 1980's. In *The Community College and Its Critics. New Directions for Community Colleges*, ed. L.S.
- Keng, L., & Dodd, B.G. (2008). *A comparison of college performances of AP and non-AP student groups in 10 subject areas* (College Board Research Report No. 2008-7). New York: The College Board.
- Kirp, D.L. (2002). Higher education Inc: Avoiding the perils of outsourcing. *Chronicle of Higher Education*. Retrieved from: <http://chronicle.com/weekly/v48/i27/27b01301.htm>.
- King, J.E. (1996). *The decision to go to college: Attitudes and experiences associated with college attendance among low-income students*. Washington, DC: The College Board.
- Kirp, D.L. (2002, March 15). Higher ed Inc.: Avoiding the perils of outsourcing. *Chronicle of Higher Education*. Retrieved from: [chronicle.com/weekly/v48/i27/27b01301.htm](http://chronicle.com/weekly/v48/i27/27b01301.htm).
- Klopfenstein, K. , & Thomas, M.K. (2005). *The Advanced Placement performance advantage: Fact or fiction?* American Economic Association. Retrieved from: [http://www.aeaweb.org/annual\\_mtg\\_papers/2005/0108\\_1015\\_0302.pdf](http://www.aeaweb.org/annual_mtg_papers/2005/0108_1015_0302.pdf).
- Klopfenstein, K. , & Thomas, M.K. (2005). The link between Advanced Placement experience and early college success. *Southern Economic Journal*, 75(3), 873-891.
- Lederman, D. (2008). *Calling Out Colleges on Student Learning*. Inside Higher Education. Retrieved <http://www.insidehighered.com/layout/set/print/news/2008/01/31/aacu>
- Koch, W.R., Fitzpatrick, S.J., Triscari, R.S., Mahoney, S.S., & Cope, J.E. (1988). *The Advanced Placement Program: Student attitudes, academic performance, and institutional policies*. Austin: The University of Texas at Austin, Measurement and Evaluation Center.
- Kuh, G., Douglas, K.B., Lund, J.P., & Ramin-Gyurnek, J. (1994). *Student learning outside the classroom: Transcending artificial boundaries*. ASHE-ERIC Higher Education Report 23(8). Washington, DC: The George Washington University, Graduate School of Education and Human Development.

- Lacy, T. (2010). Examining AP: Access, rigor, and revenue in the history of the advanced placement program. In Sandler, P., Sonnet, G., Tai, R., & Klopenstein, K. (Eds.), *AP: A critical examination of the advanced placement program* (pp.17-48). Cambridge, MA: Harvard Education Press.
- Lang, D.(1997). Accurate and fair RICs: One step closer with RIC index. *ERS Spectrum*, 15(3), 26-29.
- Lederman, D. (2008). *Calling Out Colleges on Student Learning*. Inside Higher Education. Retrieved from: <http://www.insidehighered.com/layout/set/print/news/2008/01/31/aacu>
- Lee, V.E., & Burkham, D.T. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, DC: Economic Policy Institute.
- Lederman, D. (2010). *Sizing Up the Spelling Commission*. Inside Higher Education. Retrieved from: <http://www.insidehighered.com/layout/set/print/news/2008/07/15/nacubo>
- Leslie, L.L., & Brinkman, P.T. (1986). Rates of return to higher education. In J.C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 2). New York, Agathon.
- Liu, S., & Von Secker, C. (2010). *Advanced Placement Examinations as a Key to Post-secondary Success*. Retrieved from: <http://collegeboard.com>
- Lin, Y., & Vogt, W.P. (1996). Occupational outcomes for students earning two-year college degrees: Income, status, and equity. *Journal of Higher Education*, 64, 446 – 475.
- Lord Fairfax Community College. (1995, September). *1995 Assessment report submitted to Virginia Community College System and State Council for Higher Education*. (ERIC Document Reproduction Service No. ED386243)
- Maack, S.C. (2002). *Whatever happened to students who enter in the fall 1995? Persistence at Rio Hondo College*. ERIC Document Reproduction Service No. ED466878. Retrieved from: <http://www.eduref.org>
- Marshall, C. & Gerstl-Pepin, C. (2005) *Re-Framing Educational Politics for Social Justice*. New York: Pearson Education, Inc.
- Matlin, C. (2009). Taking the \$ATs: The big money. *Slate.com*. Retrieved from: <http://www.thebigmoney.com/articles/diploma-mill/2009/5/13/taking-sat>

- McPherson, M.S., & Shapiro, M.O. (1998). *The student aid game: Meeting need and rewarding talent in American higher education*. Princeton, NJ: Princeton University Press.
- Milkewski, G.B., & Gillie, J.M. (2002). *What are the characteristics of AP teachers? An examination of survey results*. Retrieved from: [http://professionals.collegeboard.com/profdownload/pdf/200210\\_20717.pdf](http://professionals.collegeboard.com/profdownload/pdf/200210_20717.pdf)
- Montondon, L., & Eikner, A.E. (1997). Comparison of community college transfer students and native students in an upper level accounting course. *Community College Review* 25(3): 21-38.
- Morgan, G. (2006). *Images of Organizations*. Thousand Oaks (CA): Sage Publications, Inc.
- Morgan, R., & Crone, C. (1993). *Advanced Placement examinations at the University of California: An investigation of the freshman-year courses and grades of examinees in Biology, Calculus AB, and Chemistry* (ETS Statistical Report 93-210). Princeton, NJ: Educational Testing Service.
- Morgan, R., & Klaric, J. (2007). AP students in college: An analysis of five-year academic careers. *College Board: Connect to College Success, Report No. 2008-4*. Retrieved from: [http://professionals.collegeboard.com/profdownload/pdf/072065RDCBRpt07-4\\_071218.pdf](http://professionals.collegeboard.com/profdownload/pdf/072065RDCBRpt07-4_071218.pdf).
- Morgan, R., & Maneckshana, B. (1998). *Advanced Placement students in College: An investigation of course grades at 21 colleges*. (ETS Report No. SR-99-13). Princeton, NJ: Educational Testing Service.
- Morgan, R., & Maneckshana, B. (2000). AP students in college: An investigation of their course – taking patterns and college majors. *Educational Testing Services, Report No. SR-2000-09*. Retrieved from: <http://www.collegeboard.com/ap/pdf/validity2.pdf>.
- Morgan, R., & Ramist, L. (1998). *Advanced Placement students in college: An investigation of course grades in 21 colleges*. (Statistical Report 98-13). Princeton, NJ: Educational Testing Services.
- National Center for Education Statistics. (2001) *Digest of education statistics: 2000* (NCES 2001-034). Washington, DC: U.S. Department of Education.
- Nelson, J. (2007). Avidly seeking success. *Educational Leadership*, 64(7), 72-74.
- Nelson, S.A. (1997, April). The dilemmas of dual-credit. *Texas Community College Teachers Association Messenger* 28, np. (ERIC Document Reproduction Service No. ED413976)
- No Child Left Behind Act (2001). Retrieved from: <http://www.ed.gov/policy/elsec/leg/esea02/index.html>.

- Noble, J. & Sawyer, R.(2004). Is high school GPA better than admission test scores for predicting academic success in college? *College and University*, 79(4), 17-22.
- Nora, A. (1990). Campus-based aid programs as determinants of retention among Hispanic community college students. *Journal of Higher Education* 61(3): 312-331.
- Nora, A. (1993). Two-year colleges and minority student's educational aspirations: Help or hindrance. In *Higher Education: Handbook of Theory and Research*, Vol.9, ed. J.C. Smart. New York: Agathon Press.
- Nora, A. (2004). The role of habitus and cultural capital in choosing a college, transitioning from high school to higher education, and persisting in college among minority and non-minority students. *Journal of Hispanic Higher Education* 3(2): 180-208.
- Nora, A. & Cabrera, A.F.(1996). The role of perceptions of prejudice and discrimination on the adjustment of minority students to college. *Journal of Higher Education* 67(2): 119-148.
- Nora, A. & Cabrera, A.F., Hagedorn, L. & Pascarella, E.T. (1996). Differential impacts of academic and social experiences on college-related behavioral outcomes across different ethnic and gender groups at four-year institutions. *Research in Higher Education* 37(4): 427-452.
- Oaks, J.J.(1985). *Keeping track: How schools structure inequality*. New Haven, CT: Yale University Press.
- Olivas, M.A. (1985). Financial aid packaging policies: Access and ideology. *Journal of Higher Education* 56(4): 462-475.
- Olivas, M.A. (1986). Financial aid and self-reports by disadvantaged students: The importance of being earnest. *Research in Higher Education* 25: 245-52. .
- Paek, P.L., Braun, H., Ponte, E., Trapani, C., & Powers, D.E. (2010). *AP Biology Teacher Characteristics and Practices and Their Relationship to Student AP Exam Performance* (63-84). In *AP: A critical examination of the advanced placement program*, ed. Sandler, P., Sonnet, G., Tai, R., & Klopenstein, K., Cambridge, MA: Harvard Education Press.
- Pantages, T.J., & Creeden, C.F.(1978). Studies of college attrition: 1950-1975. *Review of Educational Research*, 48(1), 49-101.
- Pascarella, E. (1980). Student – faculty informal contact and college outcomes. *Review of Educational Research*, 50, 545-595.
- Pascarella, E.T. & Terenzini, P.T. (1979). Interaction effects in Spandy's and Tinto's conceptual model of college dropout. *Sociology of Education* 52 : 197-210.

- Pascarella, E.T. & Terenzini, P.T. (1990). *How college affects students: Finding and insights from twenty years of research*. San Francisco: Jossey-Bass.
- Pascarella, E.T. & Terenzini, P.T. (2005). *How college affects students*. San Francisco: Jossey-Bass.
- Perna, L.W.(2000). Differences in the decision to attend college among African Americans, Hispanics, and Whites. *Journal of Higher Education* 71(2): 117-141.
- Rothschild, E. (1999). Four decades of advanced placement program. *The History Teacher*, 32 (2), 175-206.
- Plucker, J.A., Chien, R.W., & Zaman, K. (2006). Enriching the high school curriculum through postsecondary credit-based transition programs. *Center for Evaluation and Educational Policy: Education Policy Brief*, 4(2), 1-12.
- Pulley, J.L. (2002, June 21). Well-off and wary. Even small, wealthy private colleges like Oberlin are feeling the economic pinch. *Chronicle of Higher Education*. Retrieved from: [chronicle.com/weekly/v48/i41/41a02701.htm](http://chronicle.com/weekly/v48/i41/41a02701.htm).
- Rothschild, E. (1999). Four decades of advanced placement program. *The History Teacher*, 32 (2), 175-206.
- Rowe, D.C. (2005). Under the skin: On the impartial treatment of genetic and environmental hypotheses of racial differences. *American Psychologist*, 60(1), 60-70.
- Rushton, J.P., & Jensen, A.R. (2005). Thirty years of research on race differences in cognitive ability. *Psychology, Public Policy, and Law*, 11, 235 – 294.
- Sacks, P. (2007). *Tearing down the gates: Confronting the class divide in American Education*. Berkeley: University of California Press.
- Sackett, P.R., Schmitt, N., Ellingson, J.E., & Kabin, M.B.(2001). High-stakes testing in employment, credentialing, and higher education: Prospects in a post-affirmative action world. *American Psychologist*, 56, 302-318.
- Sadler, P.M. (2010). *How Are AP Courses Different?* (51-61). In *AP: A critical examination of the advanced placement program*, ed. Sandler, P., Sonnet, G., Tai, R., & Klopenstein, K., Cambridge, MA: Harvard Education Press.
- Santoli, S.P. (2002). Is there an advantage placement advantage? *American Secondary Education*, 30(3), 23-35.
- Schneider, B.L., Kirst, M., & Hess, F.M.(2003). *Strategies for success: High school and beyond* (Brookings Paper on Education Policy No.6). Washington, D.C.: Brookings Institution Press.

- Schmidt, F.A. & Berdahl, R.O. (2005). Autonomy and accountability: Who controls academe? In Altbach, P.G., Berdahl, R.O., Gumpert, P.J.(2<sup>nd</sup> Ed.), *American higher education in the twenty-first century: Social, political, and economic challenges* (71-90). Baltimore: The Johns Hopkins University Press.
- Shapiro, J. and Stefkovich, J. (2005). *Ethical Leadership and Decision Making in Education: Applying Theoretical Perspectives to Complex Dilemmas*. (2<sup>nd</sup> ed.), Mahwah, NJ: Lawrence Erlbaum Associates.
- Soares, J.A. (2012). The future of college admissions: Discussion, *Educational Psychologist*, 47:1, 66-70.
- Stampen, J.O., & Fenske, R.H. (1988). The impact of financial aid on ethnic minorities. *The Review of Higher Education* 11: 337-53.
- Steele, C. & Aronson, J. (1998). *Stereotype Threat and the Test Performance of Academically Successful African Americans*. In *The Black-White Test Score Gap*, ed. Jencks, C. & Phillips, M., p.401-28. Washington, D.C.: Brookings Institution Press.
- Steinberg, J. (2002). *The gatekeepers: Inside the admissions process of a premier college*. New York, NY: Penguin.
- Sternberg, R.J., Grigorenko, E.L., & Kidd, K.K. (2005). Intelligence, race, and genetics. *American Psychologist*, 60 (1), 46 – 49.
- Sternberg, R.J., & The Rainbow Project Collaborators. (2006). The Rainbow Project: Enhancing the SAT through assessments of analytical, practical and creative skills. *Intelligence*, 34, 321 350.
- Stevens, M.L. (2007). *Creating a class: College admissions and the education of elites*. Cambridge, MA: Harvard University Press.
- St. John, E. (2003). *Refinancing the College Dream*. Baltimore, MD: The Johns Hopkins University Press.
- St. John, E. (2007). Finding Social Justice in Education Policy: Rethinking Theory and Approaches in Policy Research (67- 80). In *Using Quantitative Data to Answer Critical Questions*, ed. Stage, F.K., San-Francisco, CA: Jossey-Bass.
- Temple University (2011). Advance Placement Credit. Retrieved from: [http://www.temple.edu/bulletin/enrolling/admissions/enrolling\\_admissions.shtm](http://www.temple.edu/bulletin/enrolling/admissions/enrolling_admissions.shtm)
- Terenzini, P.T., Cabrera, A.F., & Bernal, E.M. (2001). *Swimming against the tide: The poor in American higher education*. College Board Research Report No. 2001-1. New York: The College Board.

- Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: The University of Chicago Press.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2<sup>nd</sup> ed.). Chicago: University of Chicago Press.
- Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. *Journal of Higher Education*, 68, 599-623.
- U.S. Department of Education. (2009). Advanced Placement test fee program. Retrieved from: <http://www.ed.gov/programs/apfee/index.html>.
- Valencia, R.R., & Aburto, S. (1991). The uses and abuses of educational testing: Chicanos as a case in point. In R.Valencia (Ed.), *Chicano school failure and success*. Philadelphia, PA: Falmer Press.
- Venezia, A., & Kirst, M.(2005). Inequitable opportunities: How current education systems and policies undermine the chances for student persistence and success in college. *Educational Policy*, 19(2), 283-307.
- Viadero, D. (2000). Study suggests fewer students receive AP credit. *Education Week*, 19(42), 5.
- Wainer, H., & Steinberg, L.(1992). Sex differences in performance on the Mathematics section of the Scholastic Aptitude Test: A bidirectional validity study. *Harvard Educational Review*, 62(3), 323-336.
- Walpole, M.B., McDonald, P.M., Bauer, C., Gibson,C., Kanyi, K., & Toliver, R. (2001). *This test is unfair: African American and Latino high school students' perceptions of standardized college admission tests*. Paper presented at the annual meeting of American Educational Research Association, Seattle, Washington.
- Weimer, D.L., & Vining, A.R. (1989). *Policy analysis: Concepts and practice*. Englewood Cliffs, NJ: Prentice Hall.
- Wildes, D.J., & Wilson, R.(1998). *Minorities in higher education, 1997-1998: Sixteenth annual status report*. Washington, D.C.: American Council on Education, Office of Minority Concerns.
- Williams, J. (2009) *Early College Academic Performance: Studying the Effects of Earning College Credits from Advanced Placement and Dual Enrollment*. Unpublished doctoral dissertation, Temple University, 2009.
- Willingham, W. & Morris, M. (1986). *Four years later: A longitudinal study of advanced placement students in college* (Report No. 86-2). Princeton, NJ: College Entrance Examination Board. (ERIC Document Reproduction Service No. 280358)

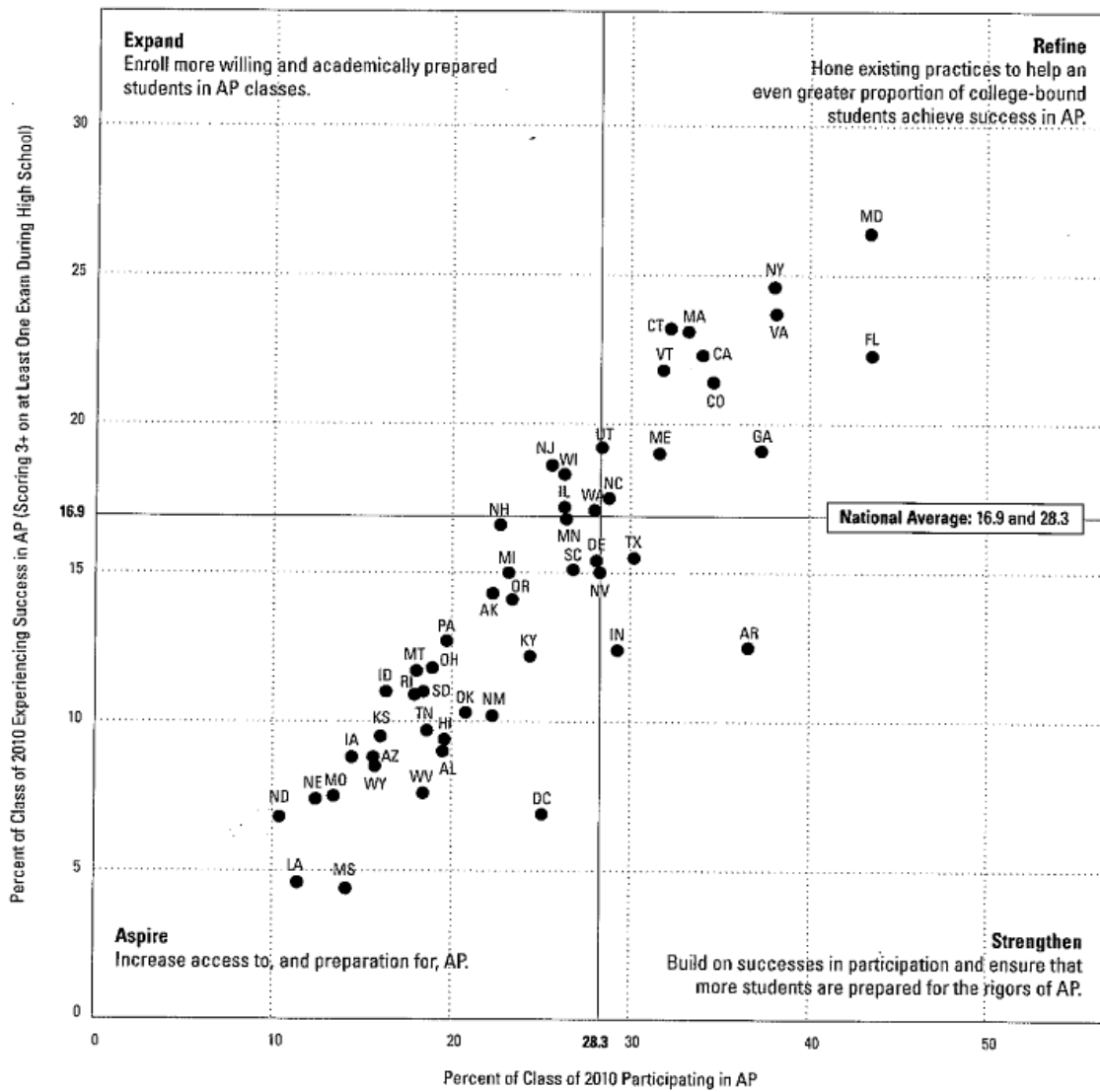
- Windham, P. (1997). High school and community college dual enrollment: Issues of rigor and transferability. *Journal of Applied Research in the Community Colleges*, 5(2), 111-115. (ERIC Document Reproduction Service No. 413936)
- Zemsky, R., Wegner, G.R., & Massey, W.F. (2005). *Remaking of the American University: Market-Smart and Mission-Centered*. Piscataway, NJ: Rutgers University Press.
- Zwerling, 54: 12-30. San Francisco: Jossey-Bass.
- Zwick, R. (2002). *Fairgame?: The use of standardized admissions tests in higher education*. New York, NY: Routledge.
- Zwick, R., & Green, J.G. (2007). New perspectives on the correlation of SAT scores, high school grades, and socioeconomic factors. *Journal of Educational Measurement*, 44, 23-45.

**APPENDIX A**

**DISTRIBUTION OF AP STATE SUPPORT**

College Board 2011a

Figure 5  
**How can states support greater AP participation and success?**



**APPENDIX B**

**AP PARTICIPATION FOR UNDERSERVED STUDENT GROUPS**

College Board 2011a

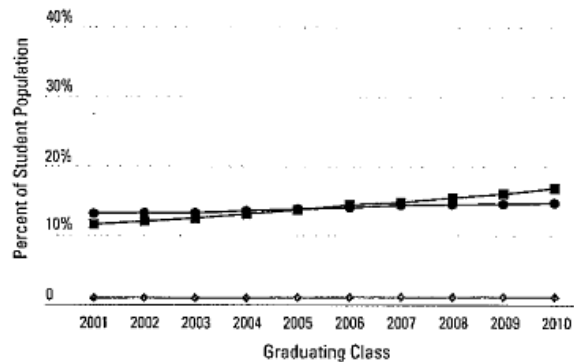
## Trends in Traditionally Underserved Student Groups

- Black/African American
- Hispanic/Latino
- ◆ American Indian/Alaska Native
- ▲ Low income

**Figure 7**  
How has the overall student population changed?

Raw number and percent of all seniors

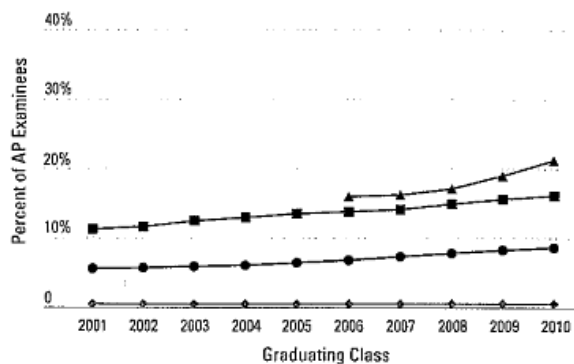
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
●	336,176	345,431	358,388	371,972	384,728	403,569	422,742	437,151	437,035	441,946
■	296,776	314,122	338,417	359,401	380,738	414,428	434,200	465,727	480,920	505,777
◆	26,137	26,903	27,992	28,331	30,456	31,908	33,326	34,039	34,763	34,481



**Figure 8**  
How has AP participation changed?

Raw number and percent of seniors leaving high school having taken an AP Exam

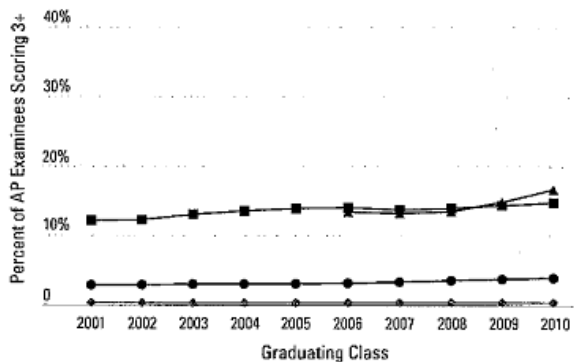
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
●	23,906	26,594	30,076	33,015	38,009	43,896	50,732	58,806	65,716	73,270
■	48,354	54,472	63,696	70,419	78,489	88,694	97,418	112,092	123,588	136,717
◆	2,199	2,333	2,569	2,907	3,199	3,541	3,862	4,331	4,528	4,891
▲	N/A	N/A	N/A	N/A	N/A	102,701	112,190	128,855	150,396	179,774



**Figure 9**  
How has the successful AP student population changed?

Raw number and percent of seniors scoring 3 or higher on an AP Exam in high school

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
●	7,764	8,632	9,784	10,422	11,290	12,517	13,910	16,101	17,749	19,675
■	33,479	37,089	43,021	47,075	51,550	56,118	57,764	63,739	68,267	74,479
◆	988	1,053	1,144	1,302	1,414	1,594	1,699	1,977	2,073	2,195
▲	N/A	N/A	N/A	N/A	N/A	53,662	55,720	61,698	70,585	84,135



At time of press, the numbers of low-income students for each graduating class (Figure 7) and for AP students prior to the class of 2006 (Figures 8 and 9) are not available.

**APPENDIX C**

**DISTRIBUTION OF BLACK/AFRICAN AMERICAN**

College Board 2011a

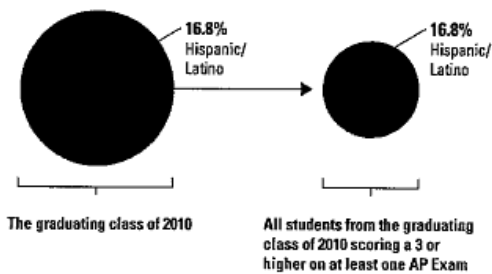
Figure 10

## How close are states to achieving equity and excellence for traditionally underserved students?

### Defining equity and excellence

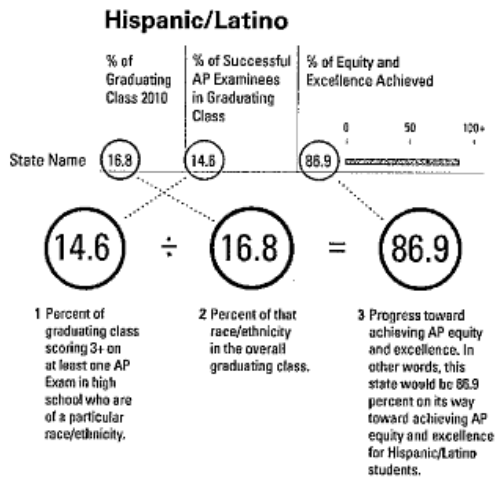
How well each state is enabling all of its students to succeed in AP can be measured by comparing the demographics of that state with the demographics of its successful AP student population.

For example, if 16.8 percent of a state's graduating class is Hispanic/Latino and 16.8 percent of the students scoring 3 or higher on at least one AP Exam in the state are Hispanic/Latino, that state would have achieved equity and excellence in AP for Hispanic/Latino students. In other words, the state's diversity is reflected in its successful AP student population.



### Measuring equity and excellence

The tables at right chart each state's, and the nation's, progress toward achieving equity and excellence. For each state, there are three numbers for each race/ethnicity:



\* Precise American Indian/Alaska Native student enrollments for the District of Columbia are not available.

### Black/African American

	% of Graduating Class 2010	% of Successful AP Examinees in Graduating Class	% of Equity and Excellence Achieved
Hawaii	1.9	2.1	100+
South Dakota	1.4	1.4	100+
Idaho	0.8	0.7	87.5
New Mexico	2.4	1.7	70.8
Vermont	1.5	1.0	66.7
Oregon	2.3	1.1	47.8
Utah	1.1	0.5	45.5
Montana	0.7	0.3	42.9
Arizona	5.8	2.4	41.4
Colorado	5.7	2.2	38.6
New Hampshire	1.6	0.6	37.5
District of Columbia	90.4	33.0	36.5
Maine	2.2	0.8	36.4
Florida	20.0	6.7	33.5
Georgia	34.8	11.6	33.3
Tennessee	22.0	7.2	32.7
Massachusetts	7.5	2.4	32.0
Kentucky	10.4	3.3	31.7
Alaska	3.8	1.2	31.6
Nevada	11.1	3.5	31.5
Washington	4.8	1.5	31.3
West Virginia	4.5	1.4	31.1
Louisiana	34.3	10.6	30.9
Wyoming	1.3	0.4	30.8
Delaware	29.5	8.8	29.8
Iowa	4.7	1.4	29.8
Virginia	24.3	6.9	28.4
Maryland	35.6	9.9	27.8
California	7.0	1.9	27.1
Oklahoma	10.0	2.7	27.0
<b>UNITED STATES</b>	<b>14.6</b>	<b>3.9</b>	<b>26.7</b>
New York	15.5	4.1	26.5
Texas	15.4	4.0	26.0
Alabama	32.4	8.3	25.6
Minnesota	6.3	1.6	25.4
Ohio	13.5	3.4	25.2
North Dakota	1.6	0.4	25.0
Illinois	15.7	3.8	24.2
Mississippi	49.0	11.8	24.1
Arkansas	21.1	4.9	23.2
Indiana	9.5	2.2	23.2
Kansas	7.0	1.6	22.9
South Carolina	38.0	8.4	22.1
North Carolina	29.9	6.5	21.7
Connecticut	12.0	2.4	20.0
Nebraska	5.7	1.1	19.3
New Jersey	15.9	3.0	18.9
Rhode Island	8.1	1.5	18.5
Missouri	16.3	3.0	18.4
Wisconsin	6.8	1.1	16.2
Michigan	16.1	2.6	16.1
Pennsylvania	13.9	2.0	14.4

**APPENDIX D**

**DISTRIBUTION OF HISPANIC/LATINO  
& AMERICAN INDIAN/ALASKA NATIVE**

College Board 2011a

### Hispanic/Latino

	% of Graduating Class 2010	% of Successful AP Examinees in Graduating Class	% of Equity and Excellence Achieved
District of Columbia	6.3	17.2	100+
Louisiana	2.3	4.9	100+
Mississippi	1.2	1.5	100+
North Dakota	1.4	1.7	100+
Florida	23.1	27.9	100+
Alaska	2.9	3.4	100+
Maryland	7.1	7.7	100+
Arkansas	7.0	7.5	100+
South Dakota	1.6	1.7	100+
Georgia	6.3	6.7	100+
Virginia	6.8	6.9	100+
Kentucky	2.7	2.7	100+
Alabama	2.3	2.3	100+
Ohio	2.0	2.0	100+
Tennessee	3.5	3.3	94.3
Maine	1.2	1.1	91.7
Oklahoma	7.7	6.7	87.0
<b>UNITED STATES</b>	<b>16.8</b>	<b>14.6</b>	<b>86.9</b>
South Carolina	3.6	3.1	86.1
Vermont	1.4	1.2	85.7
Illinois	14.4	12.3	85.4
Michigan	3.2	2.7	84.4
Missouri	3.2	2.7	84.4
Texas	39.4	32.7	83.0
New Hampshire	2.8	2.3	82.1
New Mexico	49.4	39.8	80.6
New York	14.1	11.3	80.1
California	41.4	31.9	77.1
Montana	2.4	1.8	75.0
Indiana	5.0	3.7	74.0
North Carolina	7.0	5.1	72.9
Kansas	8.3	5.8	69.9
Delaware	7.1	4.7	66.2
Hawaii	4.1	2.7	65.9
Arizona	34.8	22.4	64.4
Nevada	29.5	18.7	63.4
Iowa	4.6	2.7	58.7
New Jersey	16.9	9.8	58.0
Utah	9.2	5.2	56.5
Washington	10.9	5.9	54.1
Wisconsin	5.1	2.7	52.9
Wyoming	8.4	4.4	52.4
Connecticut	12.3	6.4	52.0
Rhode Island	15.3	7.8	51.0
Nebraska	9.0	4.5	50.0
Oregon	13.6	6.8	50.0
West Virginia	1.2	0.6	50.0
Colorado	20.8	10.3	49.5
Massachusetts	10.6	4.9	46.2
Minnesota	3.6	1.6	44.4
Pennsylvania	5.4	2.4	44.4
Idaho	10.5	3.4	32.4

### American Indian/Alaska Native

	% of Graduating Class 2010	% of Successful AP Examinees in Graduating Class	% of Equity and Excellence Achieved
West Virginia	0.1	0.5	100+
Mississippi	0.1	0.4	100+
Georgia	0.1	0.4	100+
Kentucky	0.1	0.2	100+
Ohio	0.1	0.2	100+
Pennsylvania	0.1	0.2	100+
Tennessee	0.2	0.3	100+
Indiana	0.2	0.3	100+
Maryland	0.3	0.4	100+
Virginia	0.3	0.4	100+
Texas	0.4	0.5	100+
Arkansas	0.9	1.1	100+
South Carolina	0.3	0.3	100+
Vermont	0.5	0.5	100+
Missouri	0.5	0.5	100+
Delaware	0.3	0.3	100+
Maine	0.5	0.4	80.0
Florida	0.4	0.3	75.0
Connecticut	0.3	0.2	66.7
Illinois	0.3	0.2	66.7
Massachusetts	0.3	0.2	66.7
New Hampshire	0.3	0.2	66.7
Kansas	1.3	0.8	61.5
Alabama	1.0	0.6	60.0
Michigan	0.7	0.4	57.1
Colorado	1.1	0.6	54.5
California	0.8	0.4	50.0
Iowa	0.6	0.3	50.0
Rhode Island	0.6	0.3	50.0
Hawaii	0.5	0.2	40.0
Nebraska	1.0	0.4	40.0
New York	0.5	0.2	40.0
Oklahoma	19.6	7.7	39.3
Nevada	1.3	0.5	38.5
Oregon	2.1	0.8	38.1
<b>UNITED STATES</b>	<b>1.1</b>	<b>0.4</b>	<b>36.4</b>
Washington	2.2	0.8	36.4
Idaho	1.8	0.6	33.3
New Jersey	0.3	0.1	33.3
Wisconsin	1.2	0.4	33.3
North Carolina	1.1	0.3	27.3
Louisiana	0.8	0.2	25.0
Utah	1.6	0.4	25.0
South Dakota	4.6	1.0	21.7
Montana	8.2	1.4	17.1
Arizona	6.0	1.0	16.7
Alaska	21.3	3.5	16.4
New Mexico	11.3	1.7	15.0
Minnesota	1.5	0.2	13.3
North Dakota	6.8	0.2	2.9
Wyoming	2.2	0.0	0.0
District of Columbia	*	0.0	*

**APPENDIX E**

**NEW STUDENT QUESTIONNAIRE SAMPLE**

## NEW STUDENT QUESTIONNAIRE

This questionnaire is designed to gather information from new Temple Students to help in designing Temple University's programs. Although you are not required to answer the following questions, accurate answers to these questions will help us continue improving the University for all students.

Your TUID is needed on the answer sheet for machine-processing and analysis of the information, which will be used only for the educational purposes described above.

Please record your answers **IN PENCIL** on the red answer sheet entitled **TEMPLE UNIVERSITY NEW STUDENT INFORMATION FORM**. When you record each answer, please make certain that the question number on the red answer sheet is the same as the question number in the booklet.

MEASUREMENT AND RESEARCH CENTER      4/06 - Form 6



1. Gender
  - a. Male
  - b. Female
2. Age
  - a. 16 or younger
  - b. 17-18
  - c. 19-21
  - d. 22-25
  - e. 26 or older
3. In which class will you be during your first semester at Temple?
  - a. Freshman
  - b. Sophomore
  - c. Junior
  - d. Senior
  - e. Other
4. Is English your native language?
  - a. Yes
  - b. No
5. During the school year, on the average, how many hours do you plan to work (for money) per week?
  - a. None
  - b. 1 to 15 hours
  - c. 16 to 20 hours
  - d. 21 to 25 hours
  - e. More than 25 hours
6. In what kind of residence will you be living during your first semester at Temple?
  - a. University-owned housing (including residence halls)
  - b. Home of parents/relatives
  - c. Your own home or apartment
  - d. Other
7. Where is your permanent home?
  - a. City of Philadelphia
  - b. Suburban Philadelphia
  - c. Pennsylvania, other than suburban Philadelphia
  - d. United States, other than Pennsylvania
  - e. Other country
8. What is your U.S. Military Status?
  - a. No military service
  - b. Active military service
  - c. Veteran
  - d. Reserves or ROTC
  - e. Other
9. What is your best estimate of the total income of your PARENTAL FAMILY during the past year?
  - a. Less than \$20,000
  - b. \$20,000 to \$39,999
  - c. \$40,000 to \$59,999
  - d. \$60,000 to \$79,999
  - e. \$80,000 or more
10. What is your best estimate of YOUR OWN total income during the past year?
  - a. Less than \$2,000
  - b. \$2,000 to \$3,999
  - c. \$4,000 to \$5,999
  - d. \$6,000 to \$7,999
  - e. \$8,000 or more
11. Did you apply for financial aid from Temple for this year?
  - a. Yes, and I received an aid package
  - b. Yes, but I did not receive aid
  - c. Yes, but I have yet to hear about an aid package
  - d. No, but I intend to apply
  - e. No, I will not need financial aid to attend Temple
12. How did the amount of financial aid you received from Temple compare to other schools to which you were admitted?
  - a. Higher than most
  - b. About the same
  - c. Lower than most
  - d. Applied for aid only at Temple
  - e. Did not apply for financial aid
13. Do you have any concern about your ability to finance your college education?
  - a. None (I am confident that I will have sufficient funds)
  - b. Some concern (but I will probably have enough funds)
  - c. Major concern (not sure I will have enough funds to complete college)
14. What was your rating of Temple at the time you applied for admission.
  - a. Temple was my first choice
  - b. Temple was my second choice
  - c. Temple was my third or lower choice
15. What is the highest level of formal education completed by your father?
  - a. Did not graduate from high school
  - b. Graduated from high school
  - c. Some college education
  - d. Graduated from college (a bachelor's degree)
  - e. Postgraduate or professional degree

16. What is the highest level of formal education completed by your mother?

- a. Did not graduate from high school
- b. Graduated from high school
- c. Some college education
- d. Graduated from college (a bachelor's degree)
- e. Postgraduate or professional degree

17. What was your approximate high school average?

- a. A
- b. B+
- c. B
- d. B-
- e. C+ or lower

18. What scholastic average do you expect to obtain in college?

- a. A
- b. B+
- c. B
- d. B-
- e. C+ or lower

19. Scholastically, where did you rank in your high school graduating class?

- a. Top 10%
- b. Top 20%
- c. Top 30%
- d. Top 50%
- e. Not among top 50%

20. In general, how well do you feel that your high school prepared you to do college work?

- a. Very well
- b. Fairly well
- c. Uncertain
- d. Poorly
- e. Very poorly

21. Have you decided on an academic major?

- a. Yes
- b. No

22. Do you consider yourself to be a person who has a disability?

- a. Yes
- b. No
- c. Uncertain

23. During the school year, on the average, how many hours do you plan to study per week?

- a. None
- b. 1 to 15 hours
- c. 16 to 20 hours
- d. 21 to 25 hours
- e. More than 25 hours

Questions 24 - 27 During high school (grades 9 - 12), how many years did you study each of the following subjects?

For questions 24 through 27 use the following responses:

- a. None
- b. One
- c. Two
- d. Three
- e. Four

24. English

25. Mathematics

26. Foreign Language

27. Natural Sciences

Questions 28 - 31 During high school (grades 9 - 12), how much did you like each of the following subjects?

For questions 28 through 31 use the following responses:

- a. Liked very much
- b. Liked somewhat
- c. No feeling one way or the other
- d. Disliked somewhat
- e. Disliked very much

28. English

29. Mathematics

30. Foreign Language

31. Natural Sciences

Questions 32 - 38 How important were the following in your decision to go to college?

For questions 32 through 38 use the following responses:

- a. Very important
- b. Somewhat important
- c. Not important

32. I wanted to get a general education.

33. My parents wanted me to go.

34. I wanted to get away from home.

35. I wanted to be able to get a better job.

36. I wanted to learn more about things that interest me.

37. I wanted to prepare myself for graduate or professional school.

38. It seemed like a good thing to do as a transition to work.

Questions 39 - 45 How important were the following in your finding out about or selecting Temple?

For questions 39 through 45 use the following responses:

- a. Very important
- b. Somewhat important
- c. Not important
- d. Does not apply / did not attend

39. Personal call or letter from Temple faculty member or student

40. High school visit by Temple representative

41. College Fair

42. E-mail communication from Temple

43. Temple's web site

44. Temple open house or reception

45. Regular campus visit / tour

Questions 46 - 58 Below are some reasons that might have influenced your decision to attend Temple. How important was each reason in your decision to come here?

For questions 46 through 58 use the following responses:

- a. Very important positive factor
- b. Somewhat important positive factor
- c. Not a positive factor

46. Affordable tuition

47. Temple's size

48. Social atmosphere

49. Closeness to home

50. Location in a large city

51. Variety of programs available

52. Reputation of Temple

53. Reputation of your specific major at Temple

54. Advice and experience of parents or relatives

55. Advice and experience of friends

56. Meeting students with backgrounds and interests similar to yours

57. Meeting students with backgrounds and interests different from yours

58. Availability of financial aid

Questions 59 - 73 What is the chance that you will do the following while you are at Temple?

For questions 59 through 73 use the following responses:

- a. Very good chance
- b. Some chance
- c. Very little chance
- d. No chance

59. Change your major field of study

60. Participate in an honors program

61. Be a student leader

62. Work full time while attending college

63. Join a social organization or club

64. Play varsity / intercollegiate athletics

65. Need more than 4 years to complete degree requirements

66. Make close friends

67. Work with a professor on a research project

68. Receive encouragement from family while you're in college

69. Get tutoring help in specific courses

70. Transfer to another college before graduating

71. Be satisfied with Temple University

72. Find a job after college in your chosen field of study

73. Participate in volunteer or community service work

Questions 74 - 81 Please indicate your level of agreement with each of the following statements:

For questions 74 through 81 use the following responses:

- a. Definitely agree
- b. Somewhat agree
- c. Neither agree or disagree
- d. Somewhat disagree
- e. Definitely disagree

74. Most of my teachers considered me one of the harder workers in their class.

75. I find it difficult to keep to a plan of action in my school work.

76. I enjoy studying and reading about things on which I am working.

77. I know how to manage my time well.

78. I am self confident.

79. My plans have frequently seemed so full of difficulties that I have had to give them up.

80. I am organized and have good study habits.

81. I prefer to be independent of others in deciding what I want to do.

Thank you for answering these questions.