8-2012

The Effect of Participation in Syracuse University Project Advance and Advanced Placement on Persistence and Performance at a Four-Year Private University

Kalpana Srinivas
Syracuse University

1. Abstract

Concurrent enrollment programs (CEPs) are an important source of academic preparation for high school students. Along with Advanced Placement and International Baccalaureate, CEPs allow students to challenge themselves in high school and prepare for the rigor of college. Many researchers and practitioners have claimed that, when high school students participate in such programs, they become more successful in college, having better retention rates and better grades. Based upon their knowledge about the many students who have participated in CEPs, Marshal and Andrews (2002) note that "there is scarcity of research on dual credit aka concurrent enrollment programs." The claims for the effectiveness of CEPs must be substantiated.

Syracuse University's concurrent enrollment program, Project Advance (PA), was implemented in 1972 at the request of six local Syracuse high schools. The current study is an empirical investigation of the effects of student participation in Syracuse University Project Advance (SUPA) and/or Advanced Placement (AP) on desired student outcomes such as persistence and performance, determined as follows:

1. Persistence:
    a. Short-term persistence
        i. Student dropout in the first year of college;
        ii. Student dropout in the second year of college
    b. Long-term persistence
        i. Student graduation in four years
        ii. Student graduation in six years
2. Performance:

a. College readiness
    i. Student performance in subsequent courses on the main Syracuse University campus.
b. College performance
    i. First year cumulative grade point average (freshman GPA)
    ii. Fourth year cumulative grade point average (degree GPA)

The sample consists of Syracuse University undergraduates (23,398) from fall 1997 to fall 2008, both inclusive. Students who participated in SUPA and AP in high school are tracked by college enrollment and completion, and then compared with their peers of similar demographics and achievement who had not taken such courses. This study attempts to evaluate the effect of both AP and SUPA on college persistence and performance, *with* and *without* controlling for confounding variables such as demographic, financial need, and precollege entry student characteristics. The researcher also examined other significant determinants of persistence and whether the effects varied by gender, race/ethnicity, and socioeconomic status. The effects were examined using statistical tests for differences in means as well as multiple regression analysis.

The findings of this study were mixed. No cause and effect claims were made, as this is a correlational study. Regarding short-term persistence, the findings were in favor of both AP and SUPA. Regarding long-term persistence and performance (cumulative GPA for the first and fourth year), the findings were in favor of AP. When student performance in the subsequent course was examined, participation in SUPA was not significant in predicting the grade in the subject specific postcourse grade. The findings also suggest grade inflation in six out of the eight SU courses offered through PA. However, the findings for both math and writing were

illuminating. The overall results point to some positive effects of concurrent enrollment programs, but also call for improvements to increase their effectiveness.

Reference

Marshall, R. P., & Andrews, H. A. (2002). Dual-credit outcomes: A second visit. *Community College Journal of Research and Practices, 26*, 237–242.

Keywords: dual credit, concurrent enrollment, Project Advance, SUPA, student persistence, student performance.

The effect of participation in Syracuse University Project Advance and Advanced Placement on Persistence and Performance at a Four-Year Private University

By

Kalpana Srinivas
B.Sc. Rajasthan University, 1972
M.S. Syracuse University, 2005

Dissertation

Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Instructional Design, Development and Evaluation in the Graduate School of Syracuse University

August 2012

Acknowledgements

I would like to thank the following people, beginning with my dissertation committee members:

Dr. Jerry S. Edmonds, dissertation chair, for his guidance and support in helping me understand the complexity of the Project Advance Program at Syracuse University. He helped me stay calm and take it "one step at a time." Every time I got discouraged or overwhelmed he saw me through to the next step.

Dr. Nick L. Smith, program/department advisor, for all his counsel and patience. I had the privilege of taking five courses with him. His questions, such as "Who Cares?"and "So What?" not only challenged me in class, but also helped me clarify my thoughts through the dissertation process.

Dr. Donald Dutkowsky, dissertation advisor, for his vision and encouragement. Without his thoroughness and patience there would be no dissertation. He reached out to me and offered to be my advisor when he found out about my research topic, and he has been there for me every step of the way, sometimes even to crack the whip on my methodology.

My external readers, Dr. Timothy Eatman and Dr. Jeffrey Mangram, for volunteering their time to read, critique, and provide invaluable feedback in the midst of their very busy schedules.

Dr. James Bellini, Associate Professor of Education, whose insights and advice regarding the research design expanded my thinking and refined my skills as a researcher.

Timothy Wasserman, my statistician guru, who taught me how to be "statistically accurate and statistically literate."

Charulata Chawan, my friend, who was always there in the library whenever I needed a book or an article. She helped me find articles over weekends and holidays and helped reduce some of the "research jitters."

Linda Tucker, my colleague in the Instructional Design, Development, and Evaluation (IDDE) program in School of Education, for her colleagiality, steadfast friendship, and caring attitude, which helped me fulfill all my requirements for graduation.

My family, for their words of encouragement in keeping me going even during times when I was convinced I had embarked on an impossible journey: My daughter Nina, who constantly reminded me that I was her role model and that dropping out was not an option; my special needs son, Ajay, who at times demanded all of my time and energy, but who nevertheless kept reminding me to "stay focused and do my homework"; my husband, Vijay, who has been the biggest critic my work, for his encouragement throughout the whole journey and for keeping me in the "PhD completion mode."

Dr. Robert Duffy, who shared his methodology and references and offered invaluable advice on how to move forward in my journey.

Report Organization

This is a multiple-paper format (4 independent papers) dissertation. From the inception of the project four research designs were created. This created a "roadmap" that was needed to collect the appropriate data from the Syracuse University Student Records System. Paper 1 was a pilot study. Although there is overlap in the set of independent variables used, each paper has uniquely different dependent variables. This dissertation has conceptual coherence and includes:

1. Abstract
2. Paper 1 is an ***initial investigation*** of the role of Syracuse University Project Advance (SUPA), SU's concurrent enrollment program (CEP) in terms of student persistence and performance at Syracuse University, a private, 4-year institution. This study was done as a pilot study, comparing means of SUPA and non-SUPA students, and ***did not control*** for any of the confounding variables.
3. Paper 2 examined if there were any significant differences in the three groups of students: Syracuse University Project Advance (SUPA), Advanced Placement (AP), and the non-SUPA/AP group in terms of short- and long-term persistence. This study used hierarchical multiple logistic regression analysis when controlling for all known and available variables in the Syracuse University Student Records System (SRS).
4. Paper 3 examined the effect of student enrollment in a Project Advance course and its impact on students' performance in the subsequent level course in college and compares their performance to the students who took the introductory and subsequent level course on main campus when controlling for confounding variables.
5. Paper 4 examined if there were any significant differences in the three groups of students: Syracuse University Project Advance (SUPA), Advanced Placement (AP), and the non-SUPA/AP group in terms of cumulative GPA Spring Year 1 (first-year) and cumulative GPA Spring Year 4 (degree GPA) among the three groups of students. This study used hierarchical linear regression analysis controlling for all known and available variables in the Syracuse University Student Records System (SRS).
6. Summary document that summarizes methods and findings.

Table of Contents

List of Figures

List of Tables

List of Appendices

2. The Effect of Syracuse University Project Advance on College Outcomes

2.1 Abstract

Concurrent enrollment programs (CEPs), also referred to as "dual credit," "dual enrollment," and "joint enrollment," have become an important source of academic preparation for high school students. Along with Advanced Placement (AP) and International Baccalaureate (IB), CEPs offer ways in which students can take college courses and challenge themselves in high school. Many students have said that such programs helped them be more successful in college.

This paper is an initial investigation (pilot study) of a CEP at Syracuse University (SU), a four-year, private university in Syracuse, New York. Did that CEP, called Syracuse University Project Advance, help improve the academic performance and persistence of undergraduates who took Syracuse University courses through PA in high school and then enrolled at university for their baccalaureate degree? Prior research studies on SUPA have focused on program features, teacher preparation, credit transfer rates, and satisfaction levels (Project Advance Syracuse University: Our Courses Your Classroom, 2009); but no study has followed SUPA students who subsequently enrolled at Syracuse University to determine the effect of SUPA participation on their commitment, in their early years, to college (performance) and their short-term retention and degree attainment (persistence) using statistical analysis. This pilot study seeks to answer some key questions about students taking college courses in high school through Project Advance.

Two groups were selected for the current study:

1. Students who took SU courses through PA in high school and then enrolled at SU, and

2. Students in the baseline group who did not take SUPA in high school but enrolled at SU.

The scope of this study is limited to Syracuse University. Data used in this study were retrieved from SU's student records system, covering a period of 12 years, from the fall 1997 semester to the fall 2008 semester, both inclusive. This study did not take into account other CEP courses taken by the students.

Measures of central tendency, measures of dispersion, measures of distribution, and effect sizes were generated for all continuous variables. Frequency distribution and mode were generated for all categorical variables to make it possible to count the number of times each score on a single variable occured. Both statistical and practical significances (effect sizes) of these differences were computed and discussed. No cause and effect claims were made. The statistically significant findings in this paper suggest that SUPA students had high merit rating ranking, lower dropout rates and higher financial need.

2.2 Introduction

An important indicator of the quality of college preparation at the secondary school level is how well students perform subsequently in higher education. Adelman (1999) found that the single best predictor of performing well academically in college was the intensity of the high school curriculum. There is a national debate about whether our American high school students are "college ready" and if our schools are indeed preparing students well enough to be successful in college. Venezia, Kirst, and Antonio (2006) report that "eighty-eight percent of 8th graders expect to participate in some form of postsecondary education and approximately 70 percent of high school graduates actually do go to college within two years of graduating" (p. 3). However, Bailey, Hughes, and Karp (2002) found that 37% of students entering college for the first time

left after two years without earning a degree. There is a disconnect here, and both high schools and colleges are interested in tracking the effects of high school interventions on student performance and persistence, especially through the early semesters of college.

Decades ago, when fewer students aspired to attend college, it was appropriate to treat K–12 and postsecondary education as separate units. However, in recent years, with so many high school students desiring to attend college, there has been more concern with the connection between high school and college. Callan, Finney, Kirst, Usdan, and Venezia (2006) argue that state policies should require partnerships between the two units to improve the college readiness of high school students. The U.S. Department of Education (2003) notes that about a quarter of high school students did not enroll for postsecondary education and that one approach to address this problem would be through dual enrollment (Windham & Perkins, 2001).

Syracuse University (SU) addresses this issue by creating a wider range of learning experiences and opportunities for high school seniors through its Syracuse University Project Advance (SUPA). SUPA is designed to bridge the high school-college gap by providing introductory SU courses in high schools to qualified seniors, enabling them to earn college credits, at tuition rates much lower than main campus college tuition rates. SUPA was established in 1972 when six principals from local high schools approached Syracuse University with a request to start a program for competent high school seniors who had completed their required courses. They sought a solution to "senior year boredom" that would challenge students without duplicating coursework that they would then have to take again in their first year of college. These concurrent enrollment programs are "seen as a way to encourage students who might otherwise 'slack off' to engage in demanding coursework during their final year of high

school" (Bailey et al., 2002, p. 9) which then prepares them for the rigor of the subsequent college course.

The U.S. Department of Education reports that 71% of U.S. high schools and 51% of U.S. postsecondary institutions allowed high school students to take college courses in 2002–03, with 813,000 high school students taking a college-credit course in that academic year (Waits & Lewis, 2005). In that same year, the SUPA program at SU had 6,646 student enrollments.

Dutkowsky, Evensky, and Edmonds (2006) report that in the 2006–07 school year, SUPA had approximately 10,900 student enrollments in SU classes in 180 high schools in an area of the Northeast comprised of New York, New Jersey, Maine, Michigan, and Massachusetts (see Figure 1).

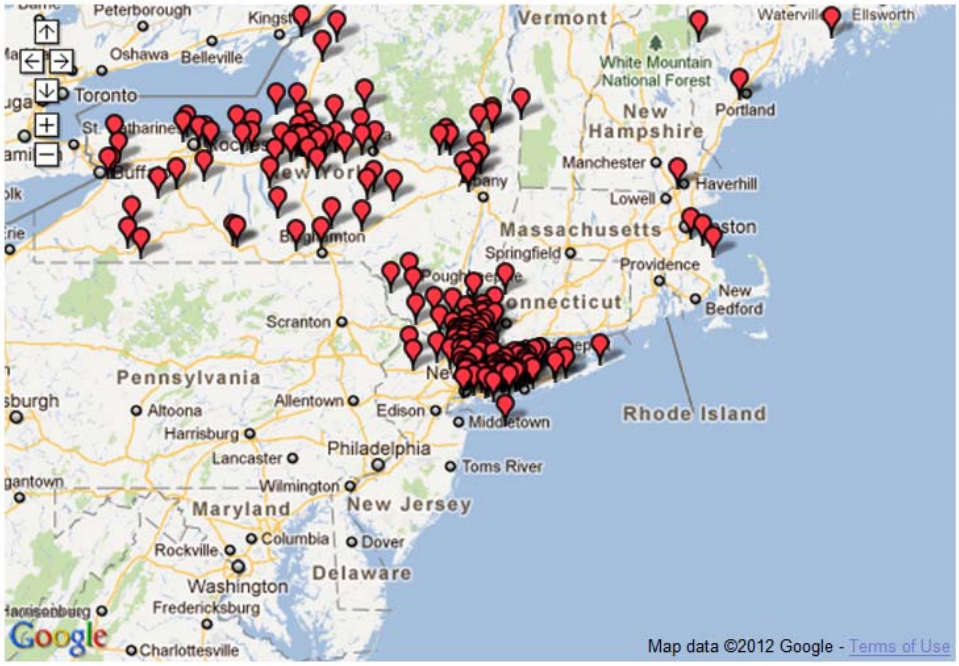


Figure 1. High Schools Offering SU Courses through Project Advance. Adapted from Credit with Credibility, "Participating Schools," on the Syracuse University Project Advance website: http://supa.syr.edu

SU Faculty members continually work with the high school teachers to ensure that college standards are maintained in the off-campus sections of their courses. Thirty-two faculty

members at SU work with high school teachers in 22 different disciplines to improve teaching strategies. About 30 courses are taught in high schools by more than 700 high school teachers who have attended graduate seminars in their subject areas and have been appointed as SU adjunct instructors (Project Advance, 2009).

Below, from the SUPA website ((http://supa.syr.edu/) is a list of courses offered through Project Advance in 2012:

1. ACC 151/Introduction to Financial Accounting (4 credits)
2. BIO 121–123/124/General Biology I and II (8 credits)
3. CHE 106/107/General Chemistry (4 credits)
4. CHE 116/117/General Chemistry (4 credits)
5. CHE 113/Forensic Science (4 credits)
6. CLS 105/College Learning Strategies (3 credits)
7. CRS 325/Presentational Speaking (3 credits)
8. CSE 283/Introduction to Object-Oriented Design (3 credits)
9. EAR 203/Earth System Science (4 credits)
10. ECN 203/Economic Ideas and Issues (3 credits)
11. ECS 100/Introduction to Cybersecurity (4 credits)
12. ECS 102/Introduction to Computing (3 credits)
13. EEE 370/Introduction to Entrepreneurship (3 credits)
14. FRE 102/French II (Beginning French) (4 credits)
15. FRE 201/French III (Intermediate French) (4 credits)
16. HST 101–102/American History (6 credits)
17. IST 195/Information Technologies (3 credits)
18. IST 263/Design and Management of Internet Services (3 credits)
19. ITA 201/Italian III (Intermediate Italian) (4 credits)
20. LAT 201/Latin III (4 credits)
21. MAT 221–222/Elementary Probability and Statistics I and II (6 credits)
22. MAT 295/Calculus I (4 credits)
23. MAT 397/Calculus III (4 credits)
24. PAF 101/An Introduction to the Analysis of Public Policy (3 credits)
25. PHY 101–102/Major Concepts of Physics I and II (8 credits)
26. PSY 205/Foundations of Human Behavior (3 credits)
27. SOC 101/Introduction to Sociology (3 credits)
28. SPA 102/Spanish II (Beginning Spanish) (4 credits)
29. SPA 201/Spanish III (Intermediate Spanish) (4 credits)
30. WRT 105/Studio I: Practices of Academic Writing and ETS 142/Narratives of Culture: Introduction to Issues of Critical Reading (6 credits)

The SU courses offered in high schools are similar in content and course rigor to the corresponding courses offered to first year and sophomore students on the SU main campus. SUPA students earn both high school and college credits. "Recent research has shown that 91% (+ or – 2%) of SUPA graduates who sent an official transcript to another university or attended SU received recognition (credit, placement, and/or exemption) for their SU courses" (Project Advance, 2009. www.syr.supa.edu).

Waits, Setzer, and Lewis (2005) note evidence that student participation in concurrent enrollment programs is currently almost equal to that of student participation in Advanced Placement. Therefore, there is a need for further research on the effectiveness of these programs. Karp, Calcagno, Hughes, Jeong, and Bailey (2007) note in their study of community colleges that further research should be conducted on the effectiveness of concurrent enrollment programs, which will help determine whether these programs should be offered to a larger audience of students. Currently they are only offered to select students in high school.

SU's Project Advance, according to its guidelines, is offered to students who have completed their high school work with a B average or better. But in reality, if the high school guidance counselor believes a specific student is motivated and committed to doing well in the college-level course, then he/she is allowed to enroll in an SU course through PA. The enrollment period is long enough so that said student can drop the class without penalty. Of course, the guidance counselor is then expected to monitor the student's progress and advise the student to either continue, just audit the course; or drop the course.

Swanson (2008) claims in her study that CEP participation may influence students' attitudes and reinforce retention and graduation, rather than attrition, from college. She notes that

participation in CEP may also increase “students’ confidence as future college graduates”, and this may prove to be one of the most important reasons to enroll in such programs in high school.

2.3 Study Purpose

The purpose of the study was to determine the effect of participation in Syracuse University Project Advance on persistence and performance at a Four-Year Private University. This study focused on:

1. Examining the two groups:
    a. SUPA students: Syracuse University undergraduates who had participated in SU courses through Project Advance (PA) while in high school versus
    b. Non-SUPA students: Syracuse University undergraduates who had not taken these courses in high school. (Both the groups may have taken other CEP courses from other programs, but this study does not address that issue.)
2. Extracting and querying the data from the Syracuse University Student Records System (SRS) and creating an observation matrix;
3. Understanding and getting acquainted with the overall data set used for this study and all subsequent analyses;
4. Listing and defining all the independent and dependent variables used in the study;
5. Utilizing descriptive statistics to describe the basic features of the data and provide details regarding SUPA students and non-SUPA students, and;

6. Applying statistical tests to identify the difference in means with respect to the independent variable between the group that has taken SU courses through PA and the group that has not.

2.4 Research Questions

This study addressed two questions:

1. Are the outcomes data consistent with the assertion that concurrent enrollment participation is beneficial to student academic performance and persistence using SUPA at Syracuse University as the specific case?
2. Is there any relationship between student participation in SUPA and student performance and persistence outcomes in college?

2.5 Conceptual Framework

Conceptual models in the area of concurrent enrollment programs are still evolving but it continues to get richer after each study. Both quantitative and qualitative studies will help contribute to the body of literature and build upon what we already know. As these studies are carefully replicated to examine other CEPs in different contexts clearer patterns will start to emerge. This study refers to McComas (2010) conceptual model which explains the benefits of CEP participation to all the different populations (multiple benefits to the student; benefits to the State, and benefits to both the high school and the institution offering the CEP) to serve as a framework to guide the study.

Project Advance's philosophy of curricular alignment, faculty collaboration, and professional development is the driving force behind creating this academic experience for the high school students. As Edmonds (In Print) points out, "the core idea has always been to offer high school students the opportunity to begin post-secondary coursework in those subject areas

where students had completed high school coursework." (p. 3) The aim was to offer high school students the opportunity "to earn postsecondary credit while still in school." (p. 4)

Multiple regression predictive models of short- and long-term persistence, performance in subsequent level course; and performance in the first year and fourth year of college helped guide the conceptual framework for analyzing the study. This study looked at how these predictive models related to the research questions. Gender, race/ethnicity, financial need, precollege entry characteristics were controlled to identify the effect of SUPA participation on the desired student outcomes. The McComas (2010) conceptual framework model (benefits to students' participation in CEPs) and the predictive multiple regression models of the dependent variables helped serve as the theoretical and conceptual frameworks to direct this study.

This is an ex post facto research design. It tests the hypothesis of association as the two student groups chosen are assumed to differ on some important variables, and are compared to see if they also differ on other variables as well. This study used a formal hypothesis to look at the effectiveness of the SUPA program as a strategy for increasing students' postsecondary outcomes.

According to Bailey et al. (2002), AP and CEP students have an advantage over students not in these programs that should correlate to more success for AP and SUPA students. Some studies have found that concurrent enrollment students are more likely to graduate from college, and others have found the opposite. The present study examined a select population of students—select because SUPA requires that students be academically successful, with at least a B average or above both in the particular subject and in overall high school grade point average (GPA) prior to gaining admission into the SUPA program.

The question of persistence has remained an important subject of research for the last 35 years, according to Tinto (1975). Pascarella and Terenzini (2005) note the importance of continuing educational and sociological research to pursue possible explanations of student departure. The literature on persistence has focused on why students depart from an institution of higher education after matriculation. It has not focused much on how students navigate their way from high school to college in terms of the overall systems model. As Venezia et al., (2005) point out,

> States need to make sure that what students are asked to know and do in high school is connected to postsecondary expectations—both in coursework and assessments. Currently, students in most states graduate from high school under one set of standards and face a disconnected and different set of expectations in college. Many students enter college unable to perform college-level work. (p. ix)

SUPA has been in existence since 1972, and claims to make the transition from high school to college easier for students. Not much is known about whether students who participate in SUPA then pursue their undergraduate education at SU have better postsecondary achievement/outcomes as a result. The primary purpose of this study was to examine the relationship between high school students' participation in SUPA and subsequent commitment to college (performance) and short-term retention and degree attainment (persistence).

Duffy (2009) found that very few outcome studies have controlled for students' precollege entry variables. He claims that, for the few studies that control for precollege entry variables, the results have been mixed. Given the tremendous growth of interest in concurrent enrollment programs, he recommends that, future empirical studies focus on student outcomes because such studies might inform future implementation of these programs. Swanson (2008)

also states that "defining efficacy of dual enrollment, in terms of college persistence, academic achievement, and degree attainment, merits scholarly investigation" (p. 9).

2.6 Limitations of the study

1. This study is based on a single institution (SU) with its own concurrent enrollment program, Syracuse University Project Advance. Therefore, the generalizability of the results to the general population is limited.
2. Does not control for any precollege entry student characteristics, so isolating the effects that relate to participation in SUPA may be difficult.
3. Does not control for possible differences in the quality of high schools and does not address the differences in populations between schools that offer SUPA courses in their curriculum.

2.7 Literature Review

Most research on dual credit is not published in refereed journals. One of the concerns addressed in the literature review is that there is a lack of strong quantitative data supporting the proposed benefits of dual credit, making it difficult to assess the real effect of the dual credit programs (Bailey & Karp, 2003). The Illinois Dual Credit Task Force (2008) points out that, without the data to explain the differences among students in the dual credit programs, it was hard to validate claims of success made by dual credit programs.

Many studies on dual enrollment programs refer to Adelman's study (1999) as "strong justification for establishing dual credit programs in high school"; but with the rapid growth of these dual credit programs, "concerns about these programs have also have increased as to whether the learning is truly at "college level" (Duffy, 2009, p. 19). The literature also discussed potential biases in the reporting of results regarding efficacy of both AP and CEPs.

Kim (2008) provides a thorough review of terms and definitions. He also looks at other aspects such as how CEP policies have evolved; program implementation; the connection between dual credit and technical preparation; characterisitics of students who enroll in concurrent enrollment programs; and the effect of dual credit participation on student outcomes in college. Kim examined the effect of dual credit in selected community colleges (but not in a four-year private university as this study does) in four states, and his study found that participation in dual credit was positively related to college readiness in mathematics. However, some of the studies Kim referred to did not control for precollege entry characteristics.

Because dual credit programs are independently administered by the offering institution most of the current literature focuses on the individual programs (Andrews, 2004; Marshall & Andrews, 2002; Smith, 2007). O'Keefe (2009) points out that research on dual credit programs is very similar to research on Advance Placement in terms of concerns and benefits cited. Presented below are some findings from individual studies regarding concurrent enrollment programs.

Karp et al. (2007) studied postsecondary achievement of dually enrolled students in community colleges in the state of Florida and in New York City. This study has been cited many times in the literature. It addressed the effectiveness of dual enrollment as a reform strategy for high schools and for career and technical education. They used nonexperimental, multiple regression statistical methods and found that the state of Florida showed a positive relationship between CEP participation and educational outcomes in community college, whereas New York found negative impacts on both short-term and long-term outcomes after controlling for student demographics, prior achievement, and high school characteristics. The study did show evidence that dual enrollment programs help a range of students in closing the

gap between high school to college. The study examined students in Florida who went on to community colleges, but not to four-year private institutions.

Similarly, Thompson and Rust (2007) followed AP students in college and compared their college grade point average to that of other high-achieving students in natural science and English courses. Their sample size included 41 students from a state-supported university in the southern United States. They used an instrument with 16 items pertaining to AP courses, English and natural science course grades, and high school GPA and ACT/SAT scores. They hypothesized that AP students would rate the benefits of their high school AP courses higher than the benefits of their general education courses, and the results supported this hypothesis. But their "findings contradicted expectations that AP students would earn significantly higher college grades when their grades were compared to those of other high-achieving students. Likewise AP students did not rate the benefit of their high school courses higher than did their high-achieving peers who did not take AP courses" (p.1). Their sample size was small, so external validity was limited.

Duffy (2009) investigated differences in the performance and persistence of credit based (CB) students, AP students, and the non-CB/AP students, while controlling for student precollege entry attributes at a four-year public university in Tennessee. His results show that, when controlling for student precollege entry attributes, no significant differences existed in student college persistence and performance outcomes among the respective student groups. He states that "the only precollege entry attribute that showed a significant relationship with college persistence and performance outcome measures in every regression model was the achievement composite variable: composite ACT/SAT, high school GPA, and high school rank" (p. v).

However, his study did not consider the number of AP/CB courses taken by each student and was conducted at an institution with limited population diversity.

Klopfenstein (2009) used regression analysis to investigate taking AP courses as a potential cause of early college success. She studied a group of Texas public school students who entered the Texas public universities directly after graduating from high school in May 1999. The data set was unique in that it included variables describing the students' non-AP curricular experience. The study showed that, when students' non-AP curricular experiences were not controlled for, there were positively biased AP coefficients. But when the study controlled for these, there was no evidence that taking AP courses increased the likelihood of early college success after what was predicted by the non-AP curriculum for the average student, irrespective of race or socioeconomic status.

Even though Tinto (1987) had stressed the connection between precollege entry characteristics and persistence/performance, Duffy (2009) noted that very few research studies pertaining to concurrent enrollment programs have controlled for precollege entry characteristics. His results were consistent with Tinto's (1993) in that, although there is a significant relationship between precollege entry attributes and persistence/performance in college, this relationship explains less than 5 percent of variation in outcomes in every regression model run in his study.

Allen (2010) did a thorough review of publications, articles, and presentations about dual enrollment that appeared from 2000 to 2010. He focused on issues related to college readiness and differences among students who did and did not participate in these programs. He also reviewed articles on the effects of dual enrollment on both high schools and universities involved in these partnerships. He notes that the lack of research is due both to lack of data and failure to

account for nonrandom assignment. He recommends that "to fully understand" the effectiveness of these programs, one should pay attention to the pre-existing differences among the participants and the nonparticipants.

A larger future study will determine if significant differences exist in performance and persistence among the SUPA only, Advanced Placement (AP) only, and non-SUPA/AP student groups when controlling for demographic, financial need, and precollege entry variables.

2.8 Methodology

2.8.1 Introduction

Two groups are compared and quantitative summarization of this data set is provided in this chapter. The two groups being compared are:

1. Students attending SU who have taken at least one SU course through Project Advance, and
2. Students attending SU who have not taken any SU courses through Project Advance.

A major emphasis is placed on the significance level for rejecting the null hypothesis that the groups being compared are equal. Note: This study was conducted as a pilot study to understand the data set and learn about the SUPA population. Understandably, the comparisons between SUPA and non-SUPA are gross, but future studies compare the SUPA-only group, the AP-only group, and the non-SUPA/AP group using more rigorous methodologies.

2.8.2 Extraction/Querying of Data

In 2008 Institutional Review Board (IRB) approval was obtained to access the data from Syracuse University's student records system. The SU Student Records System (SRS) data are considered to be the University's "official records." All data pertaining to the samples are solely reliant on the accuracy of the University student database and the information reported therein.

The data for this study are maintained in the PeopleSoft enterprise-level records/transaction system and are made available through the University data warehouse via querying and extraction. The SRS contains student academic performance records (transcript data), demographic information, and precollege entry characteristics data related to high school performance and achievement, including credit received for AP and Project Advance sections of SU courses.

The question that arises here is whether SUPA has changed over the last few years or remained the same. With respect to the fundamental components such as teacher selection, site visits, research and evaluation, and seminars, not much has changed. However, with regard to the operational side, many changes have occurred:

- They have streamlined their operations
    - Standardized financial assistance requirements;
    - Moved from paper-based applications to bubble applications to online applications;
    - Implemented direct billing (initially, fees were collected by high school teachers);
    - In 2002, changed from conducting random workshops throughout the year to holding a summer institute that brings teachers from all disciplines from different high schools to SU campus for a two-week session of professional development;
    - Created a student guide that provides information about the program for students and parents;
    - Increased the number of courses offered; and

- Increased the number of partnering high schools,

Working with the Office of Institutional Research and Assessment (OIRA), the researcher extracted these student files from the SRS database. Any student identifiers, including name and SU ID number, were removed from the data set prior to its release for use in this study. The subjects in this study were assigned an identification number. Individual student performance cannot be linked back to specific students because there are no identifying factors other than race and gender.

Babbie (2004) notes that using existing/extant data creates problems of validity and reliability. This study handled validity challenges by ensuring that complete information for each variable was available for each student included in the study. When a frequency analysis performed on the 30,846 students in the three student groups showed that 4,682 students had missing data, they were excluded from the study. It was determined that 26,164 students had valid values recorded in the SRS database for both independent and dependent variables.

As to the reliability of the data, Syracuse University's enterprise student systems maintain data integrity in three ways. First, the basic system infrastructure is built with technology that includes layers of redundancy to ensure that data are not lost or corrupted. Second, the system itself uses validation rules where appropriate to validate data entered into the system. Finally, business procedures in the schools and colleges within the university, the registrar's office, and in the information technology support unit are designed to ensure that institutional data are entered, changed, or deleted only by authorized personnel. System security (including surrounding processes) is audited once a year.

2.8.3 Data

The data were classified within these major categories:

1. Demographics (gender, race/ethnicity, and financial need).
2. Admissions/precollege achievement indicators (SAT math, SAT verbal, high school GPA), and merit rating , a score of 1 through 7, assigned by the Office of Admissions at SU. (Please refer to Appendix C for more details.) Since merit rating was an artifact of high school GPA and SAT math and verbal scores the researcher decided to remove this variable from future regressions, but left it in for this initial investigation.
3. College academic achievement indicators (subsequent course grades, GPAs).
4. Attrition and retention (dropout and graduation rates).

This chapter primarily examined SUPA and college persistence/performance. Therefore,

1. It includes only first-time higher education matriculants;
2. It excludes transfers-in, as most of them completed their first- and second-year coursework elsewhere, and transfer course grades are generally not available for them; and
3. It excludes Spring matriculants, most of whom are transfers-in.

The analysis was based on individual student records (i.e., not on aggregate data).

1. Appropriate methods were chosen so that the statistical procedures were not compromised by the different group sizes.
2. SU course information for Project Advance sections is stored on system in the same way as main campus courses and with the same level of detail, including final grade (A–F); this facilitates comparisons of SUPA sections and main campus sections of courses.
3. If a SUPA student becomes an undergraduate student at SU, information is available on his or her program of study, including major, courses taken and the grades achieved in the next sequence course, first semester and cumulative GPA, and short-term and long-

term retention. If SUPA students don't seek admission into SU, then they are considered nonmatriculated students and are not included in this study.

4. Certain variables in the multiple regressions reported in later chapters, such as course grades and GPA, are quantitative, while others, such as persistence, are qualitative. Quantitative variables include SAT scores, high school GPA, college course grades, and college GPA (GPA scale: F = 0.0; A = 4.0). Qualitative variables include SUPA participation, AP participation, course subject, demographics, admissions merit rating, financial aid, and persistence category. Thus both linear and logistic regression modeling is used in the larger, future studies. The qualitative variables were indicator (i.e., dummy) variables coded for regression modeling.

2.9 Descriptive Statistics

The data were analyzed using SPSS, a statistical software package. Descriptive statistics for all key predictor (student characteristics) and outcome variables were computed to examine the differences among SUPA students and non-SUPA students in terms of both demographic variables and academic characteristics. Students who got a D or an F on the Project Advance course did not earn any credits, but their grades are recorded on the SU transcript if they matriculate into SU.

Measures of central tendency (mean, median, mode, standard of error mean), measures of dispersion (standard deviation, range, minimum/maximum value), measures of distribution (skew, kurtosis), and effect sizes were generated for all continuous variables. Frequency distribution and mode were generated for all categorical variables to count the number of times each score occurred on a single variable. The information from the SPSS output file was then

exported into an Excel worksheet (Appendix B) and both significant and practical effect sizes were calculated.

Given the large sample (N = 26,164) used in this study, statistical significance can be found even when the differences or associations are weak. However, a significant result with a small effect size means that we can be confident that there is a meaningful difference or association. Correspondingly, effect sizes measure the strength of the relationship and/or the magnitude of the difference between levels of the independent variable with respect to the dependent variable. As we know, effect sizes are used to alert the reader to the fact that an estimate of practical significance is being reported. The attempt here is to understand whether these differences are due to reasons beyond a quirk of the sample.

Practical significance involves a judgment by the researcher and the end users. Hedrick, Bickman, and Rog (1993) defined effect size "as the proportion of variance accounted for by the treatment or as the differences between a treatment and control group, measured in standard deviation units" (p. 75). Also, Levin (1993) argued that that the *p* value shows the statistical significance and effect size shows the practical significance. He reminds readers that statistical significance (*p* value) and practical significance (effect size) "are not competing concepts—they are complimentary ones."

For this area of inquiry, I used yet another diagnostic method, and the effect size (ES) in this study is calculated as follows for judging the magnitude of effects:

ES = (SUPA Mean – Non-SUPA mean) / (Non-SUPA mean)

A positive sign means that the SUPA mean is higher and a negative sign indicates that the non-SUPA mean is higher. The purpose of this diagnostic method was to determine if there were any meaningful differences and if the differences were worth noting. It is important to

understand that this diagnostic method is more subjective relative to statistical significance. The following table lists sets of variables (available in the SU database) of the two subgroups that are compared. There are two categories of variables: (a) student characteristic variables (predictor) and (b) performance and persistence variables (outcome). (Please refer to Appendix A for codebook.)

Table 1: List of Student Characteristic Variables (IV and DV)

Student Characteristic Variables (IV)	Dependent Variables (DV)
Race/ethnicity (nominal variable) • Asian Pacific Hawaiian • Black/African American • Hispanic/Latino • Native American • Non-resident alien (international) • White • Other (multiple, unknown)	Dropout Rate • 1st Year • 2nd Year
Gender (nominal, dichotomous variables) • Female • Male	Graduate within • 4 years • 5 years • 6 years
High school academic performance • SAT math • SAT verbal • High school GPA • Merit rating 1–7 (1 being best).	College GPA (interval variable) • 1st Semester GPA • 1st Year cum GPA • 2nd Year cum GPA
Financial need • Did not apply for aid • Applied, but no need for aid • Low need for aid • Medium need for aid • High need for aid	Course Grade • In subsequent course (in a two-level course).

2.10 Analysis

Descriptive statistics for all key predictor and outcome variables were conducted to examine the types of students who enroll for SUPA when compared to students who do not

enroll for SUPA in terms of both demographic variables and academic characteristics. The SPSS file was exported to an Excel worksheet where the effect sizes were calculated using the formula described in the previous section. The effect sizes were evaluated in the context of the study and are reported below. Note that the interpretation of the effect sizes does include some subjective judgment. However, the reasoning underlying these judgments is also provided. **Effect sizes that are significant are indicated in bold.** Statistical significance (Z statistic) is indicated by **(S)** if significant and (NS) if not significant.

Benchmarks for Standardized Differences Between Means. Is the value of the effect size estimate trivial, small, medium, large, or gargantuan? That depends on the context of the research. In some contexts, a *d* of .20 would be considered small but not trivial; in others it would be considered very large. According to Cohen (1998) the significance levels are:

Small (but not trivial) Effect Size:	.2 to .49
Medium Effect Size:	.5 to .79
Large Effect Size:	.8 and higher

That said, using the significance levels described by Cohen, the findings are as follows:

2.10.1 Demographics

2.10.1a Race/Ethnicity

Race and ethnicity in the United States census, as defined by the U.S. Census Bureau, "are self-identification data items in which residents pick the race or races with which they closely identify." In this study, the SUPA group has a higher representation of white students when compared to the non-SUPA group (74% of SUPA vs. 66% of non-SUPA). Conversely, SUPA has lower proportions of African American (3% of SUPA vs. 6% of non-SUPA), Asian

American (7% vs. 8%), and Hispanic/Latino (3% vs. 6%) students. Very few (<1%) SUPA participants are Native American. The effect sizes are:

- Asian/Hawaiian: -0.035 (NS -0.352)
- White: 0.117 **(S 6.067)**
- Black/African American: -0.465 **(S -5.501)**
- Hispanic/Latino: -0.435 **(S -4.621)**
- Native American: -0.088 (NS -0.210)

2.10.1b Gender

The SUPA group has a higher representation of female students (62% of SUPA vs. 56% of non-SUPA). The effect sizes are:

- Female effect size: 0.093 **(S 3.679)**
- Male effect size: -0.120 **(S – 3.679)**

This is a meaningful difference as this study suggests that fewer males participate in SUPA. *USA Today* (2005) reported that nationally the male/female ratio on campus is 43/57 (a reversal of the 1960s trend). These demographic data are comparable to those of other CEP programs and AP programs. These effect sizes would be of concern if one looked for gender parity. It is believed that high school is the ideal place for addressing the issue of getting male students in the college mode. Of course, another possibility could be that the male students are enrolling for other accelerated courses such as AP instead of SU courses through Project Advance. According to Klopfenstein (2003), females in particular tend to take advantage of CEP, and though this is consistent with the gender gap and college graduation rates, not much is known about the reasons behind these trends.

2.10.1c Financial Need

Financial need is an indicator of a student's general socioeconomic status. In general, it is calculated as the cost of attending college minus the expected family financial contribution. It is an approximate expression of the amount of financial aid needed to "close the gap." There are five categories of financial need that can be rank-ordered from low to high. These are:

1. No financial aid application;
2. Filed application, but no need;
3. Low financial need;
4. Medium financial need; and
5. High financial need.

By comparing the proportions of SUPA and non-SUPA students who fall into each of the five categories, we can get a sense of the similarity or differences between these two groups in terms of financial need. Category 1 (no application) contained 18% of the SUPA students vs. 28% of the non-SUPA students (effect size: -0.35). On the other hand, the top category (5 - high need) contained 55% of the SUPA students versus 44% of the non-SUPA students (effect size: 0.25). Based on this pattern, one can conclude that, on average, SUPA students have greater financial need than non-SUPA students. Proportions of filers who had no application for need, low financial need, or medium financial need were comparable for the SUPA and non-SUPA groups. The effect sizes are:

No financial aid application filed	-0.350 **(S -8.564)**
Applied, but no need for aid	-0.084 (NS -1.183)
Low need for aid	0.043 (NS 0.395)
Medium need for aid	-0.054 (NS -0.540)

High need for aid 0.252 **(S 7.547)**

There is evidence from previous studies that these concurrent enrollment programs are not being offered to students from lower socioeconomic groups; according to the National Center for Education Statistics, schools with the highest minority enrollment were the least likely to offer dual enrollment courses when compared to schools with lower minority enrollment—58% to 78% (Krueger, 2006). Some policymakers believe that these programs, therefore, are not accessible to low-income students. The literature review indicates that, because minority students have lower GPAs, and because of the guidelines for admission into Project Advance require a B average or better, they may be less prevalent in SUPA. But SUPA states that this decision is left up to the guidance counselors. Students are allowed to take the course and experience a college class or audit the course, receiving a high school grade that does not then transfer to SU.

Going into this study, my assumption was that most of the SUPA students would be from the upper socioeconomic status (SES) group. However, the effect size for financial need in this study suggests otherwise; the effect size of 0.252 for high need for financial aid indicates that students enrolling in SU courses through PA, and who subsequently enrolled at SU, do come from lower income families and have a high need for financial aid. This is in alignment with SU's mission to provide exceptional support for a diverse population.

Also, the effect size for students who applied for financial aid but had no need for aid was -0.350, which is also meaningful and practical as colleges and universities do see the multiple benefits of admitting students who can pay full tuition.

2.10.1d Admissions/precollege

Nationally the debate continues on whether our high schools are preparing students adequately to compete in higher education and fulfill their requirements for graduation. Both

high schools and colleges are interested in tracking the effects of high school interventions on student performance in the early semesters of college. SUPA is designed to help students who are planning to attend a college/ university; the belief is that SUPA bridges the gap between high school and university by helping students successfully complete some academic requirements early, preparing them for the rigor of university study.

This study finds that:

2.10.1e SAT Scores:

- SAT math – comparable scores.
    - Mean of 597 for non-SUPA group
    - Mean of 599 for SUPA group
- SAT verbal – comparable scores.
    - Mean of 576 for non-SUPA group
    - Mean of 580 for SUPA group

The effect sizes are:

- SAT math effect size: 0.004 (NS 1.173)
- SAT verbal effect size: 0.008 **(S 2.145)**

This study shows that the SUPA group is being compared to matched non-SUPA students, thus satisfying one of the assumptions of multiple regressions in the future studies. The effect sizes are small in both SAT math and verbal. However, SAT verbal is statistically significant.

2.10.1f Merit Rating

Merit rating is a single indicator of a student's general level of academic preparation for college. Assigned by SU's Office of Admissions and based largely on high school GPA and test

scores (e.g., SAT), merit rating takes a value from 1 (top) to 7 (low). (Please refer to Appendix C.) By comparing the proportions of SUPA and non-SUPA students who fall into each of the seven categories, we can get a sense of similarities or differences between these two groups in terms of academic preparation. Of the seven categories, three showed significant differences in proportions of SUPA and non-SUPA students.

Category 2 contains 20% of the SUPA students versus15% of non-SUPA students. Category 3 contains 17% of the SUPA students versus13% of non-SUPA students. Conversely, the bottom category (7) contains 19% of the SUPA students versus29% of non-SUPA students. For these three categories, effect sizes range from 0.26 to 0.37. This suggests that on average, SUPA students have greater academic preparation than non-SUPA students (the top category, 1, contained 8% of the SUPA students versus7% of the non-SUPA students, though this difference is not significant).

The effect sizes are:

- Merit rating 1 effect size: 0.107 (NS 0.975)
- Merit rating 2 effect size: 0.318 **(S 4.079)**
- Merit rating 3 effect size: 0.260 **(S 3.192)**
- Merit rating 4 effect size: 0.137 (NS 1.632)
- Merit rating 5 effect size: 0.081 (NS 0.899)
- Merit rating 6 effect size: -0.078 (NS -0.917)
- Merit rating 7 effect size: -0.370 **(S -9.483)**

Merit ratings 2, 3, and 7 are statistically significant and have meaningful effect sizes as well (merit rating 2 being the highest). Understandably, this suggests that SUPA is attracting high caliber but not the best students into the university. Based on their merit rating, SU also

provides financial scholarships to entering first-year students regardless of financial need, so many of our SUPA students receive merit scholarships. These scholarships are renewable each year as long as the student maintains a minimum GPA of 2.75 on a 4.0 scale. Based on the kinds of students enrolling in SU courses through PA, SU can improve its retention/graduation rates as these students continue to strive for higher levels. The postgraduation student survey (2005 high school students in their senior year of college) results showed evidence of this. Some quotes from students are as follows:

> From what I could remember the project advance program made the transition from high school work to college level work a lot easier because my teacher made us ready for the workload. Additionally the program allowed for greater self-expression and greater freedom. Overall I know what was expected from me as I transitioned in my first year of college!
>
> I appreciate the opportunity you give high school students to take a college level course and earn credit before attending a university. It was a unique experience and I wish I had taken advantage of the other SUPA classes offered at Guilderland.
>
> I believe more courses should be available for High School students to take at the college level. The courses were challenging but helped to prepare me for the college classroom experience. Offering courses at a highly reduced rate for all students helps promote an equal opportunity for higher education.
>
> I enjoyed the program very much. The most valuable aspect of the course for me was the ten page synthesis paper I was required to write. I hadn't written a paper that length in high school and didn't know how to utilize sources in writing a research paper. In college I chose to double major in music (which I had expected to do) and in history as well. My major in history has required many, many twenty (and longer) page research papers that I was already prepared to do and knew how to do as a result of doing sociological research for the Syracuse University program in high school. Now I will go on to pursue a master's degree in musicology, which will also require heavy research and writing, and feel that I am well prepared. The SUPA program is an excellent preparation tool for college level research papers.

2.10.1g High School GPA

High school grade point average is a measure of a student's achievement in high school, which is calculated by dividing the total number of grade points received by the total number of credits attempted. In this study, SUPA students have a higher GPA. On a scale of 0 to 4.0, the mean of SUPA students is 3.72 vs. the mean of non-SUPA students, which is 3.52. The effect size is:

High school GPA effect size: 0.057 **(S 17.773)**

Tinto's research (1987) determined that students' educational expectations correspond to their "goals and commitments," and if students successfully complete SU courses offered through Project Advance in high school, and simultaneously form relationships with college faculty while in high school, they may be more inclined to continue in college. High school students who take SUPA have access to SU faculty for consultation on projects and mentoring, if needed. As stated on the SUPA website, University faculty review papers, review tests, and visit each class during the semester to ensure that the grading standards applied are consistent with those applied in the same courses on campus. Non-SUPA students who matriculate into SU may not have had similar opportunities or exposure to SU faculty.

2.10.1h GPA at Syracuse University (based on a 4.0 scale):

GPA for both groups was comparable, but SUPA students consistently showed a slightly higher GPA than non-SUPA students.

	SUPA mean	Non-SUPA mean
• 1st Semester GPA	3.06	3.05

- 1st Year cumulative GPA 3.10 3.06
- 2nd Year cumulative GPA 3.13 3.11

The effect sizes are:

- Historical cum GPA (1st Semester semester GPA) Fall Year 1: 0.003 (NS 0.590)
- Historical cum GPA (1st Year cum GPA) Spring Year 1: 0.015 (S 2.683)
- Historical cum GPA (2nd Year cum GPA) Ssring Year 2: 0.007 (NS 1.399)

Most importantly, if students used their transfer credits to get exemptions from entry-level college courses, they could reduce the time and money necessary to finish their undergraduate degree. Added to the economic benefit, the students would have more time to take other courses, thereby advancing their studies even further. They also could choose to take some electives that they are interested in. The postgraduation student survey (2005 high school students in their senior year of college) results show evidence of this as follows:

> Having course credits from Syracuse University allowed me to be able to take courses I wanted to take because I was not concerned with having to fulfill required credits. The psychology course was extremely helpful because I took three more psych courses at Hartwick which made me confident in the classes and have a better background in the field. I highly suggest that students take advantage of this program because I had such a great experience with it.
>
> Extremely helpful course, especially to develop college level writing abilities . . . also believe that it helped with the Analytical writing section on the GRE's. Counted as the required freshman English course as well as another English course at Gettysburg, which allowed me to have 2 transfer credits. This ultimately led me to go abroad 2 semesters rather than 1. An excellent program I would highly recommend to other high school students.

2.11 Retention

2.11.1 Dropout Rates

Comparisons of dropout rates after the first and second years of college, and comparisons of four-, five-, and six-year graduation rates, are suitable ways to show differences in academic success between SUPA and non-SUPA students. All five-year rate comparisons were statistically

significant and seemed to favor the SUPA group. Rates for SUPA and non-SUPA students, respectively, were: 7% versus 9% (one-year dropout), 11% versus 14% (two-year dropout), 77% versus 71% (four-year graduation), 84% versus 81% (five-year graduation), 87% versus 82% (six-year graduation). This finding suggests that SUPA students persist and graduate at a rate higher than non-SUPA students. The effect sizes are:

- 2nd Year -0.220 **(S – 2.646)**
- 3rd Year -0.214 **(S – 3.028)**
- 5th Year -0.197 **(S – 2.737)**
- 6th Year -0.172 **(S – 1.995)**

Even though both effect sizes and Z-values are significant here, no causal claims are being made. The effect sizes suggest that SUPA students are less likely to dropout of SU than are the non-SUPA students. This point is very important as attrition affects the individual student from a personal and social point of view and also hurts the university's reputation. Furthermore, in times of limited financial and general resources, attrition leads to a direct loss of tuition income for a university.

Stillman (2009) notes that graduating from college has benefits, such as "less dependence on public assistance, increased tax revenues, greater civic participation, and access to higher income jobs," and when a student drops out of college it is looked upon as "wasted talent" not only for the student but for the society as a whole. It is also well known that the gap in the capacity for earning between those who graduate from high school and those who graduate from college is sizeable. The Bureau of Labor Statistics reports that "education pays in higher earnings and lower unemployment rates." According to the agency, as of February 2010, the unemployment rate for high school students with no college was 10.5%, compared to college

graduates at 5.0%. The median weekly earnings in 2008 for high school graduates was $453, while for students with a bachelor's degree it was $1,102. Also, if students dropout of the educational system, society as a whole faces the burden of providing public assistance at a later date.

It is important to note here that some students may be dropping out of the academic system entirely, while others may be transferring to another institution for various reasons. This study does not take into account *why* a student dropped out of SU. It is possible that these observed and predictable differences are due to other factors; some students may be in SUPA and others not because of socioeconomic status; parents' education; and/or family income. This issue is discussed in a future study using multiple regressions. Also, the report from the National Student Clearinghouse will be reviewed to examine whether and where students enroll after they leave SU.

2.11.2 Graduation Rates

The SUPA group consistently showed a higher rate of graduation in all three years at which rates are assessed.

	SUPA rate	non-SUPA rate	effect size
• 5-Year	77%	71%	0.084 **(S 3.702)**
• 6-Year	84%	81%	0.041 **(S 2.112)**
• 7-Year	87%	82%	0.063 **(S 3.074)**

Although the effect sizes are small if one looks at the means, the SUPA students have a higher percentage of both persistence and graduation rates, suggesting that SUPA could be providing a positive environment in high schools that helps students transition into the college environment and persist until graduation.

High schools track whether their curricula are adequately preparing their students for the rigor of college courses. The gap that exists between high school teachers' expectations and the expectations of college faculty explains some of the attrition from colleges and universities (Achieve Inc. 2008.) Based on Tinto's model of student departure, we understand that academics and social integration are core constructs, and pre-entry college characteristics do impact a student's commitment to an institution and their commitment to graduate from that institution. Previous research studies have also found that positive experiences in concurrent enrollment programs bring about a change in attitude in the student and reduce the chances of attrition (Swanson, 2008). As Duffy (2009) explains, most of these concurrent enrollment programs have been established to increase access to higher education by reducing college costs and by reducing the time to graduate, and also by increasing college enrollments and revenue. The U.S. Department of Education claims that earning college credits before matriculation into college/university reduces the time to degree attainment. They note that the average time to graduate with no credits earned in high school is 4.65 years, as compared to 4.25 years for students who have earned nine or more credits in advance. A future study will attempt to identify SUPA students' likelihood of accumulating credits, entering SU, and graduating with a bachelor's degree in four years.

2.12 Relevance for theory/practice

Pascarella (1982) notes that often theories are viewed as abstract, difficult to understand, and not really applicable to the college's situation. Studying the relationships between SUPA and college performance and persistence outcomes using formal models, detailed rich data, and robust statistical methods will help high school administrators and faculty put into practice more

effective concurrent enrollment programs in the best interests of students, parents, institutions, and society.

Considering the tremendous increase in SUPA enrollment in the last 40 years and the lack of research on the effectiveness of SUPA on student performance and persistence at SU, the relevance of this study becomes apparent. The findings from this and future studies will help align high school outcomes to SU's expectations and help students assess their own college readiness and their subsequent success at SU.

2.13 Conclusion

This study examined student performance and persistence outcomes among SUPA and non-SUPA college students *without* controlling for pre-entry college characteristics. It is important to remember here that SUPA course taking draws from students who average a GPA of B, and Sadler and Tai (2007) note that "if this self-selection is ignored," the outcomes for SUPA course taking may be overestimated.

In summary, the results in this study *without* controlling for any confounding variables suggest a positive relationship of SUPA to merit rating, dropout rates and financial need. However, this does not rule out other rival explanations. SUPA had a higher representation of white females in the program. SUPA students had greater financial need compared with non-SUPA students, contrary to the belief that only affluent students are given the opportunity to enroll for concurrent enrollment courses. With regards to test scores, SUPA students had a higher (albeit small) mean for both SAT math and SAT verbal. Merit ratings 2, 3, and 7 are statistically significant and had meaningful effect sizes too. GPA for both groups was comparable; however, SUPA students showed a slightly higher GPA than non-SUPA students. This study *suggests* that

SUPA students were less likely to dropout in the first two years of college and also had a higher rate of graduation in the three years assessed.

Whatever the findings of a larger, future study, all research on concurrent enrollment programs, as Duffy (2009) suggests, should be seen as a step forward in understanding that CEPs have become a "viable piece of higher education in terms of planning and research." Also, SUPA can utilize the findings from this and the following studies to improve/examine their policies, procedures, and operations going forward.

The next step will be to assess the relationship of SUPA and AP participation to short-term and long-term persistence when controlling for student attributes. Multiple regression analyses examined and estimated quantitative relationships between collegiate academic performance and persistence (i.e., the dependent variables) and pertinent control (i.e., independent variables). Given that the independent variables are attributes that are not subject to manipulation, the research approach going forward will be nonexperimental. The longitudinal nature of the data set will capture, and let us control for, demographic, pre-entry, and financial student characteristics.

2.14 References

Achieve Inc. (2008). *Closing the expectations gap: An annual 50-state progress report on the alignment of high school policies with the demands of college and careers*. Washington, DC: The American Diploma Project.

Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment*. Washington, DC: U.S. Department of Education. Retrieved from http://ed.gov/pubs/Toolbox/toolbox.html

Allen, D. (2010). Dual enrollment. A comprehensive literature review and bibliography. CUNY Collaborative Programs, Office of Academic Affairs. Retrieved from http://www.cuny.edu/academics/k-to-12.html

Andrews, H. A. (2004). Dual credit research outcomes for students. *Community College Journal of Research and Practice, 28*, 415–422.

Babbie, E. (2004). *The practice of social research* (10th ed.). Belmont, CA: Wadsworth.

Bailey, T. R., Hughes, K. L., & Karp, M. M. (2002). *What role can dual enrollment programs play in easing the transition between high school and postsecondary education?* Retrieved from http://www.ed.gov/offices/-OVAE/HS/-bailey.doc

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.

Callan, P. M., Finney, J. E., Kirst, M. W., Usdan, M. D., & Venezia, A. (2006). *Claiming common ground: State policymaking for improving college readiness and success*. (National Center Report #06-1). San Jose, CA: The National Center for Public Policy and Higher Education. Retrieved October 12, 2006, from Academic Search Premier database.

Cohen, J. (1998). *Statistical power analysis for the behavioral sciences* (2nd ed). Hillsdale, NJ: Lawrence Erlbaum Associates.

Duffy, W. R. (2009). *Persistence and performance: The relationship between dual credit and persistence and performance at a four-year university.* The University of Memphis). *ProQuest Dissertations and Theses,* http://search.proquest.com/docview/305150835?accountid=14214

Dutkowsky, D. H., Evensky, J, M., & Edmonds, G. S. (2009). Should your high school adopt Advanced Placement or a concurrent enrollment program? An expected benefit approach. *Education Finance and Policy, 4*(3), 263–277. Retrieved from http://www.mitpressjournals.org/toc/edfp/4/3

Edmonds, G.S. (In Print). Bridging the High School-College Gap: The Role of Concurrent Enrollment Programs. Edited by: Gerald S. Edmonds, Director and Sari Signorelli, Associate Director, Syracuse University Project Advance, Syracuse University Press, 2012.

Hedrick, T. E., Bickman, L., & Rog, D. J. (1993). *Applied research design: A practical guide.* Thousand Oaks, CA: Sage Publications.

Illinois Dual Credit Task Force. *Report to the General Assembly* (December 2008)

Karp, M. M., Calcagno, J. C., Hughes, K. L., Jeong, D. W., & Bailey T. R. (2007). *The postsecondary achievement of participants in dual enrollment: An analysis of student outcomes in two states.* Retrieved from http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED498661&ERICExtSearch_SearchType_0=no&accno=ED498661

Kim, J. (2008). *The impact of dual and articulated credit on college readiness and total college credit earned in four community colleges*. Retrieved from http://occrl.ed.uiuc.edu/Publications/graduate_research/2006/2006_1.asp

Klopfenstein, K. (2003). Recommendations for maintaining the quality of advanced placement programs. *American Secondary Education, 32*(1), 39–48.

Klopfenstein, K. (2009). *The link between advanced placement experience and early college success*. Retrieved from http://findarticles.com/p/articles/mi_qa5421/is_3_75/ai_n-31607817/

Krueger, C. (2006). *Dual enrollment: Policy issues confronting state policymakers*. Denver, CO: Education Commission of the States. Retrieved from http://www.ecs.org/clearinghouse-/67/87/6787.htm

Levin, J. R. (1993). Statistical significance testing from three perspectives. *The Journal of Experimental Education, 61*(4), 378–382.

Marshall, R. P., & Andrews, H. A. (2002). Dual-credit outcomes: A second visit. *Community College Journal of Research and Practices, 26,* 237–242.

Marklein, M. B. (2005, October). College gender gap widens: 57% are women. *USA Today*. Retrieved from USATODAY.com

McComas, M.A. (2010). Degree completion and acceleration rates of Iowa community colleges' concurrent students. Graduate Theses and Dissertations. Paper 11585. Retrieved from http://lib.dr.iastate.edu/etd/11585.

O'Keefe, L. M. (2009). The effect of participation in Advanced Placement and/or dual credit on four-year graduation rates. (Master's thesis, University of North Texas, Denton, TeXas). Retrieved from

http://digital.library.unt.edu/ark:/67531/metadc12172/m1/1/high_res_d/thesis.pdfyear+graduation+rates.&spell=1&bav=on.2,or.r_gc.r_pw.r_qf.,cf.osb&fp=6a94573e11cda30&biw=1261&bih=750.

Pascarella, E. T. (1982). Studying student attrition. In M. W. Peterson (Ed.), *New Directions for Institutional Research, 36*. San Francisco: Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (2005). How college affects students: A third decade of research, Vol. 2. San Francisco, CA: Jossey-Bass.

Project Advance. *Our courses your classroom* [Program guide]. (2009). Retrieved from Syracuse University Project Advance website: http://supa.syr.edu

Sadler, P. M., & Tai, R. H. (2007). Advanced Placement exam scores as a predictor of performance in introductory college biology, chemistry and physics courses. *Science Educator, 16*(2), 1–19.

Smith, D. (2007). Why expand dual-credit programs? *Community College Journal of Research and Practice, 31,* 371–387.

Stillman, M. (2009). Making the case for the importance of student retention. Retrieved from http://www.pacrao.org/docs/resources/writersteam/StillmanMakingTheCaseForStudentRetention.pdf

Swanson, J. L. (2008). *An analysis of the impact of high school dual enrollment course participation on post-secondary academic success, persistence and degree completion.* Paper presented at the meeting of the National Association for Gifted Children, Tampa, FL, and at the National Alliance of Concurrent Enrollment Partnerships, Kansas City, MO.

Thompson, T., & Rust, J. O. (2007). *Follow-up of advanced placement students in college*. Retrieved from http://findarticles.com/p/articles/mi_m0FCR/is_2_41/ai_n27245690/.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: The University of Chicago Press.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.) Chicago: The University of Chicago Press.

United States Department of Labor. Bureau of Labor Statistics, Economic News Release (2010). Retrieved from http://www.bls.gov/news.release/emosit.t04.htm.

Venezia, A., Kirst, M. W., & Antonio, A. L. (2006). *Betraying the college dream: How disconnected K–12 and postsecondary education systems undermine student aspirations*. Retrieved from http://www.stanford.edu/group/bridgeproject/publications.html

Venezia, A., Callan, P. M., Finney, J. E., Kirst, M. W., & Usdan, M. D. (2005). *The governance divide: A report on a four-state study on improving college readiness and success.* San Jose, CA: National Center for Public Policy and Higher Education.

Waits T., Setzer, J. C., & Lewis, L. (2005). *Dual credit and exam-based courses in U.S. public high school: 2002–03* (NCES 2005–2009). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Windham, P., & Perkins, G. (2001). *Dual enrollment as an acceleration mechanism: Are students prepared for subsequent courses?* Paper presented at the meeting of the Association for Institutional Research Forum, Long Beach, CA.

3. Syracuse University Project Advance and Advanced Placement: Relationship to Short-Term and Long-Term Persistence

3.1 Abstract

An important indicator of the quality of college preparation at the secondary level is how well students perform subsequently in higher education. Many studies on dual enrollment programs refer to Adelman's study (1999) as "strong justification for establishing dual credit programs in high school." The rapid growth of these dual credit programs has left scholars, education leaders, and policy makers concerned as to whether the learning is truly at "college level" (Duffy, 2009, p. 19). Debate continues on both access to these programs and quality of these programs.

This study examined whether student participation in Syracuse University Project Advance (SUPA) and/or Advanced Placement (AP) in high school had a relationship to student short-term persistence (Did they dropout within the first two years of college?) and long-term persistence (Did they graduate in four to six years?) when compared with matched non-SUPA/AP students enrolled at SU. Control variables used were precollege entry student characteristics, including demographic, financial need, and academic achievement. The sample consisted of 23,398 records of SU undergraduate students who attended from fall 1997 to fall 2008, both inclusive. The study also examined other determinants of persistence to see if the effects varied by gender, race/ethnicity, and socioeconomic status. The effects were tested using multiple regression analysis with logit estimations.

The results were mixed. AP participation, and the number of SU credits earned via PA, had statistically significant effects, suggesting a higher likelihood of persisting in college during the first year in college. The AP credit indicator and the number of AP credits both related

positively to graduation in four years and graduation in six years. However, the SUPA credit indicator and the number of SUPA credits failed to reach significance and did not predict long-term persistence in this study when compared to the non-SUPA/AP group. Gender, race/ethnicity, socioeconomic status, and high school academic variables also significantly predicted relationships with dropout and graduation.

3.2 Introduction

Higher education institutions understand the importance of persistence; attrition continues to be one of the most important issues faced by the institutions. Postsecondary institutions are looking to improve their retention rates because of the costs of attrition to the student, to the university, and to society as a whole. The National Center for Education Statistics (2010) notes "approximately 57 percent of full-time, first-time bachelor's or equivalent degree-seekers in 2002 attending 4-year institutions completed a bachelor's or equivalent degree at the institution where they began their studies within six years" (p. 6).

Wasserman, Johnson, Yonai, and Yildirim (2011) note that students and parents "focus on graduating." Students begin their quest for a bachelor's degree with the application process; then they go through the admissions process; and finally they graduate with a degree. At matriculation, by definition, "one hundred percent of the cohort at the point of admission is persisting towards their degree" (p. 2). As the years pass, many students decide to leave college, either to end their schooling entirely or to transfer to another institution; many others persist until they graduate. After six years (the federal government's yardstick for assessing graduation rates of four-year programs) have passed, most of the students have completed their degree requirements, transferred to another institution, or dropped out of schooling altogether.

One might wonder why concerns about persistence begin on the first day of college instead of in high school? Why are students left to navigate the divide between high school and college by themselves? Venezia, Callan, Finney, Kirst, and Usdan (2005) write about this divide:

> A profound organizational, political, and cultural chasm persists in most states between the governance systems of K–12 and higher education. The two sectors continue to operate in separate orbits and to live apart in separate professional worlds, associations, and networks . . . within each state—and at the federal level as well—a division exists that is based on the historical and pervasive assumption that K–12 schools and colleges and universities should be guided by policies exclusive to each sector.

When students come unprepared to college, secondary schools are blamed for their unpreparedness. Secondary schools pass the blame on to middle schools; and middle schools blame elementary schools.

Viewing a student's educational context holistically, one might suggest that K–12 education and the ensuing college education are indeed part of the same continuum and should not, therefore, be separated by a chasm. Taking a systems view of the educational enterprise, one can imagine feedback components. One feedback loop would run from the postsecondary system to the K–12 system, answering the question, How can a student's performance in college inform and influence the K–12 education system? Another feedback loop—or feed-forward signal—would run from the K–12 system to the postsecondary system, answering the question, How should a student's progress (and preparation) in the K–12 portion of the system help shape and define the postsecondary portion of the student's educational journey? Thus, feedback could be used to help design the totality to help students achieve optimal performance.

To make possible such a system-wide holistic approach, it is essential that (a) the two parts are seen as a continuum and not as two distinct portions, (b) there is interdependence and interaction amongst the various parts of the overall system, and (c) success is defined as a student-centric outcome, again across the entire system. In this view, the system boundary would be drawn around a student's overall education (from elementary school through college completion).

However, most persistence studies have focused on institutional interventions and programs that promote student enrollment. Kuh, Bridges, and Hayek (2006) argue that "the trajectory for academic success in college is established long before students matriculate." Therefore, state budgets should be increased to get our students college-ready, and local school budgets should be increased so that students can gain access to dual enrollment programs. Also, Venezia, Callan, Finney, Kirst, and Usdan (2005) argue that the "responsibility for building transitions from high school to college remains at the heart of the educational missions of both K–12 and higher education" (p. 3).

Syracuse University Project Advance partners with various high schools in six different states to offer SU courses for credit to qualified high school students—primarily seniors—to expose them to the demands of college. This current study examines the program for its effectiveness in predicting both short-term and long-term retention at SU. Conley (2007) notes that "those who do not arrive at college fully prepared are significantly less likely to progress beyond entry-level courses, as witnessed by the high failure rates in these courses and the high dropout rate among freshman students" (p. 7). Bailey, Hughes, and Karp (2002) found that 37% of students entering college for the first time had left after two years without earning a degree.

Most colleges and universities take student retention very seriously. Attrition has adverse impacts on students' lives and also on the university's contribution to society. Lau (2003) argued that "the loss of students returning to campus for another year usually results in greater financial loss and a lower graduation rate for the institution, and might also affect the way that stakeholders, legislators, parents, and students view the institution" (p. 127). However, it is important to remember that not all attrition is bad. Adelman stated in an interview that sometimes "purposeful transfer has positive results" (2007, p. 1). Sometimes, when the institution is not the right fit, it is good that the student decides to move on.

Kanter (2011) states that "the centerpiece of our higher education agenda is college completion" (p. 14). Syracuse University (SU) regularly analyzes its retention rates and is constantly searching for ways to increase persistence. When SU is compared with its peer institutions on the selected indicator of six-year graduation rate, it becomes apparent in Table 2 that there is still some work to do.

Table 2: Comparison Institutions: Six-Year Graduation Rate (%)

Institution	Six-Year Graduation Rate (%)
Northwestern University	94%
Duke University	94%
Washington University (St. Louis)	94%
Cornell University	93%
Georgetown University	93%
Boston College	91%
Tufts University	91%
Vanderbilt University	91%
University of Southern California	89%
Emory University	89%
Lehigh University	88%
New York University	86%
University of Rochester	84%
Boston University	83%
Syracuse University	82%

Institution	Six-Year Graduation Rate (%)
Case Western Reserve University	82%
George Washington University	81%
University of Miami	80%
American University	79%
Northeastern University	77%
Southern Methodist University	74%
Baylor University	71%
Tulane University	70%

Note. Adapted from Integrated Postsecondary Education Data System (IPEDS) Data for students who began in fall 2004

With the goal to achieve a graduation rate of 90% for the entering cohort of 2015, the first two years seem to be especially critical for retention. SU's institutional records indicate that the current six-year graduation rate is 82%. Institutional records also indicate that more than 72% of the dropouts at SU happen within the first two years after enrollment. Half of the total loss occurs in the first year and another quarter in the second year.

3.2.1 What is Syracuse University Project Advance (SUPA)?

Syracuse University Project Advance is Syracuse University's concurrent enrollment program. It was implemented in 1972 after six principals from local high schools approached the university with a request to "establish a program for able high school seniors that would combat senioritis and prevent the course work from the students' senior year of high school from being repeated during their first year of college" (Project Advance, 2008). SUPA was conceived as a "post-regents" for students who had met their high school graduation requirements in a specific subject and were ready for the next course. SUPA partners with more than 180 high schools in New York, New Jersey, Maine, Michigan, Massachusetts, and Rhode Island and serves more than 10,000 students each year. Approximately 33 courses in 22 disciplines are offered through

SUPA. It is designed to bridge the high school-college gap and make the transition to the college environment easier for the student.

SU professors train high school teachers and provide the oversight to "ensure that college standards are maintained in the off-campus sections of their courses" (Project Advance, 2008). SU courses offered through Project Advance are designed to be identical in content to SU courses that are offered on the main campus so that students get to explore introductory courses, with multiple assessments over the semester. Out of the many students who enroll for SUPA in the five states, 3–4% of students decide to pursue their undergraduate studies at SU each year. The National Center of Education Statistics reported that during the 2002–03 school year, there were an estimated 1.2 million enrollments in courses for dual credit nationwide (Kleiner and Lewis 2003). For more details, refer to my earlier pilot study.

While commenting on Syracuse University Project Advance and other credit bearing transition programs, Tinto supported the view that college courses taken while at high school could be beneficial to students because they "enable high school students not only to acquire college credit but also to obtain first hand insight into the character of academic life at an institution of higher learning" (Tinto, 1993, p. 158).

3.2.2 What Is Advanced Placement (AP)?

The College Board created the Advanced Placement program in 1955. AP was designed by Harvard and Yale as a test to help select students from private northeastern schools. AP offers college-level courses to students in high schools in the United States and Canada. The courses were designed to correspond to introductory undergraduate courses offered in college. AP is an exam-based program administered by Educational Testing Service (ETS). In the early years, only students with the most aptitude and gifted students could enroll. However, AP courses have

become increasingly accessible to students. In 2006, 1.3 million students took 2.3 million AP examinations (Ewing, 2006).

The main focus of the AP program is to enhance the high school program for students who are eligible for college-level work. Santoli (2002) supports the statement of some teachers who say that AP courses are worth the time and effort required of students. Her study concludes that students do benefit when they are taught by high-caliber teachers and that the advantages far outweigh the concerns. AP is very widely accepted in colleges and universities. Students who enroll in AP courses in high school have the option of taking an exam at the end of the semester. Depending on the AP test score (1–5) that the student receives, colleges decide whether to give credit or not, based on their institutional policies. Anecdotal evidence shows that sometimes college admission committees consider the fact that a student enrolled for an AP course even if he/she did not take the exam in the end. During the 2002–03 school year, there were 1.8 million enrollments in AP courses. (Allen, 2010)

Table 3 provides enrollment numbers for both SUPA and AP in the 12-year period from 1997 to 2008.

Table 3: SUPA and AP Enrollment at SU (1997–2008)

Variables - Cohort	SUPA only		AP only		SUPA and AP		Non-SUPA/AP		Overall Pop.	%
	n=695	%	n=7485	%	n=386	%	n=14832	%	n=23398	100%
Fall 1997	12	1	272	30	5	1	605	68	894	100%
Fall 1998	11	1	300	28	4	0	754	71	1069	100%
Fall 1999	13	1	290	27	4	0	757	71	1064	100%
Fall 2000	11	1	333	29	4	0	786	69	1134	100%
Fall 2001	64	3	676	31	23	1	1450	66	2213	100%
Fall 2002	78	3	756	32	38	2	1485	63	2357	100%
Fall 2003	67	3	761	33	38	2	1430	62	2296	100%
Fall 2004	83	4	782	34	41	2	1411	61	2317	100%
Fall 2005	89	3	799	30	55	2	1697	64	2640	100%

Variables - Cohort	SUPA only		AP only		SUPA and AP		Non-SUPA/AP		Overall Pop.	%
Fall 2006	89	3	836	33	59	2	1569	61	2553	100%
Fall 2007	100	4	850	33	69	3	1536	60	2555	100%
Fall 2008	78	3	830	36	46	2	1352	59	2306	100%

Over the 12-year period the total number of SUPA students who matriculated into SU increased by three to four times. During the first four years, from 1997 to 2000, the enrollment was stable (1%); in 2001 it increased to 3%, and it gradually increased to 4% in 2007. Students with AP credit who matriculated into SU during the same time period were in the range of 30 to 36%. The 12 cohorts were combined for analysis, the assumption being that the students had not changed during this time period.

3.2.3 Differences between SUPA and AP

A key difference between AP and SUPA is the way in which colleges award credit to students upon matriculation. The SUPA students can transfer their credits to other higher education institutions, but when they matriculate at SU the credits are a part of their academic record. Currently, the credit acceptance rate for SU courses at other colleges and universities is at 90% (plus or minus 2% in any given year). With AP courses, students have to obtain a certain test score on the exam (3, 4, or 5) to transfer their credits to SU. Dutkowsky, Evensky, and Edmonds (2009) state that only 60% of students who take the AP exam attain a grade level of 3 or above. When a student takes AP in high school and enrolls at SU, college credit is granted at the discretion of the SU department; whereas taking SU courses through Project Advance generates a college transcript issued by the registrar's office at SU. However, with SUPA, the grade, which can range from an A through F, is noted on the transcript when the student matriculates at SU.

Some high school teachers are in favor of AP, while others are for SUPA. A key concern about AP is whether the end-of-semester exam is a true indicator of the quality of students' comprehension. SU professors sometimes discourage the use of a single test to exempt students from introductory courses. Researchers continue to raise questions about state policies that order school districts to offer AP courses to high school students and also about how colleges give preference to students who take AP courses in high schools in their admissions process. Similarly, despite the advantages offered by SUPA teachers and concurrent enrollment programs in general (small class size; more individual time with teacher; multiple ways of grading papers, tests, and quizzes; quicker feedback, etc.), there is growing concern that these programs may not be as rigorous as they claim to be.

3.3 Motivation for the Study

In response to the rapid increase in concurrent enrollment courses throughout the nation, the National Alliance of Concurrent Enrollment Partnerships (NACEP), a professional organization, was established in 1999. Syracuse University Project Advance was one of the founding members of this organization. One of NACEP's key concerns has been the quality of college classes offered by concurrent enrollment partnerships. Also, New York State is making college readiness the benchmark of high school graduation, and more attention is being paid to the effectiveness of high school transitional programs (Swanson, 2008).

Kim (2008) writes that "dual credit literature is replete with claims of positive outcomes but scarce with outcome studies" (p. 9). Kim, in his extensive literature review, expressed concerns about how program quality could suffer if college aadmissions criteria were lowered, and colleges made accessible to more students. On the other hand, if the selection criteria were

made more strict, then access to students would be limited. He also notes that research on dual credit mostly focuses on policies and trends.

Duffy (2009) notes in spite of the rapid growth of these concurrent enrollment programs, a review of the literature provided little evidence of a relationship between dual credit enrollment and college success. This study was undertaken because SUPA, implemented in 1972, has been rapidly growing over the last few decades, yet some important questions remain unexplored, including the relationship of this program to postsecondary outcomes such as persistence and performance.

According to Porter, "Most of the retention studies view the student's decision to reenroll as a binary yes/no decision" and "transferring to another institution is a second dimension of retention that researchers have for the most part ignored" (1999, p. 1). This study attempts to track where students go after they leave SU but does not address the issue of why they leave. Using the National Student Clearinghouse, one can determine (in most cases) the name of the student who transferred to another institution, the name of the transfer institution, and whether the student reenrolled at the other institution after leaving SU. (Please refer to Appendix D.)

3.4 Model and Theory

The theoretical basis for this study is Tinto's theory of institutional departure from higher education (1975), in which he postulates that successful social and academic integration in the school or college determines persistence behavior. In addition, the study applies Bean's (1983) student attrition model, which "posits that beliefs shape attitudes, attitudes shape behaviors and behaviors signal intents." According to this logic, when students participate in SUPA and/or AP classes in high school, they are exposed to college-level work which shapes their thinking and attitude that they can be successful in postsecondary education and hence they pursue it. With

such attitudes come the behaviors that help them with social and academic integration at a higher education institution. These positive behaviors then signal to them the importance of persisting to degree attainment in order to be marketable in the job arena.

Kuh, Kinzie, Buckley, Bridges, and Hayek (2006) discuss the Braxton, Sullivan, and Johnson (1997) "student departure puzzle" and note that no single view is comprehensive enough to account for the complicated set of factors that interact to influence students and institutional performance" (p. 10). This study looks at high school interventional programs (SUPA and AP), both of which claim to ease student transition to college. The conceptual model suggests a process whereby the students' self-perceptions have been positively impacted by participation in these programs.

3.5 Significance of this Study

Even though there is no single way to account for persistence in college, this study is a small step in determining whether SUPA and AP address nationwide concerns about college readiness and retention. This study helps determine if these two programs have any impact on short- and long-term persistence in college; it thereby contributes to the large body of literature on persistence. Brunsden, Davies, Shelvin, and Bracken (2000) explain how retention has an impact at three levels: societal, institutional, and personal. Studying the effects of AP and SUPA on persistence in college provides information to the educational community, policy makers, and the public about college readiness and if these programs indeed foster success and persistence.

3.6 Purpose of the Study

The purpose of this study was to examine the three groups of students—SUPA only, AP only, and the matched non-SUPA/AP group—to see if differences exist in terms of both short-term and long-term persistence amongst the three groups. The relationship of SUPA and/or AP

to persistence was evaluated in the context of a multivariate regression model that takes into account various other known and logical predictors of persistence. The availability of an array of institutional variables in the student records system at Syracuse University allowed for assessment of these variables in relation to retention within a model that also controls for factors/variables specific to the institution (Wasserman et al., 2011). In addition, this study examined if there were other significant determinants of persistence and also if these effects varied by gender, race/ethnicity and socioeconomic status.

3.7 Research Question

The following research questions were developed to guide the research design and statistical methods:

1. When controlling for demographic and precollege entry characteristics, are there significant differences in short-term persistence (dropout in Year 1 and Year 2) among the three groups: SUPA only, AP only, and non-SUPA/AP?
2. When controlling for demographic and precollege entry characteristics, are there significant differences in long-term persistence (graduation in Year 4 and Year 6) among the three groups: SUPA only, AP only and non-SUPA/AP?

3.8 Related Studies

Marshall and Anders (2002) note that there is a dearth of research on concurrent enrollment programs. O'Keefe (2009) points out that research on concurrent enrollment programs has been very similar to research on Advanced Placement in which both concerns and benefits are examined. Duffy (2009) notes that there is no uniformity in terminology about these dual credit programs at the national level (as there is for Advanced Placement/College Board) and how they are referred to. On the NACEP website they are referred to as concurrent

enrollment programs, dual credit programs, dual enrollment programs; and sometimes they have specific names at different institutions, such as SUPA at Syracuse University, College Now at City University of New York, and Running Start in Washington. Kim (2008) literature review revealed that more female students participated in dual credit programs than males. The majority of the students in these programs were white students and in general the dual credit students performed better than the nondual credit students and this may be also due to the criteria for selection into these programs. He also notes that very few studies controlled for students' prior academic performance, so the studies he reviewed don't really offer "definitive conclusions" on the effectiveness of these programs.

Most of the current literature focuses on the individual programs (Andrews, 2004; Marshall and Andrews, 2002; Smith, 2007). These programs are independently implemented and administered by the institution offering the program. Many of the studies conducted have followed students who have gone on to attend community colleges, not a 4-year private institution. Presented below are some of the findings from individual studies regarding concurrent enrollment programs and their relationship to persistence, with a table summarizing all the studies at the end of this section.

Nitzke (2002) evaluated a school-based dual credit program affiliated with a Midwestern community college and its influence on degree completion and educational progress for students. He used the longitudinal time design (1993–2001) method to follow 568 students and selected the comparison group through stratified random sampling based on semester enrollment during the same period. He found no difference in the likelihood of degree completion between dual credit and regular students. When he conducted the regression analysis, he found that dual credit

status had a statistically negative net effect on total credits completed after controlling for precollege entry characteristics.

Porter (2003) notes that most studies in the past have used descriptive data and Chi Square for statistical analysis. Also, many of the studies conducted in the past to examine the effects of dual credit programs have not controlled for confounding variables such as students' precollege entry characteristics thereby making it difficult to attribute success in postsecondary institutions solely to the dual credit program and ruling out all rival explanations. In the few studies where the researchers did control for the students' precollege entry characteristics the results were mixed. Even though Chi Squared tests have a lesser status in the pantheon of statistical tests, they are useful for testing whether a categorical variable conforms to a set of hypothesized probabilities.

Karp, Calcagno, Hughes, Jeong, and Bailey (2007) note that previous studies that have sought to examine dual enrollment programs have two limitations: (a) they lack comprehensive data, and (b) they do not control for preexisting student characteristics. Their study is frequently cited in the literature. Using rigorous multiple regression analysis, they examined the effect of dual enrollment participation in a Florida community college and in the College Now program in New York City (NYC). However, the College Now program is different than SUPA in that NYC students can take the classes at the local college campus after high school hours.

In Florida the data covered both high school and college outcomes, which allowed Karp et al. to control for precollege attributes. One research question addressed the issue of persistence into the second year of college education, grade point average, and credit accumulation. They conducted ordinary least squares and logistic regressions and controlled for various student and school characteristics. Their approach helped them examine the effectiveness of dual enrollment

in both Florida (299,685 records) and NYC (2,303 records). One limitation was that their data sets did not provide postsecondary data for students who enrolled in a four-year private institution or outside of the state.

They found that CEP students, when compared to non-CEP students, were more likely to persist in college two years after graduation from high school. Interestingly, the study in Florida found that participation intensity, i.e., the number of CEP credits, had no impact on short- or long-term outcomes. Interestingly, this finding was not replicated for the NYC group discussed below.

New York City's public university system, the City University of New York (CUNY), has a CEP program called College Now. The New York data set used by Karp et al. (2007) included students who attended one of New York City's 19 vocational high schools and enrolled in CUNY after graduation. For New York City, Karp et al. (2007) examined the effects of CEP participation for Career and Technical Education (CTE) students as compared to their CTE peers who did not participate in concurrent enrollment programs. They also ran an analysis accounting for the students' participation intensity (number of CEP courses taken through College Now). Their study in NYC revealed that concurrent enrollment was "positively related to students' overall progress toward a degree" (p. 6). Unlike their study in the state of Florida, their study in NYC found "some influence of participation intensity." When participation intensity was entered into the regression it had positive effects on persistence to the second year, cumulative GPA at the end of the second year, and progress toward a degree. This study is considered to be one of the best attempts to measure the effect of dual enrollment (Allen, 2010). Karp et al. claim that the large sample sizes from two programs in two different states enabled them to generalize their

results to a larger population. However, in Florida they track dual credit students who go on to community colleges, not to four-year private institutions.

Duffy's (2009) study was a rigorous regression study in which he examined whether significant differences exist in college student persistence amongst AP and dual credit students at the University of Tennessee at Martin, a four-year public university. He found no significant differences in first-year persistence between any of the student types (students who participated in dual enrollment, students who participated in AP, and students who did not participate in either), when controlling for precollege entry characteristics. Among the variables used in his study, only a composite of the high school achievement scale (ACT, high school GPA, and high school rank) showed a significant correlation to persistence consistent with previous research on retention. This study is comparable to the current study in terms of methodology; it extends the Duffy study by examining both the number of AP and SUPA credits and, in the next paper, student performance in the subsequent-level course.

Adelman (2004; 2006) was the first researcher who used "a nationally representative student population" to study dual enrollment (Allen, 2010, p. 21). He argues that having less than 20 credits after the first year of enrollment was

> a serious drag on degree completion. It is all the more reason to begin the transition process in high school with expanded dual enrollment programs offering true postsecondary course work so that students enter higher education with a *minimum* of 6 additive credits to help them cross that 20-credit line.

However, this study did not control for student characteristics and behaviors.

Swanson (2008) improved upon Adelman's study using the same NELS:88/00 data set and adding PETS (Post-Secondary Educational Transcript Study: 2000) and PETS

supplementary variables. Her research addressed the total and direct effects of dual enrollment participation on a specific set of outcomes. She studied the effect of these credit-bearing transition programs, specifically the CEP course participation, on college persistence and graduation. She used rigorous logistic regressions to isolate the effect when controlling for demographic and high school variables. Her study found that students who participated in dual enrollment in high school continued on in college at "statistically significant rates higher than did nonparticipants ($p<.05$)" (p. 324). She refers to the composite persistence factors as "academic momentum." This is an extensive study that controlled for demographics and high school variables. However, Allen (2010) points out two limitations of this study (p. 22):

1. Concurrent enrollment programs did not exist in the form they do today in 1988 so drawing any conclusion from this data set could be difficult.
2. The data lumps together all postsecondary credits earned at colleges or community colleges prior to the date of high school graduation.

McCauley (2007) conducted a multiple regression study of the effect of AP and CEP participation, while controlling for race, gender, and socioeconomic status, on college graduation. His study revealed that taking an AP or dual enrollment course was a significant factor in predicting whether a student would graduate from a four-year university in six years. Also, his study revealed that high-income, female, white students had a higher likelihood of graduating when compared to low-income, male, and minority students. So perhaps the predictive weight of AP and dual enrollment in this study was an artifact of these other variables.

Klofenstein (2009) used regression analysis to investigate whether taking AP courses was a potential cause of early college success. She studied a group of Texas public school students who entered the Texas public universities directly after graduating from high school in May of

1999. Her study showed that not controlling for students' non-AP curricular experiences (for example., coursework in math and science) led to positively biased AP coefficients. But when she controlled for these characteristics, she found little evidence that taking AP courses increased the likelihood of early college success. Klofenstein (2010) also found that AP course taking alone had no effect on "time to degree after accounting for differences in several observable characteristics between AP and non-AP students" (p. 212), but that dual-credit participation increases the "likelihood of graduation in four and five years, conditional on not having already graduated" (p. 212).

Dougherty, Mellor, and Jian (2005) compared AP students to non-AP students while controlling for students' observed characteristics and the characteristics of their schools. Their study looked at graduation rates in these groups of students: students who participated in AP and passed the exam; students who took AP but did not the pass the exam; students who took AP but did not take the exam; and students who took no AP course or exam. Their study found that the college graduation rates for any AP involvement were higher (in the range of 15%–45%) than that of white students across all student groups.

Reason (2009) improved upon previous studies by suggesting that, with the changing demographics of students entering universities, future studies must include as "many variables and interactions as possible to fully understand retention issues in light of the increasingly diverse student population" (p. 487). He notes the importance of studying retention in the context of a student's race/ethnicity. Following his recommendation, the current study uses demographic, financial need, and performance variables as controls and also examines the interaction between gender and race/ethnicity.

As Swanson (2008) states, the No Child Left Behind Act of 2002 included Advanced Placement in a list of recommended activities to increase student achievement, but not dual enrollment. She proposes that the relationship between CEP and AP to both performance and persistence should be investigated, which is what the present study attempts to do. *Table 4* presents a summary of related studies.

Table 4: Summary of Related Studies

Author	Method	Comments	Limitations
Nitzke (2002)	Multiple regression study	Not a limitation but this study followed students who went on to community colleges.	Control variables did not include ACT scores and/or GPA.
Adelman (2004, 2006)	Linear regression study	First researcher to use a "nationally representative student population." This is the most cited study. Cited frequently in the literature.	Did not control for student characteristics and/or behaviors. NELS: 88/2000 data—no differentiation between credits earned through college courses taught by high school teachers from those courses taught by college professors.
Dougherty et al. (2005)	Hierarchical linear modeling analysis	Compared students who took AP courses and exam, who took course and no exam, and non-AP students.	The study looked at students going to both two- and four-year institutions.
Duffy (2009)	Multiple regression studies with control variables	Compared credit based (CB, AP, and non-AP/CB students.	Did not consider the number of AP/CB courses taken by each student.
Karp et al. (2007)	Regression studies with control variables and large sample sizes in two different states	Cited most frequently in the literature.	Not a limitation, but followed students who go on to community colleges in Florida.
Klofenstein (2006)	Regression analysis	Impact of AP credits on college retention	Possible multicolinearity among predictors made it difficult to

Author	Method	Comments	Limitations
		and GPA	interpret the results Ewing (2006)
McCauley (2007)	Multiple regression studies with control variables	Used NELS data—12,144 students surveyed.	AP and dual enrollment programs were analyzed by combining the data for both together. (p.37)
Swanson (2008)	Improved upon Adelman's study and added PETS transcript data and supplementary variables	Data did not identify students by their participation in any one particular type of dual enrollment program	Data lumped together all postsecondary credits earned at colleges or community colleges. Allen (2010)
Reason (2009)	Reviewed articles	Studied retention issues in the context of the changing demographics	
Current study extends these studies by:	Used strong quantitative data to examine the benefits of SUPA and AP and to validate or invalidate claims of success. Also, • Used institutional variables to fully understand persistence "in light of the increasingly diverse student population." • Examined persistence issues in the context of a student's race/ethnicity and the interactions between gender and ethnicity. • Used demographic (gender and race/ethnicity), financial need, and high school performance variables (SAT scores and GPA) as control variables. • Examined not only participation in AP and SUPA but also participation intensity (# of SUPA and AP creidts)		

3.9 Method

The predictors of persistence included in this study fall into several thematic groups and roughly parallel the categorization scheme offered by Herzog (2006). Looking at previous institutional research on persistence helped me decide which variables to include in the study. I used multiple regression analysis to study the extent to which participation in SUPA and/or AP predicts or accounts for both short-term (dropout in Year 1 and Year 2) and long-term persistence (4-year and 6-year graduation). The relationship was examined in the context of a multivariate regression model that accounted for various other known and logical predictors of

student persistence. The research questions were examined with first-time, full-time students attending Syracuse University from fall 1997 to fall 2008 when controlling for precollege entry characteristics such as demographics, financial need, and high school academic performance. The study also examined whether these effects varied by gender, race/ethnicity and socioeconomic status.

It is important to remember that this study is a hierarchical multiple regression study and that "regression is a correlational analysis and does not by itself provide empirical evidence of a cause and effect relationship between the two variables" (Hoyt, Leierer, Millington, 2006, p. 232).

3.9.1 Data

Data used in this study were retrieved from the Syracuse University Student Records System (SRS) covering a period of 12 years from fall 1997 to the fall 2008 semester, both inclusive. The total population was 30,846. When a frequency analysis was performed, 4,682 students had missing data and were not included in this study; 26,164 students had valid values recorded in the SRS database for both independent and dependent variables. Students who identified themselves as "unspecified" (2,766) in the race/ethnicity category were removed because interpretations relating to this group were ambiguous and did not add clarity to the inferences. Student matriculation years were 1997 through 2008 (meeting the IPEDS fall cohort definition), yielding a study of 23,398 students. This cohort excludes transfers, part-time students, students who started at SU in the Spring or summer semesters, and first-year students who withdrew before the enrollment date. These criteria are consistent with the definition required for federal reporting by the Department of Education**.**

The SRS database at SU contains all demographic information, precollege entry characteristics data related to high school performance and achievements (including credit received for AP and SU courses taken through Project Advance), and student academic performance at SU. When a SUPA student matriculates as an undergraduate at SU, all information about his or her program of study and major is available on SU's database. If a SUPA student did not seek admission to SU, then he/she is considered a nonmatriculated student and was not included in this study. This study does not take into consideration whether the student had taken any other CEP courses besides SUPA. The coding is 1 = took a SUPA course and 0 = otherwise; 1 = took the AP exam and 0 = otherwise. It also does not examine "stopouts," that is, students who enrolled at SU as freshmen, then left for some reason but returned within seven semesters to SU without transferring to another higher education institution during their absence from SU.

3.9.2 Sample

The population for this study consisted of 23,398 students who fell into four groups. The cohorts are as follows:

1. Students who took only SU courses through PA in high school and then enrolled at SU (n=695).
2. Students who took only AP in high school and then enrolled at SU (n=7,485).
3. Students who took both AP and SU courses (through PA) in high school and then enrolled at SU (n=386).
4. Students in the comparison group who took neither SU nor AP courses in high school but enrolled at SU (n=14,832).

3.9.3 Dependent Variables (DV)

The analysis in this study examines the relationship of SUPA and/or AP participation to the following dependent variables:

Dropout by Fall Year 2. This is an indicator variable to measure dropping out of college in Year 1 (by fall of Year 2). Dropout is defined as a student who does not return and enroll for the second year of study. The variable specifies Dropout =1 if the student did not return in the second fall after matriculation; Dropout = 0 otherwise.

Dropout by Fall Year 3. This is an indicator variable to measure dropping out of college in Year 2 (by fall of Year 3). Dropout is defined as a student who does not return and enroll for the third year of study. At this point dropouts from Year 1 were removed from the sample. The variable specifies Dropout =1 if the student did not return in the third fall after matriculation. Dropout = 0 otherwise.

Four-year Graduation: This is an indicator variable to measure long term persistence—earning a college degree, whether a bachelor of arts or a bachelor of science, from a four-year institution. The variable specifies Persistence =1 if the student graduated in four years, 0 otherwise.

Six-year Graduation. This is an indicator variable to measure long-term persistence—earning a college degree, whether a bachelor of arts or a bachelor of science, from a four-year institution. The variable specifies Persistence =1 if the student graduated in six years, 0 otherwise.

3.9.4 Independent Variables (IV)

The target independent variables in this study are SUPA and AP participation. Based on previous literature, control variables (demographic, financial need, precollege entry characteristics, and target variables) were chosen for participating and nonparticipating subjects. The complete set of independent variables is listed in *Table 5*.

Table 5: Predictor (IV) Variables

Cohort

Fall 1997	Fall 2000	Fall 2003	Fall 2006
Fall 1998	Fall 2001	Fall 2004	Fall 2007
Fall 1999	Fall 2002	Fall 2005	Fall 2008

Demographics

Race/Ethnicity *(nominal variable)*

- Asian Pacific Hawaiian (1 = Asian Pacific Hawaiian and 0 = otherwise)
- Black/African American (1 = Black/African American and 0 = otherwise)
- Hispanic/Latino (1 = Hispanic/Latino and 0 = otherwise)
- Native American (1 = Native American and 0 = otherwise)
- International (1 = International students and 0 = otherwise)
- White (default group)

Gender *(nominal, dichotomous variables)*

- Female (1 = Female and 0 = otherwise)
- Male (default group)

Financial Aid

- Applied, but no need for aid (1= applied but no need and 0 = otherwise)
- Low need for aid (1= low need and 0 = otherwise)
- Medium need for aid (1= medium need and 0 = otherwise)
- High need for aid (1= high need and 0 = otherwise)
- Did not apply for aid (default group)

Precollege Entry High School Academic Performance

- SAT math
- SAT verbal
- High school GPA (range 0 to 4)

Target Variables

- AP credit indicator (1= student has taken at least one AP course and 0 = otherwise)
- Number of AP credits
- SUPA credit indicator (1= student has taken at least one PA course and 0 = otherwise)
- Number of SUPA credits
- Non-SUPA/AP (default group)

Dummy variables were created to represent each categorical indicator variable. The variables take on the values 1 or 0 to indicate the presence or absence of the categorical effect that may be expected to shift the outcome (Keith, 2008).

Descriptive statistics below provide a quantitative description of the main features of the entire population (N=23,398) consisting of the three groups under study. The aim here is to summarize the data set. Simple descriptive statistics between the three groups show some interesting comparisons in *Table 6*, *Table 7*, *Table 8*, and *Table 9*:

Table 6: Descriptive Statistics: Gender

Variables Gender	SUPA only		AP only		Both SUPA/AP		Non-SUPA/AP		Overall Pop.	%
	n=695	%	n=7485	%	n=386	%	n=14832	%	n=23398	100%
Female	441	63	4184	56	222	58	8337	56	13184	56%
Male	254	37	3301	44	164	42	6495	44	10214	44%

The SUPA-only group contains a higher percentage of female students (63%) in comparison to the AP group (56%). This finding seems comparable to that of other studies of concurrent enrollment programs; whereas the non-SUPA/AP group had a 56% (female) and 44% (male) ratio comparable to the overall population and the AP population.

Table 7: Descriptive Statistics: Race/Ethnicity

Variables: Race/Ethnicity	SUPA only		AP only		Both SUPA/AP		Non-SUPA/AP		Overall Pop.	%
	n=695	%	n=7485	%	n=386	%	n=14832	%	n=23398	100 %
Asian PI Hawaiian	64	9	702	9	26	7	1204	8	1996	9%
Asian PI Hawaiian Female	31	5	442	6	16	4	673	5	1162	5%
Asian PI Hawaiian male	33	5	260	4	10	3	531	4	834	4%
Black African American	39	6	259	4	3	1	1346	9	1647	7%
Black African American Female	24	4	171	2	1	0	803	5	999	4%

Variables: Race/Ethnicity	SUPA only		AP only		Both SUPA/AP		Non-SUPA/AP		Overall Pop.	%
Black African American Male	15	2	88	1	2	1	543	4	648	3%
Hispanic Latino	26	4	389	5	12	3	984	7	1411	6%
Hispanic Latino Female	14	2	253	3	9	2	594	4	870	4%
Hispanic Latino Male	12	2	136	2	3	1	390	3	541	2%
Native American AK Native	4	1	19	0	1	0	93	1	117	1%
Native American AK Native Female	3	0	16	0	0	0	50	0	69	0%
Native American AK Native Male	1	0	3	0	1	0	43	0	48	0%
White	562	81	5923	79	344	89	10636	72	17465	75 %
White Female	369	53	3203	43	196	51	5941	40	9709	41 %
White Male	193	28	2720	36	148	38	4695	32	7756	33 %
International										
International Female	0	0	99	1	0	0	276	2	375	2%
International Male	0	0	94	1	0	0	293	2	387	2%

Both the SUPA only (53%) and the AP only (43%) groups had a much higher representation of white female students compared to the other race/ethnic groups. The percentages were lower for white male students: SUPA only male students (28%) and AP only male students (36%). International students were included in the study as they are part of the main campus population and do take AP courses in high school.

Table 8: Descriptive Statistics: Financial Need

Variables: Financial Need	SUPA only		AP only		Both SUPA/AP		Non-SUPA /AP		Overall Pop.	%
	n=695	%	n=7485	%	n=386	%	n=14832	%	n=23398	100%
High Financial Need	389	56	3132	42	200	52	6647	45	10368	44%
Low Financial Need	41	6	667	9	41	11	879	6	1628	7%
Mid Financial Need	44	6	623	8	36	9	1070	7	1773	8%
No Financial Aid Application	143	21	1800	24	51	13	4414	30	6408	27%
No Financial Need	78	11	1263	17	58	15	1822	12	3221	14%

SUPA only students had the highest percentage of high financial need (56%). It would be interesting to see where these students came from and if the financial need was higher because they were coming from some of the Project Advance schools that have higher levels of financial assistance. AP students had the highest percentage of no financial need (17%).

Table 9: Descriptive Statistics: Dropout

Variables - Dropout	SUPA only		AP only		Both SUPA/AP		Non-SUPA/ AP		Overall Pop.	%
	n=695	%	n=7485	%	n=386	%	n=14832	%	n=23398	100%
Dropout Fall Year2ind	695	7	7485	7	386	5	14832	10	23398	100%
Dropout Fall Year3ind	617	10	6655	9	340	8	13480	14	21092	90%

Note: Dropout Fall Year 2 includes Fall 1997 to Fall 2008; dropout Fall Year 3 includes Fall 1997 to Fall 2007 (one less cohort). The dropout Year 3 total is cumulative of Years 2 and 3.

Students who took both AP and SUPA had the lowest dropout rates in both the first year (5%) and second year (3%) compared to the non-SUPA/AP group.

- Across the 12 years of data, 7% of the initial SUPA cohort dropped out in the first year at the census of Fall Year 2. An additional 3% of the initial SUPA cohort dropped out in the second year at the census of Fall Year 3 for a cumulative total of 10% dropout rate over the first two years.
- Across the 12 years of data, 7% of the initial AP cohort dropped out in the first year at the census of Fall Year 2. An additional 2% of the initial AP cohort dropped out in the second year at the census of Fall Year 3 for a cumulative total of 9% dropout rate over the first two years.

- Across the 12 years of data 10% of the initial non SUPA/AP cohort dropped out in the first year at the census of Fall Year 2. An additional 4% of the initial Non-SUPA/AP cohort dropped out in the second year at the census of Fall Year 3 making it a total of 14% dropout rate over the first two years.

3.10 Statistical Analysis

This study analyzed the relationships between participation in the SUPA program and AP program and subsequent short and long-term persistence at Syracuse University after controlling for demographic, financial need, and precollege entry attributes. A multiple logistic regression analysis was conducted to assess whether the predictor variables (i.e., gender, race/ethnicity, financial need, high school academic performance, AP credits, number of AP credits, SUPA credits and number of SUPA credits) have a statistically significant relationship to a student's short- and long-term persistence status. All tests are conducted at the $p = <.05$ level of significance. Delta –*p* statistics were used to describe the likelihood that SUPA or AP participation increases or decreases the probability of the dependent variable of each logistic regression when compared to the non-SUPA/AP group.

As the statistical analytic scheme indicates, interaction effects between gender and ethnicity were examined in Step 3 to see if any effect was produced by these two independent variables working in concert.

Using the hierarchical approach, predictor variables were entered in a series of blocks enabling us to see if each new group of variables adds anything to the prediction produced by the previous blocks of variables. This incremental variance explained represents the value of adding a new measure to a predictive battery. Only the results from Step 6 (the final model) are reported.

Step 1 Gender and race/ethnicity
Step 2 Interaction variables between gender and race/ethnicity
Step 3 Financial need variables that serve as the proxy for the socioeconomic-status of students
Step 4 Student high school achievement variables
Step 5 AP variables
Step 6 SUPA variables

Multiple regression analyses simultaneously examine the association between multiple predictor variables ($X_1, X_2, X_3,$ etc.) and a single criterion variable. Applying the discussion from (Hoyt, Imel, and Chan 2008, p. 321) to the current model, relationships among the variables were summarized in a regression equation below:

$$Y_1 = B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9 + B_{10}X_{10} + B_{11}X_{11} + B_0$$

Where:

$\mathbf{Y_1}$ represents the predicted dropout in Year 1 (single criterion variable);

$\mathbf{X_1}$ represents gender; $\mathbf{X_2}$ represents race/ethnicity; $\mathbf{X_3}$ represents interaction between gender and race/ethnicity; $\mathbf{X_4}$ represents financial need; $\mathbf{X_5}$ represents high school GPA; $\mathbf{X_6}$ represents SAT math; $\mathbf{X_7}$ represents SAT verbal; $\mathbf{X_8}$ represents AP participation; $\mathbf{X_9}$ represents # of AP credits; $\mathbf{X_{10}}$ represents SUPA participation and $\mathbf{X_{11}}$ represents # of SU credits through Project Advance.

The regression coefficients B_1 through B_{11} are the multipliers for X_1 through X_{11} respectively. These regression coefficients were chosen in such a way as to minimize the errors of prediction. The 12th regression coefficient (B_0) is called the *constant* or the *intercept*. The values of the regression coefficients (and their statistical significance) are information about the strength of association between each independent variable (IV) and the dependent variable (DV). For example, B_{11} (# of SU credits) is the unstandardized regression coefficient because it carries the original units of X_{11}. Because all X_1 through X_{11} are predictors in this equation, B_{11} is an

estimate of the predicted change in Y for a one-unit change in X_{11}, when X_1 through X_{10} are held constant (i.e., statistically controlled*). In causal terms*, B_{11} may be interpreted as the unique effect of X_{11} on Y, controlling for variables X_1 through X_{10}.

Because X_1 through X_{11} are usually measured in different units, B_1 through B_{11} are interpretable in terms of these original units but are not directly comparable. For example, if $B_5 > B_{11,}$ this would not indicate that X_5 is a stronger predictor of Y than $X_{11.}$ It could be that a one-unit change on X_5 is much greater as a proportion of the theoretical range of this variable than a one unit change on X_{11}.

The research design for this study is not experimental. It does not control for *all* pre-existing characteristics such as motivation, and it *does not* make any cause and effect claims. Since statistically significant differences are easily found in large sample sizes, a variable may be "statistically significant" but have no practical significance. Carver (1993), an opponent of statistical significance, advised taking the effect sizes into consideration while reporting statistical significance. The odds ratio in this study is a measure of effect size in logistic regression and is reported in this study. It should be noted that the large size of the SU sample permits more precise estimates of even very small statistical effects. This study, as Levin (1993) argued, shows "that a statistically significant difference tells us whether a difference exists," and that "the effect size gives an estimate of the noteworthiness of the results" (p. 380).

3.10.1 Results

Because of its simplicity and ease of interpretation, logistic multiple regression was used for modeling dropout and graduation status. Thus separate analyses were conducted for dropout and graduation status. But note that, since the independent variables have widely varying means and variances, the coefficients cannot be directly compared. Take for example GPA vs. SAT.

GPAs range from 0 to 4.0 with a mean of perhaps 2.4. SAT scores range from 400 to 1600 with a mean of 600. Since the GPA range is much smaller, a 1-point increase in GPA would cause a huge increase in the probability of the dropout or graduation, whereas a 1-point increase in the SAT score would be associated with a very small increase. Therefore, in some cases the unstandardized coefficients are not directly comparable.

In multiple regression analysis, the effect of a given variable is assessed in the context of all other predictors in the model. Because logistic regression was utilized, the estimated effect associated with each predictor was expressed as an *odds ratio*, Exp(B). The odds ratio indicates the effect size of each variable in the model. For example, for odds ratios that are less than 1, there is a decrease in the likelihood of dropping out for every increase in the predictor variable. A negative sign for the estimated parameter B indicates that, for every unit increase in the predictor, there is a lesser likelihood of a student dropping out. For odds ratios that are greater than 1, there is an increase in the likelihood of dropping out for every unit increase in the predictor variable. A positive sign for the estimated parameter B means that, for every unit increase in the predictor variable, there is a higher likelihood of a student dropping out. Variables were entered in six steps, with the target variables related to AP and SUPA entered in the final two steps.

The cohort indicator, when examined, did not add statistically significant variance to predicting dropout in most of the years. Small cohort effects were noted for years 1997, 2000, and 2003, but not for the others. Since the unstandardized coefficients for cohorts indicated minimal differences across the years of study, the decision was made to leave the cohort variable out of the regression. The assumption made here was that the cohorts across the years had not changed. Results of *Table **10*** are discussed below.

Table 10: Logistic Regression: Dropout by Fall Year 2

Variable	B	S.E.	Sig.	Exp(B)
Female indicator	**.143**	**.058**	**.013**	**1.154**
Black African American indicator	-.075	.150	.617	.928
Native American AK Native indicator	**1.132**	**.351**	**.001**	**3.101**
Asian PI Hawaiian indicator	**.385**	**.122**	**.002**	**1.470**
Hispanic Latino indicator	.259	.148	.081	1.295
International indicator	**1.047**	**.152**	**.001**	**2.849**
Black African American Female indicator	-.319	.194	.100	.727
Native American AK Native Female indicator	-.526	.482	.275	.591
Asian PI Hawaiian Female indicator	-.229	.160	.153	.795
Hispanic Latino Female indicator	-.170	.188	.365	.844
International Female indicator	**-.870**	**.234**	**.001**	**.419**
No Financial Need indicator	-.083	.084	.321	.920
Low Financial Need indicator	.034	.105	.748	1.034
Mid Financial Need indicator	**.290**	**.093**	**.002**	**1.336**
High Financial Need indicator	.108	.063	.085	1.115
SAT verbal	**.002**	**.000**	**.001**	**1.002**
SAT math	**-.001**	**.000**	**.019**	**.999**
High school GPA	**-.482**	**.060**	**.001**	**.617**
AP Credit Indicator	**-.184**	**.086**	**.031**	**.832**
Number Of AP Credits	**-.015**	**.007**	**.043**	**.985**
SUPA Credit indicator	.420	.273	.124	1.522
Number Of SUPA Credits	**-.115**	**.047**	**.014**	**.891**
Constant	-1.181	.291	.001	.307
Nagelkerke R Square – 2.4%				
N = 23,398				

Note: Bolded variables denote significance at the 5% level.)
Dependent Variable – Dropout in Year 1

Looking at the full model across all the steps:

- Block 1 added gender and race/ethnicity variables (with 6 df) into the regression model simultaneously, which significantly predicted dropout rate in Year 1, with a minimal Nagelkerke R Square of .004 and Cox and Snell R Square of .002.
- Block 2 included interaction terms between gender and race/ethnicity (with 5 df) and significantly predicted dropout in Year 1, again with a minimal Nagelkerke R Square of .006 and Cox and Snell R Square of .003.
- Block 3 added financial need variables to the model (with 4df) and significantly predicted dropout in Year 1, with a Nagelkerke R Square of .008 and Cox and Snell R Square of .003.
- Block 4 added the high school academic performance variables (with 3df) and resulted in a significant increase in variance, explained in the dropout rate. The total R Square for the model, including the first four steps, was 2.0% Nagelkerke R Square and Cox and Snell R Square of .009.
- Block 5 entered the AP variables (with 2 df) and these too added significant variation in explaining the outcome. The Nagelkerke R Square was .023 and Cox and Snell R Square was .010.
- Block 6, the final block, added the PA variables and was again significant, with the Nagelkerke R Square of 2.4% and Cox and Snell R Square of 1.1%. The full model including all six blocks explained 2.4% of the outcome in dropout in Year 2.

In general, educational studies do not reach a high R^2. In this regression, only 2.4% of the total variance is explained by the entire model. In summary, predictor variables were entered in

six steps, and all steps add statistically significant variation to the previous step. Given that the purpose of this study was to study the effect of participation in AP and SUPA on dropout by Fall Year 2 and dropout by Fall Year 3, these two individual predictors are examined first in both regressions.

Dropout by Fall Year 2

Controlling for gender, race/ethnicity, financial need, and high school performance variables, it was found that the AP indicator variable ($\beta = -0.184$, $p < 0.031$) and number of AP credits variable ($\beta = -0.015$, $p < 0.043$) were statistically significant in predicting dropout by Fall of Year 2. The negative parameter estimate indicates that for every unit increase in AP credit variable or the number of credits awarded for AP, there is a lesser likelihood of a student dropping out by Year 2. On the other hand the SU credit indicator was not statistically significant. However, the number of SUPA credits variable ($\beta = -0.115$, $p < 0.014$) is statistically significant, with an odds ratio of less than 1, and the negative parameter sign of the number of SU credits indicates that the more SU credits (participation intensity) a student earned, the less likelihood he or she had of dropping out by Fall of Year 2. As Swanson (2008) notes, "Accumulating credits in high school may have created a nest egg effect, thereby influencing students decision to remain in college and creating a positive outcome for dual enrollment participants in post-secondary education" (p. 3). These results suggest that dual enrollment could be a player in Tinto's model of individual departure from higher education. Both academic integration and relationships with postsecondary education through AP and SUPA seem to have a positive effect on short-term college persistence.

The Female indicator variable was statistically significant, with a positive sign ($\beta = 0.143$, $p < 0.013$). A positive β with an odds ratio greater than 1 suggests that for every unit

increase in the β there was a higher likelihood of a female student dropping out in Year 1 compared to the reference group.

Asian Pacific Hawaiian students (β = .385, p< .002) and Native American students (β = 1.132, p < .001) were 1.2 and 3.1 times more likely to dropout than whites. International students also reached statistical significance (β = 1.047, p < .001) and were 2.9 times more likely to dropout in the first year than white students. Among the interaction effects between gender and ethnicity, only the interaction of gender and international status was statistically significant. This suggests that a different relationship exists between international status and dropout for men and women. International female students reached statistical significance (β = -0.870, p< .001), with an odds ratio of more than 1, and with a negative parameter estimate indicating that female international students had a lower likelihood of dropping out in Year 1 and Year 2.

Of all the financial need variables, only the mid financial need variable was statistically significant (β = .290, p< .002). This finding suggests that students in this group have a greater risk for dropping out in Year 2 when compared with the default group of students who don't file an application for financial assistance.

All high school academic variables reached statistical significance. The SAT verbal variable (β = 0.002, p< .001) was statistically significant and had a positive sign, which meant that students with high SAT verbal scores had a slightly higher likelihood of dropping out of SU in Year 2. Possible reasons for this are addressed in the discussion section. SAT math also reached significance (β = -0.001, p< 0.019), with a negative parameter estimate, indicating that the higher the SAT math score, the lesser the likelihood of a student dropping out by Year 2. The cumulative high school GPA was a highly significant predictor of retention (β -0.482, p<.001)

indicating that there was a 48% decrease in the odds of dropout for every one-point increase in the cumulative high school GPA.

Dropout by Fall Year 3

Table 11 presents the regression results for Dropout by Fall Year 3. The table has a format similar to *Table 10*. Please note here that the students who dropped out in the first year are not included in this regression.

Table 11: Logistic Regression: Dropout by Fall Year 3

Variable	B	S.E.	Sig.	Exp(B)
Female indicator	-.052	.074	.486	.950
Black African American indicator	.124	.173	.472	1.132
Native American AK Native indicator	.560	.540	.299	1.751
Asian PI Hawaiian indicator	**.357**	**.154**	**.021**	**1.429**
Hispanic Latino indicator	**.422**	**.175**	**.016**	**1.525**
International indicator	**1.509**	**.175**	**.001**	**4.521**
Black African American Female indicator	**-.505**	**.238**	**.034**	**.604**
Native American AKNative Female indicator	.554	.682	.417	1.740
Asian PI Hawaiian Female indicator	-.247	.212	.244	.781
Hispanic Latino Female indicator	-.337	.237	.155	.714
International Female indicator	**-1.158**	**.302**	**.001**	**.314**
No Financial Need indicator	-.100	.109	.360	.905
Low Financial Need indicator	.210	.128	.100	1.234
Mid Financial Need indicator	.212	.123	.085	1.236
High Financial Need indicator	.157	.081	.054	1.169
SAT verbal	**.001**	**.000**	**.012**	**1.001**
SAT math	-.001	.001	.194	.999
High school GPA	**-.599**	**.077**	**.001**	**.549**
AP Credit indicator	-.216	.111	.053	.806
Number Of AP Credits	-.009	.010	.341	.991
SUPA Credit indicator	-.209	.321	.516	.812
Number Of SUPA Credits	.020	.044	.649	1.020
Constant	-.977	.371	.008	.376
Nagelkerke R Square – 3.1% (N = 21,092)				

Note: Bolded variables denote significance at the 5% level.
This table does not include students who dropped out in Year 1.
Dependent Variable – Dropout in Year 2.

Looking at the full model across all the steps:

- Block 1 included gender and race/ethnicity variables (with 6 df), which significantly predicted dropout rate in Year 1, with a minimal Nagelkerke R Square of .011 and Cox and Snell R Square of .004. In Year 2, Hispanic category was insignificant but significant in Year 3. In Year 2, Native American/AK was significant, but was nonsignificant in Year 3.
- Block 2 included interaction terms between gender and race/ethnicity (with 5 df) and significantly predicted dropout in Year 2, again with a minimal Nagelkerke R Square of .015 and Cox and Snell R Square of .005. Block 3 added financial need variables to the model (with 4 df); however,
- Block 3 variables did not add significant variation to the model, with a Nagelkerke R Square of .016 and Cox and Snell R Square of .006.
- Block 4 added the high school academic performance variables (with 3 df) and resulted in a significant increase in variance, explained in dropout rate. The total R Square for the model including the first four steps was 2.9% Nagelkerke R Square and a Cox and Snell R Square of .011.
- Block 5 entered the AP variables (with 2 df) and these too added significant variation in explaining the outcome. The Nagelkerke R Square was .031 and the Cox and Snell R Square was .012.
- Block 6, the final block, added the PA variables and was not significant.

The full model including all six blocks explained 3.1% of the outcome in dropout by Fall Year 2.

Once again, given that the purpose of this study was to study the impact of AP and SUPA on dropout, those individual predictors are discussed first. Controlling for gender, ethnicity,

financial need, and high school academic performance, students who participated in both AP and/or SUPA did not reach statistical significance and, therefore, did not predict dropout in the second year. AP credit indicator (β -0.009) and SUPA credit indicator (β -0.209) both have negative β, but neither estimate is significant at the 5% level. Both AP and SUPA have similar effects on dropping out by Year 3 when compared to the non-SUPA/AP group.

The gender variable did not reach statistical significance in the model for dropout by Fall of Year 3.

In the model for dropout by Fall of Year 3, Hispanic/Latino students ($\beta = 0.422$, $p < 0.016$), Asian Pacific Hawaiian ($\beta = 0.357$, $p < 0.021$) and international ($\beta = 1.509$, $p < 0.001$) students were 1.5, 1.4, and 4.5 times more likely to dropout, respectively, than were white students. Including the interaction term indicated that female international students are significantly ($\beta = -1.158$, $p < 0.001$) less likely to dropout than male international students. For both Year 2 and Year 3, this finding indicates that there is a differential risk of dropping out for international students, with male international students being far more likely to dropout than female international students.

In the full model, African American Black status has a significant effect on the dropout rate, with interaction (β -0.505, $p < .034$) with gender in Year 3. This finding indicates that African American Black female students are less likely to dropout than African American males.

Finally, two out of the three high school academic performance variables significantly predicted dropout rate. Students who scored higher on SAT verbal ($\beta = 0.001$, $p < 0.012$) were slightly more likely to dropout. The students who do well on Sat verbal and are more likely to transfer to a school that was their original first choice. Students with higher high school GPA (β

=-0.599; p<001) were considerably (54%) less likely to dropout by Year 3. Interestingly, the SAT math variable did not reach statistical significance.

In summary, when variables were entered in six steps for dropout by Year 3, none of the target variables reached statistical significance and there were no significant differences in the three groups of students. The only steps that added significance were the gender variable, race/ethnicity variable, and the pre-entry academic performance variable.

Students dropout of an institution for many reasons. When a student leaves SU and enrolls at another institution, information regarding students' subsequent enrollment can be obtained from the National Student Clearinghouse (NSC). The NSC Student Tracker facility provides attendance and completion data from more than 3,300 institutions representing over 92% of national postsecondary enrollment. The NSC report on Syracuse University students who left without completing their degree shows that approximately two-thirds of the students who left SU enrolled at other institutions. A query to the NSC database, based on a total of 6,520 first-time, full-time fall matriculating undergraduates who dropped out of SU between 12/18/97 and 12/16/11 shows that:

- Of the total number of 6,520 leavers, NSC had no data for 1,433 students.
- 277 NSC student records were either blocked by the student or by the school, resulting in a total of 4,810 students in the report.
- Of the 4,810 reported students, 4,407 transferred to other institutions after leaving SU. (This information is provided in Appendix D.)
- The breakdown in terms of the student groups being examined in this study are as follows: SUPA only (123); AP only (1063); Both SUPA/AP (50); and Non-SUPA/AP (3171).

There were a total of 403 students who could not be accounted for in this report. This could be due to one or more of the following three reasons:

- Some colleges do not report attendance and completion data to the clearinghouse; students enrolling at such institutions are not included in the Student Tracker report.
- Failure of the NSC merge algorithm due to faulty or changed merge data (e.g., Name; Date of Birth), or duplicate (e.g., nonunique) records resulting from the merge process, which indicates uncertainly about the interpretation or identity of merged records.
- Students did not subsequently enroll at other institutions.

Please refer to Appendix C for more details on where the students enrolled after leaving SU. Even though Adelman (1999) had concluded that "60% of undergraduate students attend more than one institution and 40% of this group did not complete degrees," it would still be interesting to find out why these students decided to leave SU. However, this study does not address that issue.

Graduation in four years

To identify individually important predictors of graduation in four years from the standpoint of statistical significance, the full model was run and assessed. In multiple regression analysis, the effect of a given variable is assessed in the context of all other predictors in the model. Because logistic regression was utilized, the estimated effect associated with each predictor is expressed as an *odds ratio*, Exp(B). The odds ratio indicates the effect size of each variable in the model. For example, for odds ratios that are less than 1, there is a decrease in the likelihood of graduating for every increase in the predictor variable. A negative sign for the estimated parameter β, indicates that for every unit increase in the predictor, there is a lesser

likelihood of a student graduating. For odds ratios that are greater than 1, there is an increase in the likelihood of a student graduating in four years for every unit increase in the predictor variable. Similarly, a positive sign for the estimated parameter β means that for every unit increase in the predictor variable there is a higher likelihood of a student graduating.

Variables were entered in six steps, with the target variables related to AP and SUPA entered in the final two steps. Results are displayed in *Table 12*.

Table 12: Logistic Regression: Four-year graduation

Variable	B	S.E.	Sig.	Exp(B)
Female indicator	**.412**	**.043**	**.001**	**1.510**
Black African American indicator	**-.542**	**.113**	**.001**	**.582**
Native American AK Native indicator	-.486	.448	.278	.615
Asian PI Hawaiian indicator	**-.406**	**.103**	**.001**	**.666**
Hispanic Latino indicator	**-.558**	**.121**	**.001**	**.572**
International indicator	**-1.251**	**.147**	**.001**	**.286**
Black African American Female indicator	**.544**	**.143**	**.001**	**1.723**
Native American AK Native Female indicator	-.410	.615	.504	.663
Asian PI Hawaiian Female indicator	.063	.137	.644	1.065
Hispanic Latino Female indicator	-.079	.155	.609	.924
International Female indicator	.386	.214	.072	1.470
No Financial Need indicator	.037	.063	.558	1.038
Low Financial Need indicator	-.069	.078	.373	.933
Mid Financial Need indicator	**-.281**	**.071**	**.001**	**.755**
High Financial Need indicator	**-.326**	**.048**	**.001**	**.722**
SAT verbal	**-.001**	**.000**	**.004**	**.999**
SAT math	.000	.000	.891	1.000
High school GPA	**.701**	**.047**	**.001**	**2.015**
AP Credit indicator	**.209**	**.066**	**.001**	**1.233**
Number Of AP Credits	**.019**	**.006**	**.001**	**1.019**
SUPA Credit Indicator	.208	.208	.316	1.232
Number Of SUPA Credits	-.006	.030	.842	.994
Constant	-1.077	.229	.000	.341
Nagelkerke R2 8.5%				

N = 15,984				

Note: Bolded variables denote significance at the 5% level.
Dependent Variable – Graduation in Four Years.

Looking at the full model across all the steps it can be seen that the addition of predictors in Step 4—High school performance variables—produced the largest gain in model fit.

- Block 1, gender and race/ethnicity (with 6 df) were entered into the regression model simultaneously, that significantly predicted graduation in four years, with a Nagelkerke R Square of .030 and Cox and Snell R Square of .042.
- Block 2 included interaction terms between gender and race/ethnicity (with 5 df) and significantly predicted graduation in four years again with a Nagelkerke R Square of .031 and Cox and Snell R Square of .044.
- Block 3 added financial need variables to the model (with 4df) and significantly predicted graduation in four years, with a Nagelkerke R Square of .033 and Cox and Snell R Square of .048.
- Block 4 added the high school academic performance variables (with 3df) and resulted in significant increase in variance explained the dependent variable of graduating in four years. The total R Square for the model including the first four steps was Cox and Snell of 0.55 and Nagelkerke R Square of 0.78.
- Block 5 entered the AP variables (with 2 df) and these too added significant variation in explaining the outcome. The Nagelkerke R Square was .085 and Cox and Snell R Square was .059.
- Block 6, the final block, added the PA variables, with the Nagelkerke R Square of .85 and Cox and Snell R Square of .059.

The full model including all six blocks explained 8.5% of the variance of the dependent variable of graduating in four years. In summary, predictor variables were entered in six steps, and all steps added significant variation on the previous step.

Controlling for gender, race/ethnicity, financial aid, and high school performance variables, the AP Credit indicator variable ($\beta = 0.209$, $p < .001$) and the number of AP credits ($\beta = 0.019$, $p < 0.001$) were both statistically significant in predicting graduation in four years. Interesting to note here was that the β for AP Credit indicator was .209 and the β for SUPA credit indicator was .208, both positive and nearly identical in magnitude. However, the SUPA indicator variable was not significant. Also, the number of SUPA credits did not reach statistical significance, but the relationship between the number of SUPA credits and the dependent variable is negative, as the β coefficient is -.006.

In answering the research question related to four-year graduation, several control variables also produced statistically significant estimates for the dependent variable. The Female indicator variable was significant, with a $\beta = 0.412$, $p < 0.001$, and an Exp (B) 1.510. The odds ratio indicates that the odds of graduating in four years are about 1.5 times higher for female students than for the reference group; that is, females have a much higher likelihood of graduating in four years compared to males. Race/ethnicity variables (Black African American ($\beta = -0.542$, $p < 001$), Asian PI Hawaiian ($\beta = -0.406$, $p < 001$), Hispanic Latino ($\beta = -0.558$, $p < 001$), and International student ($\beta = -1.251$, $p < 001$) indicators) are all statistically significant (except for the Native American AK Native indicator variable), with a negative B showing a higher likelihood of not graduating in four years.

For ease of interpretation, a simple transformation was conducted (Herzog, 2006) to put the odds ratio for negatively-related coefficients on the same metric as the odds ratio produced

when estimated coefficients are positive. Now, taking the inverse of the odds ratio (IOR) in the example above, (International students; B -1.251; Sig .001 and Exp(B) .286); for example 1/.286 = 3.496 was interpreted as meaning that international students have odds of graduating in four years that are 3.5 times lesser than white students.

Among the interaction effects between gender and ethnicity, only the interaction between gender and Black African American student status was significant, indicating that a different relationship exists between Black African American and four-year graduation for men and women. Female Black African Americans are more likely to graduate in four years.

Mid Financial Need indicator and High Financial Need indicator variables both are significant, with negative parameters (-.281 and -.326 respectively). This finding indicates that students with mid and high financial need are less likely to graduate within four years, consistent with previous research on retention.

Interestingly, SAT verbal, as in the previous chapter, is significant, with a negative parameter indicating that students with high SAT verbal scores were less likely to graduate in four years. This result is consistent with the previous regression on dropout in 1st Year and dropout in 2nd Year where students with high SAT verbal scores were more likely to dropout of the institution.

Beginning with Tinto (1993) to Astin (2001), researchers continued to find that the student's high school GPA is the strongest precollege entry attribute in predicting persistence in college, college GPA, and degree completion. In this study Step 4 (high school GPA) also indicated positive and statistically significant relationships to graduating in four years. This finding also reinforces Adelman (2006) that concluded that the intensity of the high school curriculum still counts, more than anything else, towards degree completion.

Graduation in six years

To identify individually important predictors of graduation in 6-years from the standpoint of statistical significance, the full model was run and assessed. *Table 13* presents the regression results for graduation in six years and has a format similar to *Table 12*.

Table 13: Logistic Regression: Six-year graduation

Variable	B	S.E.	Sig.	Exp(B)
Female indicator	.066	.061	.277	1.069
Black African American indicator	**-.431**	**.151**	**.004**	**.650**
Native American AK Native indicator	-1.000	.558	.073	.368
Asian PI Hawaiian indicator	**-.464**	**.146**	**.001**	**.629**
Hispanic Latino indicator	**-.353**	**.172**	**.040**	**.703**
International indicator	**-1.554**	**.182**	**.001**	**.211**
Black African American Female indicator	**.593**	**.199**	**.003**	**1.809**
Native American AK Native Female indicator	.658	.862	.445	1.932
Asian PI Hawaiian Female indicator	.103	.195	.598	1.108
Hispanic Latino Female indicator	-.022	.225	.923	.979
International Female indicator	**.934**	**.297**	**.002**	**2.544**
No Financial Need indicator	.099	.090	.269	1.104
Low Financial Need indicator	-.063	.107	.556	.939
Mid Financial Need indicator	**-.244**	**.096**	**.011**	**.784**
High Financial Need indicator	**-.307**	**.068**	**.001**	**.736**
SAT verbal	**-.002**	**.000**	**.001**	**.998**
SAT math	.000	.000	.913	1.000
High school GPA	**.756**	**.066**	**.001**	**2.130**
AP Credit indicator	.144	.097	.135	1.155
Number Of AP Credits	**.033**	**.009**	**.001**	**1.034**
SUPA Credit indicator	.602	.337	.074	1.826
Number of SUPA credits	-.041	.045	.360	.960
Constant	.273	.319	.391	1.314
Nagelkerke R2–3.7%				
N = 11,027				

Note: Bolded variables denote significance at the 5% level.
Dependent Variable – Graduation in Six Years.

Looking at the full model across all the steps:

- Block 1 included gender and race/ethnicity variables (with 6 df), which significantly predicted graduation in six years, with a minimal Nagelkerke R Square of .018 and Cox and Snell R Square of .011.
- Block 2 included interaction terms between gender and race/ethnicity (with 5 df) and significantly predicted graduation in six years again with a Nagelkerke R Square of .021 and Cox and Snell R Square of .013.
- Block 3 added financial need variables to the model (with 4 df) and added significant variation to the model, with a Nagelkerke R Square of .024 and Cox and Snell R Square of .015.
- Block 4 added the high school academic performance variables (with 3 df) and resulted in significant increase in variance explained in graduation in six years. The total R Square for the model including the first four steps was 5.3% Nagelkerke R Square and a Cox and Snell R Square of .032.
- Block 5 entered the AP variables (with 2 df) and these too added significant variation in explaining the outcome. The Nagelkerke R Square was .061 and the Cox and Snell R Square was .037.
- Block 6, the final block, added the SUPA variables and was not significant. The full model including all six blocks explained 3.7% of the variance of the dependent variable of graduation in six years.

In summary, variables were entered in six steps. The only step that did not add statistical significance was the first step in which the gender variables were added.

Controlling for gender, race/ethnicity, financial aid and high school performance variables, the only variable that was significant (of the four target variables) is the number of

credits awarded for AP. Important to remember here is that students receive a test score on the AP examination that the institution uses to determine how many credits that the student receive for the course. Even though both the AP Credit indicator and SUPA Credit indicator generated positive estimates, neither were statistically significant. The number of SUPA credits did not reach statistical significance.

Once again, in answering the research question related to 6-year graduation, several control variables produced statistically significant estimates for the dependent variable. Especially notable are all the race/ethnicity groups that are statistically significant, with negative parameter estimates for the dependent variable. All the race/ethnicity groups have a lower likelihood of graduating in six years. The only group that was not significant is the Native American AK indicator variable. However, the numbers here for this group are very small. Also, interestingly, unlike in the first regression with the dependent variable (graduating in four years), the Female indicator is not significant and does not predict graduation within six years.

When the interaction effects between gender and ethnicity were examined in Step 2, only the Black African American Female indicator (β =0.593, p<003) and the International Female indicator (β =0.934, p<002) variables were statistically significant, with positive parameter estimates and an odds ratio of more than 1. This finding indicates that both these categories of female students had a higher likelihood of graduating in six years.

Once again, the SAT math variable failed to reach significance. However, SAT verbal (β =-0.002, p<001) variable mirrored the results of the previous regressions indicating that higher the SAT verbal the less likelihood of students graduating in six years. The regression on short-term persistence had also found that students with higher SAT verbal scores had a higher

likelihood of dropping out of Syracuse University. High school GPA (β =0.756, p<001) was again one of the strongest predictors of students graduating in six years with an Exp (B) of 2.130.

3. 11 Discussion

The findings here in this study were mixed. They were more in favor of AP participation than SUPA participation and in some instances in favor of both; in some cases there were no significant differences between SUPA, AP, and non-SUPA/AP groups. As we all know there is rarely a single reason why a student drops out of college. Some students leave because of poor preparation; they cannot keep up with the academics and don't have the intellectual capacities to complete their program of study. Another reason is the socioeconomic status of the students and their inability to pay after entry into college. Some leave to be near their girlfriends or boyfriends and/or near family. Some leave because they do not get playing time in the sport of their choice. Yet other students leave because they are too far from home and get homesick. Some transfer to other institutions because they don't find the program of study at the current institution challenging or engaging enough.

Karp et al. (2007) provide a suitable comparison to the methodology with the current investigation, given the similarities in methodology and variables. One difference was that the Florida sample followed community college students. When the researchers examined the effect of CEP participation intensity on their Florida sample, they found that participation intensity did not have an impact on short- or long-term outcomes. However, in their College Now, NYC sample, they found that participation intensity did have positive effects on persistence to the second year. In the current study, both the variables related to AP credits were statistically significant and were negatively related to dropout by Fall Year 2. The number of SU credits taken through Project Advance was statistically significant, with an odds ratio of less than 1,

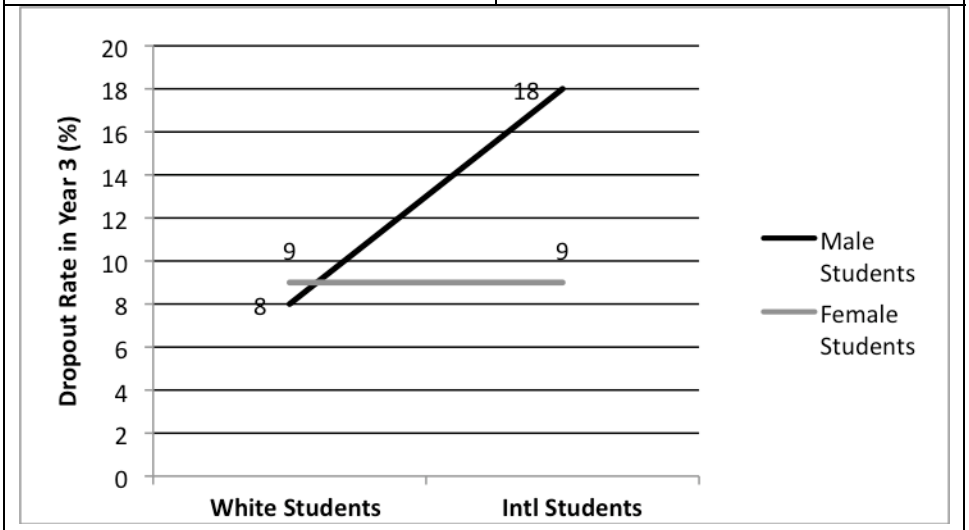
indicating that the more SU credits students accrued, the less likely they were to dropout at the census of Fall Year 2.

Duffy (2009) also provided an appropriate comparison with the current investigation as he also controlled for precollege entry variables. Duffy found that, when precollege entry variables were controlled for, there were no significant differences in the three groups of students: those who took AP, those who took dual credit, and those who took neither. Interestingly, both AP and SUPA participation intensity did not reach statistical significance and appear to have had no effect on dropout at the census of Fall Year 3. There were no significant differences between the three groups of students being compared: SUPA only, AP only, non-SUPA/AP group. Like his study, this study also found that the research findings were consistent with Tinto's (1993) research in that, although there is a significant relationship between precollege entry attributes and persistence/performance in college, this relationship explains less than 5 percent of variation in outcomes in every regression model run in this study.

Following Reason's (2009) recommendation, this study examined the interaction between gender and ethnicity in predicting dropout in the early semesters. It found that the interaction term for international student and gender variables was statistically significant, showing that the male international students had a higher likelihood of dropping out. International female students were no more or less likely to dropout in both Year 2 and Year 3 than white females (or white males); however, male international students are more than twice as likely to dropout than the other three groups, as illustrated below in *Table 14.*

Table 14: Dropout: International Students

White female 9%	International female 9%
White male 8%	International male 18%



The majority of international undergraduate students at SU (from 2000 to 2008) were Korean students, as *Table 15* indicates.

Table 15: Syracuse University International Undergraduate Student Enrollment

Countries	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
China	8	5	6	4	3	5	11	28	116
S. Korea	110	110	89	95	95	111	144	67	199
Canada	19	19	22	31	36	38	47	54	65
Taiwan	16	17	14	11	14	22	24	24	36
Hong Kong	11	12	9	3	2	5	7	10	18
Japan	28	22	26	20	20	12	13	20	13
India	22	23	18	9	12	9	6	11	19
S. Arabia	2	3	2	1	2	1	2	8	14
Singapore	5	5	2	2	5	7	6	5	5
UK	7	7	6	4	5	10	9	10	12
Brazil	1	4	4	3	4	3	3	2	10
Turkey	19	18	18	16	14	12	13	16	13
Indonesia	13	11	10	6	5	4	2	2	2

Countries	2000	2001	2002	2003	2004	2005	2006	2007	2008
Thailand	12	8	9	4	2	3	2	4	7
Kuwait	8	6	3	4	3	3	3	3	2
Kazakhstan	0	1	1	2	0	2	15	17	20

Note: Data obtained from the Slutzker Center for International Services, Syracuse University

"Preparing to get to the best American universities has become something of a national obsession in Korea," said Alexander Vershbow, the American ambassador to South Korea in an interview with Dillon (2008). Anecdotal evidence indicates that some Korean students come from very rich and elite families and do have the opportunity to attend high schools in the United States and, by the process of enculturation, learn some of the bad habits of American students such as drinking, doing drugs, etc., which may lead to their dropping out of college. Review of the the literature also indicates that certain international students "put their careers on hold" after their sophomore year to return to their country to enlist in military service in their homeland, as every male student is mandated to serve for two years in certain countries.

Overall, female students were slightly more likely to dropout by Fall Year 2 than were male students. However, by Fall Year 3, female students were no more or less likely to dropout than males. White females (9%) and black males (9%) are at approximately the same risk for dropout, whereas white males (8%) and black females (7%) have a slightly reduced risk. Consistent with both Duffy (2009) and Swanson (2008), this study also found that both AP and SUPA had a higher percentage of white, female students who participated in these programs.

This study analyzes the data longitudinally, in that retention was evaluated after the second and third fall of college enrollment. However, the 12 years of cohort data were combined in the final models for both dropout and graduation. To examine cohort effects in the multivariate model, the models were run with and then without the cohort variables. Very minimal changes in parameter estimates (i.e., β weights) were observed for the set of predictors

when the cohort variable was added to the regression model. Therefore, the cohort variable was removed from the model for the sake of parsimony.

Unlike some of the previous studies on retention and attrition, this study found that socioeconomic status (high and low financial need) was not a significant predictor of dropout in the second year at SU. However, mid financial need was significant in predicting dropout in the first year. One of the reasons could be that students with high financial need are eligible for more student assistance/grants and are given more consideration by the institution. Students who have no financial need or do not apply for financial aid are able to pay their way through college, leaving the middle-class students with the burden of having to take student loans, as their family income may be just high enough to make them ineligible for financial assistance.

3.11.1 Summary of Key Findings (Dropout in Year 1 and Year 2):

The analysis focused on the relationship between participation in SUPA and AP and short-term persistence of students at Syracuse University. After controlling for demographic, financial need and precollege entry variables including Advanced Placement, this study revealed that the number of SU credits taken through Project Advance reached significance and was associated with a lower risk of dropout, albeit only in the first year. SUPA students were more likely to persist through the first year of college than were nonparticipating students. Bailey and Karp (2003) suggested looking at CEP participation intensity over the first few semesters as it could help us determine if "increased exposure to many college courses was more strongly related to student post-secondary outcomes than exposure to a few" (p. 24). My study substantiates their hypothesis that the number of SUPA credits taken in high school has a positive relationship to short-term retention. This is also consistent with Swanson's (2008)

findings. The AP indicator variable also reached significance and was associated with a lower risk of dropout in Year 1.

3.11.2 Summary of Key Findings (Graduation in four or six years):

In assessing the relationship between participation in AP and/or SUPA and graduation in four to six years, this study yielded mixed findings when compared with the previous regression where Dropout in 1st Year and Dropout in 2nd Year were the two dependent variables. AP credit indicator and number of AP credits were both statistically significant and significantly predicted graduation in four years. SUPA credit indicator and number of SUPA credits were not significant in predicting graduation in four years. However, in predicting graduation in six years, the only variable that significantly predicted the dependent variable was the number of AP credits. None of the other target variables were significant.

Keeping up with the recent trend of women—for the first time in U.S. history—out-numbering men in earning college degrees, this study suggests that female students at Syracuse University are more likely to graduate in four years. However, gender did not seem to play a role in predicting graduation in six years.

Both Mid Financial Need and High Financial Need, as expected, negatively contributed to graduation in four years and six years. This is consistent with previous research in which Chen and DesJardins (2008) explored the relation between types of assistance received and retention and graduation of students. It is well known that students who experience the financial stress of paying for college are not able to focus on degree completion because, when students have "overwhelming debt burdens," they worry and also work many hours a week to make ends meet.

Research in the last few decades has found that financial aid in higher education is essential to the enrollment and persistence of students from low-income backgrounds (Nora,

2001; Tinto, 1993). Rooney (2002) studied the impact of college costs on Hispanic students and found that increasing college tuition in times of dwindling financial aid forces many Hispanic students to work additional hours, attend college part-time, or defer college enrollment. Promise of financial aid has been shown to have a positive correlation to college persistence (Duffy 2009).

Overall, considering the variables included in this study, it appears that the student high school GPA has the most influence on the dependent variable. These results align well with Adelman's (1999), whose study found that the strongest predictor of college persistence and performance was the rigor of the curriculum in high school.

3.12 Strengths of the study

These are the study's strengths:

- In a multivariate correlational study, using control variables is a primary method of strengthening the internal validity of research findings. The nature of this data set allowed for the control of a rich set of demographic, financial need, and precollege entry student characteristics. This study not only captured a student's participation in these credit-based programs, but also captured the "participant intensity" by examining the number of SUPA and AP credits taken by each student. Control variables also known to have an impact on persistence were included in the multivariate model. This study is a much more robust (stringent) test of the impact of SUPA/AP than one that simply compared persistence rates of the student groups without inclusion of the control variables.
- Prior research on concurrent enrollment programs has used local community college, university, or statewide programmatic data (Swanson, 2008). The research method for the current study allowed us to examine the relationship between programs like SUPA and

AP and college persistence outcomes so we can better understand the effectiveness of these programs (relationships only) on desired student outcomes in in a four-year private university.

- This study tells us that a student left SU at a certain time. Even though, in some cases, we do not know why the student decided to leave, the National Student Clearinghouse report was used to track students who transferred out of SU to other four- or two-year institutions.

3.13 Limitations of the study

Several limitations of this study need to be considered when interpreting the findings:

- The design was not experimental, so it could not control for all pre-existing characteristics.
- Internal validity seeks to establish a causal relationship between two variables, but this study constitutes ex-post facto research. The independent variable, in this case, could not be manipulated, hence the hypothesis being tested was one of association and not of cause and effect.
- Prior academic achievement does not account for such characteristics as motivation.
- The study is based on only one institution, Syracuse University, with its concurrent enrollment program. This study examined only students who enrolled for SUPA and then matriculated at SU, and it did not follow the students who took SUPA and later went to other institutions for their undergraduate education. What makes this study unique could also be the factor that limits generalizability (external validity) to other institutions. The conclusions drawn from this study may be entirely specific to this institution's data set.

- This study does not control for differences in the quality of high schools where the SU course offered through Project Advance was taken, as the Myatt and Waddell (1990) study did. Also, this study does not access the experiences of students gained from other concurrent enrollment programs.

3.14 Conclusion

The purpose of this paper was to examine the role of SUPA and AP and their impact on short- and long-term persistence. Theoretical assertions have been made that, when a student fails academically and socially to integrate with an institution, then he or she fails to persist, especially in the early semesters. This study examines the premise of these high school interventional programs that persistence in college is a mindset that starts long before one enters college. Some findings of this study are encouraging and underscore the importance of not dropping out in the early semesters in college. It appears that participation in both AP and SUPA may lead to some positive college outcomes (short-term persistence) for SU students, especially during the first two critical years.

Students who matriculate into SU (or any other institution) are faced with three fundamental decisions, according to Porter (1999). They are whether to (a) complete their baccalaureate program where they matriculated, or, (b) transfer out and graduate from another institution, or (c) dropout completely from the educational pipeline. The current study helped in determining if SUPA and AP participation had an effect on both short-term and long-term persistence. Studying the transfer behavior of these groups of students (for some students) added more substance to the study. The findings of this study can be positioned within the literature, and some predictions will be useful in informing institutional policy. If Syracuse University can identify why some students take longer to graduate and why some students transfer to other

institutions, this knowledge will help faculty, administrators, and staff focus on the appropriate intervention programs to foster academic success and promote degree attainment.

Consistent with prior research studies, this study reveals that "persistence is heavily influenced by nonacademic factors such as finances, family, and social considerations" (Camara & Echternacht, 2000). Future research will focus on the relationship of these concurrent enrollment programs to performance in terms of grade point average and grades in subsequent college course taken on the SU main campus.

3.15 References

Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment*. Washington, DC: U.S. Department of Education. Retrieved from http://ed.gov/pubs/Toolbox/toolbox.html

Adelman, C. (2004). *Principal Indicators of Student Academic Histories in PostsecondaryEducation: 1972–2000*. Washington, DC: U.S. Department of Education, Institute of Education Sciences.

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college.* Washington, DC: U.S. Department of Education. Retrieved February 29, 2008, from http://www.ed.gov/rschstat/research/pubs/toolboxrevisit/ toolbox.pdf

Akst, G. (2007). Postsecondary attendance and success patterns: An interview with Clifford Adelman. *Journal of Developmental Education.* 31(2).

Allen, D. (2010). *Dual enrollment: A comprehensive literature review & b ibliography*. CUNY Collaborative Programs, Office of Academic Affairs. Retrieved from http://www.cuny.edu/academics/k-to-12.html

Astin, A. W. (2001). *What matters in college? Four critical years revisited.* San Francisco: Jossey-Bass.

Bailey, T., Hughes, K. L., & Karp, M. M. (2002). *What role can dual enrollment programs play in easing the transition between high school and postsecondary education?* Washington DC: Office of Vocational and Adult Education, U.S. Department of Education.

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.

Bean, J. P. (1983). The synthesis and test of a causal model of student attrition. *Research in Higher Education, 12*(2), 155–187.

Braxton, J. M., Sullivan, A. S., and Johnson, R. T. (1997). Appraising Tinto's theory of college student departure. In J. C. Smart (Ed.), *Higher Education: Handbook of Theory and Research, Vol. 12* (pp. 107–158). New York: Agathon.

Brunsden, V., Davies, M., Shelvin, M., & Bracken, M. (2000). Why do HE students dropout? A test of Tinto's model. *Journal of Further and Higher Education, 24*(3), 301–310.

Carver, R. (1993). The case against statistical significance testing, revisited. *Journal of Experimental Education*, *61*, 287–292.

Camara, W. J., & Echternacht, G. (2000). The SAT I and high school grades: Utility in predicting success in college. The College Board, Research Notes, Office of Research and Development/ RN0=-10, July 2000.

Chen, R. & DesJardins, S. L. (2008). Exploring the effects of financial aid on the gap in student dropout risks by income level. *Research in Higher Education, 49*(1), 1–18.

Conley, D. T. (2007). *Redefining college readiness*. Educational Policy Improvement Center. Retrieved from http://www.aypf.org/documents/RedefiningCollegeReadiness.pdf

Dillon, S. (2008, April 27). S. Korean schools push students for Ivy League results. *The Seattle Times*. Retrieved from http://seattletimes.nwsource.com/html/education/2004376338_prepschool27.html

Dougherty, C., Mellor L., Jian, S. (2005). The relationship between Advanced Placement and college graduation. National Center for Educational Accountability. NCEA Study Series Report 1.

Duffy, W. R. (2009). *Persistence and performance: The relationship between dual credit and*

persistence and performance at a four-year university. The University of Memphis). *ProQuest Dissertations and Theses,* http://search.proquest.com/docview/305150835?accountid=14214

Dutkowsky, D. H., Evensky, J, M., & Edmonds, G. S. (2009). Should your high school adopt Advanced Placement or a concurrent enrollment program? An expected benefit approach. *Education Finance and Policy, 4*(3), 263–277. Retrieved from http://www.mitpressjournals.org/toc/edfp/4/3

Ewing, M. (2006). The AP program and student outcomes: A summary of research. (College Board Research Report Note RN-29). New York: The College Board.

Herzog, S. (2006). Estimating student retention and degree-completion time: Decision trees and neural networks vis-à-vis regression. In J. Luan & C. Zhao (Eds.), Data Mining in Action: Case Studies of Enrollment Management. *New Directions for Institutional Research*, no.131, pp. 17–33. San Francisco: Jossey-Bass.

Hoyt, W. T., Imel Z. B., & Chan F. (2008). Multiple regression and correlation techniques: Recent controversies and best practices. *Rehabilitation Psychology, 51*, 321–339.

Hoyt, W. T., Leierer, S., & Millington, M. J. (2006). Analysis and interpretation of findings using multiple regression techniques. *Rehabilitation Council Bulletin 2006, 49*, 223.

Kanter, M. J. (2011). American higher education: "First in the World" *Change: The Magazine of Higher Learning, May–June 2011.*

Karp, M. M, Calcagno, J. C., Hughes, K. L., Jeong, D. W., & Bailey, T. (2007). *The postsecondary achievement of participants in dual enrollment: An analysis of student putcomes in two states.* St. Paul, MN: National Research Center for Career and Technical Education, University of Minnesota.

Keith, T. Z., (2008). *Multiple Regression and Beyond*. Boston, Pearson Educational.

Kim, J. (2008). *The impact of dual and articulated credit on college readiness and total credit hours in four selected community colleges: Excerpts from a doctoral dissertation literature review*. Retrieved from http://occrl.illinois.edu/node/337.

Kleiner, B., & Lewis, L. (2005). *Dual enrollment of high school students at post-secondary institutions: 2002–03* (NCES 2005–008). Washington, DC: National Center for Education Statistics, U.S. Department of Education.

Klofenstein, K. (2009). *The link between advanced placement experience and early college success*. Retrieved from http://findarticles.com/p/articles/mi_qa5421/is_3_75/ai_n-31607817/.

Klofenstein, K. (2010). Does Advanced Placement program save taxpayers money? The effect of AP participation on time to college graduation. In *AP: A Critical Examination of the Advanced Placement Program*. Cambridge, MA: Harvard Education Press.

Kuh, G. D., Bridges, B. K., & Hayek, J. C. (2006) *What matters to student success: A review of the literature.* Commissioned report for the National Symposium on Postsecondary Student Success: Spearheading a Dialog on Student Success, National Postsecondary Education Cooperative (NPEC, July 2006 Report)

Lau, L. (2003). Institutional factors affecting student retention. *Education, 124*(1), 126–136.

Levin, J.R. (1993). Statistical significance testing from three perspectives. *The Journal of Experimental Education, 61*(4), 378–382.

Marshall, R. P., & Andrews, H. A. (2002). Dual-credit outcomes: A second visit. *Community College Journal of Research and Practices, 26,* 237–242.

McCauley, D. (2007). The impact of Advanced Placement and dual enrollment programs on college graduation. Retrieved from http://ecommons.txstate.edu/arp/206

National Center for Education Statistics. (2010). Enrollment in postsecondary institutions, fall 2008; graduation rates, 2002 and 2005 cohorts; and financial statistics, fiscal year 2008. (Report NCES 2010-152). Retrieved from http://research.studentclearinghouse.org/content/case_studies/UofMD_casestudy.pdf

Nitzke, J. E. (2002). *A longitudinal study of dual credit enrollment of high school students as an accelerator for degree completion* (Doctoral Dissertation, Iowa State University). Available from ProQuest Dissertations and Theses Database. (UMI Dissertation, AAT 3061852).

Nora, A. (2001). *How minority students finance their higher education*. New York: ERIC Clearinghouse on Urban Education. (ERIC no. EDO UD-01-0)

Edmunds, G. S., & Signorelli, S. (Eds.). (2009). Our courses your classroom: Research on Syracuse University courses taught in high school. Project Advance Press, Syracuse University. Retrieved from http://supa.syr.edu/

Porter, S. R. (1999). *Including transfer-out behavior in retention models: Using the NSLC enrollment search data*. Paper presented at the 1999 North East Association of Institutional Research conference, Newport, RI.

Porter, R. (2003). *A study of students attending Tennessee Board of Regents universities who participated in high school dual enrollment programs* (Unpublished doctoral dissertation). East Tennessee State University, Johnson City, TN.

Reason, R. D. (2009). Student variables that predict retention: Recent research and new developments. *NASPA Journal, 46*(3), 482.

Rooney, M. (2002). *Report on Latino-American students notes high college enrollment rate, lower graduation rate*. Retrieved from http://chronicle.com/daily/2002/09/2002090604n.htm.

Santoli, S. P. (2002). Is there an Advanced Placement advantage? *American Secondary Education*, *30*(3), 23–35.

Swanson, J. (2008) *An analysis of the impact of high school dual enrollment course participation on post-secondary academic success, persistence and degree completion*. University of Iowa, College of Education. Retrieved from http://nacep.org/research-and-policy/research-studies/.

Tinto, V. (1975) Dropout from higher education: Toward an empirical synthesis of recent research. *Journal of Review of Educational Research, 45*, 89–125.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: The University of Chicago Press.

Venezia, A., Callan, P. M., Finney, J. E., Kirst, M., & Usdan, M. D. (2005) *The governance divide: A report on a four-state study on improving college readiness and success*. San Jose, CA: National Center for Public Policy and Higher Education.

Venezia, A. K. (2003). *Betraying the college dream: How disconnected K–12 and postsecondary education systems undermine student aspirations.* Stanford, CA: Stanford University.

Venezia, A. & Kirst, M. W. (2005). Inequitable opportunities: How current education systems and policies undermine the chances for persistence and success in college. *Educational Policy, 19*(2), 283–306. doi: 10.1177/0895904804274054

Wasserman, T., Johnson, D. R., Yonai, B., & Yildirim, N. (2011). *The impact of academic, financial, family, and personal stressors on GPA and persistence of racially/ethnically*

diverse first- and second-year college students. Paper presented at the 2011 AIR Forum: Passport to New Ideas, Better Decisions. Toronto, Ontario.

4. Syracuse University Project Advance: How well does the program prepare students for the subsequent course at Syracuse University?

4.1 Abstract

More and more high school students are envisioning enrolling in postsecondary institutions. Concurrent enrollment programs (CEPs) have been created to tackle two challenges arising from this demand: helping high school seniors to avoid a "year of boredom" and helping to ease their transition into college. These programs offer eligible students the opportunity to take college courses during their senior year in high school. Because of the rapid growth of these high school-college partnerships, states have started recognizing the importance of offering such opportunities to students while placing the emphasis on the quality of the program.

The current study examined a program that is a partnership between high schools and a four-year private institution. Syracuse University's concurrent enrollment program, Project Advance, was implemented in 1972. Students who take SU courses through Project Advance in high school and then matriculate into Syracuse University (SU) for their baccalaureate studies have their SUPA grades as part of their academic record. Many of them do take the subsequent course on the Syracuse University main campus. This study examined the effect of taking *introductory* SU courses through Project Advance on student performance in the subject specific subsequent-level course at SU.

This study examined the grades that students received in subsequent courses on Syracuse University's main campus, after having participated in Project Advance. Twelve years of data, from 1997 to 2008 (both inclusive), were used in the study. In addition, the study examined the grades of main campus students who took both the pre- and postcourse on the main campus and who did not participate in Project Advance. I focused on eight subjects that had the highest

enrollment: Economics, Writing, Public Affairs, Chemistry, Psychology, Sociology, Mathematics, and English and Textual Studies. I compared the grades in these subjects using the means procedure, the frequency procedure, the t-test, and, lastly, multiple regressions with control variables, including the time lag between pre- and postcourse. The results were mixed and illuminating.

4.2 Introduction

President Obama (2010) in the report *Blueprint for Reform* at the US DOE stated the importance of promoting a culture of college readiness and success by increasing "access to college-level, dual credit, and other accelerated courses" (p. 6) to high school students.

A key to success in college is college readiness. Conley (2007) states:

> College readiness can be defined operationally as the level of preparation a student needs in order to enroll and succeed—without remediation—in a credit-bearing general education course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program. 'Succeed' is defined as completing entry level courses at a level of understanding and proficiency that makes it possible for the student to consider taking the next course in the sequence or the next level of course in the subject area. (p. 5)

Choy (2001) postulates that taking the right courses in high school is a crucial step for students in preparing for college. She notes the importance of being college ready and doing well in entry-level general education courses, because not succeeding in these courses is closely related with dropping out of college. American College Testing (2008) reports that 22% of first-year college students were prepared for college-level work in the four subject areas of mathematics, English, reading, and science. When students enter college and are not prepared for

the rigor of college courses and/or don't fully understand faculty expectations, they are at risk of not achieving success in college. Bailey, Hughes, and Karp (2002) point out that 37% of students entering college for the first time dropped out after two years, without earning a degree or certificate. Several factors may have contributed to this decision, but Tai (2008) argues that even students who participate in accelerated programs in high school may not be prepared to advance past first-year-level courses because of the difference in instructional and assessment strategies.

This study determines if participating in Syracuse University courses through Project Advance while in high school helps in college readiness, based on data concerning students who pursue their baccalaureate degree at Syracuse University. One way of measuring the effectiveness of Project Advance (PA) courses is to determine whether exposure to a given subject in high school prepares them to succeed at the university level in the subsequent subject-specific course. SU courses offered through Project Advance carry both high school and college credit. For students matriculating into Syracuse University, grades (A through F) from these SU courses are recorded on their official SU transcript. In the 2006–07 school year, PA offered SU courses to 10,900 students in 176 schools in a five-state area. Currently, PA offers 35 courses in 22 academic disciplines.

4.3 Related Studies

Johnstone and Del Genio (2001) report that there is "virtual overlap" in the curriculum of the last year in high school and the first year in college. Their study, which analyzed policies and practices at 450 postsecondary institutions, showed great differences between two- and four-year colleges and universities in terms of what is accepted as credit upon matriculation. Their study revealed that some colleges and universities continue to question whether the grading standards of high school teachers in dual enrollment programs are strict enough.

North and Jacobs (2008, 2010) conducted an analysis of students taking dual credit in an Oregon high school in 2005–2006 with their subsequent college performance in 2006–2007. They then did a follow-up study of a 2007–2008 cohort and their subsequent college performance in 2008–2009. The researchers compared the average grades for both groups of students and also looked at the proportion of students who passed the postcourse. Their study produced mixed results. In some mathematics sequences dual credit students had lower grades, and in some of the other mathematics sequences dual credit students had the same or higher grades than college-situated students. In Writing and Spanish, dual credit students had higher grades in the subsequent courses. Based on these findings, the researchers concluded that dual credit instruction did as well as college-situated instruction in preparing students for college work. They did not, however, control for confounding variables or conduct rigorous statistical tests.

Windham and Perkins (2001) also examined students who had taken dual enrollment courses in the Florida Community College System to determine how well they were prepared for the subsequent-level course. They found that dual enrollment students were statistically more successful in the next-level course when compared with students who had not taken dual enrollment courses. Allen (2010) in his review reminds us that no rigorous statistical tests were used and pre-entry student characteristics were not controlled. Windham and Perkins were following students who went on to Community Colleges and not to a four-year private institution as in the current study.

Chatman and Smith (1998) examined academic transcripts from high school and college for foreign languages using Chi-Square tests. Their study showed that dual credit courses can be "as effective as on-campus instruction in preparing students for subsequent instruction in the

same discipline" (p. 106). However, these researchers did not control for precollege entry characteristics.

Kim, Barnett, and Bragg (2003) found that the main concern amongst researchers was whether these dual enrollment courses are taught at the college level. Evaluators of these programs contend that the courses are not taught at the same academic level when compared to college courses on main campuses. Their research on the Illinois program revealed that "promoting accessibility vs. maintaining quality of program" was a major issue. Some education researchers and policy makers felt the need to provide access to as many students as possible, and some argued that the students accepted in these programs should meet the entrance standards. Hoffman, Vargas, and Santos (2008) and Makela (2005) agreed that this standard could be a problem because there is no universal agreement on the meaning of college level. Researchers firmly believe that the "quality control" of high school teachers' who teach these courses should be a priority, and efforts should be made to keep the curricular content of these courses up to date.

Schnee (2005) compared the curriculum and instruction in two pairs of similar courses offered as a section in CUNY's College Now program. This program offers two courses (writing and psychology) to high school students, and the same two courses in as part of the undergraduate curriculum. After observing the four sections, then conducting interviews with the teachers and a focus groups with the students, the researchers found no patterns of difference between the College Now and the undergraduate sections of these courses.

The current study extends studies by North (2010) and others. In addition to comparing average grades and proportions of students passing (C or better) and failing (D or F) in the two groups, multiple regressions are conducted, controlling for all other available confounding

variables. This technique controls for precollege student characteristics (demographic, financial need, and high school academic achievement). To use in these regressions, I created a variable to measure the effect of time/semester lag between these courses, as well as an interaction variable between the PA indicator and the PA course grade. This variable provides information on both the quality effect of PA and the possible grade inflation in PA.

Morgan and Crone (1993) investigated the course grades of Advanced Placement students at nine different colleges in three subject areas: biology, calculus, and chemistry. They compared the performance in upper-level courses of students who had received AP credits based on their AP test scores, with the performance of students who took the introductory college courses. Their study found that students who received AP test scores of 3, 4, or 5 flourished in the upper-level courses.

4.4 Research Question

1. Do SU courses offered through Project Advance give students the necessary foundation they need to handle subsequent SU main campus coursework?
2. How do the students who take PA courses compare with students who take both the pre- and postcourse on main campus and not the related PA course?

4.5 Data

Data reported in this study were retrieved from the Syracuse University Student Records System (SRS). The data covered a period of 12 years, from the fall 1997 semester to the fall 2008 semester, both inclusive. This yielded a sample size that was different for each subject-specific course, depending on enrollment. The database at SU contained all demographic information, precollege entry characteristics data related to high school performance and achievements (including SU grade earned in high school), and student academic performance at

SU. When a PA student matriculates as an undergraduate at SU, all information about their program of study and major is available on SU's database.

4.6 Method

This study examined SUPA student performance in second-level subsequent courses and in some cases third-, or forth-level courses. They were then compared to students who take both the pre-and postcourses on the SU main campus. Even though these comparisons are dependent on student participation in Project Advance, the study allows for a direct comparison to their peers who take both pre- and postcourses on the main SU campus.

A review of the SU courses offered through PA in the years 1997–2008 was conducted to address the research questions. Common two-course sequences in which the PA course is a prerequisite to a course that is then subsequently taken on main campus were identified. Eight subjects were chosen because they represented PA courses with the highest enrollment. Furthermore and more importantly, the content area of these eight courses covers the three disciplines (natural sciences, social sciences, and the humanities) that fulfill the divisional perspectives requirement of the liberal arts core at Syracuse University. Even though Biology had a high enrollment, it was not included in this study as students' course taking patterns showed that most students take both the pre- and postcourse as SUPA students in high school. **Error! Reference source not found.** *Table 16* lists the typical two-course sequences that were suitable for analysis.

Table 16: Typical Two-Course Sequences

Subject	Precourse	Postcourse
Social Sciences		
Economics	ECN 203	ECN 301 or ECN 302
Public Affairs	PAF 101	All PAF courses
Sociology	SOC 101	All Sociology courses

Subject	Precourse	Postcourse
Psychology	PSY 205	All Psychology courses
Humanities		
English and Textual Studies	ETS 142	All ETS courses
Writing Skills		
Writing	WRT 105	WRT 205
Natural Sciences		
Calculus (Calculus I and II)	MAT 295	MAT 296
Chemistry	CHE 106/107	CHE 116/117

After identifying the course sequences, the next step was to determine students' comparative success. Success here is equivalent to passing the postcourse of the college sequence with a grade of C or better. Pass rates for both groups were compared to see if Project Advance does a "good enough" job in getting the students college ready.

Myatt and Waddell (1990) note that "effective teaching/learning necessitates retention of information or ideas for a certain minimum period of time (allowing for some decay effects)" (p. 1.) The time lag between completing a high school precourse and taking a university-level postcourse "puts importance on this retention factor." Based on their recommendation, this study controlled for the time lag between the pre- and postcourse as the students mastered the fundamental concepts in these courses in high school and then proceeded to take the subsequent-level (more difficult) course after matriculating into the university. So variables were created to indicate the time lag between the pre- and postcourse. These variables are included in the multiple regression models.

4.7 Limitations of this Study

1. This study does not control for possible differences in the quality of high schools and does not address the differences in populations between schools that offer Project Advance and Advanced Placement courses in their curriculum.

2. This study is based on one single institution, Syracuse University, with its own concurrent enrollment program, so the generalizability of the results to the general population is limited.
3. This study does not track former Project Advance students who enroll at other institutions.
4. Did not control for variations in grading methods on how one arrives at a final grade in high school and in college.

4.8 Hypothesis

If the Project Advance precourse taught in high school is at the same college level as the Syracuse University main campus precourse, then PA students should perform comparably to main campus students in the subsequent course. Controlling for all other factors, Project Advance may have a positive effect because PA "offers genuine SU courses, so the coursework is more demanding than high school coursework. Students are expected to conceptualize and draw conclusions from reading and research" (Project Advance, 2008). One could assume that, with the smaller class size, more face time, and quicker feedback from the teacher, the PA students would master the subject and hence even do better in the main campus postcourse.

4.9 Analysis

Estimates of course grade point average and percentages of Project Advance and Main Campus students with all grades (A through F) were produced. The analysis was conducted in four ways:

1. The Means Procedure
2. The Frequency Procedure
3. T-test for differences in Means

4. Multiple regressions controlling for demographic, race/ethnicity, financial need, student precollege entry attributes, time/semester lag between courses, and the interaction variable (PA indicator variable and the precourse grade).

4.9.1 The Means Procedure

The analysis identified the first group of students who took the Project Advance course in high school and then finished the next-level course at Syracuse University. This group's performance was then compared to the second group of students who took both the pre- and postcourse on the main campus.

Results and Discussion

The evidence collected for the two-course sequence is listed below—they are subject specific pre- and postcourse grade by campus. This study did not restrict the analysis to just the two-course sequence. It looked at any subject-specific subsequent course. Figures included only those students who have both a pre- and postgrade. Each subject area has a different sample size and will be discussed separately. For ease of reporting, from here on, the Project Advance population is referred to as PA and the main campus population is referred to as MC. *Table 17* presents the results in Economics.

Table 17: Economics ECN 203 (Economic Ideas and Issues)

ECNCampusPre	ECNCampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	ECNPre	2310	3.038	0.824
		ECNPost	2310	3.043	0.896
		ECNDiff	2310	0.005	0.871
PA	MAIN	ECNPre	68	3.373	0.542
		ECNPost	68	2.892	1.122
		ECNDiff	68	-0.480	1.119

The key observations are:

1. The mean grade in the ECN 203 precourse on the MC is lower than the mean grade of the PA precourse in high school. The difference is a third of a letter grade, 0.335 (3.038 vs. 3.373), which would be a B vs. a B+.
2. The mean grade in the ECN postcourse is higher for the students who took the postcourse on the main campus than for the PA students who took the postcourse on the main campus. The difference between 3.043 and 2.892 is 0.151 (from B to B-).
3. For the PA population, the precourse vs. postcourse, shows a decline in grade from 3.373 to 2.892 (difference of -0.480). For the main campus population the precourse, vs. postcourse, shows a minimal increase, from 3.038 to 3.043 (difference of 0.005).
4. The MC population outperformed the PA population in the subsequent course taken on the main campus based on the mean postcourse grade.

Table 18 presents the results in Public Affairs.

Table 18: Public Affairs: PAF 101 (Introduction to the Analysis of Public Policy)

PAFCampusPre	PAFCampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	PAFPre	785	3.400	0.814
		PAFPost	785	3.668	0.618
		PAFDiff	785	0.268	0.886
PA	MAIN	PAFPre	32	3.688	0.486
		PAFPost	32	3.729	0.680
		PAFDiff	32	0.042	0.712

The key observations are:

1. The mean grade in the PAF 101 precourse for the MC population is lower than the mean grade of the PA population precourse in high school. The difference is a little less than a third of a letter grade 0.288 (3.688 vs. 3.400), which would be A- to B+.

2. The mean grade in the PAF postcourse is lower for the students who took the precourse on the main campus than for the PA population who took the precourse in high school (3.668 vs. 3.729).
3. For the PA population the precourse vs. postcourse, shows a minimal increase in the mean grade, 3.729 vs. 3.688 (difference of 0.042). For the main campus population the precourse vs. postcourse, also shows an increase in the mean grade, 3.400 vs. 3.668 (difference of 0.042).
4. The PA population outperformed the main campus population in the subsequent course taken on the main campus based on the mean postcourse grade.

Table 19 presents the results in Sociology.

Table 19: Sociology: SOC 101 (Introduction to Sociology)

SOCCampusPre	SOCCampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	SOCPre	1604	3.446	0.639
		SOCPost	1604	3.395	0.757
		SOCDiff	1604	-0.052	0.787
PA	MAIN	SOCPre	55	3.612	0.496
		SOCPost	55	3.400	0.630
		SOCDiff	55	-0.212	0.735

The key observations are:

1. The mean grade in the SOC 101 precourse for the MC population is lower than the mean grade for the PA population precourse in high school. The difference is minimal, 0.166 (3.446 vs. 3.612).
2. The mean grade in the SOC postcourse is slightly lower for the students who took the precourse on the main campus than for the PA population who took the precourse in high school (3.395 vs. 3.400).

3. For the PA population, the precourse vs. postcourse, shows a decline in the mean grade, 3.612 vs. 3.400 (difference of -0.212). For the main campus population the precourse, vs. postcourse, also shows a slight decline in the mean grade, 3.446 vs. 3.395 (difference of -0.052).
4. The PA population outperformed the main campus population in the subsequent course taken on the main campus based on the mean postcourse grade.

Table 20 presents the results in English and Textual Studies.

Table 20: English and Textual Studies: ETS 142 (Introduction to Issues of Critical Reading)

ETSCampusPre	ETSCampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	ETSPre	413	3.425	0.642
		ETSPost	413	3.400	0.630
		ETSDiff	413	-0.025	0.783
PA	MAIN	ETSPre	153	3.207	0.679
		ETSPost	153	3.368	0.717
		ETSDiff	153	0.161	0.769

The key observations are:

1. The mean grade in the ETS 142 precourse for the MC population is higher than the mean grade for the PA population precourse in high school. The difference is minimal, 0.166 (3.425 vs. 3.207).
2. The mean grade in the ETS postcourse is slightly lower for the PA population who took the precourse in high school than for the students who took the precourse on the main campus (3.400 vs. 3.368).
3. For the PA population, the precourse vs. postcourse, shows a rise in the mean grade, 3.207 vs. 3.368 (difference of 0.161). For the main campus population the precourse vs. postcourse shows a slight decline in the mean grade, 3.425 vs. 3.400 (difference of -0.025)

4. The MC population performed slightly better (albeit only by 0.032) than the PA population in the subsequent course taken on the main campus based on the mean postcourse grade.

Table 21 presents the results in Mathematics.

Table 21: Mathematics: Calculus I

MATCampusPre	MATCampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	MATPre	2761	2.558	1.199
		MATPost	2761	2.549	1.214
		MATDiff	2761	-0.009	1.337
PA	MAIN	MATPre	49	3.327	0.692
		MATPost	49	2.837	0.974
		MATDiff	49	-0.490	0.993

The key observations are:

1. The mean grade in the MAT 295 precourse for the main campus population is lower than the mean grade in the PA population precourse in high school. The difference is 0.769 (3.327 vs. 2.558).
2. The mean grade in the MAT postcourse is higher for the PA population who took the precourse in high school than for the students who took the precourse on the main campus.
3. For the PA population, the precourse vs. postcourse, shows a decline in the mean grade, 3.327 vs. 2.837 (difference of -0.490). For main campus population the pre vs. postcourse shows a slight decline from 2.558 to 2.549 a difference of -0.009.
4. The PA population performed slightly better than the main campus population in the subsequent course taken on main campus based on the mean postcourse grade.

Table 22 presents the results in Psychology.

Table 22: Psychology: PSY 205 (Foundations of Human Behavior)

PSYCampusPre	PSYCampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	PSYPre	6469	3.250	0.733
		PSYPost	6469	2.959	0.934
		PSYDiff	6469	-0.291	0.859
PA	MAIN	PSYPre	101	3.380	0.613
		PSYPost	101	2.696	1.194
		PSYDiff	101	-0.683	1.257

The key observations are:

1. The mean grade in the PSY 205 precourse for the main campus population is slightly lower than the mean grade of the PA population precourse in high school. The difference is minimal, 0.13 (3.250 vs. 3.380).
2. The mean grade in the PSY postcourse is lower for the PA population who took the precourse in high school than for the students who took the precourse on the main campus (2.696 vs. 2.959).
3. For the PA population, the precourse vs. postcourse, shows a significant decline in the mean grade, 3.380 vs. 2.696 (difference of -0.683). For the main campus population the pre vs. postcourse also shows a decline in the mean grade 3.250 vs. 2.959 (difference of -0.291)
4. The MC population performed better (by 0.263) than the PA population in the subsequent course taken on main campus based on the mean postcourse grade.

Table 23 presents the results in Chemistry.

Table 23: Chemistry: CHE 106/107 (General Chemistry)

CHECampusPre	CHECampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	CHEPre	200	3.242	0.641
		CHEPost	200	2.882	0.858

CHECampusPre	CHECampusPost	Variable	N	Mean	Std Dev
		CHEDiff	200	-0.360	0.870
PA	MAIN	CHEPre	32	3.552	0.584
		CHEPost	32	2.594	0.983
		CHEDiff	32	-0.958	1.097

The key observations are:

1. The mean grade in the CHE 106 precourse for the main campus population is slightly lower than the mean grade for the PA population precourse in high school. The difference is minimal, 0.31 (3.552 vs. 3.242).
2. The mean grade in the CHE postcourse is lower for the PA population who took the precourse in high school than for the students who took the precourse on the main campus (2.594 vs 2.882).
3. For the PA population, the precourse vs. postcourse shows significant decline in the mean grade, 3.552 vs. 2.594 (difference of -0.958). The main campus population also shows a decline in the postcourse grade from 3.242 to 2.882 (difference of -0.360).
4. The MC population performed slightly (0.288) better than the PA population in the subsequent course taken on the main campus based on the mean postcourse grade.

Table 24 presents the results in Writing.

Table 24: Writing: WRT 105 (Practices of Academic Writing)

WRTCampusPre	WRTCampusPost	Variable	N	Mean	Std Dev
MAIN	MAIN	WRTPre	15025	3.173	0.687
		WRTPost	15025	3.243	0.710
		WRTDiff	15025	0.070	0.797
PA	MAIN	WRTPre	308	3.126	0.555
		WRTPost	308	3.321	0.679
		WRTDiff	308	0.196	0.784

The key observations are:

1. The mean grade in the WRT 105 precourse for the main campus population is slightly higher than the mean grade for the PA population precourse in high school. The difference is minimal, 0.047 (3.173 vs. 3.126).
2. The mean grade in the WRT postcourse is higher for the PA population who took the precourse course in high school than for the students who took the precourse on the main campus. (3.321 vs. 3.243).
3. For the PA population, the precourse vs. postcourse, shows an increase in the mean grade, 3.126 vs. 3.321 (difference of 0.196). For the main campus population the precourse vs. postcourse also shows an increase in the mean grade, 3.173 vs. 3.243 (difference of 0.070).
4. The PA population performed slightly better than the main campus population in the subsequent course taken on the main campus based on the mean postcourse grade.

In summary, the results were mixed and split in the middle. In four subjects the PA population fared better and in four subjects the MC population fared better in the postcourse. Some patterns that emerge from the Means Procedure are:

1. Mean course grade for the PA students taking the precourse in high school is higher for six subjects (↑). This could be a factor of grade inflation or lower teacher expectations when compared to college faculty expectations or smaller class size in a familiar environment.
2. Mean postcourse grade for the PA and MC students are split in the middle. Economics, Sociology, Psychology, and Chemistry show a higher (↑) postgrade for MC students,

whereas Public Affairs, Sociology, Writing, and Mathematics show a higher (↑) postgrade for PA students.

3. Both groups did better in the precourse than in the postcourse.

Table 25 presents the summary of the mean grade comparisons.

Table 25: Summary of Mean Grade Comparison

	Mean Grade Comparison			
Subject	PA vs. MC for Precourse mean grade	PA vs. MC for Postcourse mean grade	Precourse and Postcourse mean grade for PA population	Precourse and Postcourse mean grade for MC population
ECN	PA ↑	PA ↓	PA Postcourse ↓	MC Postcourse ↑
PAF	**PA** ↑	**PA** ↑	**PA Postcourse**↑	MC Postcourse ↑
SOC	**PA** ↑	**PA** ↑	PA Postcourse ↓	MC Postcourse ↓
ETS	PA ↓	PA ↓	**PA Postcourse**↑	MC Postcourse ↓
WRT	PA ↓	**PA** ↑	**PA Postcourse**↑	MC Postcourse ↓
PSY	**PA** ↑	PA ↓	PA Postcourse ↓	MC Postcourse ↑
MAT	**PA** ↑	**PA** ↑	PA Postcourse ↓	MC Postcourse ↓
CHE	**PA** ↑	PA ↓	PA Postcourse↓	MC Postcourse ↓

4.9.2 The Frequency Procedure

At Syracuse University grades are assigned in letters (for example, A, B, C, D, or F), and as a range (for example 1.0–4.0). *Table 26* shows the ranges for grades at SU for ease of interpretation.

Table 26: Ranges for Grades

Letter Grade	A	A-	B+	B	B-	C+	C	C-
Grade Point	4.0	3.667	3.333	3.0	2.667	2.333	2.0	1.667

Following are the pass rates for both the PA population and the MC population using the frequency procedure for each subject area.

Results and Discussion

The results in Economics are as follows:

Table 27: ECNCampusPre by ECNPost

ECNCampusPre- ECNPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	43	71	441	886	869	2310
Percent	1.81	2.99	18.54	37.26	36.54	97.14
Row percent	1.86	3.07	19.09	38.35	37.62	
Column percent	91.49	95.95	97.35	97.36	97.20	
PA						
Frequency	4	3	12	24	25	68
Percent	0.17	0.13	0.50	1.01	1.05	2.86
Row percent	5.88	4.41	17.65	35.29	36.76	
Column percent	8.51	4.05	2.65	2.64	2.80	
Total	47	74	453	910	894	2378
	1.98	3.11	19.05	38.27	37.59	100.00

The key observations are:

1. A total of 2,310 MC students took the ECN postcourse; 2,196 (95%) students passed the postcourse with a grade of C or better.
    a. 114 (5%) MC students were in the D and F range.
2. A total of 68 PA students took the ECN postcourse; 61 (89%) students passed the postcourse with a grade of C or better.
    a. 7 (10%) PA students were in the D and F range.

The results in English and Textual Studies are as follows:

Table 28: ETSCampusPre by ETSPost

ETSCampusPre- ETSPost						
	F	D	C range	B range	A range	Total

ETSCampusPre- ETSPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	2	1	32	155	223	413
Percent	0.35	0.18	5.65	27.39	39.40	72.97
Row Percent	0.48	0.24	7.75	37.53	54.00	
Column Percent	50.00	50.00	72.73	74.16	72.64	
PA						
Frequency	2	1	12	54	84	153
Percent	0.35	0.18	2.12	9.54	14.84	27.03
Row Percent	1.31	0.65	7.84	35.29	54.90	
Column Percent	50.00	50.00	27.27	25.84	27.36	
Total	4	2	44	209	307	566
	0.71	0.35	7.77	36.93	54.24	100.00

The key observations are:

1. A total of 413 MC students took the ETS postcourse; 378 (99%) students passed the postcourse with a grade of C or better.
    a. 3 (.72%) MC students were in the D and F range.
2. A total of 153 PA students took the ETS postcourse; 150 (98%) students passed the postcourse with a grade of C or better.
    a. 3 (2%) PA students were in the D and F range.

The results in Mathematics are as follows:

Table 29: MATCampusPre by MATPost

MATCampusPre - MATPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	239	273	666	817	768	2763
Percent	8.47	9.67	23.60	28.95	27.21	97.91
Row Percent	8.65	9.88	24.10	29.57	27.80	
Column Percent	99.58	98.20	98.81	96.92	97.59	
PA						
Frequency	1	5	8	26	19	59
Percent	0.04	0.18	0.28	0.92	0.67	2.09

MATCampusPre - MATPost						
	F	D	C range	B range	A range	Total
Row Percent	1.69	8.47	13.56	44.07	32.20	
Column Percent	0.42	1.80	1.19	3.08	2.41	
Total	240	278	674	843	787	2822
	8.50	9.85	23.88	29.87	27.89	100.00

The key observations are:

1. A total of 2763 MC students took the MAT postcourse; 2251 (78%) students passed the postcourse with a grade of C or better.
    a. 512 (19%) MC students were in the D and F range.
2. A total of 59 PA students took the MAT postcourse; 45 (90%) students passed the postcourse with a grade of C or better.
    a. 6 (10%) PA students were in the D and F range.

The results in Public Affairs are as follows.

Table 30: PAFCampusPre by PAFPost

PAFCampusPre - PAFPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	2	4	46	132	601	785
Percent	0.24	0.49	5.63	16.16	73.56	96.08
Row Percent	0.25	0.51	5.86	16.82	76.56	
Column Percent	100.00	80.00	95.83	98.51	95.70	
PA						
Frequency	0	1	2	2	27	32
Percent	0.00	0.12	0.24	0.24	3.30	3.92
Row Percent	0.00	3.13	6.25	6.25	84.38	
Column Percent	0.00	20.00	4.17	1.49	4.30	
Total	2	5	48	134	628	817
	0.24	0.61	5.88	16.40	76.87	100.00

The key observations are:

1. A total of 785 MC students took the PAF postcourse; 779 (99%) students passed the postcourse with a grade of C or better.
    a. 6 (.76%) MC students were in the D and F range.
2. A total of 32 PA students took the PAF postcourse; 31 (97%) students passed the postcourse with a grade of C or better.
    a. 1 (3%) PA students were in the D and F range.

The results in Psychology are as follows:

Table 31: PSYCampusPre by PSYPost

PSYCampusPre- PSYPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	133	265	1444	2344	2283	6469
Percent	2.02	4.03	21.98	35.68	34.75	98.46
Row percent	2.06	4.10	22.32	36.23	35.29	
Column percent	94.33	98.15	98.10	98.86	98.58	
PA						
Frequency	8	5	28	27	33	101
Percent	0.12	0.08	0.43	0.41	0.50	1.54
Row percent	7.92	4.95	27.72	26.73	32.67	
Column percent	5.67	1.85	1.90	1.14	1.42	
Total	141	270	1472	2371	2316	6570
	2.15	4.11	22.40	36.09	35.25	100.00

The key observations are:

1. A total of 6469 MC students took the PSY postcourse; 6071 (94%) students passed the postcourse with a grade of C or better.
    a. 88 (6%) MC students were in the D and F range.
2. A total of 101 PA students took the PSY postcourse; 88 (87%) students passed the postcourse with a grade of C or better.
    a. 13 (13%) PA students were in the D and F range.

The results in Sociology are as follows:

Table 32: SOCCampusPre by SOCPost

SOCCampusPre- SOCPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	20	25	125	488	946	1604
Percent	1.21	1.51	7.53	29.42	57.02	96.68
Row percent	1.25	1.56	7.79	30.42	58.98	
Column percent	100.00	96.15	97.66	95.31	97.23	
PA						
Frequency	0	1	3	24	27	55
Percent	0.00	0.06	0.18	1.45	1.63	3.32
Row percent	0.00	1.82	5.45	43.64	49.09	
Column percent	0.00	3.85	2.34	4.69	2.77	
Total	20	26	128	512	973	1659
	1.21	1.57	7.72	30.86	58.65	100.00

The key observations are:

1. A total of 1604 MC students took the SOC postcourse; 1559 (98%) students passed the postcourse with a grade of C or better.
    a. 45 (3%) MC students were in the D and F range.
2. A total of 55 PA students took the SOC postcourse; 54 (99%) students passed the postcourse with a grade of C or better.
    a. 1 (2%) PA students were in the D and F range.

The results in Writing are as follows:

Table 33: WRTCampusPre by WRTPost

WRTCampusPre - WRTPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	194	151	1330	6983	6367	15025
Percent	1.27	0.98	8.67	45.54	41.52	97.99
Row Percent	1.29	1.00	8.85	46.48	42.38	
Column Percent	97.98	98.69	98.37	98.21	97.65	
PA						

WRTCampusPre - WRTPost						
	F	D	C range	B range	A range	Total
Frequency	4	2	22	127	153	308
Percent	0.03	0.01	0.14	0.83	1.00	2.01
Row Percent	1.30	0.65	7.14	41.23	49.68	
Column Percent	2.02	1.31	1.63	1.79	2.35	
Total	198	153	1352	7110	6520	15333
	1.29	1.00	8.82	46.37	42.52	100.00

The key observations are:

1. A total of 15,025 MC students took the WRT postcourse. 14,680 (98%) students passed the postcourse with a grade of C or better.
    a. 345 (3%) MC students were in the D and F range.
2. A total of 308 PA students took the WRT postcourse. 302 (98%) students passed the postcourse with a grade of C or better.
    a. 6 (2%) PA students were in the D and F range.

The results in Chemistry are as follows:

Table 34: CHECampusPre by CHEPost

CHECampusPre - CHEPost						
	F	D	C range	B range	A range	Total
MAIN						
Frequency	2	9	47	85	57	200
Percent	0.85	3.83	20.00	36.17	24.26	85.11
Row percent	1.00	4.50	23.50	42.50	28.50	
Column percent	66.67	81.82	79.66	86.73	89.06	
PA						
Frequency	1	2	12	13	7	35
Percent	0.43	0.85	5.11	5.53	2.98	14.89
Row percent	2.86	5.71	34.29	37.14	20.00	
Column percent	33.33	18.18	20.34	13.27	10.94	
Total	3	11	59	98	64	235
	1.28	4.68	25.11	41.70	27.23	100.00

The key observations are:

1. A total of 200 MC students took the CHE postcourse; 189 (94.5%) students passed the postcourse with a grade of C or better.
    1. 11(5.5%) MC students were in the D and F range.
2. A total of 35 PA students took the WRT postcourse; (91.42%) students passed the postcourse with a grade of C or better.
    2. 3 (8.5%) PA students were in the D and F range.

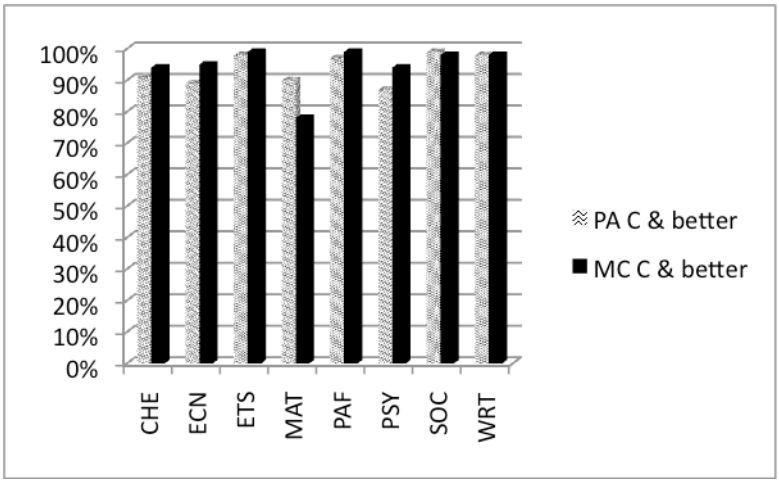
Summary:

The analysis by the Frequency Procedure shows that students who took the introductory SU course through Project Advance tended to pass the subsequent course of the sequence in percentages lower than the students who took the introductory course on the main campus after enrolling at Syracuse University. Overall, the MC population's pass rates are higher in Chemistry, Economics, English and Textual Studies, Public Affairs, and Psychology. However, the PA students outperformed the MC population in both Mathematics and Sociology postcourses. Both the MC and PA populations did comparably in the Writing postcourse.

Below is a summary of the pass grades:

Table 35: Pass Rates for PA and MC students (Grades C or better)

Subject	PA pass rate in postcourse	MC pass rate in postcourse
CHE	91%	94%
ECN	89%	95%
ETS	98%	99%
MAT	90%	78%
PAF	97%	99%
PSY	87%	94%
SOC	99%	98%
WRT	98%	98%

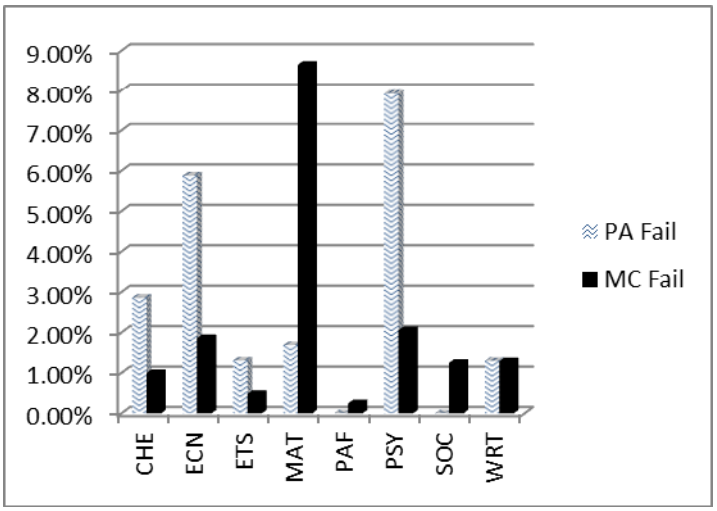


Also interesting to note are the rates at which students attained failing grades in the postcourse. Following is a table that summarizes the Fail rates for both the populations. PA students had a higher percentage of F grades in Chemistry, Economics, English and Textual Studies, and Psychology. MC students had a higher percentage of Fail grades in Mathematics, Public Affairs, and Sociology. Fail grades in Writing were the same for both PA and MC populations.

Below is a summary of the fail grades:

Table 36: Fail Rates of PA and MC students

Subject	PA - F rates in postcourse	MC - F rates in postcourse
CHE	2.86%	1.00%
ECN	5.88%	1.86%
ETS	1.31%	0.48%
MAT	1.69%	8.65%
PAF	0.00%	0.25%
PSY	7.92%	2.06%
SOC	0.00%	1.25%
WRT	1.30%	1.29%



4.9.3 T-test for differences in means

Another approach to testing the effectiveness of participation in PA in high school, the T-test, for subject-specific postcourse grades by campus, were calculated. Figures again include only those students having both a precourse and a postcourse grade. This post-test comparison showed if there was any postcourse main-campus difference between those taking the precourse via Project Advance vs. those taking it on main campus. With this we can assess the postmain-campus course performance of those prepared through PA vs. those prepared on the main campus. The null hypothesis is that the two means are equal $H_{0:}$ vs. the alternative hypothesis that the two means are not equal.

Two methods were used to account for variances. The difference between the two methods is about how standard deviations are treated—a subtle, but important difference:

- Pooled method: we take the arithmetic average of the standard deviations and convert this value into a standard error.
- Satterthwaite approximation: we calculate the standard error from the sum of two variances.
    - The main difference is that the Satterthwaite approximation does not assume that the variances of the two samples are equal, whereas the Pooled method does.

The following formula was used where the PA Std Dev is the standard deviation of the sample of PA students, and the MC Std Dev is the standard deviation of the sample of MC students.

$$\mathbf{T = \frac{Mean\ grade\ of\ Post\ PA - Mean\ grade\ of\ Post\ MC}{\sqrt{\frac{(PA\ Std\ Dev)^2}{PA\ (N)} + \frac{(MC\ Std\ Dev)^2}{MC\ (N)}}}}$$

A summary of the results from both methods for all subjects is presented below in *Table 37*:

If the t values are greater than 2, then the null hypothesis of equal mean postcourse is rejected at the 5% level. If the t values are less than 2, then it is nonsignificant and the null hypothesis is not rejected.

Table 37: T-test for Differences in Means

Subject	Pooled t Value	Satterthwaite t Value	Significance
CHE	-1.73	-1.56	Nonsignificant
ECN	-1.00	-0.84	Nonsignificant
ETS	-0.52	-0.49	Nonsignificant
MAT	1.65	2.04	Mixed–PA better
PAF	0.54	0.50	Nonsignificant
PSY	-2.80	-2.20	Significant–PA worse
SOC	0.05	0.06	Notsignificant
WRT	1.93	2.02	Mixed–PA better

Chemistry, Economics, English and Textual Studies, Public Affairs, and Sociology were not significant at the 5% level and there is no significant difference in the postcourse performance in these subjects. Mathematics and Writing were significant in favor of PA. Psychology was significant in favor of MC.

4.9.4 Multiple Regression

Finally, multiple regression analysis was conducted to assess whether the PA predictor variables had a significant effect on the student's performance, measured by grade in the postcourse taken on the main SU campus. Interaction effects between gender and ethnicity were also examined to see if any effect was produced by these two independent variables working in concert in predicting the grade in the subject-specific postgrade.

Also, interaction effects between the PA indicator variable and the PA precourse grade were examined to see if any effect (grade inflation) was produced by these two individual

variables working together. According to Myatt et al. (1990), a new independent variable was created for the time/semester lag between precourse and postcourse to see if semester lag had any effect on the postcourse performance. All tests were conducted at the p =<.05 level of significance.

The study examined if the Project Advance precourse (taught in high school by a high school instructor) prepares the students for the rigor of college as well as the main campus precourse (taught at SU). This was done by comparing the grade levels in the main campus postcourse, controlling for demographic, financial need, and precollege entry characteristics. *Table 38* lists the independent (predictor) variables.

Table 38: Independent Variables

Demographics

Gender *(nominal, dichotomous variables)*

- Female (1 = Female and 0 = otherwise)
- Male (default group)

Race/ethnicity *(nominal variable)*

- Asian Pacific Hawaiian (1 = Asian Pacific Hawaiian and 0 = otherwise)
- Black/African American (1 = Black/African American and 0 = otherwise)
- Hispanic/Latino (1 = Hispanic/Latino and 0 = otherwise)
- Native American (1 = Native American and 0 = otherwise)
- International (1 = International students and 0 = otherwise)
- White (default group)

Financial Aid

- Applied, but no need for aid (1= applied but no need and 0 = otherwise)
- Low need for aid (1= low need and 0 = otherwise)
- Medium need for aid (1= medium need and 0 = otherwise)
- High need for aid (1= high need and 0 = otherwise)
- Did not apply for aid (default group)

Precollege Entry High School Academic Performance

- SAT math
- SAT verbal
- High school GPA (range 0 to 4)

Time lag between precourse and postcourse

- Subject specific Pre Post Semester Lag for each subject–length of time elapsed since the completion of the previous course measured in semesters (fall, spring, summer)

Target Variables

- PA (subject specific) Credit indicator (1 = took subject specific course through PA; 0 = otherwise (which measures the PA effect)
- Subject specific precourse grade
    - Economics
    - Public Affairs
    - Sociology
    - English and Textual Studies
    - Writing
    - Mathematics
    - Psychology
    - Chemistry
- Interaction between PA credit indicator and subject specific PA precourse grade (which measures possible inflated high school grade effect)

Dependent Variable: Subject specific postcourse grade.

In multiple regression analysis, the effect of a given variable is assessed in the context of all the other predictors in the model. A negative sign for B indicates that, for every unit increase in the predictor variable, there is a drop in the grade for the subject specific postcourse. Variables were entered in steps. Target variables relating to Project Advance (PA indicator variable, time/semester lag, grade in precourse, and the interaction variable) are entered in the last two steps. Given that the purpose of the study was to discover the effect of participation in the precourse on the postcourse, the retention decay due to time/semester lag was also examined in all regressions when controlling for other confounding variables. Variables were entered in separate blocks/steps and each subject is discussed separately.

1. Gender variables
2. Race/ethnicity variables
3. Interaction (gender and race/ethnicity) variables

4. Financial Need variables
5. High School Academic Variables
6. Subject specific pre-post Semester Lag variable
7. Subject specific precourse grade
8. PA variables
    a. Subject specific PA Credit indicator variable
    b. Interaction between PA Credit indicator variable and PA precourse grade

The PA indicator variable is 1= if a student participated in PA; or 0 = if the student did not participate in PA. Interaction effects between the PA indicator variable and the PA precourse grade were examined to determine if there was any grade inflation in the PA precourse offered in the high school. I encountered multicolinearity issues in each subject regression because of the interaction between PA Credit indicator variable and the PA precourse grade; nevertheless the decision was made to run the regressions with the interaction as it does not bias the parameter estimates; it just inflates the standard error and makes the t statistics lower. However, regressions were also run without the interaction term, although I do not report them here. Following are the model summary tables and coefficients tables for each subject. The model summary table provides information about the regression line's ability to account for the total variation in the dependent variable.

The model summary table for Economics shows that the multiple correlation coefficient (R) using 7 predictors in steps is .523 (R Square = .274) and the adjusted R Square is .266. This result means that 26% of the variance in the dependent variable (ECN postcourse grade) can be predicted from the independent variables combined.

Table 39: Economics Model Summary Table

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.057a	.003	.003	.888	.003	6.804	1	2080	.009
2	.243b	.059	.056	.863	.056	24.576	5	2075	.000
3	.245c	.060	.055	.864	.001	.528	5	2070	.755
4	.253d	.064	.057	.863	.004	2.175	4	2066	.069
5	.397e	.158	.150	.819	.094	76.410	3	2063	.000
6	.401f	.161	.153	.818	.003	7.702	1	2062	.006
7	.523g	.274	.266	.761	.113	106.940	3	2059	.000

The coefficients table provides information on each predictor variable in the last step. We see select variables contribute statistical significance to the model (by reviewing the *Sig.* column). Beta coefficients were reviewed to determine any significant differences and to directly compare the relative effect of each independent variable upon the dependent variable. By reviewing the *B* column under the *Unstandardized Coefficients* column we can present the regression results as follows:

Table 40: Economics Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.049	.215		.227	.820		
Femaleind	.044	.044	.024	.984	.325	.589	1.699
BlackAfAmerind	-.148	.098	-.041	-1.506	.132	.479	2.089
NativeAmericanAKNativeind	-.002	.343	.000	-.005	.996	.705	1.418
AsianPIHawaiianind	**-.142**	**.068**	**-.056**	**-2.096**	**.036**	.498	2.009
HispanicLatinoind	**-.455**	**.107**	**-.120**	**-4.258**	**.001**	.443	2.257
Internationalind	.019	.097	.006	.199	.843	.418	2.392
BlackAfAmerFemaleind	-.046	.138	-.009	-.331	.741	.489	2.044
NativeAmericanAKNativeFemaleind	.433	.642	.015	.675	.500	.704	1.420

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
AsianPIHawaiianFemaleind	.103	.099	.028	1.039	.299	.492	2.033
HispanicLatinoFemaleind	.118	.145	.023	.815	.415	.446	2.242
InternationalFemaleind	.038	.129	.008	.297	.766	.500	2.000
NoFinancialNeedind	.060	.058	.023	1.034	.301	.706	1.416
LowFinancialNeedind	.034	.077	.009	.441	.659	.825	1.212
MidFinancialNeedind	.150	.082	.038	1.835	.067	.844	1.185
HighFinancialNeedind	.049	.046	.027	1.055	.292	.525	1.903
SATVerbal	.000	.000	-.025	-1.073	.283	.643	1.555
SATMath	**.002**	**.000**	**.125**	**5.203**	**.001**	.609	1.642
HighSchoolGPA	**.279**	**.045**	**.132**	**6.252**	**.001**	.791	1.265
ECNPrePostSemLag	-.005	.007	-.013	-.692	.489	.941	1.063
ECNPreGrade	**.410**	**.023**	**.374**	**17.817**	**.001**	.802	1.247
ECNcampusPrePAind	.549	.511	.105	1.074	.283	.037	27.133
ECNcampusPrePAind_x_ECNPreGrade	-.270	.157	-.169	-1.723	.085	.037	27.270

Note: Dependent Variable: ECNPostGrade

Out of the target variables, only the ECNPreGrade indicator variable (β = .410, p< .001) was statistically significant, with a positive B indicating that with every unit increase in the ECNPreGrade (whether taken as PA or MC), the higher the likelihood would be of a better grade on the postcourse. The ECNPrePostSemLag (β = -0.005, p< .489) had a negative parameter but was not statistically significant in predicting ECN Post Grade. The ECNcampusPrePA indicator variable did not reach significance and did not appear to predict the grade in the postcourse but it did have a positive estimate. The interaction between the ECNcampusPA indicator and the ECNPregrade had a negative parameter but again did not reach statistical significance.

Both the Asian PI Hawaiian indicator (β = -0.142, p< .036) and the Hispanic indicator variables (β = -0 .455, p< .001) were statistically significant, with negative parameters indicating that they had a higher probability of not performing as well as the reference group in the

postcourse. Asian Americans are predicted to have a letter grade lower by .142 when compared to the Whites. Hispanics are predicted to score half of a letter grade lower than the Whites. Among the interaction effects between gender and ethnicity, none of the interactions were significant in predicting the grade in the postcourse. None of the financial aid variables were statistically significant either.

Both SAT math ($\beta = .002$, $p < .001$) and high school GPA ($\beta = .279$, $p < .001$) significantly predicted the dependent variable of ECNPostGrade. The higher the SAT math score and the higher the high school GPA, the better the grade on the postcourse. SAT verbal did not reach statistical significance.

Interestingly, Dutkowsky, Evensky, and Edmonds (2006) at SU had examined the performance of high school students who took SU's one-semester Micro/Macro-Economics course through SUPA. They found that SUPA students "averaged nearly one percentage point higher than the AP/Honors economics group in the test for economic literacy and scored considerably better in fundamentals and international economics" (p. 1). Also, their study showed that "SUPA students scored over 4 points in the knowledge area, and exhibited better performance on application questions" (p. 1). Their study was about the quality of economics training from SUPA, which contrasts to some extent with the evidence that was found in this study. This could have been because:

- They used different samples
- They examined test grades of these students and not the overall grade.

Questions that arise here are whether students did well in Economics because they were good at taking tests and if the test score is a good way to measure performance.

The model summary table for English and Textual Studies shows that the multiple correlation coefficient (R) using 7 predictors in steps is .343 (R Square = .118) and the adjusted R Square is .080. This result means that 8% of the variance in the dependent variable (ETS postcourse grade) can be predicted from the independent variables combined.

Table 41: English and Textual Studies Model Summary

	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.043[a]	.002	.000	.649	.002	.935	1	508	.334
2	.111[b]	.012	.001	.648	.011	1.076	5	503	.372
3	.183[c]	.033	.014	.644	.021	2.717	4	499	.029
4	.186[d]	.035	.007	.646	.001	.145	4	495	.965
5	.236[e]	.056	.023	.641	.021	3.643	3	492	.013
6	.264[f]	.070	.036	.637	.014	7.500	1	491	.006
7	.343[g]	.118	.080	.622	.048	8.821	3	488	.000

The coefficients table below provides information on each predictor variable in the last step.

Table 42: English and Textual Studies Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.155	.376		5.734	.000		
Femaleind	-.003	.071	-.002	-.045	.964	.706	1.417
BlackAfAmerind	-.148	.250	-.051	-.594	.553	.243	4.119
NativeAmericanAKNativeind	-.562	.628	-.038	-.894	.372	.983	1.017
AsianPIHawaiianind	-.458	.247	-.143	-1.851	.065	.301	3.325
HispanicLatinoind	-.127	.286	-.040	-.444	.657	.225	4.446
Internationalind	**-1.280**	**.451**	**-.174**	**-2.836**	**.005**	**.479**	**2.087**
BlackAfAmerFemaleind	-.001	.284	.000	-.004	.997	.250	4.000
AsianPIHawaiianFemaleind	**.579**	**.297**	**.151**	**1.950**	**.052**	**.302**	**3.312**
HispanicLatinoFemaleind	.056	.326	.016	.172	.863	.221	4.516

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
International Femaleind	**1.723**	**.630**	**.166**	**2.737**	**.006**	**.491**	**2.039**
NoFinancialNeedind	.004	.095	.002	.041	.967	.697	1.434
LowFinancialNeedind	-.046	.110	-.020	-.420	.675	.769	1.300
MidFinancialNeedind	.040	.107	.018	.371	.711	.732	1.366
HighFinancialNeedind	.046	.075	.035	.609	.543	.555	1.801
SATVerbal	.000	.000	.038	.746	.456	.683	1.465
SATMath	.000	.001	.048	.860	.390	.579	1.726
HighSchoolGPA	.013	.077	.009	.168	.866	.681	1.467
ETSPostSemLag	**-.029**	**.011**	**-.129**	**-2.563**	**.011**	**.713**	**1.402**
ETScampusPrePAind	-.103	.331	-.070	-.311	.756	.036	27.900
ETSPreGrade	**.218**	**.053**	**.220**	**4.108**	**.001**	**.632**	**1.581**
ETScampusPrePAind_x_ETSPreGrade	.067	.098	.150	.682	.496	.038	26.630

Note: Dependent Variable: ETSPost Grade

The ETSPostSemLag variable (β = -0.029, p< .011) in this case reached statistical significance, with a negative parameter estimate suggesting that with every unit (semester) increase in the predictor variable there was a higher likelihood of a drop in the ETS postcourse grade, affirming the concept of "retention decay." So for every semester that elapsed after the precourse, the letter grade in the postcourse went down by approximately .03. ETScampusPrePAind variable had a negative parameter estimate but failed to reach statistical significance. However, ETS PreGrade (β = .218, p< .001) was statistically significant, with a positive parameter indicating that, with every unit increase in the precourse grade the higher the likelihood was of a better grade on the postcourse grade. The interaction between ETScampusPrePAind and ETSPreGrade variable was not statistically significant.

The International student variable (β = -1.280, p< .005) reached significance, with negative parameters indicating that they were more likely to have lower grades (1 1/3 lower letter grade) in the postcourse when compared to the reference group. But with the interaction

effects between gender and ethnicity the International Student Female variable (β =1.723, p< .006) was statistically significant, this time with positive parameter estimates indicating that international females were more likely to perform better in the postcourse than the international males. The females seemed to recoup the detriment with the interaction.

The model summary table for Mathematics shows that the multiple correlation coefficient (R) using 7 predictors in steps is .484 (R Square = .234) and the adjusted R Square is .228. This result means that 22% of the variance in the dependent variable (MAT postcourse grade) can be predicted from the independent variables combined.

Table 43: Mathematics Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.104a	.011	.010	1.208	.011	27.728	1	2554	.000
2	.145b	.021	.019	1.203	.010	5.399	5	2549	.000
3	.148c	.022	.018	1.203	.001	.388	5	2544	.857
4	.153d	.023	.018	1.203	.002	1.068	4	2540	.371
5	.302e	.091	.085	1.161	.068	63.218	3	2537	.000
6	.397f	.158	.152	1.118	.067	200.540	1	2536	.000
7	.484g	.234	.228	1.067	.076	84.283	3	2533	.000

The coefficients table below provides information on each predictor variable in the last step.

Table 44: Mathematics Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.209	.297		.702	.483		
Femaleind	**.142**	**.057**	**.055**	**2.470**	**.014**	**.612**	**1.633**
BlackAfAmerind	-.044	.109	-.010	-.405	.685	.509	1.965

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
NativeAmericanAKNative ind	.251	.379	.014	.661	.509	.662	1.510
AsianPIHawaiianind	.131	.082	.037	1.609	.108	.581	1.721
HispanicLatinoind	-.151	.117	-.030	-1.288	.198	.562	1.780
Internationalind	.220	.136	.038	1.622	.105	.537	1.861
BlackAfAmerFemaleind	-.102	.160	-.015	-.639	.523	.515	1.943
NativeAmericanAKNative Femaleind	-1.145	.657	-.037	-1.742	.082	.660	1.515
AsianPIHawaiianFemaleind	-.097	.133	-.017	-.732	.464	.553	1.808
HispanicLatinoFemaleind	-.182	.184	-.023	-.990	.322	.573	1.745
InternationalFemaleind	-.220	.218	-.022	-1.007	.314	.655	1.526
NoFinancialNeedind	.015	.084	.004	.173	.862	.653	1.532
LowFinancialNeedind	-.131	.098	-.027	-1.346	.179	.737	1.356
MidFinancialNeedind	-.178	.096	-.038	-1.860	.063	.728	1.373
HighFinancialNeedind	**-.156**	**.064**	**-.064**	**-2.438**	**.015**	**.441**	**2.266**
SATVerbal	-7.232 E-005	.000	-.005	-.219	.827	.660	1.516
SATMath	.000	.000	.009	.393	.694	.614	1.629
HighSchoolGPA	**.464**	**.058**	**.160**	**8.054**	**.001**	**.767**	**1.304**
MATPrePostSemLag	**-.119**	**.009**	**-.248**	**-13.705**	**.001**	**.924**	**1.082**
MATcampusPrePAind	-.243	.763	-.029	-.318	.750	.036	27.544
MATPreGrade	**.312**	**.020**	**.308**	**15.584**	**.001**	**.774**	**1.292**
MATcampusPrePAind_x_ MATPreGrade	.136	.222	.056	.611	.541	.036	27.574

Note: Dependent Variable: MATPost Grade

The MATPrePostSemLag variable ($\beta = -0.119$, $p < .001$) reached significance, with a negative parameter indicating that, with every unit increase in the time lag between the precourse and postcourse there was a higher likelihood of a drop in the postgrade. So for every semester that elapsed between precourse and postcourse, the grade in the postcourse went down by 1/10 of the letter grade. The MATCampusPrePA indicator was not statistically significant.

MATPreGrade variable (β = .312, p< .001) did reach significance, with a positive B indicating that, with every unit increase in the pregrade in the first math course, there was an increase in the MATPostGrade.

The Female indicator variable reached statistical significance (β = .142, p< .014), with a positive parameter indicating that there is a higher likelihood of females performing better than the reference group. The HighFinancialNeed indicator variable (β = -0.156, p< .015) was statistically significant, with a negative parameter indicating that students with high financial need did not perform as well as the reference group in the Math postcourse. The high school GPA (β = .464, p< .001) was statistically significant with a positive parameter and had a positive relationship with the dependent variable. Interestingly, though SAT math did not reach statistical significance. Once could infer that SAT math demonstrates a capability to learn, whereas grades are work habits to learn. Some students may have the capability to learn but just do not apply themselves.

The model summary table for Public Affairs shows that the multiple correlation coefficient (R) using 7 predictors in steps is .477 (R Square = .228) and the adjusted R Square is .203. The result means that 20% of the variance in the dependent variable (PAF postcourse grade) can be predicted from the independent variables combined.

Table 45: Public Affairs Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.040[a]	.002	.000	.643	.002	1.068	1	675	.302
2	.169[b]	.029	.020	.637	.027	3.731	5	670	.002
3	.186[c]	.035	.020	.637	.006	1.041	4	666	.385
4	.214[d]	.046	.026	.635	.011	1.935	4	662	.103
5	.321[e]	.103	.080	.617	.057	13.973	3	659	.000

6	.438[f]	.192	.170	.586	.089	72.321	1	658	.000
7	.477[g]	.228	.203	.574	.036	10.233	3	655	.000

The coefficients table below provides information on each predictor variable in the last step.

Table 46: Public Affairs Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.742	.283		6.144	.000		
Femaleind	**.109**	**.054**	**.081**	**2.018**	**.044**	**.731**	**1.368**
BlackAfAmerind	.003	.178	.001	.017	.986	.182	5.487
NativeAmericanAKNativeind	.235	.410	.020	.574	.566	.984	1.016
AsianPIHawaiianind	.181	.174	.071	1.041	.298	.253	3.950
HispanicLatinoind	**.478**	**.200**	**.158**	**2.393**	**.017**	**.271**	**3.696**
Internationalind	.312	.579	.049	.539	.590	.142	7.045
BlackAfAmerFemaleind	-.104	.194	-.043	-.535	.593	.185	5.412
AsianPIHawaiianFemaleind	-.252	.201	-.086	-1.254	.210	.254	3.945
HispanicLatinoFemaleind	-.374	.235	-.105	-1.594	.111	.270	3.710
InternationalFemaleind	-.132	.622	-.019	-.212	.832	.143	6.991
NoFinancialNeedind	.126	.080	.068	1.576	.116	.635	1.575
LowFinancialNeedind	.061	.094	.026	.649	.517	.727	1.375
MidFinancialNeedind	**.179**	**.088**	**.084**	**2.035**	**.042**	**.688**	**1.453**
HighFinancialNeedind	.016	.066	.013	.249	.803	.452	2.212
SATVerbal	.001	.000	.071	1.626	.104	.625	1.600
SATMath	**.001**	**.000**	**.128**	**2.795**	**.005**	**.566**	**1.767**
HighSchoolGPA	.085	.063	.053	1.342	.180	.750	1.332
PAFPrePostSemLag	**-.103**	**.012**	**-.301**	**-8.356**	**.001**	**.909**	**1.101**
PAFcampusPrePAind	.433	.628	.132	.690	.491	.032	31.041
PAFPreGrade	**.172**	**.033**	**.202**	**5.213**	**.001**	**.782**	**1.278**
PAFcampusPrePAind_x_PAFPreGrade	-.071	.180	-.075	-.391	.696	.032	31.424

Note: Dependent Variable: PAFPostGrade

The PAFPrePostSemLag variable (β = -0.103, p< .001) reached significance, with a negative parameter indicating that, with every unit increase in the semester lag between pre- and postcourse there was a higher likelihood of the postgrade being lower by a tenth of a letter grade. The PAFcampusPrePAind variable was not statistically significant and did not appear to predict the grade in the postcourse. PAFPreGrade (β = .172, p< .001) was statistically significant and positively related to the dependent variable.

The Female indicator variable (β = .109, p< .044) was statistically significant, with a positive parameter indicating that the females have a higher likelihood of performing better on the postgrade compared to the reference group. Of all the race/ethnicity variables, only the Hispanic Latino student indicator (β = .478, p< .017) was statistically significant, with positive parameters indicating that they had a higher likelihood of having a higher grade in the postcourse.

SAT math (β = .001, p< .005) was the only high school variable which was statistically significant, with positive parameter estimates indicating that, with every unit increase in SAT math Score, there was a higher likelihood of a student performing better in the postcourse. Both high school GPA and SAT verbal were not statistically significant.

The model summary table for Psychology showed that the multiple correlation coefficient (R) using 7 predictors in steps is .541 (R Square = .292) and the adjusted R Square is .290. This results means that 29% of the variance in the dependent variable (PSY postcourse grade) can be predicted from the independent variables combined.

Table 47: Psychology Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.042[a]	.002	.002	.935	.002	10.334	1	5949	.001
2	.181[b]	.033	.032	.921	.031	38.164	5	5944	.000
3	.184[c]	.034	.032	.921	.001	1.447	5	5939	.204
4	.196[d]	.038	.036	.919	.005	6.967	4	5935	.000
5	.416[e]	.173	.171	.852	.135	322.527	3	5932	.000
6	.416[f]	.173	.171	.852	.000	.178	1	5931	.673
7	.541[g]	.292	.290	.789	.119	331.676	3	5928	.000

The coefficients table below provides information on each predictor variable in the last step.

Table 48: Psychology Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.111	.125		-8.862	.000		
Femaleind	**.072**	**.025**	**.037**	**2.826**	**.005**	**.708**	**1.411**
BlackAfAmerind	-.048	.078	-.013	-.622	.534	.278	3.603
NativeAmericanAKNative ind	-.163	.251	-.012	-.650	.516	.343	2.914
AsianPIHawaiianind	-.104	.064	-.031	-1.628	.104	.336	2.979
HispanicLatinoind	.037	.083	.009	.443	.658	.287	3.485
Internationalind	.060	.104	.010	.575	.565	.428	2.338
BlackAfAmerFemaleind	-.040	.091	-.009	-.440	.660	.285	3.514
NativeAmericanAKNative Femaleind	-.084	.309	-.005	-.271	.786	.343	2.913
AsianPIHawaiianFemaleind	-.037	.079	-.009	-.474	.635	.332	3.008
HispanicLatinoFemaleind	**-.193**	**.098**	**-.040**	**-1.977**	**.048**	**.289**	**3.463**
InternationalFemaleind	-.066	.137	-.008	-.485	.628	.447	2.237
NoFinancialNeedind	-.008	.035	-.003	-.215	.830	.735	1.360
LowFinancialNeedind	.012	.045	.003	.273	.785	.835	1.197

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
MidFinancialNeedind	**-.083**	**.042**	**-.024**	**-1.961**	**.050**	**.811**	**1.233**
HighFinancialNeedind	**-.062**	**.028**	**-.033**	**-2.238**	**.025**	**.557**	**1.797**
SATVerbal	**.001**	**.000**	**.077**	**5.819**	**.001**	**.677**	**1.477**
SATMath	**.001**	**.000**	**.088**	**6.314**	**.001**	**.616**	**1.623**
HighSchoolGPA	**.337**	**.027**	**.156**	**12.334**	**.001**	**.749**	**1.335**
PSYPrePostSemLag	**.016**	**.004**	**.042**	**3.706**	**.001**	**.951**	**1.051**
PSYcampusPrePAind	-.062	.386	-.008	-.160	.873	.047	21.256
PSYPreGrade	**.495**	**.016**	**.384**	**31.396**	**.001**	**.799**	**1.252**
PSYcampusPrePAind_x_PSYPreGrade	-.069	.121	-.029	-.573	.566	.047	21.248

Note: Dependent Variable: PSYPostGrade

The PSYPrePostSemLag variable (β = .016, p< .001) was statistically significant, with a positive β and did positively contribute to predicting the PSYPostgrade. The only way I can explain this is maybe the students with time are more mature, older, and have been influenced by real-world experiences and pick up the Psychology major in the later years with renewed vigor and not as the major they came in with. The PSYPreGrade (β = .495, p< .001) was statistically significant and positively predicted the grade in the postcourse. The PA indicator variable had a negative β but was not statistically significant and did not seem to predict performance in the postcourse. The interaction variable had a negative B but did not reach significance.

The Femaleind variable was significant (β = .072, p< .005), with a positive parameter estimate thereby indicating that females have a higher likelihood of have a higher postcourse grade when compared to the reference group in Psychology. None of the race/ethnicity groups reached significance. In the interaction term between race/ethnicity and gender, the Hispanic Latino indicator (β = -0.193, p< .048) variable was significant, with a negative parameter

estimate. This result indicates that Hispanic Latino females had a lower likelihood of doing as well as the Hispanic Latino males in the postcourse.

Both Mid Financial Need (β = -0.083, p< .050) and High Financial Need indicator (β = -0.062, p< .025) variables were significant in predicting performance in the postcourse with negative parameters. For every unit increase in the β for either of these variables there was higher likelihood that the postcourse grade would be lower.

SAT verbal (β = .001, p< .001), SAT math (β = .001, p< .001), and high school GPA (β = .337, p< .001) all reached statistical significance, with positive parameter estimates indicating that, with every unit increase in each of these predictor variables, there was an increase in the dependent variable, PSYPostGrade.

The model summary table for Sociology shows that the multiple correlation coefficient (R) using 7 predictors in steps is .459 (R Square = .211) and the adjusted R Square is .199. This result means that 19% of the variance in the dependent variable (SOC postcourse grade) can be predicted from the independent variables all combined.

The coefficients table below provides us with information on each predictor variable in the last step.

Table 49: Sociology Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.189[a]	.036	.035	.745	.036	56.686	1	1525	.000
2	.253[b]	.064	.061	.735	.028	9.216	5	1520	.000
3	.270[c]	.073	.066	.733	.009	2.899	5	1515	.013
4	.284[d]	.081	.072	.731	.008	3.212	4	1511	.012
5	.399[e]	.159	.149	.700	.079	46.944	3	1508	.000
6	.399[f]	.159	.149	.700	.000	.072	1	1507	.788
7	.459[g]	.211	.199	.679	.051	32.466	3	1504	.000

The coefficients table below provides information on each predictor variable in the last step.

Table 50: Sociology Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.811	.193		4.190	.000		
Femaleind	**.158**	**.048**	**.094**	**3.312**	**.001**	**.658**	**1.520**
BlackAfAmerind	**-.198**	**.090**	**-.081**	**-2.186**	**.029**	**.383**	**2.610**
NativeAmericanAKNativeind	.433	.681	.029	.636	.525	.249	4.013
AsianPIHawaiianind	.231	.143	.066	1.613	.107	.314	3.181
HispanicLatinoind	-.119	.149	-.036	-.798	.425	.263	3.804
Internationalind	.089	.285	.012	.312	.755	.338	2.956
BlackAfAmerFemaleind	.106	.117	.031	.904	.366	.440	2.271
NativeAmericanAKNativeFemaleind	-.534	.787	-.031	-.679	.497	.249	4.021
AsianPIHawaiianFemaleind	**-.348**	**.174**	**-.082**	**-1.997**	**.046**	**.314**	**3.180**
HispanicLatinoFemaleind	-.082	.171	-.021	-.479	.632	.273	3.667
InternationalFemaleind	-.020	.350	-.002	-.058	.954	.345	2.895
NoFinancialNeedind	.068	.057	.031	1.191	.234	.782	1.278
LowFinancialNeedind	-.048	.081	-.015	-.600	.549	.882	1.133
MidFinancialNeedind	-.003	.078	-.001	-.038	.970	.880	1.136
HighFinancialNeedind	.008	.045	.005	.181	.856	.624	1.602
SATVerbal	**.001**	**.000**	**.097**	**3.277**	**.001**	**.599**	**1.671**
SATMath	.000	.000	-.021	-.688	.492	.567	1.764
HighSchoolGPA	**.295**	**.046**	**.177**	**6.357**	**.001**	**.677**	**1.477**
SOCPrePostSemLag	.000	.003	.002	.098	.922	.972	1.029
SOCcampusPrePAind	.426	.516	.098	.824	.410	.037	26.878
SOCPreGrade	**.299**	**.030**	**.252**	**9.854**	**.001**	**.801**	**1.248**
SOCcampusPrePAind_x_SOCPreGrade	-.153	.153	-.119	-1.003	.316	.037	26.882

Note: Dependent Variable: SOCPostGrade

Interestingly, neither the SOCPrePostSemLag nor the SOCcampusPrePA indicator variables reach statistical significance. Both had positive β but did not predict the dependent variable, SocPostGrade. SOCPreGrade (β = .299, p< .001) was statistically significant and positively predicted the PostCourse grade. The SAT verbal (β = .001, p< .001) and HighSchoolGPA (β = .295, p< .001) variables were significant, with positive parameters indicating that, with every unit increase in either of the predictor variables, there was a higher likelihood of students performing better in the SOC postcourse. The Female indicator variable was significant (β = .158, p< .001) and positively affected the SOC postgrade when compared with the reference group.

The Black African American indicator variable (β = -0.198, p< .029) was significant but with a negative parameter estimate, indicating that, with every unit increase in the predictor variable there was a higher likelihood that this group would underperform when compared to the reference group in the postcourse grade.

With the interaction between race and gender only the Asian PIHawaiian Female (β = -0.348, p< .046) indicator variable had a negative relationship with the dependent variable when compared to the reference group.

The model summary table for Writing shows that the multiple correlation coefficient (R) using 7 predictors in steps is .399 (R Square = .159) and the adjusted R Square is .158. This result means that 15% of the variance in the dependent variable (WRT postcourse grade) can be predicted from the independent variables all combined.

Table 51: Writing Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.117[a]	.014	.014	.705	.014	191.823	1	13810	.000

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
2	.176[b]	.031	.031	.698	.017	49.286	5	13805	.000
3	.178[c]	.032	.031	.698	.001	1.984	5	13800	.078
4	.183[d]	.034	.033	.698	.002	7.025	4	13796	.000
5	.295[e]	.087	.086	.678	.053	268.100	3	13793	.000
6	.301[f]	.091	.089	.677	.004	57.247	1	13792	.000
7	.399[g]	.159	.158	.651	.068	372.914	3	13789	.000

The coefficients table below provides us with information on each predictor variable in the last step.

Table 52: Writing Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.151	.068		16.843	.000		
Femaleind	**.085**	**.013**	**.060**	**6.318**	**.001**	**.682**	**1.465**
BlackAfAmerind	**-.087**	**.033**	**-.034**	**-2.617**	**.009**	**.363**	**2.758**
NativeAmericanAKNativeind	-.064	.121	-.006	-.530	.596	.534	1.872
AsianPIHawaiianind	**-.102**	**.030**	**-.041**	**-3.379**	**.001**	.420	2.378
HispanicLatinoind	**-.104**	**.037**	**-.036**	**-2.815**	**.005**	.367	2.726
Internationalind	.007	.068	.001	.108	.914	.464	2.153
BlackAfAmerFemaleind	.027	.041	.008	.658	.510	.382	2.619
NativeAmericanAKNative Femaleind	.000	.178	.000	.002	.999	.535	1.870
AsianPIHawaiianFemaleind	-.001	.040	.000	-.016	.988	.417	2.399
HispanicLatinoFemaleind	-.028	.046	-.008	-.603	.546	.372	2.685
InternationalFemaleind	-.012	.093	-.001	-.131	.896	.471	2.123
NoFinancialNeedind	.018	.019	.008	.940	.347	.753	1.329
LowFinancialNeedind	.010	.025	.003	.404	.686	.847	1.181
MidFinancialNeedind	-.029	.023	-.011	-1.252	.211	.824	1.214
HighFinancialNeedind	-.018	.015	-.013	-1.208	.227	.568	1.761
SATVerbal	**.001**	**.000**	**.050**	**5.339**	**.001**	**.694**	1.440

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
SATMath	-1.737 E-005	.000	-.002	-.185	.853	.615	1.625
HighSchoolGPA	**.268**	**.014**	**.162**	**18.591**	**.001**	**.803**	**1.245**
WRTPrePostSemLag	**-.014**	**.002**	**-.064**	**-7.649**	**.001**	**.874**	**1.145**
WRTcampusPrePAind	**.490**	**.233**	**.096**	**2.104**	**.035**	**.029**	**34.192**
WRTPreGrade	**.292**	**.009**	**.280**	**33.422**	**.001**	**.868**	**1.151**
WRTcampusPrePAind_x_WRTPreGrade	-.141	.073	-.088	-1.936	.053	.029	34.195

Dependent Variable: WRTPostGrade

Of the three target variables the WRTPrePostSemLag variable (β = -0.014, p< .001) was statistically significant, with a negative parameter estimate indicating that, with every semester lag there was a higher indication of a drop in the post grade. So for every semester that elapsed the letter grade in WRT went down by a tenth. The WRTcampusPrePAind (β = .490, p< .035) and the WRTPreGrade (β = .292, p< .001) were statistically significant and were positively related to the dependent variable suggesting that, with every unit increase in the predictor variable there was a higher likelihood of students performing better in the postcourse. SAT verbal was significant (β = .001, p< .001), with positive parameter estimates indicating that, with every unit increase in the predictor variable, there was a high likelihood of students achieving a higher WRTPostGrade. The HighSchool GPA was statistically significant, with a positive parameter indicating that, with every unit increase in the predicator variable, there was a high likelihood of students doing better on the WRTPostGrade.

The Female indicator variable (β = .085, p< .001) was statistically significant, with a positive B indicating that they had a higher likelihood of performing better in the postcourse when compared to the reference group.

Black African American students (β = -0.087, p< .009), Hispanic students (β = -0.104, p< .005), and Asian students (β = -0.104, p< .005) all were statistically significant, with negative parameters indicating that, with every unit increase in the predictor variable, there was a higher likelihood that they would underperform in the postcourse when compared to the reference group.

Table 53: Chemistry Model Summary

The model summary table for Chemistry shows that the multiple correlation coefficient (R) using 7 predictors in steps is .566 (R Square = .321) and the adjusted R Square is .211. This means that 21% of the variance in the dependent variable (CHE postcourse grade) can be predicted from the independent variables all combined.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.142[a]	.020	.013	.828	.020	2.937	1	143	.089
2	.332[b]	.110	.071	.804	.090	2.786	5	138	.020
3	.345[c]	.119	.060	.808	.009	.465	3	135	.707
4	.368[d]	.135	.050	.813	.016	.622	4	131	.648
5	.516[e]	.267	.175	.758	.131	7.622	3	128	.000
6	.521[f]	.271	.173	.758	.005	.793	1	127	.375
7	.566[g]	.321	.211	.741	.049	3.011	3	124	.033

The coefficients table below provides information on each predictor variable in the last step.

Table 54: Chemistry Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-.710	.821		-.865	.389		
Femaleind	**.398**	**.171**	**.224**	**2.335**	**.021**	**.594**	**1.684**
BlackAfAmerind	.016	.561	.005	.028	.978	.187	5.337
NativeAmericanAKNativeind	-.860	.547	-.121	-1.573	.118	.930	1.075
AsianPIHawaiianind	-.523	.414	-.197	-1.264	.209	.225	4.450
HispanicLatinoind	-.104	.329	-.044	-.317	.752	.283	3.538
Internationalind	.050	.772	.005	.064	.949	.927	1.079
BlackAfAmerFemaleind	-.076	.619	-.021	-.123	.902	.189	5.279
AsianPIHawaiianFemaleind	.094	.476	.031	.198	.843	.221	4.535
HispanicLatinoFemaleind	-.430	.393	-.153	-1.094	.276	.281	3.565
NoFinancialNeedind	.112	.206	.050	.544	.587	.646	1.547
LowFinancialNeedind	.314	.329	.081	.955	.341	.761	1.314
MidFinancialNeedind	.081	.368	.019	.220	.826	.706	1.417
HighFinancialNeedind	.222	.176	.133	1.258	.211	.488	2.048
SATVerbal	.000	.001	-.033	-.333	.740	.564	1.772
SATMath	**.003**	**.001**	**.276**	**2.601**	**.010**	**.488**	**2.051**
HighSchoolGPA	.300	.178	.159	1.685	.095	.612	1.634
CHEPrePostSemLag	.035	.034	.081	1.010	.314	.854	1.172
CHEcampusPrePAind	.231	.755	.115	.306	.760	.039	25.874
CHEPreGrade	**.243**	**.112**	**.225**	**2.170**	**.032**	**.508**	**1.968**
CHEcampusPrePAind_x_CHEPreGrade	-.197	.227	-.337	-.868	.387	.036	27.544

Dependent Variable: CHEPost Grade

The CHePrePostSemLag was not significant and did not contribute to predicting the variance in the dependent variable. The CHEcampusPrePAind also did not reach statistical significance. The CHEPreGrade was statically significant, with a positive B suggesting that students who did well on the precourse also did well on the postcourse.

The Female indicator variable ($\beta = 398$, $p < .021$) did reach significance, with a positive parameter estimate so the females had a higher likelihood of a achieving a higher CHEPost grade when compared to the reference group. SAT math ($\beta = .003$, $p < .010$) significantly predicted success in CHEPost Grade. None of the other predictor variables reached significance.

4.10 Summary of Results

1. The Female indicator variable was statistically significant, with positive parameters for six out of the eight subjects: MAT, PAF, PSY, SOC, WRT, and CHE, indicating that females had a higher likelihood of performing better in the subject specific postcourse on main campus when compared to the reference group. Both ECN and ETS did not reach statistical significance.
2. The precourse grade (whether the precourse is taken in high school or on the main campus) is statistically significant, with positive parameter estimates for all subjects (ECN, ETS, MAT, PAF, PSY, SOC, WRT, and CHE). This result indicates that if students show that they have successfully completed the precourse there is a higher likelihood of the student performing well in the postcourse taken on the main campus.
3. The pre-post semester lag was statistically significant for ETS, MAT, PAF, and WRT with negative parameter estimates. This suggests that the amount of time that elapses between taking consecutive courses in these sequences is a significant factor in a student's chance for success in the postcourse. This reinforces the concept of "retention decay," that as time passes students do not retain information learned in the precourse. The semester lag variable did not have a role in predicting performance in postcourse for CHE, ECN, and SOC. Interestingly, the semester lag in PSY was statistically significant but with a positive parameter.

4. SAT math was statistically significant for ECN, PAF, PSY, and CHE, with positive parameter estimates.
5. SAT verbal was statistically significant for PSY, SOC, and WRT, with positive parameter estimates.
6. High school GPA was statistically significant for ECN, MAT, PSY, SOC and CHE, with positive parameter estimates.
7. High financial need was statistically significant for MAT and PSY. Mid financial need variable was statistically significant for PSY and PAF.
8. Race/Ethnicity variables' relationship to the dependent variable were mixed. In some cases, the "N" was very small that reaching statistical significance may not indicate any meaningful relationships.

Coefficients With and Without the Interaction

Table 40 below further examines the effect of SU courses offered through PA on postcourse grade, with the coefficients spot-lighted. Columns 2 and 3 are the results for the regressions without the interaction variables that were estimated but were not reported earlier. Columns 4, 5, and 6 are the results for the regression with the interaction variables and were reported earlier.

In Table 40, Model 1, (column 2) is the singular effect of PA (i.e., all effects of PA combined) ***without the interaction term***. For example the effect of PA for ECN is -0.315; ETS is 0.116; MAT is 0.214; PAF is 0.192; PSY is -0.062; SOC is -0.082; WRT is 0.046 and finally CHE is -0.047. Since we don't have the interaction term here the parameter estimate is the ceteris paribus (with all other things the same) effect of PA. The effect of PA for ETS, MAT, PAF, and WRT are positive but not statistically significant. The effect for both PSY and SOC are

statistically insignificant but negative. Whereas the PA effect for both ECN and CHE are statistically significantly and negative.

In Table 40, Model 2, ***with the interaction term*** (columns 4, 5, and 6,) the interpretations become a little bit more complex. The interaction term (**β_3**) is the interaction of the PA indicator and the grade in the precourse. Therefore, the effect of PA shows up in column 4 and column 5. The grade in previous course **β_1** is in column 3 and 6.

More specifically, the effect of the grade in the previous course on the grade in the postcourse equals **β_1** + [**β_3** x **the PA indicator**]. If the student took the course on the main campus, the PA indicator is zero and the effect is **β_1**. But if the student took the course through PA the effect is **β_1** + **β_3**, because the PA indicator is a zero-one variable.

Within Model 2, PA has two effects on the grade in the postcourse:

- Its own effect which is the intrinsic quality effect (PA indicator **β_2**). Intrinsic in terms of small classes, individual attention from teacher, spending more time on difficult matters, etc.
- Negative grade inflation effect which is **β_3 x grade in the precourse**. Therefore, we estimate the total effect of PA as equal to **β_2** + |**β_3** x **mean grade in PA precourse**]

Table 55: Parameter Estimates with and without the interaction variable

	Model 1			Model 2		
1	2	3		4	5	6
Subject	PA Indicator (β_2)	Grade in Precourse (β_1)		PA Indicator (β_2)	Interaction Term (β_3)	Grade in Pre-Course (β_1)
ECN	**-0.315**	**0.407**		0.549	-0.270 *	**0.410**
ETS	0.116	**0.236**		-0.103	0.067	**0.218**
MAT	0.214	**0.312**		-0.243	0.136	**0.312**
PAF	0.192	**0.171**		0.433	-0.071	**0.172**
PSY	-0.062	**0.495**		-0.062	-0.069	**0.495**

SOC	-0.082	**0.295**		0.426	-0.153	**0.299**
WRT	0.046	**0.290**		0.490	-0.141 *	**0.292**
CHE	**-0.407**	**0.195**		0.231	-0.197	**0.243**

* 10% level of significance

Now comparing the effect of a good grade in the PA course with the effect of the same grade on the same MC course, for example, we have:

The effect for MC precourse grade, for example, in ECN is 0.410 (Column 6). The effect for the PA precourse grade is 0.410 + (-0.270) = 0.140. A high grade in the PA course has a ***weaker*** effect than the same grade on the MC course in ECN.

The effect for MC precourse grade, for example, in ETS is 0.218 (Column 6). The effect for the PA precourse grade is .218 + .067 = .285. In ETS, the effect of the PA grade would seem to have a ***stronger*** effect than the same grade on the MC course in ETS.

The effect for MC precourse grade, for example, in MAT is 0.312. The effect for the PA precourse grade is 0.312 + 0.136 = 0.448. The effect of a high grade on the PA course has a ***stronger*** effect than the same grade on the MC course in MAT.

The effect for MC precourse grade, for example, in PAF is 0.172. The effect for the PA precourse grade is 0.172 + (-0.071) = 0.101. The effect of a high grade on the PA precourse has a slightly ***weaker*** effect than the MC precourse grade in PAF.

The effect for MC precourse grade, for example, in PSY is 0.495. The effect of the PA precourse grade is 0.495 + (-0.069) = 0.426. The effect of a PA precourse grade has a ***slightly weaker*** than the effect of the MC precourse grade.

The effect for the main campus student for SOC is .299. The effect of the PA precourse grade is 0.299 + (-0 .153) = 0.146. The effect of a high grade on the PA precourse grade has a ***weaker*** effect than the MC precourse grade.

The effect for the main campus student for WRT is .292. The effect of the PA precourse grade is .292 + (-0.141) = 0.151. The effect of a high grade on the PA precourse has a ***weaker*** effect than the MC precourse grade.

The effect for the main campus student for CHE is .243. The effect of the PA precourse grade is 0.243 + (-0.197) = 0.046. The effect of a high grade on the PA precourse has a ***weaker*** effect than the MC precourse grade.

When the effect of a high grade in the PA precourse is weaker, this can have a negative effect because a higher grade in the previous course due to grade inflation may be misleading to the student in terms of their actual knowledge of the subject matter. This view was also reflected in (ACT 2005) "One factor that is commonly believed to influence reliability of high school grades is grade inflation." With most schools trying to meet the No Child Left Behind standards passing students from one grade on to next to prevent dropouts, grade inflation is problematic in high schools. This test suggests that there may be grade inflation relative to the actual knowledge in the PA precourse for ECN, PAF, SOC, WRT, PSY and CHE, in some subjects more than the others.

The next step examined the effect of PA on grade in the postcourse based on Model 2 with the interaction term. In trying to separate out the intrinsic quality aspects of each of the PA courses (smaller classes, more graded assignments, more face time with teacher, quicker feedbacks, extra credits, etc.) vs. a negative effect due to a misleading grade (grade inflation) that is not a true indicator of the knowledge gained in these courses following were the results:

Total Effect of PA = $\beta_2 + \beta_3 *$ **(Mean grade in PA precourse)**

ECN 0.549 + -0.270* (3.373) = -0.362

ETS -0.103 + 0.067* (3.207) = 0.112

MAT -0.243 + 0.136* (3.327) = 0.209

PAF 0.433 + -0.071* (3.368) = 0.194

PSY -0.062 + -0.069* (3.380) = -0.295 (anomaly)

SOC 0.426 + -0.153* (3.612) = -0.127

WRT 0.490 + -0.141* (3.126) = 0.049

CHE 0.231 + -0.197* (3.552) = -0.469

These estimates are very close to the estimates in column 2 in model 1. The estimates are decomposed into the intrinsic quality effect plus the grade effect. For example:

For ECN, there is a strong intrinsic quality effect [0.549] but an easier grading standard i.e., a stronger grade inflation effect. The net effect is negative.

For ETS, there is a weaker intrinsic quality effect [-0.103] but a tougher grading standard. i.e., no grade inflation. The net effect is positive.

For MAT, there is a weaker intrinsic quality effect [-0.243] but a tougher grading standard that gives students a better idea of what is to come. The net effect is positive. Math seems to be the best example.

For PAF, there is a strong intrinsic quality effect [0.433] but an easier grading standard. The net effect is positive but the grading takes away from the effect.

Psychology seems to be an anomaly. I cannot explain what is going on.

For SOC, there is a strong intrinsic quality effect [0.426] but an easier grading standard. The net effect is positive but the grading takes away the effect.

For WRT, there is a strong intrinsic quality effect [0.490]. The effect is positive but nets out at zero.

For CHE, there is a strong intrinsic quality effect [0.231] but a much easier grading standard with high grade inflation. The net effect is negative.

So the effect in column 2 of model 1 is essentially reflected here.

4.11 Discussion and Conclusion

This study is the most definitive work available concerning the performance in upper-level courses of students who were granted SUPA credit and then matriculated into Syracuse University. This is a rigorous investigation comparing student performance in the postcourse taken on main campus. I compare students who took the introductory class through Project Advance in high school to students who did not take Project Advance courses but who took the introductory course on the main campus at Syracuse University. This study looked at eight subjects, with the highest representation out of the thirty-six subject areas taught by Project Advance. There is hardly anything in the literature about this kind of investigation for concurrent enrollment programs. Two studies by (North et al., 2008, 2010) compared the means, one original report and one follow-up report on dual credit in Oregon. As recommended by North et al. (2008, 2010) this study also looked at students who had acquired a C or a better grade in the precourse, thereby isolating students of "similar academic strength who have shown that they ought to be prepared to succeed in the sequence's final course" (p. 12).

In my study the evidence from the means procedure and the frequency procedure regarding the performance of PA and MC students on the postcourse was mixed. In some subjects PA students performed better and in some subjects MC students performed better. The results were roughly equal, indicating that PA adequately prepared students to pass the postcourse of the sequence.

But when multiple regression analysis was done, controlling for all the confounding variables, the lack of statistical significance for the PA indicator variable was disappointing. Evidence shows that the explanatory power of the subject specific PA indicator variable was well decayed and did not reach statistical significance. Therefore, it did not predict performance in the MC postcourse. The significance and magnitude of PA experience were clearly muted when controlled for all background factors for ECN, CHE, SOC, PAF, PSY, and ETS. Nonetheless, there was still evidence that exposure to high school PA courses in Math and WRT had a positive effect on the students' performance in the subsequent course. Even though this study found indications that the SUPA program had value to many students, there was a lack of evidence necessary to support its claim that ***all*** PA courses had the same academic rigor as the introductory courses offered on main campus. Most definitely, claims of the rigor in Math and Writing were validated. However, important to remember here is that when students take the SU courses through PA, they have a minimum of two months and up to 12 months before they may take the subject specific postcourse. A MC student may take ECN 203 in the fall, then the next level course in the spring semester.

This study also shows evidence of grade inflation in the PA courses in ECN, PAF, PSY, CHE, and SOC. The literature review revealed that high school teachers may not be as strict with the grading as college professors and that stricter quality control should be implemented. High school grade point averages along with other measures are used by the Office of Admissions to predict a student's freshman year GPA based on the assumption that they provide valid and reliable measures of a student's achievement in high school. If grade inflation is an issue with SU courses offered through PA, it may be due to the differences in the high school teachers' pedagogy. Some teachers use grades to measure achievement and some also use it as a way to

reward student effort (ACT Report. 2005). Also, teachers' expectations of the students may not be as high as those of college professors.

Many times administrators in high schools request that Project Advance courses be offered to juniors. This study showed evidence of the "decay effect" in Writing, Public affairs, Math and English and Textual studies, which means that the longer the time lag between the precourse and the postcourse, the more the retention decay. Some possible reasons are as follows:

1. Students had matured and the initial measures of ability and attitude became outdated.
2. Students in college are expected to take responsibility for their decisions and don't understand that out of classroom behaviors and lack of time on task (spent on homework) have serious consequences.

Feedback from this study could be shared by SUPA administration with high schools so that they can better prepare students for the academic rigor in postsecondary education. As Kuh et al. (2006) suggest, "Feedback loops are essential for strengthening the high school curriculum" (p. 101).

4.12 Recommendations

With the rapid growth of Project Advance, administrators are continuously looking for ways in which to ensure the high quality of the program and to help students transition into college. Evaluating the efficacy of select PA courses to predict performance in subsequent courses may have allowed us to assess students' ability and motivation to do college-level work. Evaluating the efficacy also, though, points to weaknesses in the current operation of PA and

possibly other concurrent enrollment programs in training students for the subsequent courses, relative to those who take it on main campus.

Could the weakness be due to the "retention decay" mentioned above? The time between the courses is sometimes too long. Is there a difference between a SUPA student who takes ECN 203 in the spring then follows up with the next ECN course in the fall, compared to a SUPA student who takes ECN 203 in the fall semester of high school then doesn't take the next course until the spring of the freshmen year?

Based upon the findings from this study, here are some reflections and recommendations regarding Syracuse University Project Advance:

1. Grading procedures in PA courses should be more stringent (as Sadler et al. [2007] recommended for AP), so that the grade in the precourse taken in high school truly represents achievement at the college level.
2. The results from this study were strong enough for SUPA to change its credit granting policies. There needs to be close oversight so that credit is not given when students are underprepared. Colleges and universities should only accept grades of B or better in the PA course as transfer credits instead of the current C or better. Grades of B or better truly represent achievement at the college level. For those students who apply for PA credit we can be confident that they know the subject material.
3. The PA courses may need to be geared to college-level-type testing. One of the claims that SUPA makes is that the AP is just one test, but SUPA has multiple ways to test, such as tests, quizzes, homework, and papers. This feature is always a draw for students when they choose between AP and SUPA. For example,

consider ECN 203. The main campus course has an enrollment of 135 students in each of the two sections—so approximately 270 students. The professor gives four tests during the semester but no homework, no extra credit work, etc. But in high school with the smaller PA classes (15 to 20), teachers affirm that there is more hand holding, with individual attention given to each student. Students have more class time each week and are able to get quicker feedback from the teacher. If a student does not do well on a test, he or she has other opportunities, such as graded homework, quizzes, and papers, to improve his/her final grade. These extra measures may in fact be counterproductive as training for the next course.

4. Students enrolling in SU courses through Project Advance receive both high school and college credit for the courses. High school teachers could be asked to give two grades for SUPA courses; one used for the high school transcript and one for the college transcript. This procedure would not damage the high school GPA of excellent students. The college grade could be determined from the "college structure" evaluations.
5. Evidence from this study shows high grade inflation in the Chemistry course. Students who are on the pre-med track should be advised not to take chemistry as a PA course because their next Chemistry course on campus could be the "dreaded" organic chemistry. Alternatively, the course could be modified so there is no grade inflation.
6. Project Advance courses should continue to be offered only to seniors because of concerns regarding "retention decay."

7. Students should be advised to re-take a course prior to enrolling in the subsequent course if it has been two or more years since they successfully completed the precourse, as this study shows evidence of "retention decay."
8. PA students do well in Mathematics and Writing. Both subjects are essential for success in college. Good writing skills enable students to communicate effectively, and math skills enable students to collect information, analyze data, and identify new patterns. May be these two subjects could serve as a model for other subjects.

4.13 Future Research

A future paper examines whether student participation in SU's own Concurrent Enrollment Program known as Project Advance, and/or Advanced Placement in high school has any relationship to college grades—specifically, the first-year cumulative freshman grade point average (GPA) and the fourth-year cumulative degree GPA—when controlling for demographic, financial need, and precollege entry student characteristics.

4.14 References

Allen, D. (2010). *Dual enrollment: A comprehensive literature review & bibliography*. CUNY Collaborative Programs, Office of Academic Affairs. Retrieved from http://www.cuny.edu/academics/k-to-12.html

American College Testing. (2005). *Issues in college readiness: Are high school grades inflated?* [Report]. Retrieved from http://www.act.org/research/policymakers/pdf/issues.pdf

American College Testing. (2008). *National Profile Report.* Retrieved from http://www.act.org/news/data/08/data.html

Attewell, P., Lavin, D., Domina, T., & Levey, T. (2006). New evidence of college remediation. *Journal of Higher Education, 77*, 886-924.

Bailey, T. R., Hughes, K. L., & Karp, M. M. (2002). *What role can dual enrollment programs play in easing the transition between high school and postsecondary education?* Working Paper 1–22. Retrieved from http://www.ed.gov/offices/-OVAE/HS/-bailey.doc

Chatman S., & Smith, K. (1998, April). Dual-credit preparation for further study in foreign languages. *NASSP Bulletin, 82*(597), 99–107.

Choy, S. P. (2001). *Students whose parents did not go to college: Post-secondary access, persistence, and attainment.* Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Choy, S. P., Horn, L. J., Nunez, A.-M., & Chen, X. (2000). Transition to college: What helps at-risk students and students whose parents did not attend college. *New Directions for Institutional Research, 27*(3), 45–63.

Gehring, J. 2001. Dual-enrollment programs spreading. *Education Week on the Web*. Retrieved from edweek.org/ew/ewstory.cfm?slug=32dual.h2

Hoffman, N., Vargas, J., & Santos, J. (2008). *On ramp to college: A state policymaker's guide to dual enrollment*. Boston: Jobs for the Future. Retrieved from http://www.jff.org/Documents/OnRamp.pdf

Johnstone, D. B., & Del Genio, B. (2001). *College-level learning in high school: Purposes policies, and practical implications*. Washington, DC: Association of American Colleges and Universities.

Kim, J., Barnett, E., & Bragg, D. (2003). *Dual credit in Illinois: Results of expert panel deliberations and a Delphi study of definitions and priorities*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign. Retrieved from http://occrl.illinois.edu/node/282

Makela, J. P. (2005). *Current practices and policies on dual credit admissions in Illinois' 4-year colleges and universities*. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign. Retrieved from http://occrl.ed.uiuc.edu/Projects/dual_credit/4YearInstitutions_print.htm

Morgan, R., & Crone, C. (1993). Advanced Placement examinees at the University of California: An examination of the freshman year courses and grades of examinees in biology, calculus, and chemistry (Statistical Report 93–210). Princeton, NJ: Educational Testing Service.

Morgan, R., & Ramist, L. (1998) Advanced Placement students in college: An investigation of course grades at 21 colleges. Educational Testing Service (Statististical Report No. SR-98–13). Princeton, NJ: Educational Testing Service.

Myatt, A., & Waddell, C. (1990, Summer) An approach to testing the effectiveness of the teaching and learning of economics in high school. *The Journal of Economic Education, 21*(3).

North, T., & Jacobs, J. (2008). *Dual credit in Oregon 2008: An analysis of students taking dual credit in high school in 2005–2006 with subsequent performance in college. Office of Institute Research, Oregon University System*. Retrieved October 28, 2011, from http://www.ous.edu/dept/ir/reports

North, T., & Jacobs, J. (2010). *Dual credit in Oregon 2010 follow-up: An analysis of students taking dual credit in high school in 2007–2008 with subsequent performance in college*. *Office of Institute Research, Oregon University System*. Retrieved October 28, 2011, from http://www.ous.edu/dept/ir/reports

Sadler, P. M., & Tai, R. H. (2007, Spring). Advanced Placement exam scores as a predictor of performance in introductory college biology, chemistry and physics courses. *Science Educator,* Vol. 16. No 1.

Schnee, E. (2005). *A comparison of College Now and undergraduate introductory course sections*. New York: CUNY Collaborative Programs, Office of Academic Affairs. Retrieved from: http://web.cuny.edu/academics/CUNYPublicSchoolPrograms/-databook/library/cn_undergrad_comparison_e_schnee.pdf

Tai, R. H. (2008). Posing tougher questions about the advanced placement program. *Liberal Education, 94*, 38–43.

Texas Higher Education Coordinating Board (THECB). (2008a, September). *Dual credit overview.* Retrieved June 17, 2009, from

http://www.thecb.state.tx.us/index.cfm?objectid=8226FB20-D52D-AB20-E946B42B78DE81FB

U.S. Department of Education, Office of Planning, Evaluation and Policy Development, *ESEA Blueprint for Reform,* Washington, D.C., 2010.

5. The Effect of Participation in SUPA and AP on Student Performance at Syracuse University

5.1 Abstract

Concurrent enrollment programs continue to increase rapidly—along with debates on the quality of these programs. According to Clark (2001), "Dual credit is both loved and hated . . . some have strong investments in its success; others have equally strong investments in its failure. There is very little neutral ground" (p. 5). Researchers not only question the value of the last two years in high school, but also debate about whether the high school curriculum should be more rigorous and more in alignment with the curriculum in the first two years of college (Kirst & Venezia, 2002).

This study examined whether student participation in SU's Concurrent Enrollment Program (CEP), known as Project Advance (PA), and/or Advanced Placement (AP) in high school had any relationship to college grades earned—specifically, the first-year cumulative freshman grade point average (GPA) and the fourth-year degree cumulative GPA when controlling for demographic, financial need, and precollege entry-student characteristics. The grade obtained in the SU course offered through Project Advance in high school becomes a part of the student's permanent record at SU and does count toward the GPA if the student decides to attend SU. The sample consists of 23,398 records of institutional data from undergraduates at Syracuse University from fall 1997 to fall 2008, both inclusive. The study also examined other significant determinants of performance and whether the effects vary by gender, race/ethnicity, and socioeconomic status. This study tested for these effects using multiple regression analysis. Relationships between participation in SUPA and/or AP and grade point average were mixed.

5.2 Introduction:

Higher education institutions are always searching for programs and strategies that enhance and foster student persistence as well academic performance. The demand for dual enrollment programs keeps on growing, yet some researchers and faculty continue to express concerns over the academic quality of these programs (Duffy, 2009). The National Research Council released a report criticizing high school AP math and science courses, noting that they relied too much on rote memorization of facts and not on problem solving and discussion (Flores, 2002). High schools also question the effectiveness of the AP program, and often seek other methods for high school students to accumulate college credit (Russo, 2000), which leads us to concurrent enrollment programs and their effectiveness.

Greenberg (1989) notes that these dual credit programs were only for high achievers and the social elite students who could then advance through their postsecondary education. Then came the 1960s and 1970s movement demanding increased access and equity (Garule, 1996). At that time both the Carnegie Foundation for the Advancement of Teaching and the Carnegie Commission on Higher Education tried to address the high school-college partnership debate and the school reform movement (Greenberg, 1991). Syracuse University established the Project Advance Program in 1972 to begin talks about the high school-Syracuse University partnership and the implementation of SU's concurrent enrollment program, Project Advance. Since its implementation, one of the primary goals of this program has been to expose high school students to rigorous college courses and to help ease students' transition from secondary to postsecondary institutions. For more detail on the program, please refer to the pilot study conducted by this author.

The current study measured performance by cumulative grade point average at the end of the first year (freshman) and the fourth year (degree) in college. The basis for considering cumulative GPA as a gauge for success in college is "that it encompasses the entire scholastic performance of a student at a college" (Camara & Echternacht, 2000, p. 5). Also, in education research, there is a long-established tradition of using GPA to measure performance (Higgins & Kastinas, 1999).

Not many studies have followed these concurrent enrollment students from high school to a four-year private university and measured performance in terms of cumulative grade point average. This study follows high school students who participated in Project Advance and then enrolled at Syracuse University for their undergraduate education. The Students Records System at SU records the grades (A through F) of the SU courses taken in high school on the official transcript, and they are included in the GPA calculation for both the cumulative GPA Spring Year 1 and cumulative GPA Spring Year 4. If a student does not complete the SU course via PA, then a grade designation of Incomplete (I) is given to the student, which appears on the SU transcript upon matriculation. If a student chooses to withdraw from the SU course offered through PA, then the student receives a WD (Withdrawal) on the transcript. AP test scores on the other hand are transferred in as a score received on the AP examination that is then used to award corresponding SU course credit. The admissions data at SU, however, does not include student scores on the AP exam. The credits are only transferred to SU if the student has received a test score of 3, 4, or 5, depending on the criteria established by the department. For a list of AP scores required for credit, refer to Undergraduate Course Catalog, Academic Rules and Regulations. Click on the link for "II. Records" and refer to tables B and D in section 7.5.

5.3 Purpose of the Study

This study examined the relationship of participation in SUPA and/or AP on college grade point average. The research questions guiding this study were:

1. When controlling for demographic and precollege entry characteristics, are there significant differences in cumulative 1st Year or freshman grade point average among the three groups: SUPA only, AP only, and Non-SUPA/AP?
2. When controlling for demographic and precollege entry characteristics, are there significant differences in cumulative 4th Year or degree GPA among the three groups: SUPA only, AP only and Non-SUPA/AP?

5.4 Related Studies

Allen (2010) states that even when data are available and rigorous statistical methods are used, such studies have limitations because of self-selection into these programs. Without random assignment, it is difficult to rule out all rival explanations and attribute success in postsecondary institutions entirely to the concurrent enrollment program.

Spurling and Gabringer (2002) compared concurrent enrollment students at the City College of San Francisco, with students who had no prior experience of concurrent enrollment to determine whether any significant differences existed between these two groups from fall 1998 to fall 2000. His study found that students with prior CEP experience passed 58% of their units and had a cumulative GPA of 2.33, compared to students without CEP experience who passed 53% of their units with a cum GPA of 2.10. Based on the level of college placement, they found that students with prior CEP experience performed significantly higher in most categories. But Karp et al. (2007) also concludes that it is important to note that positive findings may be due to

other unmeasured factors not included in the model. Furthermore, many of the studies track dual enrollment students who go on to community colleges and not to four-year private universities.

Geiser and Santelices's (2004) study found that the number of AP/Honors courses that a student participated in high school was not a statistically significant predictor of college performance, and they concluded that such courses "have little, if any validity with respect to the prediction of college outcomes" (p. 24). However, their study found that performance on the AP examination was strongly related to college performance.

Kotamraju (2005) noted that one of the "stumbling blocks" to desired student outcomes appears at the course content/rigor level and that increased attention was being paid to high school-college transitions because of the "general dissatisfaction about the management and effectiveness of public funded education and workforce development programs" (p. 21) His study compared the mean differences in college cumulative GPA and concluded that students with the dual enrollment experience had higher mean GPAs than those that did not participate in the program. However, the gains that were seen in the early years seemed to be lessened closer to graduation.

Mattern, Shaw, and Xiong (2009) studied the relationship between AP exam performance in four subject areas and college outcomes, one of which was the first-year GPA. Their study, after controlling for SAT scores and high school GPA, found that students with an AP test score of 3 or higher outperformed the two other groups (no AP exam taken; a score of 1 or 2 on the AP exam). This current study attempted to extend Mattern et al. study by comparing matriculated students at Syracuse University with an AP exam score of 3, 4, or 5 with SUPA students and the non-SUPA/AP students.

Betts and Morell (1999) analyzed the grade point average of over 5,000 undergraduate students at the University of California in San Diego and found that personal background (gender, race/ethnicity, and family income) significantly affected GPA. Also, quality of high schools from which the students graduated significantly influenced GPA even after the personal background variables were controlled. One of the limitations of the current study is that it did not control for the quality of high schools where SUPA is offered.

Sadler and Tai (2007) summarized the studies that have used controls to study the effect of AP on college grade point average, college science course grades, persistence to graduation, and choice of further study. They studied the validity of AP exams as predictors of college science performance and the value added by taking science courses in high school.

5.5 Limitations of the Study

1. The current study did not control for possible differences in the quality of high schools and did not address the differences in populations between schools that offer Project Advance and Advanced Placement courses.
2. The study is based on a single institution with its own concurrent enrollment program, so the generalizability of the results to the general population is limited.
3. The study does not track Project Advance students who enroll at other institutions, nor does it track the students who participate in other concurrent enrollment programs and then come to Syracuse University.

5.6 Method

5.6.1. Data Collection

Data used in this study were retrieved from Syracuse University's Student Records System (SRS) covering a period of 12 years from the fall 1997 semester to the fall 2008

semester, both inclusive. The total population was 23,398 students. The SRS database at SU contains all demographic information, precollege entry characteristics data related to high school performance and achievements (including credit received for AP and SU courses taken through Project Advance), and student academic performance at SU. When a SUPA student matriculates as an undergraduate at SU, all information about his or her program of study and major is available on SU's database. If a SUPA student did not seek admission into SU, then he/she is considered a nonmatriculated student and wan not included in this study. If students took other CEP courses besides SUPA in high school, the credits are brought in to SU as transfer credits if they have met the subject specific department criteria. However, this study does not take into consideration whether the student has taken any other CEP courses besides SUPA. The coding is 1 = took a SUPA course and 0 = otherwise; 1 = took the AP exam and 0 = otherwise.

5.6.2 Sample

The population for this study consists of 23,398 students who fall into four groups. The cohorts are as follows:

1. Students who took only SU courses through PA in high school and then enrolled at SU (n=695).
2. Students who took only AP in high school and then enrolled at SU (n=7,485).
3. Students who took both AP and SU courses (through PA) in high school and then enrolled at SU (n=386).
4. Students in the comparison group who took neither SU nor AP courses in high school but enrolled at SU (n=14,832).

Dependent Variables

The analysis in this study examined the effect of CEP and/or AP participation on the following two dependent variables:

1st Year GPA: This is an indicator variable to measure performance at the end of the first year. Grade point average is for the first academic year of attendance—the first year cumulative GPA on a scale of 4.0.

4th Year GPA: This is an indicator variable to measure performance at the end of four years. Grade point average in the four-year institutional attendance—final degree cumulative GPA; scale of 4.0.

Independent Variables

Based on previous literature and on empirical comparisons of the data, control variables (demographic, financial need, and precollege entry characteristics) were chosen for AP students, SUPA students, and Non-AP/SUPA students.

The complete set of independent variables is listed in *Table 56*.

Table 56: Predictors of Performance

Cohort			
Fall 1997	Fall 2000	Fall 2003	Fall 2006
Fall 1998	Fall 2001	Fall 2004	Fall 2007
Fall 1999	Fall 2002	Fall 2005	Fall 2008

Demographics

Gender *(nominal, dichotomous variables)*

- Female (1 = Female and 0 = otherwise)
- Male (default group)

Race/Ethnicity *(nominal variable)*

- Asian Pacific Hawaiian (1 = Asian Pacific Hawaiian and 0 = otherwise)
- Black/African American (1 = Black/African American and 0 = otherwise)
- Hispanic/Latino (1 = Hispanic/Latino and 0 = otherwise)
- Native American (1 = Native American and 0 = otherwise)
- International (1 = International students and 0 = otherwise)
- White (default group)

Financial Aid

- Applied, but no need for aid (1= applied but no need and 0 = otherwise)
- Low need for aid (1= low need and 0 = otherwise)
- Medium need for aid (1= medium need and 0 = otherwise)
- High need for aid (1= high need and 0 = otherwise)
- Did not apply for aid (default group)

Precollege Entry High School Academic Performance

- SAT math
- SAT verbal
- High school GPA (range 0 to 4)

Target Variables

- AP Credit indicator (1= Student has taken at least one AP course and 0 = otherwise)
- Number of AP credits
- CEP Credit indicator (1= Student has taken at least one PA course and 0 = otherwise)
- Number of SUPA credits
- Non SUPA/AP (default group)

5.7. Data Analysis

Use of the dummy variables allowed each student type to be equally compared during the regression analyses. The coefficient of determination was then used to determine the proportion of variance explained by each set of variables within the regression model. The Beta coefficients were examined to determine the relative effect of each independent variable on the respective dependent variables. All statistical tests in the study were conducted at the 5% level of significance. The $p < .05$ or p value is a statistic that is used to explain whether a measured difference is due to an intervention rather than to chance.

This study examined the relationships between participation in SUPA only, and AP only, and the baseline group, the non-SUPA/AP student groups and their subsequent performance at Syracuse University after controlling for demographic, financial, and precollege entry attributes. A multiple regression analysis was conducted to assess whether the predictor variables (i.e.,

gender, race/ethnicity, financial need, high school academic performance, AP credit indicator, number of AP credits, SUPA credit indicator, and number of SUPA credits) had a significant effect upon student performance measured in terms of 1st Year cumulative GPA and 4th Year cumulative GPA.

Using the hierarchical approach, predictor variables were entered in a series of blocks enabling us to see if each new group of variables added anything to the prediction produced by the previous blocks of variables. As the statistical analytic scheme indicates, interaction effects between gender and ethnicity were examined in step 2 to see if any effect was produced by these two independent variables working in concert. Only the results from Step 7 (i.e., the final model) are reported in this paper.

Step 1	Gender
Step 2	Race/Ethnicity
Step 3	Interaction variables between gender and race/ethnicity
Step 4	Financial need variables that serve as the proxy for the socioeconomic status of students
Step 5	Student high school achievement variables
Step 6	AP variables
Step 7	SUPA variables

5.8 Results

5.8.1 Cum GPA Spring Year 1 (aka freshman GPA)

Hierarchical multiple regression analysis was conducted to determine the best linear combination of the predictor variables for predicting the dependent variable, CumGPASpring Year 1 (also referred to as freshman GPA).

- Step 1 (gender) accounted for R Square of .031 or 3.1% of the variation in the CumGPASpring Year 1.

- Step 2 added Race/Ethnicity to the model, which explained 6.1% of GPA variation, a significant gain.
- Step 3, the addition of the interaction variables, only showed an increment of 1 percent.
- Step 4 added the financial need variables, which did not seem to add a lot to the variation in the dependent variable.
- Step 5 added the high school academic variables and accounted for the greatest amount of variation (16%) in CumGPASpring Year 1.
- Step 6 added the AP variables, which brought about a 1% improvement to the model.
- Step 7 added the SUPA variables, which, even though significant, did not add much variation.

The model summary table shows that the multiple correlation coefficient (***R)*** using 7 predictors is .525 (**R Square** = .276) and the **adjusted R Square** is .275, meaning that 27% of the variance in the dependent variable can be predicted from the independent variables all combined in the model.

Table 57: Model Summary: CumGPASpring Year 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.175a	.031	.031	.613683	.031	717.290	1	22753a	.000
2	.310b	.096	.096	.592674	.065	329.338	5	22748b	.000
3	.313c	.098	.097	.592130	.002	9.372	5	22743c	.000
4	.321d	.103	.102	.590530	.005	31.856	4	22739d	.000
5	.515e	.265	.265	.534372	.163	1677.815	3	22736e	.000
6	.525f	.275	.274	.530881	.010	151.015	2	22734f	.000
7	.525g	.276	.275	.530680	.001	9.614	2	22732g	.000

A hierarchical multiple linear regression was conducted to find out the linear relationship between the dependent variable and one or more independent variables. The dependent variable, CUMGPA Spring Year 1, was regressed among all independent variables to identify existing

differences. The coefficient of determination was used to determine the proportion of variance explained by each variable within the regression model. Model equations were created for each regression analysis, and all statistical tests in the study were conducted at the alpha level of .05.

The coefficients *Table 58* below, provides information on each predictor variable in the last step. Both the constant and select variables contributed significantly to the model. Beta coefficients were reviewed to determine any significant differences and to directly compare the relative effect of each independent variable upon the dependent variable. By reviewing the **β** column under the Unstandardized Coefficients column we can present the regression results as follows:

The dependent variable in the first regression model is the Cum GPA Spring Year 1. To identify individually important predictors of Cum GPASpringYear 1 from the standpoint of statistical significance, the full model was run and assessed. *Table 58* presents the regression results for Cum GPA Spring Year 1.

Table 58: Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	**.758**	**.045**		**16.759**	**.000**
Femaleind	**.182**	**.008**	**.145**	**21.464**	**.001**
BlackAfAmerind	**-.290**	**.023**	**-.119**	**-12.675**	**.001**
NativeAmericanAKNativeind	**-.394**	**.079**	**-.044**	**-5.014**	**.001**
AsianPIHawaiianind	**-.112**	**.020**	**-.050**	**-5.608**	**.001**
HispanicLatinoind	**-.281**	**.024**	**-.107**	**-11.525**	**.001**
Internationalind	**-.059**	**.030**	**-.017**	**-1.975**	**.048**
BlackAfAmerFemaleind	**.096**	**.028**	**.031**	**3.370**	**.001**
NativeAmericanAKNativeFemaleind	.049	.102	.004	.482	.630
AsianPIHawaiianFemaleind	.014	.026	.005	.543	.587
HispanicLatinoFemaleind	.031	.031	.009	1.016	.310
InternationalFemaleind	.010	.040	.002	.244	.807
NoFinancialNeedind	-.001	.012	-.001	-.076	.940
LowFinancialNeedind	-.021	.015	-.008	-1.355	.176
MidFinancialNeedind	-.009	.015	-.004	-.618	.536

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
HighFinancialNeedind	**-.069**	**.010**	**-.055**	**-7.291**	**.001**
SATVerbal	**.001**	**.000**	**.101**	**14.007**	**.001**
SATMath	**.000**	**.000**	**.031**	**4.247**	**.001**
HighSchoolGPA	**.456**	**.009**	**.321**	**49.227**	**.001**
APCreditIndicator	**.116**	**.012**	**.088**	**9.897**	**.001**
NumberOfAPCredits	**.003**	**.001**	**.031**	**3.460**	**.001**
SUPACreditIndicator	**-.111**	**.034**	**-.037**	**-3.239**	**.001**
NumberOfSUPACredits	.007	.005	.016	1.366	.172
N = 22,732					

Note: Dependent Variable: CumGPASpring Year 1

In summary, predictor variables were entered in seven steps. Only the final step of the regression is explained below. Both the AP indicator variable ($\beta = 0.116$, $p < 0.001$) and the number of AP credits indicator variable ($\beta = 0.003$, $p < 0.016$) were statistically significant, with a positive parameter estimate. Assuming that the model is appropriate, this finding points to a strong relationship between AP and college performance even after controlling for demographic variables, financial need, and precollege entry student abilities. This finding suggests that an increase in AP exposure, ceteris paribus, increases student CumGPASpring Year 1.

In comparison, the SUPA credit indicator was also statistically significant ($\beta = -0.111$, $p < 0.001$) but with a negative parameter estimate. So the conclusion that can be drawn here is that if a student participated in SUPA in high school there is a higher likelihood that his or her CumGPA SpringYear1 would be lower than that of the reference group (non-AP/SUPA group). However, this does not come as a surprise because PA grades (A through F) from high school are included in the calculation for freshman GPA. Also, during the student and faculty interviews conducted for a qualitative course class project, three of the students who were interviewed said, "Had I known or understood clearly that my poor grade in SUPA course in high school would be posted on my Syracuse University transcript and counted in my GPA calculation upon

matriculation, I would have worked much harder in the course," or "I would have dropped the course." However, the number of SUPA credits variable had a positive parameter estimate but did not reach significance and was not a strong predictor of college performance in the first year when compared to the reference group.

The Female indicator variable reached statistical significance ($\beta = 0.182$, $p < 0.016$), with a positive parameter estimate. This finding indicates that females had a higher likelihood of performing better in the first year at Syracuse University when compared to the reference group.

All the race/ethnicity groups were statistically significant, with negative parameter estimates, indicating that students from these groups had lower cum GPAs after completing their first year at SU when compared to the reference group.

Of all the interactions between gender and race/ethnicity only the Black African American Female student variable was statistically significant ($\beta = 0.096$, $p < 0.001$), with a positive parameter estimate indicating that Black African American Female students had a higher likelihood of having a higher CumGPA SpringYear1 compared to their male counterparts.

The high financial need indicator variable was statistically significant ($\beta = -0.069$, $p < 0.001$) with a negative parameter. It is a known fact that the rising cost of higher education can be a barrier to college success. Also, students with high financial need may have had poorer high school preparation, or they may worry about finances and have to hold down jobs to help their families.

Both SAT verbal ($\beta = 0.001$, $p < 0.001$) and SAT math ($\beta = 0.000$, $p < 0.001$) were statistically significant in predicting Cum GPA Spring Year 1, with a positive sign indicating that with every unit increase in SAT math or SAT verbal there was a higher likelihood that the student would have a higher Cum GPA Spring Year 1. High school GPA also was statistically

significant (β = 0.456, p< 0.001), with a positive relationship to freshman GPA. The combination of high school grades and SAT scores was the best predictor of freshman grade point average in this study.

As mentioned earlier, SUPA grades (A through F) are recorded on the SU transcript, whereas AP credits are transferred in as credits for students who had a test score of 3, 4, or 5. So as not to underestimate the effects of SUPA on academic preparation, it was decided to run the regressions again using the CUMGPA Spring Year 1 on or after matriculation into Syracuse University. The regressions results showing the target variables were not much different than the previous regression. They are as follows:

Table 59: Coefficients Table (w/o SUPA grades)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
APCreditIndicator	**.102**	**.013**	**.078**	**7.887**	**.001**
NumberOfAPCredits	**.004**	**.001**	**.039**	**3.955**	**.001**
SUPACreditIndicator	**-.119**	**.035**	**-.043**	**-3.423**	**.001**
NumberOfSUPACredits	.001	.005	.002	.181	.856

Note: Dependent Variable: CumGPASpring Year 1

The AP credit indicator variable was significant (β = 0.102, p< 0.001), with a positive parameter estimate suggesting that, with every unit increase in the predictor variable there was an increase in the dependent variable, CUMGPA Spring Year 1. Also, the number of AP credits variable was significant (β = 0.004, p< 0.001), with a positive parameter estimate indicating that with every unit increase in the predictor variable there was an increase in the dependent variable.

The SUPA indicator variable reached significance (β = -0.119, p< 0.001) but with a negative β suggesting that students who participated in the SUPA program would have a lower CumGPASpring Year 1 when compared to the reference group. Therefore, the SUPA credit

indicator had a statistically negative effect on CUMGPA Spring Year 1. The number of SUPA credits variable again did not reach significance, indicating that there were no significant effects.

5.8.2 Cum GPA Spring Year 4 (aka degree GPA)

The second multiple regression was conducted to determine the best linear combination of the predictor variables for predicting the dependent variable, Cum GPA Spring Year 4 (also referred to as degree GPA).

The model summary, Table 4, shows that the multiple correlation coefficient (***R)*** using 7 predictors in steps, is .552, which represents the simple correlation and, therefore, indicates a moderate degree of correlation. The **R Square** value = .304 and it indicates how much of the CUM Spring GPA Year 4 can be explained by the independent variables in the model. The adjusted R Square is =.303, meaning that 30% of the variance in the dependent variable can be predicted from the independent variables all combined. Again, the high school achievement variables (high school GPA, SAT math, and SAT verbal) accounted for the most variance in the model.

Table 60: Model Summary: CumGPASpring Year 4

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.175a	.031	.031	.454124	.031	411.730	1	12962a	.000
2	.299b	.089	.089	.440322	.058	166.063	5	12957b	.000
3	.301c	.091	.090	.440032	.002	4.419	5	12952c	.001
4	.311d	.097	.096	.438577	.006	22.510	4	12948d	.000
5	.545e	.297	.296	.386988	.200	1228.433	3	12945e	.000
6	.551f	.304	.303	.385147	.007	63.022	2	12943f	.000
7	.552g	.304	.303	.385071	.000	3.558	2	12941g	.029

The coefficients table below provides information on each predictor variable in the last step. We see that both the constant and the select variables contribute significantly to the model

(by looking at the **Sig.** column). Beta coefficients were reviewed to determine any significant differences and to directly compare the relative effect of each independent variable upon the dependent variable. By reviewing the **B** column under the **Unstandardized Coefficients** column we can present the regression results as follows:

Table 61: Coefficients Table

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std.Error	Beta		
(Constant)	**1.156**	**.044**		**26.307**	**.000**
Femaleind	**.139**	**.008**	**.150**	**17.585**	**.001**
BlackAfAmerind	**-.214**	**.024**	**-.114**	**-8.906**	**.001**
NativeAmericanAKNativeind	-.052	.094	-.006	-.553	.580
AsianPIHawaiianind	**-.084**	**.022**	**-.045**	**-3.894**	**.001**
HispanicLatinoind	**-.151**	**.026**	**-.070**	**-5.795**	**.001**
Internationalind	**-.111**	**.036**	**-.033**	**-3.056**	**.002**
BlackAfAmerFemaleind	**.058**	**.029**	**.026**	**2.022**	**.043**
NativeAmericanAKNativeFemaleind	-.113	.137	-.008	-.826	.409
AsianPIHawaiianFemaleind	-.002	.028	-.001	-.056	.956
HispanicLatinoFemaleind	.000	.033	.000	.005	.996
InternationalFemaleind	.070	.050	.014	1.385	.166
NoFinancialNeedind	-.001	.011	-.001	-.066	.948
LowFinancialNeedind	-.015	.014	-.009	-1.088	.276
MidFinancialNeedind	-.007	.013	-.004	-.526	.599
HighFinancialNeedind	**-.036**	**.009**	**-.038**	**-3.971**	**.001**
SATVerbal	**.001**	**.000**	**.139**	**14.765**	**.001**
SATMath	**.000**	**.000**	**.028**	**2.976**	**.003**
HighSchoolGPA	**.376**	**.009**	**.356**	**42.083**	**.001**
APCreditIndicator	**.081**	**.012**	**.082**	**7.036**	**.001**
NumberOfAPCredits	.001	.001	.016	1.320	.187
SUPACreditIndicator	.001	.037	.000	.015	.988
NumberOfSUPACredits	-.007	.005	-.020	-1.262	.207
N = 12,941					

Note: Dependent Variable: CumGPASpring Year 4

Again, predictor variables were entered in seven steps. The effect of AP and SUPA on degree GPA were examined in this regression. Only the final step of the model is explained below. In answering the research question related to fourth-year performance in college, it was

apparent that there were significant differences in fourth-year college GPAs between the student types (SUPA, AP, and Non-AP/CEP) when student pre-entry attributes were controlled.

The AP indicator variable was the only target variable that reached statistical significance ($\beta = 0.081$, $p < 0.001$), with a positive parameter estimate, indicating that with every unit increase in the β there was a higher likelihood of students performing better at the end of the fourth year. This finding points to a strong relationship between the AP credit indicator variable and college performance, even after controlling for demographic variables, financial need, SAT scores, and high school GPA. The number of AP credits did not reach statistical significance thereby falling short of predicting degree GPA. The SUPA credit indicator variable had a positive parameter estimate but did not reach statistical significance. Even though the number of SUPA credits variable did not reach significance, it had a negative relationship to performance. By the fourth year SUPA did not play a significant role in predicting degree GPA.

The Female indicator variable reached statistical significance ($\beta = 0.139$, $p < 0.001$), with a positive parameter estimate indicating that females had a higher likelihood of performing better in the fourth year at Syracuse University when compared to the reference group.

All the race/ethnicity groups were statistically significant, with negative parameter estimates indicating that students from these groups had lower cum degree GPAs after completing their fourth year at SU. However, the Native American students' indicator variable did not reach significance.

Of all the interactions between gender and race/ethnicity, only the Black African American Female student variable was significant ($\beta = 0.058$, $p < 0.043$), with a positive parameter estimate indicating that they had a higher likelihood of having a higher Cum GPA Spring Year 4 compared to their male counterparts.

The high financial need indicator variable was statistically significant (β = -0.036, p< 0.000), with a negative parameter reiterating previous statements in the literature that the stress of the rising costs of higher education is a barrier to college success as students work long hours to pay for their tuition, and stress out about paying for college and amassing huge students loans.

SAT verbal (β = 0.001, p< 0.001) and SAT math (β = 0.000, p< 0.003) were statistically significant and had a positive relationship to the dependent variable, Cum GPA Spring Year 4. Also, high school GPA (β = 0.376, p< 0.001) reached statistical significance and positively predicted degree GPA.

The regressions were run again using the CUMGPA Spring Year 4 on or after matriculation into Syracuse University so as not to underestimate the effects of SUPA in comparison to AP. The regression results showing the target variables were not much different than those of the previous regression. They are as follows:

Table 62: Coefficients Table (w/o SUPA grades)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
APCreditIndicator	**.073**	**.013**	**.072**	**5.685**	**.001**
NumberOfAPCredits	.002	.001	.024	1.870	.061
SUPACreditIndicator	-.012	.038	-.005	-.330	.742
NumberOfSUPACredits	-.007	.006	-.021	-1.269	.205

Note: Dependent Variable: CumGPASpring Year 4

Of the four target variables, only the AP credit indicator variable was significant (β = 0.073, p< 0.001), with a positive parameter estimate suggesting that with every unit increase in the predictor variable there was an increase in the dependent variable, CUMGPA Spring Year 4. The number of AP credits indicator variable, the SUPA credit indicator variable, and the number of SUPA credits variable did not reach statistical significance. It is important to stress that the

measure used in this study captured students who had received a 3, 4, or 5 on the AP exam but had taken into account all SUPA students who had received grades A through F.

5.9 Discussion

Previous studies had found that dual credit programs had positive relationships both with persistence and performance (Chatman & Smith, 1998). In this study, where students who had participated in Project Advance then matriculated into a four-year private university, Syracuse University), both regressions gave practical results in determinants of grade point average for both the Cumulative GPA Spring Year 1 and Cumulative GPA Spring Year 4, i.e., academic aptitude (SAT verbal and SAT math); good study habits (grades); and concern about financial issues.

Evidence from this study shows that participation in AP in high school (with AP exam scores of 3 or better) does have positive relationships to both Cum GPA Spring Year 1 and Cum GPA Spring Year 4 at SU. However, Sadler and Tai (2007) in their study also found that students who passed an AP exam might well repeat the introductory course in college to gain mastery over the subject matter, so this could be an overestimation of the AP effect.

Going into this study I hypothesized that, with the SUPA classes in high school being smaller in size (15–20 students), with more individualized attention from the teacher, quicker feedback from the teacher, and opportunities for extra credit, these students would do better in college than the non-AP/SUPA student group. But evidence in this study finds no significant role for SUPA on its own in predicting academic performance in the first or the fourth year at Syracuse University. Important to note is that in the AP group, the poorly performing students who had a score of 1 and 2 were not included in this study as they did not transfer in any credits to SU, whereas the SUPA students with a C or lower grade were included in the SUPA group.

This study found no significant difference between matched pairs of SUPA and non-AP/SUPA students on Cum GPA Spring Year 1 and Cum GPA Spring Year 4. My previous study on short- and long-persistence provided evidence of the value of SUPA in terms of short-term retention, but this study found no evidence to support SUPA's claim of academic rigor for the SU courses taught through that program. The lack of statistical significance of the SUPA variables was surprising.

Even though SUPA students take college courses in high school, structured and formatted identically to main campus college courses, they may not really understand the amount of time they need to stay on task for a college course with all the distractions they face when they come to the main campus. Perhaps students at 18 years of age do not understand that with independence comes the responsibility to stay on task, learn good study skills, and not give in to peer pressure. Maybe in high school their goal was to gain admission to college, but once they get to the main campus as first year students, they are not sure of their long-term goals and are not yet mature enough to stay focused on academics. Yet another reason could be that Syracuse University was just not the right choice of college. Alternatively, doing well on the introductory SUPA course may have given them a false sense of security and confidence, so they did not study as much as they should have once they got to college. Most importantly, they didn't have their parents around to tell them to do basic things such as go to class. Lastly, may be SU is not attracting the best students through SUPA. This list can go on forever.

Sadler et al. (2007) found that the "AP experience can be accounted for by variables representing the academic abilities and experiences possessed by AP students, prior to or independent of, their AP course experience. Likewise, in this dissertation, high school academic variables such as SAT verbal, SAT math, and especially, high school GPA consistently show a

significant and positive relationship to performance outcomes in both Year 1 and Year 4. This reinforces previous research that high school GPA and SAT scores are positively and strongly linked to university GPAs.

However, according to Morell et al. (1999) predictions can be vastly improved by including measures of students' demographic (gender, race/ethnicity, and socioeconomic status) variables. Based on their recommendation, this study examined other significant determinants of performance and whether the effects varied by gender, race/ethnicity, and socioeconomic status. The Female indicator was significant in both regressions and had a positive relationship to both cum GPA Year 1 and cum GPA Year 4.

When the interaction with race and gender was conducted in both regressions, the only variable that was significant was the Black African American Female indicator variable, indicating that black females had a higher likelihood of performing better in both Cumulative GPA Spring Year 1 and Cumulative GPA Spring Year 4 than their male counterparts.

Socioeconomic status continues to significantly impact college performance, as stated in my earlier paper on persistence, reinforcing previous research showing that the burden of financial stress does negatively impact a student's performance in college. Also, these students may be coming from lower-income area schools where their academic preparation for college may not have been as rigorous as that of other students from higher-income area schools.

Astin (2001) found that being white was a positive predictor of college performance. This study also finds that race/ethnicity played a significant role in predicting the dependent variables. All race/ethnicity groups were significant, with negative parameters, and they had a negative relationship to cumulative GPA Spring Year 1 and cumulative GPA Spring Year 4 when compared to the reference group. Prior studies have found that students from different

race/ethnicity groups feel isolated and are not able to seamlessly integrate into the mainstream, and that seems to directly influence their performance in college (Astin, 1975; Pascarella & Terenzini, 1991; Tinto, 1993).

Another method of predicting university GPA would be to model GPA with separate intercepts for each high school, which the current study did not do. Morell et al. (1999, p. 268) states that "this model explained about 10% of the variation in the university GPA beyond the simple model."

5.10 Conclusion

This study found that after controlling for all the personal variables, minority student groups are likely to achieve lower GPAs. These findings should be of interest to Syracuse University educators because "many of our current students are coming from our 'geographies of opportunities' in the fastest growing metropolitan areas of the West and South, as well as internationally" (SU Magazine, Spring 2012, Vol 29. No. 1). New and innovative programs could be put in place to help foster both academic and social integration of our minority students. Speroni (2011) had stressed that "factors such as subject area, quality, or the level of difficulty of these CEP courses should be considered when expanding these programs with the objective of addressing the needs of high school students as they transition to postsecondary education" (p. 1).

Since this study followed only the SUPA students who enrolled at SU, it would be interesting to find out how SUPA students perform when they matriculate at other institutions. Also, future research could focus on case studies of a group of SUPA students and their experiences both in high school and on the main campus.

Given the long-term personal and socioeconomic benefits of attaining a college degree, this study will help administrators, faculty, and staff in Project Advance gain a better

understanding of the SUPA program and continue to make paradigmatic changes in the program and focus on college outcomes in the best interest of the students, the institution, and society. As Sadler and Tai (2007) note in their research on AP scores being a predictor of performance, that AP exam scoring should be made more stringent to really represent achievement. Perhaps SUPA high school teachers should be more stringent in their grading standards. One change SUPA might want to make to better serve its clients is to change the eligibility policy so that only grades of B or better are accepted as transfer credits.

5.11 References

Astin, A. W. (1975). *Preventing students from dropping out.* San Francisco: Jossey-Bass Publishers.

Astin, A. W. (2001). *What matters in college? Four critical years revisited.* San Francisco: Jossey-Bass Publishers.

Betts, J. R. & Morell, D. (1999, Spring). The determinants of undergraduate grade point average: The relative importance of family background, high school resources, and peer group effects. *The Journal of Human Resources, 34*(2), 268–293.

Camara, W. J., & Echternacht, G. (2000). The SAT I and high school grades: Utility in predicting success in college. The College Board, Research Notes, Office of Research and Development/ RN0=-10, July 2000.

Cantor, N. (2011). "Chancellor's Message." *Syracuse University Magazine, 28*(3).

Chatman, S., & Smith, K. (1998). *Dual credit preparation for further study in foreign languages.* National Association of Secondary School Principals (NASSP) Bulletin, *82*(597), 99–107.

Chen, R. & DesJardins, S. L. (2008). Exploring the effects of financial aid on the gap in student dropout risks by income level. *Research in Higher Education, 49*(1), 1–18.

Clark, R.W. (2001). *Dual credit: A report of programs and policy that offer high school students college credits*. Seattle, WA: Institute for Educational Inquiry.

DesJardins, S. L. (2001). *A comment on interpreting odds-ratios when logistic regression coefficients are negative* (AIR Professional File no. 81). The Association for Institutional Research for Management Research, Policy Analysis, and Planning.

Duffy, W. R. (2009). *Persistence and performance: The relationship between dual credit and*

persistence and performance at a four-year university. The University of Memphis). *ProQuest Dissertations and Theses,* http://search.proquest.com/docview/305150835?accountid=14214

Flores, C. (2002, February 22). Harvard U. raises standards for advanced-placement credit. *The Chronicle of Higher Education.* from http://chronicle.com/colloquy.

Freese, J., & Long, J. S. (2006). *Regression models for categorical dependent variables using* Stata. College Station, TX: Stata Press.

Geiser, S., & Santelices, V. (2004). *The role of Advanced Placement and honors courses in college admissions.* Berkeley, CA: Center for Studies in Higher Education, University of California, Berkeley. Retrieved from http://cshe.berkeley.edu/publications/papers-/papers.html.

Garule, J. M. (1996). A study of high school to community college dual enrollment for underprepared/moderate student achievers. (Doctoral dissertation). *Dissertation Abstracts International, 57*(3A), 0990.

Greenberg, A. R. (1989). Concurrent enrollment programs: College credit for high school students. Bloomington, IN: Phi Delta Kappa Educational Foundation.

Greenburg, A. R. (1991). High school-college partnerships: Conceptual models, programs, and issues. Washington, DC: George Washington University, School of Education and Human Development.

Higgins, S. C., & Katsinas, S. G. (1999). The relationship between environmental conditions and transfer rates of selected rural community colleges." C*ommunity College Review*, *27*(2), 1–25.

Kotamraju, P. (2005). *The Minnesota post-secondary enrollment options program: Does participation in dual enrollment programs help high school students attain career and technical education majors and degrees in college?* Paper presented at the Council for the Study of Community Colleges, 47th Annual Conference, Boston, MA.

Long, J. S. (1997). *Regression models for categorical and limited dependent variables*. Thousand Oaks, CA: Sage Publications.

Mattern, K. D., Shaw, E. J., & Xiong, X. (2009). The relationship between AP exam performance and college outcomes. New York: The College Board.

Pascarella, E. T., & Terenzini, P. T. (1991). How college affects students: Findings and insights from twenty years of research. San Francisco: Jossey-Bass.

Russo, F. (2000). Beyond advanced placement. *The Village Voice, 45*(15), 90–93. Retrieved October 12, 2003 from ProQuest database, ISSN: 00426180.

Sadler, P. M., & Tai, R. H. (2007, Spring). Advanced placement exam scores as a predictor of performance in introductory college biology, chemistry and physics courses. *Science Educator,* 1–19. No 1.

Singell, L. D. (2004). Come and stay a while: Does financial aid effect retention conditioned on enrollment at a large public institution? *Economics of Education Review, 23*, 459–471.

Speroni, C. (2011). High School Dual Enrollment Programs: Are we Fast-Tracking Students Too Fast? [Working paper). National Center for Postsecondary Research.

Spurling, S., & Gabringer, R. (April 2002). *The effect of concurrent enrollment program upon student success at City College of San Francisco: Findings.* San Francisco, CA: City College of San Francisco, Office of Institutional Development, Research, and Planning.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.

Wang, M. (2007). *A validity test of financial aid logistic model in predicting student retention*. Paper presented at the 34th Annual Meeting of the North East Association for Institutional Research, New Brunswick, NJ.

6. Summary of dissertation

The National Center for Education Statistics (2008) reported that the college enrollment rate between 1995 and 2005 had increased by 23%. They projected an additional 14% increase by 2016. In times when student enrollments in postsecondary institutions are on the rise, concurrent enrollment programs (CEP) have become an important source of study for high school students. Along with Advanced Placement and International Baccalaureate, these programs provide ways in which students can challenge themselves in high school. At the same time students can earn credits that they can then transfer to the college of their choice for their undergraduate education. The programs are also viewed as helping to prepare students for the rigors of college work. But, at the same time, debates continue as to whether our high schools in general are preparing students adequately for college.

Many studies have postulated important determinants of college success, including persistence, grades, and transfer credits. When students are not ready for college-level work, they are at risk of either dropping out of college before graduating or facing the consequences of having to enroll in remedial courses. For example, Adelman (1998) reports that one third of the students enrolling in postsecondary education took remedial courses because they did not have the skill level to take the college's credit bearing course.

In the past, research on Syracuse University Project Advance, has been done on state policies, teacher preparation, program features, and credit transfer rates. However, not much is known about the effectiveness of the Project Advance program at SU as a strategy for improving students' postsecondary achievement in the subsequent course as well as overall performance and persistence. Recent research on dual enrollments has not focused on SUPA's impact for students who decide to pursue undergraduate studies at Syracuse University. There is a general lack of research on concurrent enrollment programs, especially on their impact using control

variables. Few quantitative studies have been conducted on the effects of concurrent enrollment programs, especially studies that control for pre-entry characteristics such as demographics, financial need, high school GPA, and SAT scores.

For this dissertation I conducted an empirical investigation of the effect of student participation in Syracuse University Project Advance and Advanced Placement on various measures of success in college. This was done by obtaining a detailed data set of all students who enrolled at Syracuse University from 1997 to 2008. Correlates of college student dropout, student persistence to graduation, and student performance at Syracuse University were examined. A six-step, multivariate regression model was utilized to examine the separate and collective contributions of demographic, socioeconomic status, and precollege entry student characteristics on college outcomes. The benefit of this design was that it helped me explore complex relationships amongst several variables in a regression design based on measureable numeric data. The primary limitation was that it was not as thorough as the experimental design—it only showed correlation between two variables; it did not show causal relationships.

The focus of this study was on two individual predictors, Syracuse University Project Advance and Advanced Placement. The other rich set of predictors were used both to model college persistence and also to serve as control variables so that the marginal effects of SUPA and AP could be ascertained. Additional analyses also examined the interactions between gender and race and found that in some cases the interaction effect was statistically significant.

Previous research studies (Chatman & Smith, 1998; Garule, 1996; Santoli, 2002) indicate that the students who participate in CEP and AP are self-selected and motivated students. This fact may account for the observed positive correlation between participation in CEP and AP and persistence and performance outcomes from previous research.

The initial (pilot) study for this dissertation examined student performance and persistence outcomes among SUPA and non-SUPA college students WITHOUT controlling for pre-entry college characteristics. This initial investigation suggested a positive relationship of SU students who had taken SUPA courses to, merit rating, dropout rates and financial need. The findings in this paper suggest that SUPA students had high merit rating ranking, lower dropout rates and higher financial need,.

After I finished the pilot study, my first research question examined whether significant differences existed among the three student types—SUPA only, AP only, and the non-SUPA/AP—in terms of both short-term (dropout in 1st year and 2nd year) and long-term (graduation in four to six years) persistence when controlling for demographic (gender, race/ethnicity), financial need, and precollege entry characteristics (high school GPA and SAT math and SAT verbal). This study was based upon ex-ante (before they started college) characteristics (gender, high school grades, race, participation in AP or CEP, etc.), rather than measures taken during their college study. The sharpest results are for short-term persistence. Participation in SUPA and/or AP was positively and significantly related to short-term persistence in the first year. However, there were no significant effects of participation in SUPA and/or AP in terms of long-term persistence. Findings for dropout in Year 2 after controlling for precollege characteristics, revealed no significant differences between the three students groups. It is important to remember here that not all dropout is considered bad. Adelman, in an interview with Goeffrey Akst (2007), stated that sometimes "purposeful transfer has positive results" (p. 1). Sometimes, when the institution is not the right fit, it is good that the student decides to move on. Even though universities have an obligation to educate and are concerned about good students dropping out, they need to be reminded that "they have a collective responsibility to help

students get the best education they can, even if that means giving them the right to leave" (Wyness, 2012). AP was statistically significant in predicting long-term persistence.

The second research question examined the effect of SU courses taken through Project Advance on grades in the subsequent postcourse (taken on the main campus). The effect was examined for eight subjects with typical two-course sequences for two student populations: students who took the precourse in high school through SUPA and students who took the precourse on the Syracuse University main campus. When examining the grades in the subsequent-level postcourse taken on the main campus, the results were mixed. The significance and magnitude for the SUPA experience were clearly diminished when controlling for all background factors for the following subjects: Economics, Chemistry, Sociology, Public Affairs, Psychology, and English and Textual Studies. But there was evidence that exposure to high school SUPA courses in Mathematics and Writing had a significant positive effect on the student's performance in the subsequent course. On further examination, this study also suggested that there might have been grade inflation in six of the eight subjects examined. One of the most important findings was the "concept of retention decay" where pre-post semester lag was statistically significant for ETS, MAT, PAF, and WRT with negative parameters. This suggests that the amount of time that elapses between taking consecutive courses in these sequences is a significant factor in a student's chance for success in the postcourse. The semester lag variable did not have a role in predicting performance in postcourse for CHE, ECN, and SOC. Psychology was the only subject which was statistically significant but with a positive parameter.

As part of the second research question regarding performance, this study examined whether significant differences existed among the three student types—SUPA only, AP only, and

the non-SUPA/AP—in terms of the Cumulative GPA Spring Year 1 and the Cumulative GPA Spring Year 4 when controlling for demographic, financial need, and precollege entry characteristics. This study found no conclusive evidence that, for the average student, SUPA provides better academic preparation than the regular curriculum. In fact, the SUPA credit indicator had a statistically significant and negative effect on the Cumulative GPA in the Spring of Year 1. If a student participated in Syracuse University courses through Project Advance, there was a higher likelihood of achieving a lower cumulative GPA at the end of the first year. The number of SUPA credits did not reach significance, indicating that there were no significant differences between the SUPA students and the reference group in terms of academic preparation. However, participation in AP and the number of AP credits taken is statistically significant and a positive predictor of Cumulative GPA Spring Year 1. Participation in AP was also positively related to the Cumulative GPA in the Spring of Year 4, suggesting better academic preparation for the AP participants. This result was in contrast to Klopfenstein (2006), who found that AP experience did not provide preparation for college that was "superior to that provided by a non-AP curriculum rich in math and science" (p. 17).

With regard to the other variables in the multiple regression analysis, high school GPA produced positive and statistically significant relationships to graduating in four years. This was in alignment with Tinto (1993) and Astin (2001), studies that found that the student's high school GPA is the strongest pre-entry attribute in predicting persistence in college, college GPA, and degree completion. This finding also reinforces Adelman (2006), whose study concludes that the intensity of the high school curriculum still counts, more than anything else, towards degree completion. High school GPA in this study consistently and significantly predicted all the modes of success, in terms of being a positive factor for college success.

Of interest to note was that SAT verbal was positively related to dropping out in in Year 1 and Year 2. Anecdotal evidence shows that students who had good writing skills opted to transfer to other institutions because they were not challenged enough at the current institution. Also, SAT verbal was negatively related to graduation in four years and graduation in six years.

The Female indicator variable was statistically significant in the model for dropout in Year 1, suggesting there was a higher likelihood of a female student dropping out in Year 1, compared to the reference group. However, the gender variable was muted in the model for dropout in Year 2 and did not reach significance. The female student had an odds ratio of 1.5 times higher of graduating in four years when compared to males. The gender variable again did not have a role in predicting graduation in six years.

The results suggest many of the race/ethnicity groups (Asian Pacific Hawaiian, Native American and International students) have a higher likelihood of dropping out when compared to whites. Black African Americans, Asians, Hispanics, and International students all had a lower likelihood of graduating in four to six years. All minority groups had a negative relationship to cumulative GPA Spring Year 1 and cumulative GPA Spring Year 4 when compared to the reference group.

Of all the financial need variables, only the mid financial need variable was statistically significant. This finding suggests that students in this group have a greater risk for dropping out by Fall of Year 2 when compared with the default group of students who did not file an application for financial assistance. Interestingly, none of the financial need variables were important at any conventional level of statistically significance in predicting dropout by Fall of Year 3. However, students with both Medium and High Financial Need were less likely to graduate within four to six years.

7. Suggestions for future research

The findings of this study also provide important implications for future research.

1. It would be important to replicate this study at other institutions, to assure the validity of the results.
3. Use a smaller sample and obtain more data as we go forward to examine if SUPA students have changed in significant ways over time. As Karp, Calcagno, Hughes, Jeong and Bailey (2007) note, dual enrollment programs have grown and evolved significantly in the last few years. Maybe the span of the current sample is too large (1997 to 2008).
4. Conduct a mixed method study. Add a qualitative component to the study to answer some of the "WHY" questions. Conduct case studies to understand the central phenomenon behind SUPA by using the triangulation approach—student/teacher interviews, document reviews, and focus groups—to see if that will reveal underlying meanings and patterns of relationships and provide a deeper and richer understanding of the problem being stated. The quantitative data can also be used to minimize potential exaggeration from qualitative narratives.
5. Conduct research using SUPA students who have attended colleges or universities other than SU in order to gauge success.

6. Separate out long-term dropouts from stopouts (who are students who enroll at SU as freshmen, then leave for some reason but return within seven semesters to SU without transferring to another higher education institution during their absence from SU) as not examining these differences could bias the results of the attrition model. Also, separate out transfers from the students who leave because of lack of academic preparation, and from those who leave because the fit is not good, and from others who leave for personal reasons. How can we try to better separate the reasons? As stated above, "purposeful transfers" are good in some cases and

students may leave because of various reasons. Knowing why they leave would be useful in implementing new programs and interventions at the university.

8. Conclusion

The strength of this study is in the evidence—not necessarily the evidence in support of Syracuse University Project Advance or Advanced Placement. This was a comprehensive study that put Syracuse University Project Advance to the test using rigorous multiple regression models that controlled for the inherent talent of the students, their study habits, and demographic factors. Despite its limitations, this study shows that SUPA may have different values for different students. However, the results of this study provide little evidence to support SUPA's claim that its courses offered in high school are equal in rigor when compared to the introductory courses offered on the main campus. Despite previous work in this area and in this study much remains to be known about the factors associated with student success in postsecondary education.

Going back to the discussion of taking a systems view of the educational enterprise, here are some feedback components. One feedback loop could run from the postsecondary system to the K–12 system, answering the question as to how can a student's performance in college inform and influence the K–12 education system. Another feedback loop—or feed-forward signal—would run from the K–12 system to the postsecondary system, answering the question as to how should a student's progress (and preparation) in the K–12 portion of the system help shape and define the postsecondary portion of the student's educational journey? Thus, feedback could be used to help design the totality to help students achieve optimal performance. SUPA administrators could share feedback from this study with high schools so that they can collectively work on better preparing students for the rigors of college work. They could also use

the results to examine internal aspects of the program to improve its effectiveness in preparing students and in the professional development of teachers. Some questions that arise here are how SUPA and possibly other concurrent enrollment programs can be modified to better prepare students for the rigors of college work. Does SUPA need a tune-up and re-evaluation based upon this study? If so, in what direction? Or are we asking too much of SUPA in these programs, because it is merely a vehicle for high school students to take courses? These are just some questions that emerge from this study.

References

Adelman, C. (1998). National Crosstalk. San Jose, CA: National Center for Public Policy and Higher Education.

Chatman, S., & Smith, K. (1998). *Dual credit preparation for further study in foreign languages.* National Association of Secondary School Principals (NASSP) Bulletin, *82*(597), 99–107.

Garule, J. M. (1996). A study of high school to community college dual enrollment for underprepared/moderate student achievers. (Doctoral dissertation). *Dissertation Abstracts International, 57*(3A), 0990.

Karp, M. M., Calcagno J. C., Hughes, K. L., Jeong, D. W., & Bailey, T., R. (2007). The Postsecondary Achievement of Participants in Dual Enrollment: An Analysis of Student Outcomes in Two States Retrieved from http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED498661&ERICExtSearch_SearchType_0=no&accno=ED498661

Santoli, S. P. (2002). Is there an Advanced Placement advantage? *American Secondary Education*, *30*(3), 23–35.

Wyness, G. (2012) Give students the right to switch university. The Guardian. Higher Education Network. Retrieved from http://www.guardian.co.uk/higher-education-etwork/blog/2012/feb/01/student-choice-in-higher-education

Appendix A

Variable	Definition of Variable
ID	Unique identifier of student
Cohort Code	Student Records System (SRS) code for fall entering cohort
Cohort	Literal fall entering cohort
CohortFall1997ind	Indicator for Fall 1997 entering cohort; 1 = Fall 1997 cohort; 0 = otherwise
CohortFall1998ind	Indicator for Fall 1998 entering cohort; 1 = Fall 1998 cohort; 0 = otherwise
CohortFall1999ind	Indicator for Fall 1999 entering cohort; 1 = Fall 1999 cohort; 0 = otherwise
CohortFall2000ind	Indicator for Fall 2000 entering cohort; 1 = Fall 2000 cohort; 0 = otherwise
CohortFall2001ind	Indicator for Fall 2001 entering cohort; 1 = Fall 2001 cohort; 0 = otherwise
CohortFall2002ind	Indicator for Fall 2002 entering cohort; 1 = Fall 2002 cohort; 0 = otherwise
CohortFall2003ind	Indicator for Fall 2003 entering cohort; 1 = Fall 2003 cohort; 0 = otherwise
CohortFall2004ind	Indicator for Fall 2004 entering cohort; 1 = Fall 2004 cohort; 0 = otherwise
CohortFall2005ind	Indicator for Fall 2005 entering cohort; 1 = Fall 2005 cohort; 0 = otherwise
CohortFall2006ind	Indicator for Fall 2006 entering cohort; 1 = Fall 2006 cohort; 0 = otherwise
CohortFall2007ind	Indicator for Fall 2007 entering cohort; 1 = Fall 2007 cohort; 0 = otherwise
Femaleind	Indicator for female 1= female; 0 = otherwise
Maleind	Indicator for male 1 = male; 0 = otherwise
Unspecifiedind	Indicator for race/ethnicity Unknown 1 = student did not identify race/ethnicity; 0 = Otherwise

Variable	Definition of Variable
BlackAfAmerind	Indicator for race/ethnicity Black/African American 1=Black; 0=otherwise
NativeAmericanAKNativeind	Indicator for race/ethnicity Native American/AK Native 1 = Native American; 0=otherwise
AsianPIHawaiianind	Indicator for race/ethnicity Asian/Pacific Islander 1=Asian/Pacific Islander; 0 = otherwise
HispanicLatinoind	Indicator for race/ethnicity Hispanic 1 = Hispanic; 0 = otherwise
Whiteind	Indicator for race/ethnicity White 1 = White; 0 = otherwise
Internationalind	Indicator for race/ethnicity non-resident alien 1= nonresident alien 0= otherwise
Interaction Variable	Interaction variable between gender and race/ethnicity
PersistingFallYear2ind	Indicator for persisting as of fall of second year derived from SRS 1 = Yes; 0 = No
DropoutFallYear2ind	Indicator for drop out as of fall of second year derived from SRS 1 = Yes; 0 = No
PersistingFallYear3ind	Indicator for persisting as of fall of third year derived from SRS 1 = Yes; 0 = No
DropoutFallYear3ind	Indicator for drop out as of fall of third year derived from SRS 1 = Yes; 0 = No
PersistenceFallYear4	Indicator for persisting as of fall of fourth year derived from SRS 1 = Yes; 0 = No
GraduatedFallYear5ind	Indicator for graduated as of fall of fifth year derived from SRS 1 = Yes; 0 = No
DropoutFallYear5ind	Indicator for drop out as of fall of fifth year derived from SRS 1 = Yes; 0 = No
GraduatedFallYear6ind	Indicator for graduated as of fall of sixth year derived from SRS 1 = Yes; 0 = No
DropoutFallYear6ind	Indicator for drop out as of fall of sixth year derived from SRS 1 = Yes; 0 = No
GraduatedFallYear7ind	Indicator for graduated as of fall of seventh year derived from SRS

Variable	Definition of Variable
	1 = Yes; 0 = No
DropoutFallYear7ind	Indicator for drop out as of fall of seventh year derived from SRS 1 = Yes; 0 = No
HistoricalSemGPAFallYear1	Semester GPA fall of first year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPASpringYear1	Semester GPA spring of first year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPAFallYear2	Semester GPA fall of second year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPASpringYear2	Semester GPA spring of second year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPAFallYear3	Semester GPA fall of third year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPASpringYear3	Semester GPA spring of third year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPAFallYear4	Semester GPA fall of fourth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPASpringYear4	Semester GPA spring of fourth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPAFallYear5	Semester GPA fall of fifth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPASpringYear5	Semester GPA spring of fifth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPAFallYear6	Semester GPA fall of sixth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPASpringYear6	Semester GPA spring of sixth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalSemGPAFallYear7	Semester GPA fall of seventh year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPAFallYear1	Cumulative GPA fall of first year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPASpringYe	Cumulative GPA spring of first year not adjusted for retaken courses;

Variable	Definition of Variable
ar1	derived from SRS - on a 4 point scale 0-4
HistoricalCumGPAFallYear2	Cumulative GPA fall of second year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPASpringYear2	Cumulative GPA spring of second year not adjusted for retaken courses; derived from SRS -on a 4 point scale 0-4
HistoricalCumGPAFallYear3	Cumulative GPA fall of third year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPASpringYear3	Cumulative GPA spring of third year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPAFallYear4	Cumulative GPA fall of fourth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPASpringYear4	Cumulative GPA spring of fourth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPAFallYear5	Cumulative GPA fall of fifth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPASpringYear5	Cumulative GPA spring of fifth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPAFallYear6	Cumulative GPA fall of sixth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPASpringYear6	Cumulative GPA spring of sixth year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
HistoricalCumGPAFallYear7	Cumulative GPA fall of seventh year not adjusted for retaken courses; derived from SRS - on a 4 point scale 0-4
NoFinancialAidApplind	Indicator for FAFSA not filed for first year 1 = FAFSA not filed; 0 = otherwise
NoFinancialNeedind	1 = FAFSA form filed but zero dollar need; 0 = otherwise
LowFinancialNeedind	1 = FAFSA form filed and first tercile (lowest) dollar need; 0 = otherwise
MidFinancialNeedind	1 = FAFSA form filed and second tercile (middle) dollar need; 0 = otherwise
HighFinancialNeedind	1 = FAFSA form filed and third tercile (highest) dollar need;

Variable	Definition of Variable
	0 = otherwise
MeritRating1ind	1 = merit rating of one (highest rating); 0 = Otherwise
MeritRating2ind	1 = merit rating of two; 0 = Otherwise
MeritRating3ind	1 = merit rating of three; 0 = Otherwise
MeritRating4ind	1 = merit rating of four; 0 = Otherwise
MeritRating5ind	1 = merit rating of five; 0 = Otherwise
MeritRating6ind	1 = merit rating of six; 0 = Otherwise
MeritRating7ind	1 = merit rating of seven - lowest rating outside of SSS/HEOP; 0 = otherwise
MeritRatingHEOPind	1 = merit rating of HEOP - (Higher Education Opportunity Program); 0 = otherwise
MeritRatingSSSind	1 = merit rating of SSS - (Student Support Services); 0 = otherwise
MeritRatingNew1to9	1xMR1ind+2xMR2ind+3xMR3ind+4xMR4ind+5xMR5ind+6xMR6ind + 7xMR7ind+8xMR8ind+9xMR9ind
MeritRatingNew1to7	1xMR1ind+2xMR2ind+3xMR3ind+4xMR4ind+5xMR5ind+6xMR6ind +7xMR7ind
SATVerbal	SAT Verbal zero to 800
SATMath	SAT Math zero to 800
ACT	ACT combined
HighSchoolGPA	High School GPA off application HS transcript (on a scale of 1.16 to 4.0)
HS_ClassRank	High School Class Rank
HS_ClassSize	High School Class Size
HS_ClassPercentile	High School Class Percentile
APTestCreditsIndicator	1 = AP coursework credits transferred to SU; 0 = Otherwise
TotalAPTestCredits	Total number of AP coursework credits transferred to SU
SUPACreditIndicator	1 = PA coursework; 0 = Otherwise
NumberOfSUPACredits	Total number of PA coursework credits on transcript
Interaction Variable1	Interaction term between each Race/ethnicity and Gender
PrePost Semester Lag	Subject Specific semester lag between when the student took the pre-

Variable	Definition of Variable
	course and when the student took the post-course (for both SUPA and Non-SUPA students)
ECN PA Indicator	1 = took Economics as a PA course in high school; 0= Otherwise
PSY PA Indicator	1 = took Psychology as a PA course in high school; 0= Otherwise
MAT PA Indicator	1 = took Mathematics as a PA course in high school; 0= Otherwise
CHE PA Indicator	1 = took Chemistry as a PA course in high school; 0= Otherwise
WRT PA Indicator	1 = took Writing as a PA course in high school; 0= Otherwise
ETS PA Indicator	1 = took English and Textual Studies as a PA course in high school; 0= Otherwise
SOC PA Indicator	1 = took Sociology as a PA course in high school; 0= Otherwise
PAF PA Indicator	1 = took Public Affairs as a PA course in high school; 0= Otherwise
Interaction Variable 2 SubjectPAIndicator SubjectPre-Grade	Interaction term between Subject Specific PA indicator and Subject Specific Pre-Grade in course

APPENDIX B

Non-PA	Non-PA N	Non-PA Mean	Non-PA SD	PA	PA N	PA Mean	PA SD	Z Numerator	Z Denominator	Z-statistic	Conc.	O. Sort	Effect Size	Effect Size Name	Effect size	Effect Size Name
AsianPIHawaiianind	24943	0.08	0.27	AsianPIHawaiianind	1221	0.07	0.26	-0.00270	0.00766774	-0.35266593	ns	1	-0.01026106	Less than Small	-0.03538805	Less than small
BlackAfAmerind	24943	0.06	0.25	BlackAfAmerind	1221	0.03	0.18	-0.02995	0.005444181	-5.50104383	SIG	2	-0.14004576	Less than Small	-0.46542668	Less than small
CohortFall1997ind	24943	0.04	0.19	CohortFall1997ind	1221	0.01	0.12	-0.02376	0.003564746	-6.66608789	SIG	3	-0.1544757	Less than Small	-0.63055134	Less than small
CohortFall1998ind	24943	0.05	0.21	CohortFall1998ind	1221	0.01	0.12	-0.03202	0.003607055	-8.87753113	SIG	4	-0.19609807	Less than Small	-0.69696184	Less than small
CohortFall1999ind	24943	0.05	0.21	CohortFall1999ind	1221	0.01	0.12	-0.03182	0.003606043	-8.82443345	SIG	5	-0.19513057	Less than Small	-0.69563389	Less than small
CohortFall2000ind	24943	0.05	0.21	CohortFall2000ind	1221	0.01	0.11	-0.03502	0.003428259	-10.215928	SIG	6	-0.21719543	Small	-0.74031774	Less than small
CohortFall2001ind	24943	0.09	0.29	CohortFall2001ind	1221	0.08	0.27	-0.01179	0.008064593	-1.4623849	ns	7	-0.04169298	Less than Small	-0.12587345	Less than small
CohortFall2002ind	24943	0.11	0.31	CohortFall2002ind	1221	0.11	0.32	0.00926	0.009326732	0.992823831	ns	8	0.029592703	Less than Small	0.087853648	Less than small
CohortFall2003ind	24943	0.10	0.29	CohortFall2003ind	1221	0.09	0.29	-0.00357	0.008470351	-0.42137403	ns	9	-0.01225701	Less than Small	-0.03745318	Less than small
CohortFall2004ind	24943	0.10	0.29	CohortFall2004ind	1221	0.11	0.31	0.01107	0.009055011	1.222497387	ns	10	0.036624102	Less than Small	0.115046751	Less than small
CohortFall2005ind	24943	0.12	0.32	CohortFall2005ind	1221	0.14	0.34	0.02079	0.010044224	2.069716165	SIG	11	0.062620205	Less than Small	0.1792369	Less than small
CohortFall2006ind	24943	0.11	0.31	CohortFall2006ind	1221	0.14	0.34	0.03025	0.010029531	3.016119528	SIG	12	0.092755186	Less than Small	0.283979056	Small
CohortFall2007ind	24943	0.10	0.31	CohortFall2007ind	1221	0.16	0.36	0.05315	0.010623028	5.003087649	SIG	13	0.158317661	Less than Small	0.506560613	Large
DropoutFallYear2ind	24943	0.09	0.29	DropoutFallYear2ind	1221	0.07	0.26	-0.01997	0.007547413	-2.64621196	SIG	14	-0.07359572	Less than Small	-0.22091485	Less than small
DropoutFallYear3ind	22317	0.14	0.34	DropoutFallYear3ind	1076	0.11	0.31	-0.02949	0.009735578	-3.02886459	SIG	15	-0.09011515	Less than Small	-0.21477744	Less than small
DropoutFallYear5ind	17043	0.19	0.39	DropoutFallYear5ind	716	0.15	0.36	-0.03783	0.013818171	-2.73738241	SIG	16	-0.10029246	Less than Small	-0.19756727	Less than small
DropoutFallYear6ind	14150	0.18	0.38	DropoutFallYear6ind	549	0.15	0.36	-0.03106	0.015565993	-1.99547507	SIG	17	-0.08380017	Less than Small	-0.17215862	Less than small
DropoutFallYear7ind	11750	0.17	0.38	DropoutFallYear7ind	418	0.12	0.32	-0.05750	0.016137972	-3.56293367	SIG	18	-0.16385546	Less than Small	-0.32908312	Less than small
Femaleind	24943	0.56	0.50	Femaleind	1221	0.62	0.49	0.05255	0.014280451	3.679650262	SIG	19	0.10692645	Less than Small	0.093413257	Less than small
GraduatedFallYear5ind	17043	0.71	0.46	GraduatedFallYear5ind	716	0.77	0.42	0.05996	0.016195214	3.702287046	SIG	20	0.136514451	Less than Small	0.08483205	Less than small
GraduatedFallYear6ind	14150	0.81	0.39	GraduatedFallYear6ind	549	0.84	0.37	0.03369	0.015947533	2.112272255	SIG	21	0.088701849	Less than Small	0.041698038	Less than small
GraduatedFallYear7ind	11750	0.82	0.38	GraduatedFallYear7ind	418	0.87	0.34	0.05166	0.016804376	3.074464637	SIG	22	0.143369143	Less than Small	0.0630709	Less than small
HighFinancialNeedind	24943	0.44	0.50	HighFinancialNeedind	1221	0.55	0.50	0.11011	0.014591251	7.546533965	SIG	23	0.221549628	Small	0.251516277	Small
HighSchoolGPA	24943	3.52	0.44	HighSchoolGPA	1221	3.72	0.38	0.20087	0.011301528	17.77377022	SIG	24	0.487774055	Small	0.057131691	Less than small
HispanicLatinoind	24943	0.06	0.23	HispanicLatinoind	1221	0.03	0.17	-0.02392	0.005177007	-4.62110112	SIG	25	-0.11908379	Less than Small	-0.43461266	Less than small
HistoricalCumGPAFallYear1	24836	3.05	0.68	HistoricalCumGPAFallYear1	1216	3.14	0.56	0.08664	0.016528732	5.241520668	SIG	26	0.140631038	Less than Small	0.0283788	Less than small
HistoricalCumGPAFallYear2	20415	3.09	0.56	HistoricalCumGPAFallYear2	1012	3.13	0.53	0.04284	0.017030442	2.515361546	SIG	27	0.078722377	Less than Small	0.013876185	Less than small
HistoricalCumGPAFallYear3	17057	3.12	0.51	HistoricalCumGPAFallYear3	795	3.17	0.49	0.04625	0.017940981	2.577773822	SIG	28	0.091994173	Less than Small	0.014804412	Less than small
HistoricalCumGPAFallYear4	14398	3.15	0.47	HistoricalCumGPAFallYear4	624	3.18	0.47	0.03353	0.019264179	1.740423808	ns	29	0.071135188	Less than Small	0.010657401	Less than small
HistoricalCumGPAFallYear5	1454	2.77	0.55	HistoricalCumGPAFallYear5	45	2.79	0.60	0.02484	0.090081404	0.275804336	ns	30	0.043374284	Less than Small	0.008979776	Less than small
HistoricalCumGPAFallYear6	143	2.44	0.57	HistoricalCumGPAFallYear6	5	2.38	0.51	-0.05408	0.232677224	-0.23242378	ns	31	-0.10041495	Less than Small	-0.02217946	Less than small

HistoricalCumGPAFallYear7	56	2.34	0.54	HistoricalCumGPAFallYear7	2	2.04	0.68	-0.29104	0.484406582	-0.60080875	ns	32	-0.47809097	Small	-0.12463866	Less than small
HistoricalCumGPASpringYear1	24230	3.06	0.63	HistoricalCumGPASpringYear1	1192	3.10	0.58	0.04628	0.017244304	2.683558891	SIG	33	0.076808993	Less than Small	0.015144339	Less than small
HistoricalCumGPASpringYear2	19813	3.11	0.53	HistoricalCumGPASpringYear2	984	3.13	0.52	0.02385	0.017035534	1.399999801	ns	34	0.045315528	Less than Small	0.007679069	Less than small
HistoricalCumGPASpringYear3	16348	3.14	0.49	HistoricalCumGPASpringYear3	751	3.18	0.48	0.04081	0.018080552	2.257388925	SIG	35	0.083616955	Less than Small	0.013002111	Less than small
HistoricalCumGPASpringYear4	13783	3.13	0.46	HistoricalCumGPASpringYear4	573	3.18	0.44	0.04234	0.018989557	2.229664738	SIG	36	0.093473293	Less than Small	0.01351022	Less than small
HistoricalCumGPASpringYear5	1031	2.78	0.56	HistoricalCumGPASpringYear5	32	2.76	0.63	-0.01403	0.112160565	-0.12513129	ns	37	-0.02367333	Less than Small	-0.00505229	Less than small
HistoricalCumGPASpringYear6	115	2.44	0.58	HistoricalCumGPASpringYear6	3	2.72	0.24	0.27696	0.150017735	1.846158538	ns	38	0.675774916	Medium	0.113318983	Less than small
HistoricalSemGPAFallYear1	24836	3.05	0.68	HistoricalSemGPAFallYear1	1216	3.06	0.66	0.01140	0.019304014	0.590647525	ns	39	0.017122839	Less than Small	0.003734814	Less than small
HistoricalSemGPAFallYear2	20306	3.08	0.68	HistoricalSemGPAFallYear2	1000	3.11	0.67	0.03046	0.021825151	1.395672915	ns	40	0.045098249	Less than Small	0.009895547	Less than small
HistoricalSemGPAFallYear3	17008	3.16	0.65	HistoricalSemGPAFallYear3	791	3.22	0.65	0.06371	0.023806641	2.675976766	SIG	41	0.097795943	Less than Small	0.020156346	Less than small
HistoricalSemGPAFallYear4	14390	3.15	0.70	HistoricalSemGPAFallYear4	624	3.17	0.76	0.01653	0.031098563	0.531390168	ns	42	0.022608015	Less than Small	0.005238149	Less than small
HistoricalSemGPAFallYear5	1447	2.75	0.87	HistoricalSemGPAFallYear5	45	2.88	1.00	0.12747	0.150462814	0.847196881	ns	43	0.136264531	Less than Small	0.046381888	Less than small
HistoricalSemGPAFallYear6	142	2.54	1.06	HistoricalSemGPAFallYear6	5	2.83	1.61	0.28559	0.724293726	0.394297663	ns	44	0.214443022	Small	0.11240884	Less than small
HistoricalSemGPAFallYear7	55	2.52	1.14	HistoricalSemGPAFallYear7	2	0.50	0.71	-2.02385	0.523096689	-3.86898749	SIG	45	-2.19134777	Large	-0.80189033	Less than small
HistoricalSemGPASpringYear1	24229	3.05	0.71	HistoricalSemGPASpringYear1	1192	3.04	0.75	-0.00725	0.022267453	-0.32577676	ns	46	-0.00995066	Less than Small	-0.002382	Less than small
HistoricalSemGPASpringYear2	19812	3.12	0.65	HistoricalSemGPASpringYear2	984	3.10	0.72	-0.01584	0.02330189	-0.67973128	ns	47	-0.02311809	Less than Small	-0.00508257	Less than small
HistoricalSemGPASpringYear3	16344	3.17	0.62	HistoricalSemGPASpringYear3	751	3.21	0.65	0.03697	0.024148547	1.531010164	ns	48	0.058158471	Less than Small	0.011648845	Less than small
HistoricalSemGPASpringYear4	13773	3.08	0.74	HistoricalSemGPASpringYear4	573	3.12	0.79	0.03653	0.033557753	1.088490139	ns	49	0.047699026	Less than Small	0.011858554	Less than small
HistoricalSemGPASpringYear5	1025	2.71	0.86	HistoricalSemGPASpringYear5	32	2.60	1.13	-0.10482	0.202245719	-0.51828783	ns	50	-0.10536996	Less than Small	-0.03869679	Less than small
HistoricalSemGPASpringYear6	115	2.61	1.16	HistoricalSemGPASpringYear6	3	3.10	0.67	0.49466	0.401032805	1.23345289	ns	51	0.541892741	Medium	0.189691758	Less than small
HS_ClassRank	13004	59.94	64.21	HS_ClassRank	734	52.35	55.56	-7.58649	2.126606697	-3.56741429	SIG	52	-0.1266855	Less than Small	-0.12656652	Less than small
HS_ClassSize	13044	304.21	188.45	HS_ClassSize	735	319.38	162.87	15.17799	6.230126418	2.436224245	SIG	53	0.086404025	Less than Small	0.049893824	Less than small
HS_Percentile	13003	79.61	15.49	HS_Percentile	734	83.87	12.69	4.26221	0.487559908	8.741914955	SIG	54	0.302551358	Small	0.053537858	Less than small
LowFinancialNeedind	24943	0.07	0.25	LowFinancialNeedind	1221	0.07	0.26	0.00301	0.00761562	0.395469841	ns	55	0.011695819	Less than Small	0.043099272	Less than small
Maleind	24943	0.44	0.50	Maleind	1221	0.38	0.49	-0.05255	0.014280451	-3.67965026	SIG	56	-0.10692645	Less than Small	-0.12011377	Less than small
MeritRating1ind	24943	0.07	0.26	MeritRating1ind	1221	0.08	0.27	0.00772	0.007912871	0.975568788	ns	57	0.029208931	Less than Small	0.107629251	Less than small
MeritRating2ind	24943	0.15	0.36	MeritRating2ind	1221	0.20	0.40	0.04724	0.011580493	4.079499904	SIG	58	0.125556204	Less than Small	0.318135163	Small
MeritRating3ind	24943	0.13	0.34	MeritRating3ind	1221	0.17	0.38	0.03499	0.010957719	3.192854621	SIG	59	0.097642616	Less than Small	0.26003154	Small
MeritRating4ind	24943	0.12	0.32	MeritRating4ind	1221	0.14	0.34	0.01636	0.010025407	1.632000019	ns	60	0.049032561	Less than Small	0.136809927	Less than small
MeritRating5ind	24943	0.10	0.30	MeritRating5ind	1221	0.11	0.31	0.00823	0.009150972	0.899867672	ns	61	0.026791944	Less than Small	0.081120543	Less than small
MeritRating6ind	24943	0.10	0.30	MeritRating6ind	1221	0.09	0.29	-0.00778	0.008478369	-0.91748584	ns	62	-0.02645362	Less than Small	-0.07817333	Less than small
MeritRating7ind	24943	0.29	0.46	MeritRating7ind	1221	0.19	0.39	-0.10894	0.011487257	-9.483222	SIG	63	-0.25809744	Small	-0.37049301	Less than small
MeritRatingHEOPind	24943	0.02	0.13	MeritRatingHEOPind	1221	0.02	0.14	0.00404	0.004133687	0.97674128	ns	64	0.030037923	Less than Small	0.245630331	Small
MeritRatingNew1to7	24180	4.55	2.09	MeritRatingNew1to7	1181	4.05	1.99	-0.50000	0.059299894	-8.43171834	SIG	66	-0.24557957	Small	-0.10989011	Less than small

MeritRatingNew1to9	24943	4.67	2.17	MeritRatingNew1to9	1221	4.20	2.12	-0.47404	0.062122019	-7.63083878	SIG	65	-0.22123157	Small	-0.10140614	Less than small
MeritRatingSSSind	24943	0.01	0.12	MeritRatingSSSind	1221	0.01	0.11	-0.00187	0.003241196	-0.57610054	ns	67	-0.01635641	Less than Small	-0.13194034	Less than small
MidFinancialNeedind	24943	0.08	0.26	MidFinancialNeedind	1221	0.07	0.26	-0.00408	0.007552181	-0.5400672	ns	68	-0.01564862	Less than Small	-0.05414297	Less than small
NativeAmericanAKNativeind	24943	0.00	0.07	NativeAmericanAKNativeind	1221	0.00	0.06	-0.00040	0.001876708	-0.21059939	ns	69	-0.00604577	Less than Small	-0.08802065	Less than small
NoFinancialAidApplind	24943	0.28	0.45	NoFinancialAidApplind	1221	0.18	0.39	-0.09748	0.011382561	-8.56360344	SIG	70	-0.2339139	Small	-0.35003418	Less than small
NoFinancialNeedind	24943	0.14	0.35	NoFinancialNeedind	1221	0.13	0.33	-0.01157	0.009778987	-1.18321965	ns	71	-0.03410691	Less than Small	-0.08353334	Less than small
NonResAlienind	24943	0.03	0.17	Internationalind	1221	0.00	0.00	-0.03055	0.001089683	-28.0353508	SIG	72	-0.35502722	Small	-1	Less than small
NumberOfSUPACredits	24943	0.00	0.00	NumberOfPACredits	1221	6.05	3.36	6.04668	0.096230491	62.83541726	SIG	73	3.596471864	Large	#DIV/0!	
SUPACreditIndicator	24943	0.00	0.00	PACreditIndicator	1221	1.00	0.00	1.00000	0	#DIV/0!	ns	74	#DIV/0!	Less than Small	#DIV/0!	
PersistingFallYear2ind	24943	0.91	0.29	PersistingFallYear2ind	1221	0.93	0.26	0.01997	0.007547413	2.646211959	SIG	75	0.073595721	Less than Small	0.021957113	Less than small
PersistingFallYear3ind	22317	0.86	0.34	PersistingFallYear3ind	1076	0.89	0.31	0.02865	0.009770451	2.93210592	SIG	76	0.087379739	Less than Small	0.033210605	Less than small
SATMath	24943	597.02	76.53	SATMath	1221	599.53	73.02	2.51717	2.145061812	1.173473439	ns	77	0.033664832	Less than Small	0.004216257	Less than small
SATVerbal	24943	576.00	78.71	SATVerbal	1221	580.57	72.27	4.56222	2.127359922	2.144547303	SIG	78	0.060435216	Less than Small	0.007920488	Less than small
APCreditsIndicator	24943	0.34	0.47	TestCreditsIndicator	1221	0.36	0.48	0.01627	0.01404221	1.158456854	ns	79	0.034127318	Less than Small	0.047730281	Less than small
TotalAPCredits	24943	3.38	6.12	TotalTestCredits	1221	3.48	6.08	0.09573	0.178361885	0.536701473	ns	80	0.015692049	Less than Small	0.028306964	Less than small
Unspecifiedind	24943	0.11	0.31	Unspecifiedind	1221	0.11	0.32	0.00938	0.009326528	1.005741479	ns	81	0.029984487	Less than Small	0.089096436	Less than small
Whiteind	24943	0.66	0.47	Whiteind	1221	0.74	0.44	0.07814	0.012878489	6.067568188	SIG	82	0.171720341	Less than Small	0.117704796	Less than small

APPENDIX C

2007-2008 First Year Merit Rating Guidelines

	Standard Criteria	Exception Column	Notes
1	*Academic Criteria:* Top 10% or 93 avg. or 4.0 GPA AND *Standardized Test Criteria:* SAT V/M 680 ± 10 points ACT 31 ± 1 point		1) All students with 1 or 2 portfolio/audition ratings should receive one merit level rating higher than the standard. 2) GPA is based on a 4.0 scale. 3) If rating is based on rank rather than GPA, evaluate carefully the strength of curriculum, % of college bound students, and overall strength of high school. 1. Grade distributions may help to determine rank. 4) Refer to SAT percentile ranks (Appendix H) for special populations as appropriate. 5) Use the highest test scores, either SAT or ACTs. 6) English as a second language. Look for TOEFL and/or English Proficiency Exam scores. 2. 7) Identify plus factors that warrant special consideration/GPA.
2	*Academic Criteria:* Top 20% or 92 avg. or 3.9 GPA AND *Standardized Test Criteria:* SAT V/M 640 ± 10 points ACT 29 ± 1 point	*Academic Criteria:* Top 10% or 92 avg. or 3.9 GPA AND *Standardized Test Criteria:* SAT V/M 600 ± 10 points ACT 27 ± 1 point	
3	*Academic Criteria:* Top 25% or 90 avg. or 3.7 GPA AND *Standardized Test Criteria:* SAT V/M 620 ± 10 points ACT 28 ± 1 point	*Academic Criteria:* Top 10% or 90 avg. or 3.7 GPA AND *Standardized Test Criteria:* SAT V/M 550 ± 10 points ACT 24	
4	*Academic Criteria:* Top 30% or 89 avg. or 3.6 GPA AND *Standardized Test Criteria:* SAT V/M 600 ± 10 points ACT 27 ± 1 point	*Academic Criteria:* Top 10% or 89 avg. or 3.6 GPA AND *Standardized Test Criteria:* SAT V/M 500 ± 10 points ACT 21	
5 **6**	*Academic Criteria:* Top 35% or 88 avg. or 3.4 GPA AND *Standardized Test Criteria:* SAT V/M 580 ± 10 points ACT 26 ± 1 point *Academic Criteria:* Top 40% or 87 avg. or 3.3 GPA AND *Standardized Test Criteria:* SAT V/M 560 ± 10 points ACT 25 ± 1 point	*Academic Criteria:* Top 15% or 88 avg. or 3.4 GPA AND *Standardized Test Criteria:* SAT V/M 500 ± 10 points ACT 21	
7	All others		

APPENDIX D

SU Leavers/Dropouts
National Student Clearinghouse Student Tracker

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
ACADEMY OF ART UNIVERSITY	4	Private	0	0.00	3	0.28	0	0.00	5	0.16
ADELPHI UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
ALBANY COLLEGE OF PHARMACY AND HEALTH SCIENCES	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
ALBRIGHT COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
ALFRED UNIVERSITY	4	Private	1	0.81	3	0.28	0	0.00	4	0.13
ALLEGHENY COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
ALVERNIA UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
AMERICAN RIVER COLLEGE LOS RIOS CC DISTRICT	2	Public	0	0.00	1	0.09	0	0.00	2	0.06
AMERICAN UNIVERSITY	4	Private	0	0.00	6	0.56	0	0.00	16	0.50
AMHERST COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ANDREWS UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ANNA MARIA COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ANNE ARUNDEL COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	3	0.09
ANTHEM INSTITUTE - NORTH BRUNSWICK	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ARAPAHOE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
ARCADIA UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
ARGOSY UNIVERSITY-PHX-ONLINE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ARIZONA STATE UNIVERSITY	4	Public	0	0.00	3	0.28	0	0.00	6	0.19
ART CENTER COLLEGE OF DESIGN	4	Private	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
ASHEVILLE-BUNCOMBE TECHNICAL COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
ASHFORD UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
ASHLAND UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
ASSUMPTION COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
ATLANTA TECHNICAL COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
ATLANTIC CAPE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
AUBURN UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
AUBURN UNIVERSITY AT MONTGOMERY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
AURORA UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
AUSTIN COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
BALTIMORE CITY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
BANK STREET COLLEGE OF EDUCATION	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
BARNARD COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
BATES COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
BELLEVUE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	5	0.16
BELMONT UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
BENNINGTON COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
BENTLEY UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
BERGEN COMMUNITY COLLEGE	2	Public	0	0.00	4	0.38	1	0.02	28	0.88
BERKELEY CITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
BERKLEE COLLEGE OF MUSIC	4	Private	0	0.00	1	0.09	0	0.00	3	0.09
BERKSHIRE COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	5	0.16
BLINN COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
BLOOMFIELD COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
BLOOMSBURG UNIVERSITY OF PENNSYLVANIA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
BOSTON COLLEGE	4	Private	1	0.81	10	0.94	0	0.00	13	0.41
BOSTON UNIVERSITY	4	Private	1	0.81	22	2.07	0	0.00	43	1.36
BOWIE STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
BOWLING GREEN STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
BRANDEIS UNIVERSITY	4	Private	0	0.00	3	0.28	0	0.00	5	0.16
BRIARCLIFFE COLLEGE- BETHPAGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
BRIDGEWATER STATE UNIVERSITY	4	Public	0	0.00	4	0.38	0	0.00	11	0.35
BRIGHAM YOUNG UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
BRISTOL COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	3	0.09
BROOKDALE COMMUNITY COLLEGE	2	Public	0	0.00	3	0.28	0	0.00	18	0.57
BROOKHAVEN COLLEGE-DALLAS CC DISTRICT	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
BROWN UNIVERSITY	4	Private	0	0.00	3	0.28	0	0.00	1	0.03
BRYANT & STRATTON COLLEGE - NORTH	4	Private	1	0.81	0	0.00	0	0.00	0	0.00
BRYANT & STRATTON COLLEGE - SYRACUSE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
BRYANT UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
BUCKNELL UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
BUCKS COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	5	0.16
BUFFALO STATE COLLEGE	4	Public	0	0.00	2	0.19	0	0.00	7	0.22
BUNKER HILL COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	3	0.09
BURLINGTON COUNTY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	5	0.16
CABRINI COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CALIFORNIA COLLEGE OF THE ARTS	4	Private	0	0.00	1	0.09	0	0.00	3	0.09
CALIFORNIA INSTITUTE OF THE ARTS	4	Private	0	0.00	0	0.00	0	0.00	4	0.13

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
CALIFORNIA STATE UNIVERSITY - FULLERTON	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
CALIFORNIA STATE UNIVERSITY - LONG BEACH	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
CALIFORNIA STATE UNIVERSITY - LOS ANGELES	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
CALIFORNIA STATE UNIVERSITY - NORTHRIDGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
CALIFORNIA STATE UNIVERSITY - SACRAMENTO	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
CALIFORNIA UNIVERSITY OF PENNSYLVANIA	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
CAMBRIDGE COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
CAMDEN COUNTY COLLEGE	2	Public	0	0.00	3	0.28	0	0.00	5	0.16
CAMPBELL UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
CANADA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CANISIUS COLLEGE	4	Private	0	0.00	5	0.47	0	0.00	4	0.13
CAPE COD COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	6	0.19
CAPE FEAR COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
CARNEGIE MELLON UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
CARROLL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CARTERET COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CASE WESTERN RESERVE UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
CENTENARY COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
CENTRAL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CENTRAL CONNECTICUT STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	6	0.19
CENTRAL PIEDMONT COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
CENTRAL TEXAS COLLEGE-TRADITIONAL	2	Public	1	0.81	0	0.00	0	0.00	0	0.00
CHABOT COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CHAFFEY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
CHAMPLAIN COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CHAPMAN UNIVERSITY-AC 2	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CHAPMAN UNIVERSITY-ORANGE	4	Private	0	0.00	3	0.28	0	0.00	1	0.03
CHARTER OAK STATE COLLEGE	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
CHESAPEAKE COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
CHESTNUT HILL COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
CHRISTIAN BROTHERS UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CHRISTOPHER NEWPORT UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
CINCINNATI STATE TECHNICAL AND COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CISCO COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CITRUS COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CITY COLLEGE OF SAN FRANCISCO	2	Public	0	0.00	1	0.09	0	0.00	6	0.19
CITY OF CHICAGO - HARRY S TRUMAN COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
CITY OF CHICAGO - WRIGHT COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CLAREMONT GRADUATE UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
CLAREMONT MCKENNA COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
CLARION UNIVERSITY OF PENNSYLVANIA	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
CLARK COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
CLARK UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	5	0.16
CLARKSON UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
CLEMSON UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
CLEVELAND STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
COASTAL CAROLINA COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
COASTAL CAROLINA UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
COASTLINE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
COLBY COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
COLBY SAWYER COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
COLGATE UNIVERSITY	4	Private	0	0.00	3	0.28	0	0.00	3	0.09
COLLEGE OF CHARLESTON	4	Public	0	0.00	3	0.28	0	0.00	2	0.06
COLLEGE OF DUPAGE	2	Public	0	0.00	2	0.19	0	0.00	1	0.03
COLLEGE OF LAKE COUNTY	2	Public	0	0.00	4	0.38	0	0.00	3	0.09
COLLEGE OF MOUNT ST VINCENT	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
COLLEGE OF NEW JERSEY	4	Public	0	0.00	3	0.28	0	0.00	7	0.22
COLLEGE OF NEW ROCHELLE-UNDERGRADS	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
COLLEGE OF SAINT ROSE	4	Private	1	0.81	0	0.00	0	0.00	3	0.09
COLLEGE OF SAN MATEO	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
COLLEGE OF SOUTHERN MARYLAND	2	Public	0	0.00	2	0.19	0	0.00	2	0.06
COLLEGE OF SOUTHERN NEVADA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
COLLEGE OF THE CANYONS	2	Public	0	0.00	1	0.09	0	0.00	2	0.06
COLLEGE OF THE DESERT, COACHELLA	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
COLLEGE OF THE HOLY CROSS	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
COLLEGE OF WILLIAM & MARY	4	Public	0	0.00	3	0.28	0	0.00	6	0.19
COLLIN COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
COLORADO MOUNTAIN COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
COLORADO STATE UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	6	0.19
COLORADO STATE UNIVERSITY - PUEBLO	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
COLUMBIA COLLEGE ADULT8WK UNDERGRAD	4	Private	1	0.81	3	0.28	0	0.00	1	0.03
COLUMBIA COLLEGE CHICAGO	4	Private	0	0.00	1	0.09	0	0.00	5	0.16

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
COLUMBUS STATE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
COMMUNITY COLLEGE OF ALLEGHENY COUNTY @ MAIN	2	Public	0	0.00	3	0.28	0	0.00	6	0.19
COMMUNITY COLLEGE OF AURORA	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
COMMUNITY COLLEGE OF BALTIMORE COUNTY	2	Public	0	0.00	3	0.28	0	0.00	5	0.16
COMMUNITY COLLEGE OF PHILADELPHIA	2	Public	0	0.00	0	0.00	0	0.00	6	0.19
COMMUNITY COLLEGE OF RHODE ISLAND	2	Public	0	0.00	0	0.00	0	0.00	4	0.13
COMMUNITY COLLEGE OF RHODE ISLAND-LINCOLN	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
COMMUNITY COLLEGE OF RHODE ISLAND-PROVIDENCE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
COMMUNITY COLLEGE OF VERMONT	2	Public	0	0.00	2	0.19	0	0.00	2	0.06
CONNECTICUT COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
CORNELL UNIVERSITY	4	Private	3	2.44	24	2.26	0	0.00	10	0.32
CORNELL UNIVERSITY - ENG/ARCH/IRL/HUM.EC/HOTEL	4	Public	0	0.00	12	1.13	1	0.02	17	0.54
CORNELL UNIVERSITY-ARTS	4	Public	0	0.00	5	0.47	0	0.00	5	0.16
CORNELL UNIVERSITY-GRADS/JGSM/LAW/VET	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
COUNTY COLLEGE OF MORRIS	2	Public	0	0.00	2	0.19	0	0.00	11	0.35
COWLEY COUNTY COMMUNITY JUNIOR	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CUESTA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
CULINARY INSTITUTE OF AMERICA	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CUNY BERNARD M. BARUCH COLLEGE	4	Public	1	0.81	6	0.56	0	0.00	12	0.38
CUNY BOROUGH OF MANHATTAN	2	Public	1	0.81	4	0.38	0	0.00	17	0.54
CUNY BRONX COMMUNITY COLLEGE	2	Public	0	0.00	4	0.38	0	0.00	5	0.16
CUNY BROOKLYN COLLEGE	4	Public	0	0.00	3	0.28	0	0.00	10	0.32
CUNY CITY COLLEGE	4	Public	0	0.00	4	0.38	0	0.00	15	0.47
CUNY COLLEGE OF STATEN ISLAND	4	Public	0	0.00	2	0.19	0	0.00	4	0.13

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
CUNY GRADUATE SCHOOL AND UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
CUNY HOSTOS CMTY COLLEGE & CUNY	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
CUNY HUNTER COLLEGE	4	Public	1	0.81	13	1.22	0	0.00	28	0.88
CUNY JOHN JAY COLLEGE OF CRIMINAL JUSTICE	4	Public	0	0.00	2	0.19	0	0.00	3	0.09
CUNY KINGSBOROUGH COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	7	0.22
CUNY LAGUARDIA COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	10	0.32
CUNY LEHMAN COLLEGE	4	Public	0	0.00	3	0.28	0	0.00	7	0.22
CUNY MEDGAR EVERS COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
CUNY NEW YORK CITY COLLEGE OF TECHNOLOGY	4	Public	0	0.00	0	0.00	0	0.00	5	0.16
CUNY QUEENS COLLEGE	4	Public	0	0.00	4	0.38	0	0.00	9	0.28
CUNY QUEENSBOROUGH COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	10	0.32
CURRY COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
CUYAHOGA COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	4	0.13
CUYAMACA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
DAEMEN COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	3	0.09
DANIEL WEBSTER COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
DAYTONA STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
DE ANZA COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	3	0.09
DEAN COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
DELAWARE COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	4	0.13
DELAWARE STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
DELAWARE TECHNICAL AND CC -STANTON/WILMINGT	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
DELAWARE TECHNICAL AND COMMUNITY COLLEGE-OWENS	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
DELTA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
DENISON UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
DEPAUL UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	6	0.19
DEPAUW UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
DES MOINES AREA COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
DIABLO VALLEY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	3	0.09
DOWLING COLLEGE	4	Private	1	0.81	1	0.09	0	0.00	2	0.06
DREW UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
DREXEL UNIVERSITY	4	Private	0	0.00	2	0.19	0	0.00	8	0.25
DREXEL UNIVERSITY - HEALTH SCIENCES	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
DUQUESNE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
EAST STROUDSBURG UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
EAST TENNESSEE STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
EASTERN CONNECTICUT STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
EASTERN ILLINOIS UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
EASTERN KENTUCKY UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
EASTERN MICHIGAN UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	1	0.03
EASTERN UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
EASTERN WASHINGTON UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
ECKERD COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
EDINBORO UNIVERSITY OF PENNSYLVANIA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
EDISON STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
EL CAMINO COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
ELIZABETHTOWN COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
ELMIRA COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
EMBRY-RIDDLE AERONAUTICAL UNIV.-WORLDWIDE CAMPUS	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
EMBRY-RIDDLE AERONAUTICAL UNIVERSITY - DAYTONA	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
EMERSON COLLEGE	4	Private	1	0.81	2	0.19	1	0.02	14	0.44
EMMANUEL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
EMORY UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
EMORY UNIVERSITY-OXFORD	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ENDICOTT COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
ESSEX COUNTY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	3	0.09
EVEREST INSTITUTE-SOUTH PLAINFIELD	2	Private	0	0.00	0	0.00	0	0.00	1	0.03
FAIRFIELD UNIVERSITY	4	Private	0	0.00	3	0.28	0	0.00	7	0.22
FAIRLEIGH DICKINSON UNIVERSITY - MADISON	4	Private	0	0.00	0	0.00	0	0.00	6	0.19
FAIRLEIGH DICKINSON UNIVERSITY - TEANECK	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
FEATHER RIVER COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
FERRUM COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
FITCHBURG STATE UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	2	0.06
FLORIDA A&M UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
FLORIDA ATLANTIC UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	3	0.09
FLORIDA INTERNATIONAL UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	11	0.35
FLORIDA SOUTHERN COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
FLORIDA STATE COLLEGE AT JACKSONVILLE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
FLORIDA STATE UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	6	0.19
FOOTHILL COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	0	0.00
FORDHAM UNIVERSITY	4	Private	0	0.00	11	1.03	0	0.00	24	0.76
FOX VALLEY TECHNICAL COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
FRAMINGHAM STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	1	0.03
FRANCISCAN UNIVERSITY OF STEUBENVILLE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
FRANKLIN PIERCE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
FRANKLIN UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
FULLERTON COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
GANNON UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
GATEWAY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	2	0.06
GEORGE MASON UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
GEORGE WASHINGTON UNIVERSITY	4	Private	0	0.00	5	0.47	0	0.00	20	0.63
GEORGETOWN UNIV - GRAD SCHOOL	2	Private	0	0.00	1	0.09	0	0.00	0	0.00
GEORGETOWN UNIVERSITY	4	Private	0	0.00	9	0.85	1	0.02	6	0.19
GEORGIA PERIMETER COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
GEORGIA STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
GETTYSBURG COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
GLENDALE COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	4	0.13
GLOUCESTER COUNTY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
GODDARD COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
GOLDEN WEST COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
GONZAGA UNIVERSITY	4	Private	0	0.00	2	0.19	0	0.00	1	0.03
GOUCHER COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
GRAND RAPIDS COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
GRAND VALLEY STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
GRANITE STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
GREENFIELD COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
GREENVILLE TECHNICAL COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
GROSSMONT COLLEGE	2	Public	0	0.00	0	0.00	1	0.02	1	0.03
HAMILTON COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
HAMLINE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
HAMPSHIRE COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
HAMPTON UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
HARDIN-SIMMONS UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
HARFORD COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
HARRISBURG AREA COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	6	0.19
HARTWICK COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
HARVARD - LAW SCHOOL	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
HARVARD GRADUATE SCHOOL OF EDUCATION	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
HARVARD UNIVERSITY - CONTINUING ED	4	Private	0	0.00	3	0.28	0	0.00	5	0.16
HAWKEYE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
HESSER COLLEGE - MANCHESTER	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
HIGHLINE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
HOFSTRA UNIVERSITY	4	Private	4	3.25	9	0.85	0	0.00	22	0.69
HOLYOKE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	6	0.19
HOUGHTON COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
HOUSATONIC COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
HOUSTON BAPTIST UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
HOUSTON COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	5	0.16
HOWARD COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	5	0.16
HUDSON COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
HUSSON COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
ILLINOIS VALLEY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
ILLINOIS WESLEYAN UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
IMMACULATA UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
INDIAN HILLS COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
INDIAN RIVER STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
INDIANA UNIVERSITY BLOOMINGTON	4	Public	0	0.00	2	0.19	0	0.00	4	0.13
INVER HILLS COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
IONA COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
IOWA CENTRAL COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
IOWA STATE UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	2	0.06
ITHACA COLLEGE	4	Private	0	0.00	7	0.66	2	0.04	7	0.22
ITT TECHNICAL INSTITUTE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
ITT TECHNICAL INSTITUTE	L	Private	0	0.00	0	0.00	1	0.02	2	0.06
J.SARGEANT REYNOLDS COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
JAMES MADISON UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	4	0.13
JEFFERSON COMMUNITY AND TECHNICAL COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
JOHN TYLER COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
JOHNS HOPKINS UNIVERSITY ARTS,SCIENCES ENGINEERING	4	Private	0	0.00	2	0.19	0	0.00	0	0.00
JOHNSON & WALES UNIVERSITY	4	Private	1	0.81	1	0.09	0	0.00	7	0.22
JOHNSON COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	3	0.09
JOHNSON STATE COLLEGE	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
KANSAS STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
KAPIOLANI COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
KATHARINE GIBBS SCHOOL - MONTCLAIR	2	Private	0	0.00	0	0.00	0	0.00	1	0.03
KEAN UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	3	0.09
KEENE STATE COLLEGE	4	Public	0	0.00	1	0.09	0	0.00	3	0.09
KENDALL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
KENT STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
KEUKA COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
KING'S COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
KUTZTOWN UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
LA ROCHE COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
LA SALLE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
LABORATORY INSTITUTE OF MERCHANDISING	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
LAFAYETTE COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
LAKE FOREST COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
LAKE TAHOE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
LAKELAND COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
LAMAR UNIVERSITY - BEAUMONT	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
LANCASTER COUNTY CAREER & TECHNOLOGY CTR	2	Private	0	0.00	0	0.00	0	0.00	1	0.03
LANDMARK COLLEGE	2	Private	0	0.00	1	0.09	0	0.00	0	0.00
LASELL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
LAWRENCE MEMORIAL HOSPITAL, SCHOOL OF NURSING	2	Private	0	0.00	0	0.00	0	0.00	1	0.03
LE MOYNE COLLEGE	4	Private	2	1.63	2	0.19	1	0.02	8	0.25
LEBANON VALLEY COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
LEEWARD COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
LEHIGH CARBON COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	4	0.13

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
LEHIGH UNIVERSITY	4	Private	0	0.00	2	0.19	0	0.00	9	0.28
LESLEY UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	5	0.16
LETOURNEAU UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
LINFIELD COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
LIPSCOMB UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
LOCK HAVEN UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
LONE STAR COLLEGE SYSTEM DISTRICT	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
LONG BEACH CITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
LONG ISLAND UNIV - BROOKLYN	4	Private	0	0.00	0	0.00	0	0.00	4	0.13
LONG ISLAND UNIVERSITY	4	Private	2	1.63	0	0.00	0	0.00	12	0.38
LORAIN COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
LORD FAIRFAX COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
LOS ANGELES CITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
LOS ANGELES MISSION COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
LOS ANGELES VALLEY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
LOUISIANA STATE UNIVERSITY - AG	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
LOYOLA MARYMOUNT UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
LOYOLA UNIVERSITY CHICAGO	4	Private	0	0.00	2	0.19	0	0.00	2	0.06
LOYOLA UNIVERSITY IN NEW ORLEANS	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
LOYOLA UNIVERSITY MARYLAND	4	Private	0	0.00	2	0.19	0	0.00	5	0.16
LUZERNE COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
LYCOMING COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
LYNDON STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
MACOMB COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
MADISON AREA TECHNICAL COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
MAINE COLLEGE OF ART	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MANCHESTER COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
MANHATTAN COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	4	0.13
MANHATTAN SCHOOL OF MUSIC	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
MANHATTANVILLE COLLEGE-BA	4	Private	0	0.00	0	0.00	0	0.00	7	0.22
MARIETTA COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MARION MILITARY INSTITUTE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
MARIST COLLEGE	4	Private	0	0.00	2	0.19	0	0.00	8	0.25
MARQUETTE UNIVERSITY	4	Private	0	0.00	2	0.19	0	0.00	1	0.03
MARYLAND INSTITUTE, COLLEGE OF ART	4	Private	0	0.00	1	0.09	0	0.00	7	0.22
MARYMOUNT MANHATTAN COLLEGE	4	Private	0	0.00	2	0.19	0	0.00	8	0.25
MARYMOUNT UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
MARYWOOD UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
MASSACHUSETTS BAY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	8	0.25
MASSACHUSETTS COLLEGE OF ART	4	Public	0	0.00	3	0.28	0	0.00	9	0.28
MASSACHUSETTS COLLEGE OF LIBERAL ARTS	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
MASSACHUSETTS COLLEGE OF PHARMACY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MASSASOIT COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	3	0.09
MAYO CLINIC COLL OF MEDICINE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MC DANIEL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MCLENNAN COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
MEDAILLE COLLEGE	4	Private	1	0.81	0	0.00	0	0.00	2	0.06
MERCER COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	5	0.16

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
MERCY COLLEGE	2	Private	0	0.00	1	0.09	0	0.00	0	0.00
MERCY COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
MERCYHURST COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MERRIMACK COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
METROPOLITAN COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
METROPOLITAN STATE COLLEGE OF DENVER	4	Public	0	0.00	1	0.09	0	0.00	3	0.09
MIAMI DADE COLLEGE	4	Public	0	0.00	2	0.19	0	0.00	4	0.13
MIAMI UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	6	0.19
MICHIGAN STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	5	0.16
MIDDLEBURY COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
MIDDLESEX COMMUNITY COLLEGE	2	Public	0	0.00	4	0.38	0	0.00	13	0.41
MIDDLESEX COUNTY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	4	0.13
MILLERSVILLE UNIVERSITY OF PENNSYLVANIA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
MINNEAPOLIS COLLEGE OF ART AND DESIGN	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MINNESOTA WEST COMM & TECH CLG-SPRINGFIELD	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
MIRACOSTA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
MISSISSIPPI STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
MISSOURI STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
MODESTO JUNIOR COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
MOLLOY COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MONMOUTH UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MONROE COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	4	0.13
MONTANA STATE UNIVERSITY - BOZEMAN	4	Public	0	0.00	3	0.28	0	0.00	2	0.06
MONTCLAIR STATE UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	16	0.50

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
MONTGOMERY COLLEGE	2	Public	0	0.00	6	0.56	0	0.00	6	0.19
MONTGOMERY COLLEGE - GERMANTOWN	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
MONTGOMERY COLLEGE - TAKOMA PARK	2	Public	0	0.00	1	0.09	0	0.00	2	0.06
MONTGOMERY COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	8	0.25
MOORE COLLEGE OF ART AND DESIGN	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
MOORPARK COLLEGE	2	Public	0	0.00	3	0.28	0	0.00	0	0.00
MORAINE VALLEY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
MORGAN STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
MOTT COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
MOUNT HOLYOKE COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
MOUNT IDA COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
MOUNT WACHUSETT COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	2	0.06
MOUNTAIN STATE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
MUHLENBERG COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
NAROPA UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
NASSAU COMMUNITY COLLEGE	2	Public	7	5.69	8	0.75	3	0.06	35	1.10
NATIONAL COLLEGE	2	Private	0	0.00	0	0.00	0	0.00	1	0.03
NAUGATUCK VALLEY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	3	0.09
NAZARETH COLLEGE OF ROCHESTER	4	Private	0	0.00	0	0.00	1	0.02	6	0.19
NEUMANN UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
NEW ENGLAND COLLEGE-SEMESTERS	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
NEW ENGLAND SCHOOL OF LAW	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
NEW JERSEY CITY UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NEW JERSEY INSTITUTE OF TECHNOLOGY	4	Public	0	0.00	1	0.09	0	0.00	4	0.13

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
NEW MEXICO STATE UNIVERSITY-MAIN	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
NEW YORK INSTITUTE OF TECHNOLOGY- OLD WESTBURY	4	Private	0	0.00	1	0.09	0	0.00	7	0.22
NEW YORK MEDICAL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
NEW YORK SCHOOL OF INTERIOR DESIGN	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
NEW YORK UNIVERSITY	4	Private	1	0.81	29	2.73	6	0.12	71	2.24
NHTI - CONCORD'S COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
NIAGARA UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	5	0.16
NICHOLLS STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORFOLK STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORMANDALE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORTH CAROLINA A&T STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORTH CAROLINA CENTRAL UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
NORTH CAROLINA STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORTH CENTRAL TEXAS COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
NORTH DAKOTA STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORTH IDAHO COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
NORTH SHORE COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
NORTHAMPTON COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	4	0.13
NORTHEASTERN UNIVERSITY	4	Private	0	0.00	6	0.56	0	0.00	13	0.41
NORTHEASTERN UNIVERSITY - LAW/SPCS	4	Private	0	0.00	2	0.19	0	0.00	4	0.13
NORTHERN ARIZONA UNIVERSITY	4	Public	1	0.81	1	0.09	0	0.00	0	0.00
NORTHERN ESSEX COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORTHERN ILLINOIS UNIVERSITY	4	Public	1	0.81	1	0.09	0	0.00	0	0.00
NORTHERN KENTUCKY UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
NORTHERN MICHIGAN UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
NORTHERN VIRGINIA COMMUNITY COLLEGE	2	Public	1	0.81	2	0.19	0	0.00	12	0.38
NORTHLAND COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
NORTHWEST FLORIDA STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORTHWESTERN STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
NORTHWESTERN UNIVERSITY	4	Private	0	0.00	7	0.66	0	0.00	6	0.19
NORTHWOOD UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
NORWALK COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	8	0.25
NORWICH UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
NYACK COLLEGE- GRADUATE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
OAKLAND COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	3	0.09
OAKLAND UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
OAKTON COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	3	0.09
OBERLIN COLLEGE	4	Private	0	0.00	4	0.38	0	0.00	1	0.03
OCCIDENTAL COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
OCEAN COUNTY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	8	0.25
OGLETHORPE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
OHIO UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	7	0.22
OHIO WESLEYAN UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
OKLAHOMA CITY UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
OKLAHOMA STATE UNIVERSITY - STILLWATER	4	Public	0	0.00	1	0.09	0	0.00	1	0.03
OLD DOMINION UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
ORANGE COAST COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
ORANGEBURG-CALHOUN TECHNICAL COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
OREGON STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
PACE UNIVERSITY	4	Private	2	1.63	1	0.09	0	0.00	8	0.25
PACE UNIVERSITY - PLEASANTVILLE	4	Private	0	0.00	2	0.19	0	0.00	7	0.22
PACIFIC LUTHERAN UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
PACIFIC UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
PALM BEACH STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	5	0.16
PALOMAR COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
PARK UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
PARKLAND COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
PASADENA CITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	1	0.03
PASSAIC COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	12	0.38
PAUL SMITH'S COLLEGE OF THE ADIRONDACKS	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
PEIRCE COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
PENNSYLVANIA STATE UNIVERSITY	4	Public	0	0.00	15	1.41	0	0.00	33	1.04
PEPPERDINE UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
PHILADELPHIA BIBLICAL UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
PHILADELPHIA UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
PIEDMONT VIRGINIA COMM COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
PIERCE COLLEGE - MILITARY PROGRAM	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
PIKES PEAK COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
PLYMOUTH STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
POINT PARK UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
POLYTECHNIC INSTITUTE OF NEW YORK UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	3	0.09
PONTIFICAL CATHOLIC UNIVERSITY OF PUERTO RICO	4	Private	0	0.00	0	0.00	0	0.00	2	0.06

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
PORTLAND COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
PORTLAND STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
PRATT INSTITUTE	4	Private	0	0.00	1	0.09	0	0.00	5	0.16
PRESBYTERIAN COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
PRESCOTT COLLEGE-RESIDENT DEGREE PROGRAM	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
PRINCE GEORGES COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	5	0.16
PROVIDENCE COLLEGE	4	Private	1	0.81	0	0.00	0	0.00	9	0.28
PURDUE UNIVERSITY - WEST LAFAYETTE	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
QUINCY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	3	0.09
QUINNIPIAC UNIVERSITY	4	Private	0	0.00	1	0.09	2	0.04	6	0.19
QUINSIGAMOND COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
RADFORD UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
RAMAPO COLLEGE OF NEW JERSEY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
RARITAN VALLEY COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	6	0.19
READING AREA COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
RED ROCKS COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
REGENT UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
REGIS COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
RENSSELAER POLYTECHNIC INSTITUTE	4	Private	0	0.00	2	0.19	1	0.02	1	0.03
RENTON TECHNICAL COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
RHODE ISLAND COLLEGE	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
RHODE ISLAND SCHOOL OF DESIGN	4	Private	0	0.00	3	0.28	0	0.00	5	0.16
RICE UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
RICHARD STOCKTON COLLEGE OF NEW JERSEY	4	Public	0	0.00	1	0.09	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
RICHLAND COLLEGE-DALLAS CC DISTRICT	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
RIDER UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	4	0.13
RINGLING COLLEGE OF ART AND DESIGN	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
RIVERSIDE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
RIVIER COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
ROBERT MORRIS UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
ROBERTS WESLEYAN COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
ROCHESTER INSTITUTE OF TECHNOLOGY	4	Private	2	1.63	3	0.28	0	0.00	14	0.44
ROCKHURST UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ROCKY MOUNTAIN COLLEGE OF ART & DESIGN	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
ROGER WILLIAMS UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
ROLLINS COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ROOSEVELT UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
ROWAN UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	5	0.16
ROXBURY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
RUTGERS - THE STATE UNIVERSITY OF NJ - CAMDEN	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
RUTGERS - THE STATE UNIVERSITY OF NJ - NEWARK	4	Public	1	0.81	1	0.09	0	0.00	7	0.22
RUTGERS -THE STATE UNIVERSITY OF NJ -NEW BRUNSWICK	4	Public	1	0.81	9	0.85	0	0.00	36	1.14
SACRAMENTO CITY COLLEGE-LOS RIOS CC DISTRICT	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SADDLEBACK COLLEGE	2	Public	0	0.00	4	0.38	0	0.00	5	0.16
SAGE COLLEGES	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
SAGINAW VALLEY STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
SAINT ANSELM COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SAINT FRANCIS UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
SAINT LOUIS UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SAINT MARY'S COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
SAINT MICHAELS COLLEGE	4	Private	0	0.00	3	0.28	0	0.00	2	0.06
SALEM STATE UNIVERSITY	4	Public	0	0.00	3	0.28	0	0.00	13	0.41
SALISBURY UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
SALT LAKE COMMUNITY COLLEGE	2	Public	1	0.81	0	0.00	0	0.00	0	0.00
SALVE REGINA UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
SAMFORD UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
SAMUEL MERRITT UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SAN DIEGO MESA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	3	0.09
SAN DIEGO MIRAMAR COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
SAN DIEGO STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
SAN FRANCISCO STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
SANTA ANA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
SANTA BARBARA CITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	4	0.13
SANTA CLARA UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
SANTA FE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
SANTA FE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SANTA FE UNIVERSITY OF ART AND DESIGN	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
SANTA MONICA COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	14	0.44
SANTA ROSA JUNIOR COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
SARAH LAWRENCE COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
SAVANNAH COLLEGE OF ART & DESIGN	4	Private	0	0.00	3	0.28	0	0.00	4	0.13
SCHENECTADY COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	5	0.16

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
SCHOOL OF THE ART INSTITUTE OF CHICAGO	4	Private	0	0.00	3	0.28	0	0.00	5	0.16
SCHOOL OF VISUAL ARTS	4	Private	1	0.81	1	0.09	0	0.00	6	0.19
SCHOOLCRAFT COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SCRIPPS COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SEATTLE CENTRAL COMMUNITY COLLEGE	4	Public	0	0.00	1	0.09	0	0.00	4	0.13
SEATTLE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SEMINOLE STATE COLLEGE OF FLORIDA	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SETON HALL UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
SHENANDOAH UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
SHEPHERD UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
SHORELINE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
SHORTER UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SIENA COLLEGE	4	Private	0	0.00	2	0.19	0	0.00	3	0.09
SIERRA COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SIMMONS COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	4	0.13
SIMMONS COLLEGE - GRADS	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SIT GRADUATE INSTITUTE NON TRADITIONAL	2	Private	0	0.00	1	0.09	0	0.00	1	0.03
SKIDMORE COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	6	0.19
SMITH COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
SOUTH PUGET SOUND COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
SOUTH SEATTLE COMMUNITY COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
SOUTH SUBURBAN COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SOUTHAMPTON COLLEGE OF LONG ISLAND UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	3	0.09
SOUTHERN CONNECTICUT STATE UNIVERSITY	4	Public	0	0.00	3	0.28	0	0.00	9	0.28

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
SOUTHERN ILLINOIS UNIVERSITY CARBONDALE	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
SOUTHERN MAINE COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SOUTHERN METHODIST UNIVERSITY	4	Private	0	0.00	2	0.19	0	0.00	0	0.00
SOUTHERN NEW HAMPSHIRE- 08WEEK UNGRAD	4	Private	1	0.81	0	0.00	0	0.00	1	0.03
SOUTHERN NEW HAMPSHIRE- 15WEEK UNGRAD	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SOUTHWESTERN ILLINOIS COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SOUTHWESTERN UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SPELMAN COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
SPOKANE FALLS COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SPRINGFIELD COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
SPRINGFIELD TECHNICAL COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	6	0.19
ST BONAVENTURE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	4	0.13
ST CLOUD TECHNICAL AND COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
ST FRANCIS COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ST JOHN FISHER COLLEGE	4	Private	0	0.00	1	0.09	1	0.02	5	0.16
ST JOHNS UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	14	0.44
ST JOSEPH COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ST JOSEPH'S COLLEGE - SUFFOLK	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ST JOSEPH'S UNIVERSITY	4	Private	1	0.81	2	0.19	0	0.00	6	0.19
ST LAWRENCE UNIVERSITY	4	Private	1	0.81	0	0.00	0	0.00	1	0.03
ST LOUIS COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	3	0.09
ST LOUIS COMMUNITY COLLEGE AT MERAMEC	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
ST MARY'S COLLEGE OF CALIFORNIA	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ST MARYS COLLEGE OF MARYLAND	4	Public	0	0.00	1	0.09	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
ST OLAF COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
ST PETERS COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
ST PETERSBURG COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
STATE COLLEGE OF FLORIDA, MANATEE-SARASOTA	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
STETSON UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
STEVENSON UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
STONEHILL COLLEGE	4	Private	0	0.00	3	0.28	0	0.00	0	0.00
STRAYER UNIVERSITY-WASHINGTON	4	Private	1	0.81	0	0.00	0	0.00	0	0.00
SUFFOLK UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	10	0.32
SUNY ADIRONDACK COMM COLL	2	Public	1	0.81	0	0.00	0	0.00	7	0.22
SUNY ALBANY	4	Public	3	2.44	7	0.66	1	0.02	18	0.57
SUNY BINGHAMTON	4	Public	1	0.81	13	1.22	0	0.00	28	0.88
SUNY BROOME COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	1	0.02	10	0.32
SUNY CAYUGA COUNTY COMMUNITY	2	Public	1	0.81	2	0.19	0	0.00	9	0.28
SUNY CLINTON COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SUNY COBLESKILL	4	Public	1	0.81	0	0.00	0	0.00	1	0.03
SUNY COLLEGE - BROCKPORT	4	Public	1	0.81	4	0.38	0	0.00	2	0.06
SUNY COLLEGE - CORTLAND	4	Public	0	0.00	0	0.00	1	0.02	8	0.25
SUNY COLLEGE - GENESEO	4	Public	0	0.00	7	0.66	0	0.00	2	0.06
SUNY COLLEGE - OLD WESTBURY	4	Public	0	0.00	1	0.09	0	0.00	4	0.13
SUNY COLLEGE AT FREDONIA	4	Public	0	0.00	2	0.19	0	0.00	8	0.25
SUNY COLLEGE AT PURCHASE	4	Public	0	0.00	3	0.28	0	0.00	4	0.13
SUNY COLLEGE OF ENVIRONMENTAL	4	Public	0	0.00	2	0.19	0	0.00	1	0.03
SUNY COLLEGE OF TECHNOLOGY @ DELHI	4	Public	0	0.00	1	0.09	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
SUNY COLLEGE OF TECHNOLOGY AT CANTON	4	Public	0	0.00	0	0.00	0	0.00	11	0.35
SUNY COLLEGE ONEONTA	4	Public	1	0.81	0	0.00	0	0.00	1	0.03
SUNY COLLEGE PLATTSBURGH	4	Public	1	0.81	0	0.00	0	0.00	2	0.06
SUNY COLLEGE POTSDAM	4	Public	0	0.00	1	0.09	0	0.00	3	0.09
SUNY CORNING COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SUNY DUTCHESS COMMUNITY COLLEGE	2	Public	0	0.00	4	0.38	0	0.00	3	0.09
SUNY EMPIRE STATE COLLEGE	4	Public	1	0.81	1	0.09	0	0.00	3	0.09
SUNY ERIE COMMUNITY COLLEGE-CITY CAMPUS	2	Public	0	0.00	5	0.47	0	0.00	4	0.13
SUNY FARMINGDALE	4	Public	0	0.00	1	0.09	0	0.00	6	0.19
SUNY FASHION INSTITUTE OF TECHNOLOGY	4	Public	2	1.63	6	0.56	1	0.02	34	1.07
SUNY FINGER LAKES COMMUNITY COLLEGE	2	Public	0	0.00	3	0.28	0	0.00	4	0.13
SUNY FULTON-MONTGOMERY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
SUNY GENESEE COMMUNITY COLLEGE	2	Public	0	0.00	2	0.19	0	0.00	2	0.06
SUNY HERKIMER COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	9	0.28
SUNY HUDSON VALLEY COMMUNITY COLLEGE	2	Public	2	1.63	2	0.19	1	0.02	11	0.35
SUNY INSTITUTE OF TECH AT UTICA-ROME	4	Public	1	0.81	2	0.19	0	0.00	4	0.13
SUNY JAMESTOWN COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	4	0.13
SUNY JEFFERSON COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	6	0.19
SUNY MOHAWK VALLEY COMMUNITY COLLEGE	2	Public	2	1.63	1	0.09	0	0.00	7	0.22
SUNY MONROE COMMUNITY COLLEGE	2	Public	3	2.44	12	1.13	1	0.02	26	0.82
SUNY MORRISVILLE	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
SUNY NEW PALTZ	4	Public	0	0.00	2	0.19	0	0.00	4	0.13
SUNY NIAGARA COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	9	0.28
SUNY NORTH COUNTRY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	3	0.09

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
SUNY ONONDAGA COMMUNITY COLLEGE	2	Public	32	26.02	33	3.10	8	0.16	167	5.27
SUNY ORANGE COUNTY COMMUNITY COLLEGE	2	Public	2	1.63	3	0.28	0	0.00	5	0.16
SUNY OSWEGO	4	Public	0	0.00	2	0.19	3	0.06	10	0.32
SUNY ROCKLAND COMMUNITY COLLEGE	2	Public	2	1.63	0	0.00	0	0.00	10	0.32
SUNY STONY BROOK UNIVERSITY	4	Public	2	1.63	5	0.47	1	0.02	14	0.44
SUNY SUFFOLK COUNTY CC - BRENTWOOD	2	Public	1	0.81	0	0.00	0	0.00	3	0.09
SUNY SUFFOLK COUNTY CC - RIVERHEAD	2	Public	1	0.81	1	0.09	0	0.00	2	0.06
SUNY SUFFOLK COUNTY COMMUNITY COLLEGE	2	Public	1	0.81	1	0.09	3	0.06	7	0.22
SUNY TOMPKINS CORTLAND COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	6	0.19
SUNY ULSTER COUNTY COMMUNITY	2	Public	0	0.00	1	0.09	0	0.00	4	0.13
SUNY UNIVERSITY AT BUFFALO	4	Public	1	0.81	17	1.60	1	0.02	30	0.95
SUNY UPSTATE MEDICAL UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
SUNY UPSTATE MEDICAL UNIVERSITY YRS 1&2	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
SUNY WESTCHESTER COMMUNITY COLLEGE	2	Public	1	0.81	6	0.56	0	0.00	31	0.98
SUSSEX COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
TACOMA COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
TARRANT COUNTY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
TEACHERS COLLEGE COLUMBIA UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
TEMPLE UNIVERSITY	4	Public	0	0.00	8	0.75	0	0.00	28	0.88
TENNESSEE STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
TEXAS A&M UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
TEXAS CHRISTIAN UNIVERSITY	4	Private	0	0.00	2	0.19	0	0.00	2	0.06
TEXAS SOUTHERN UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
TEXAS TECH UNIVERSITY, LUBBOCK	4	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
TEXAS WOMAN'S UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
THE CATHOLIC UNIVERSITY OF AMERICA	4	Private	1	0.81	0	0.00	0	0.00	6	0.19
THE EVERGREEN STATE COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
THE NEW SCHOOL	4	Private	1	0.81	6	0.56	1	0.02	18	0.57
THE OHIO STATE UNIVERSITY	4	Public	0	0.00	5	0.47	0	0.00	16	0.50
THE UNIVERSITY OF MEMPHIS	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
THOMAS JEFFERSON UNIVERSITY ALLIED HEALTH SCIENCE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
THOMAS NELSON COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
THREE RIVERS COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
TIDEWATER COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
TOURO UNIVERSITY - INTERNATIONAL	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
TOWSON UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
TRINITY CHRISTIAN COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
TRINITY UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
TROCAIRE COLLEGE	2	Private	0	0.00	1	0.09	0	0.00	0	0.00
TUFTS UNIVERSITY	4	Private	0	0.00	5	0.47	0	0.00	2	0.06
TULANE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	4	0.13
TULSA COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
TUNXIS COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
UMDNJ - ROBERT WOOD JOHNSON MEDICAL SCHOOL-PISCAT	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNION COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
UNION COUNTY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	10	0.32
UNIVERSIDAD DEL SAGRADO CORAZON	4	Private	0	0.00	1	0.09	0	0.00	6	0.19
UNIVERSITY OF ALASKA - ANCHORAGE	4	Public	0	0.00	0	0.00	0	0.00	3	0.09

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
UNIVERSITY OF ARIZONA	4	Public	0	0.00	1	0.09	0	0.00	1	0.03
UNIVERSITY OF BRIDGEPORT	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF CALIFORNIA-BERKELEY	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
UNIVERSITY OF CALIFORNIA-DAVIS	4	Public	0	0.00	2	0.19	0	0.00	0	0.00
UNIVERSITY OF CALIFORNIA-EXTENSION	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF CALIFORNIA-LOS ANGELES	4	Public	0	0.00	4	0.38	0	0.00	2	0.06
UNIVERSITY OF CALIFORNIA-SAN DIEGO	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF CALIFORNIA-SANTA BARBARA	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
UNIVERSITY OF CALIFORNIA-SANTA CRUZ	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF CENTRAL FLORIDA	4	Public	0	0.00	1	0.09	0	0.00	3	0.09
UNIVERSITY OF CHICAGO	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF CINCINNATI	4	Public	0	0.00	2	0.19	0	0.00	2	0.06
UNIVERSITY OF COLORADO AT BOULDER	4	Public	0	0.00	6	0.56	0	0.00	13	0.41
UNIVERSITY OF COLORADO AT COLORADO SPRINGS	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF COLORADO AT DENVER	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF COLORADO AT DENVER HEALTH SCIENCES	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF CONNECTICUT	4	Public	0	0.00	9	0.85	0	0.00	21	0.66
UNIVERSITY OF CONNECTICUT - LAW	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF DAYTON	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF DELAWARE	4	Public	0	0.00	6	0.56	0	0.00	18	0.57
UNIVERSITY OF DENVER - COLORADO	4	Private	0	0.00	2	0.19	0	0.00	4	0.13
UNIVERSITY OF DETROIT MERCY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
UNIVERSITY OF FLORIDA	4	Public	0	0.00	5	0.47	0	0.00	5	0.16
UNIVERSITY OF GEORGIA	4	Public	0	0.00	3	0.28	0	0.00	3	0.09

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
UNIVERSITY OF HARTFORD	4	Private	0	0.00	3	0.28	0	0.00	2	0.06
UNIVERSITY OF HAWAII AT HILO	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF HAWAII AT MANOA	4	Public	1	0.81	6	0.56	0	0.00	2	0.06
UNIVERSITY OF HOUSTON	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF HOUSTON-DOWNTOWN	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF IDAHO	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
UNIVERSITY OF ILLINOIS @ URBANA	4	Public	0	0.00	3	0.28	0	0.00	1	0.03
UNIVERSITY OF INDIANAPOLIS	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF IOWA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF KANSAS	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
UNIVERSITY OF KENTUCKY	4	Public	0	0.00	1	0.09	0	0.00	1	0.03
UNIVERSITY OF LOUISIANA LAFAYETTE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF LOUISVILLE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF MAINE, AUGUSTA	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF MAINE, FARMINGTON	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF MAINE, ORONO	4	Public	0	0.00	3	0.28	0	0.00	5	0.16
UNIVERSITY OF MARY HARDIN-BAYLOR	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF MARY WASHINGTON	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF MARYLAND - BALTIMORE COUNTY	4	Public	0	0.00	2	0.19	0	0.00	2	0.06
UNIVERSITY OF MARYLAND - COLLEGE PARK	4	Public	0	0.00	25	2.35	1	0.02	38	1.20
UNIVERSITY OF MARYLAND - UNIVERSITY COLLEGE	4	Public	0	0.00	2	0.19	0	0.00	7	0.22
UNIVERSITY OF MASSACHUSETTS AT AMHERST	4	Public	0	0.00	13	1.22	0	0.00	26	0.82
UNIVERSITY OF MASSACHUSETTS AT LOWELL	4	Public	0	0.00	7	0.66	0	0.00	12	0.38
UNIVERSITY OF MASSACHUSETTS BOSTON	4	Public	0	0.00	5	0.47	0	0.00	16	0.50

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
UNIVERSITY OF MASSACHUSETTS-DARTMOUTH	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
UNIVERSITY OF MIAMI	4	Private	0	0.00	8	0.75	0	0.00	16	0.50
UNIVERSITY OF MICHIGAN, DEARBORN	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
UNIVERSITY OF MICHIGAN, FLINT	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF MICHIGAN-CENTRAL CAMPUS	4	Public	0	0.00	7	0.66	0	0.00	14	0.44
UNIVERSITY OF MINNESOTA-TWIN CITIES	4	Public	0	0.00	1	0.09	0	0.00	4	0.13
UNIVERSITY OF MISSOURI-COLUMBIA	4	Public	0	0.00	3	0.28	0	0.00	2	0.06
UNIVERSITY OF MISSOURI-ST LOUIS	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF MONTANA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF NEBRASKA AT KEARNEY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF NEBRASKA AT OMAHA	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
UNIVERSITY OF NEBRASKA-LINCOLN	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF NEVADA LAS VEGAS	4	Public	0	0.00	1	0.09	0	0.00	4	0.13
UNIVERSITY OF NEVADA-RENO	4	Public	0	0.00	1	0.09	0	0.00	1	0.03
UNIVERSITY OF NEW ENGLAND	4	Private	0	0.00	1	0.09	0	0.00	4	0.13
UNIVERSITY OF NEW HAMPSHIRE	4	Public	0	0.00	6	0.56	0	0.00	23	0.73
UNIVERSITY OF NEW HAVEN-SEMESTERS	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF NEW MEXICO	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF NEW ORLEANS	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF NORTH CAROLINA - CHARLOTTE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF NORTH CAROLINA, ASHEVILLE	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
UNIVERSITY OF NORTH CAROLINA-CHAPEL HILL	4	Public	0	0.00	7	0.66	0	0.00	5	0.16
UNIVERSITY OF NORTH CAROLINA-GREENSBORO	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF NORTH FLORIDA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
UNIVERSITY OF NOTRE DAME	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF OKLAHOMA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF OREGON, MAIN CAMPUS	4	Public	0	0.00	2	0.19	0	0.00	5	0.16
UNIVERSITY OF PENNSYLVANIA	4	Private	0	0.00	2	0.19	0	0.00	1	0.03
UNIVERSITY OF PHOENIX	4	Private	2	1.63	1	0.09	0	0.00	23	0.73
UNIVERSITY OF PITTSBURGH	4	Public	0	0.00	8	0.75	0	0.00	13	0.41
UNIVERSITY OF REDLANDS	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF RHODE ISLAND	4	Public	0	0.00	1	0.09	0	0.00	9	0.28
UNIVERSITY OF RICHMOND	4	Private	0	0.00	1	0.09	0	0.00	2	0.06
UNIVERSITY OF ROCHESTER	4	Private	2	1.63	3	0.28	0	0.00	5	0.16
UNIVERSITY OF SAN DIEGO	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF SAN FRANCISCO	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF SCRANTON	4	Private	0	0.00	1	0.09	0	0.00	9	0.28
UNIVERSITY OF SOUTH ALABAMA	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF SOUTH CAROLINA	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF SOUTH CAROLINA, UPSTATE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF SOUTH FLORIDA	4	Public	0	0.00	1	0.09	0	0.00	4	0.13
UNIVERSITY OF SOUTHERN CALIFORNIA	4	Private	0	0.00	11	1.03	0	0.00	19	0.60
UNIVERSITY OF SOUTHERN MAINE	4	Public	0	0.00	1	0.09	0	0.00	19	0.60
UNIVERSITY OF ST THOMAS	4	Private	0	0.00	3	0.28	0	0.00	3	0.09
UNIVERSITY OF TAMPA	4	Private	0	0.00	1	0.09	0	0.00	6	0.19
UNIVERSITY OF TENNESSEE	4	Public	1	0.81	0	0.00	0	0.00	0	0.00
UNIVERSITY OF TEXAS - PAN AMERICAN	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF TEXAS AT AUSTIN	4	Public	0	0.00	5	0.47	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
UNIVERSITY OF TEXAS AT EL PASO	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF TEXAS AT TYLER	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF THE ARTS	4	Private	0	0.00	2	0.19	0	0.00	4	0.13
UNIVERSITY OF THE SCIENCES IN PHILADELPHIA	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF THE VIRGIN ISLANDS	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
UNIVERSITY OF UTAH	4	Public	0	0.00	3	0.28	0	0.00	2	0.06
UNIVERSITY OF VERMONT & STATE AGRICULTURAL COLLEGE	4	Public	0	0.00	4	0.38	0	0.00	15	0.47
UNIVERSITY OF VIRGINIA	4	Public	0	0.00	9	0.85	0	0.00	9	0.28
UNIVERSITY OF WASHINGTON - SEATTLE	4	Public	0	0.00	2	0.19	0	0.00	4	0.13
UNIVERSITY OF WISCONSIN - MADISON	4	Public	0	0.00	5	0.47	0	0.00	5	0.16
UNIVERSITY OF WISCONSIN - MILWAUKEE	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
UNIVERSITY OF WISCONSIN COLLEGES - ROCK	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF WISCONSIN COLLEGES - WAUKESHA	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
UNIVERSITY OF WYOMING	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
URSULINE COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
UTAH STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UTAH VALLEY UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
UTICA COLLEGE	4	Private	1	0.81	1	0.09	0	0.00	14	0.44
VALENCIA COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	2	0.06
VANDERBILT UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	6	0.19
VANGUARD UNIVERSITY OF SOUTHERN CALIFORNIA	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
VAUGHN COLLEGE OF AERONAUTICS AND TECHNOLOGY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
VENTURA COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
VERMONT TECHNICAL COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	1	0.03

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
VILLANOVA UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	8	0.25
VIRGINIA COMMONWEALTH UNIVERSITY	4	Public	0	0.00	2	0.19	0	0.00	3	0.09
VIRGINIA MILITARY INSTITUTE	4	Public	0	0.00	1	0.09	0	0.00	0	0.00
VIRGINIA POLYTECH AND STATE UNIV	4	Public	0	0.00	1	0.09	0	0.00	3	0.09
VIRGINIA WESTERN COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
WAKE FOREST UNIVERSITY	4	Private	0	0.00	0	0.00	1	0.02	2	0.06
WAKE TECHNICAL COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
WALDEN UNIVERSITY	4	Private	0	0.00	0	0.00	1	0.02	1	0.03
WASHINGTON STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
WASHINGTON UNIVERSITY	4	Private	0	0.00	3	0.28	0	0.00	11	0.35
WASHTENAW COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
WAYNE STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
WEBSTER UNIVERSITY SEMESTER	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
WELLESLEY COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
WENTWORTH INSTITUTE OF TECHNOLOGY	4	Private	0	0.00	2	0.19	0	0.00	3	0.09
WESLEYAN UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
WEST CHESTER UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
WEST KENTUCKY COMMUNITY & TECHNICAL COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
WEST LOS ANGELES COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
WEST VALLEY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	2	0.06
WEST VIRGINIA UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	3	0.09
WESTERN CONNECTICUT STATE UNIVERSITY	4	Public	1	0.81	1	0.09	0	0.00	6	0.19
WESTERN KENTUCKY UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
WESTERN MICHIGAN UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
WESTERN NEVADA COLLEGE	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
WESTERN WASHINGTON UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
WESTFIELD STATE UNIVERSITY	4	Public	0	0.00	0	0.00	1	0.02	3	0.09
WHARTON COUNTY JUNIOR COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	1	0.03
WHATCOM COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
WHEATON COLLEGE	4	Private	0	0.00	0	0.00	0	0.00	3	0.09
WHITMAN COLLEGE	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
WILKES UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
WILLAMETTE UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
WILLIAM PATERSON UNIVERSITY OF NEW JERSEY	4	Public	0	0.00	0	0.00	0	0.00	4	0.13
WILLIAM RAINEY HARPER COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	0	0.00
WILMINGTON UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
WITTENBERG UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
WOODBURY UNIVERSITY	4	Private	0	0.00	1	0.09	0	0.00	1	0.03
WORCESTER POLYTECHNIC INSTITUTE	4	Private	0	0.00	3	0.28	0	0.00	0	0.00
WORCESTER STATE UNIVERSITY	4	Public	0	0.00	1	0.09	0	0.00	2	0.06
WRIGHT STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	1	0.03
XAVIER UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
YAKIMA VALLEY COMMUNITY COLLEGE	2	Public	0	0.00	0	0.00	0	0.00	1	0.03
YESHIVA UNIVERSITY	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
YESHIVA UNIVERSITY-CARDOZO LAW	4	Private	0	0.00	0	0.00	0	0.00	1	0.03
YESHIVA UNIVERSITY-MIDTOWN-STERN COLLEGE FOR WOMEN	4	Private	0	0.00	1	0.09	0	0.00	0	0.00
YORK COLLEGE OF PENNSYLVANIA	4	Private	0	0.00	0	0.00	0	0.00	2	0.06
YORK COUNTY COMMUNITY COLLEGE	2	Public	0	0.00	1	0.09	0	0.00	2	0.06

College Name	Two- or Four-year	Public/ Private	PA only	PA only %	AP only	AP only %	Both AP and PA	Both AP and PA %	Non AP/PA	Non AP/PA %
YOUNGSTOWN STATE UNIVERSITY	4	Public	0	0.00	0	0.00	0	0.00	2	0.06
Total			**123**	**100**	**1063**	**100**	**50**	**100**	**3171**	**100**

APPENDIX E

SYRACUSE UNIVERSITY
Institutional Review Board
MEMORANDUM

TO: Donald Dutkowsky
DATE: September 29, 2008
SUBJECT: **Submitted for Expedited Review-Determination of Exemption from Regulations**
IRB#: 08-302
TITLE: *Data Analysis of Syracuse University Project Advance (SUPA)/Admission Records to Find Out the Effect of SUPA on Overall GPA, Grade in Next Sequence Course, Graduation Rate, and Retention Rate*

The above referenced application, submitted for expedited review has been determined by the Institutional Review Board (IRB) to be exempt from federal regulations as defined in 45 C.F.R. 46, and has been evaluated for the following:

1. determination that it falls within the one or more of the five exempt categories allowed by the organization;
2. determination that the research meets the organization's ethical standards.

This protocol has been assigned to exempt category **4** and is authorized to remain active for a period of five years from **September 29, 2008** until **September 28, 2013.**

CHANGES TO PROTOCOL: Proposed changes to this protocol during the period for which IRB authorization has already been given, cannot be initiated without additional IRB review. If there is a change in your research, you should notify the IRB immediately to determine whether your research protocol continues to qualify for exemption or if submission of an expedited or full board IRB protocol is required. Information about the University's human participants protection program can be found at: http://www.orip.svr.edu/humanresearch.html. Protocol changes are requested on an amendment application available on the IRB web site; please reference your IRB number and attach any documents that are being amended.

STUDY COMPLETION: The completion of a study must be reported to the IRB within 14 days.

Thank you for your cooperation in our shared efforts to assure that the rights and welfare of people participating in research are protected.

Diane S. Young,

Note to Faculty Advisor: This notice is only mailed to faculty. If a student is conducting this study, please forward this information to the student researcher.
DEPT: Economics, 110 Eggers Hall **STUDENT: Kalpana Srinivas**

Office of Research Integrity and Protections

121 Bowne Hall Syracuse, New York 13244-1200 (Phone) 315.443.3013 ♦ (Fax) 315.443.9889
orip@syr.edu ♦ www.orip.syr.edu

Kalpana (Kal) Srinivas
8451 Prestwick Drive
Manlius, NY 13104
(315) 317-1415(c) (315) 682-7034 (h) ksrini01@syr.edu

EDUCATION

Doctoral Program, School of Education, Syracuse University (Ph.D. August 2012)

Master of Science, School of Education, Syracuse University (2005)

Bachelor of Science, Rajasthan University, India (1973)

SYRACUSE UNIVERSITY EXPERIENCE

Assistant Chancellor for Administration 9/2005 - present

This position reports directly to the Chancellor, supervises a staff of six, and manages a high volume of critical activities to ensure smooth and efficient operation of the Chancellor's office and residence.

Job Responsibilities:

- Serve as a member of Chancellor's Cabinet and ex-officio member of the University Senate
- Manage Chancellor's office and residence budgets including general operations, events, personnel, and special accounts.
- Systematically assess each project to examine its meaning, history, existing protocols, and potential for improvement.
- Supervise management of Chancellor's office daily operations
    - Serve as liaison to members of the Chancellor's Cabinet
    - Serve as first point of contact for trustees; government and community leaders; college and university presidents; and deans, vice presidents, and other key university leaders
    - Serve as first point of contact for all faculty and staff
    - Oversee response and follow-up to high volume of phone calls, letters, e-mails, invitations and other communications
    - Oversee document management system for all hard copy and electronic documents received and mailed out in the Chancellor's office
    - Oversee complicated and intense scheduling system
    - Oversee high volume of travel planning
- Manage all administrative support for the Chancellor
    - Oversee preparation of briefing packets and all necessary information for meetings and conferences, including written reports and graphic presentations
    - Coordinate speech-writing activities and organize materials for major speeches and addresses

    - Coordinate all aspects of the chancellor's participation in on-campus events with appropriate University offices
    - Coordinate all aspects of Chancellor participation in off campus events, both University and non-University
- Supervise management of Chancellor's residence
    - Oversee residence manager and activities associated with daily operations of the residence
    - Oversee processes for necessary preventive and emergency maintenance
    - Oversee preparation for events hosted at the residence
- Oversee the technology needs for the Chancellor at the office, residence, Lubin House and Greenberg House and needs of the office staff

Executive Assistant to the Dean of the College of Arts and Sciences 2002- 9/2005

This position reports directly to the dean, supervised three staff members and managed a large volume of activities associated with effective operation of the dean's office and the college.

Job Responsibilities:

- Serve as first point of contact for University administrators and deans, college Board of Visitors, department chairs, faculty, students, and parents
- Serve as a member of the Dean's Cabinet
- Responsible for management of Dean's office operations
    - Responsible for office budget management
    - Manage the Dean's calendar and travel schedule
    - Prepare correspondence, written reports and graphic presentations
    - Supervised three staff members
- Assist in Chair/Faculty searches and manage all aspects of faculty appointments
    - Orchestrate the college's promotion and tenure processes
    - Manage, coordinate, and maintain voluminous and sensitive records of candidates

Senior Administrator, College of Arts and Sciences 1996-2002

Provide administrative support for the Student Services division of the College of Arts and Sciences and serve as a member of the senior staff.

Job Responsibilities:

- Serve as first point of contact for faculty, staff, students, and the public
- Respond to inquiries or complaints requiring interpretation of policies and procedures
- Participate with the Associate Dean and four directors in planning programs of instruction and service activities of the various units
- Serve and/or coordinate the Academic Committee, Student Standards Committee, and various scholarship committees
- Serve on faculty and staff search committees
- Manage budget and payroll for three operating accounts and 18 full-time staff members, 4 graduate assistants, and 6 student employees
- Coordinate all events involving the participation of the Student Services division, including Convocation, Opening Weekend, Registration, and Parents Weekend

- Publish an electronic newsletter, CASNET for 3,500 Arts and Sciences students with news pertaining to Academic Advising and Counseling Services, Career Exploration Services, Health Professions Advisory Program, Student Records Office and other general information
- Design, develop, and maintain a web page for the Student Services division

Activities

Served the University by participating in various committees and service activities.

▪ Member of the Research Committee (University Senate)	2009 - Present
▪ Ex-officio member of the University Senate	2005 - Present
▪ Member of the Women's Concerns Committee	2005
▪ Summer Advisor for incoming first year students	2005 - 2010
▪ First Year Forum leader for College of Arts & Sciences	2005 - Present
▪ Workshops/study group leader for IDD&E MS Comprehensive Exams	2005 - 2006
▪ Lower Division Advisor for incoming A&S students	2005
▪ Served on a Search Committee for the Honors Program	2004
▪ Recorded books on tape recorder for learning disabled students	2004
▪ Staff to Staff training session leader	2004
▪ Member of the Remembrance Scholar Selection Committee	2001 - 2010
▪ Keynote speaker at Remembrance Convocation	2001
▪ Volunteer for Opening Weekend activities	2001 - 2010
▪ Advisor for honors students before and during registration	2001
▪ Member of the Student Affairs Committee on Diversity	1997 - 2003
▪ Trained advocate for the Syracuse University R.A.P.E. Center	1997 - 2005
▪ Conversation leader for English Language Institute	1997 - 2002
▪ Mentor for the Office of Multicultural Affairs	1997 - 1998
▪ Member of the MLK Committee	1998 - 2001

COMMUNITY GENERAL HOSPITAL EXPERIENCE

Assistant to the Vice President of Ancillary & Support Services 1991-1995

- Coordinate all office and project functions including correspondence, budget management, scheduling, data research and compilation, travel arrangements and other pertinent administrative duties

Secretary to the Administrative Director, Radiologists Group 1986-1991

- Represented Community General Hospital at Breast Screening Fairs
- Set up computerized accounting system for tracking payroll and operating expenses
- Performed administrative functions including hands-on Kurzweil knowledge-base system implementation, quality assurance reporting, departmental statistics, and travel arrangements

Technical Skills

- Proficient in Windows and Macintosh based software including Microsoft Word, Excel, Power Point, and Outlook; Meeting Maker; Dreamweaver; MS Project; Inspiration; Docushare
- Web page development and web publishing (Fair)

Transferable Skills

- Project Management
- Conflict Management
- Critical Incidence Stress Management
- Diverse Workplace
- Situational Leadership
- Performance Evaluation and Assessment

Professional Experience:

April 18, 2008	Presented at Edward F. Kelly Evaluation Conference Registration Form Queen's University, Ottawa, Canada. *What are the problems of doing large scale student tracking studies?*
October 26, 2009	Presented at the NACEP 2009 National Conference in Memphis Tennessee. *The effect of Syracuse University Project Advance (SUPA) on Performance and Persistence.*
Spring 2011	Co-taught IDE 641: Techniques in Educational Evaluation with Dr. Tiffany Koszalka, at Assumption College in Thailand
April 2011	Co-guest taught IDE 641: Techniques in Educational Evaluation and graded final presentations based on strengths, limitations, feasibility, and problems of the designs.
October 23, 2011	Presented at the NACEP 2011 National Conference in Mystic, CT. *The Effect of Participation in CEP vs. AP on Student Persistence at Syracuse University*
Spring 2012	Served on the National Alliance of Concurrent Enrollment Partnerships (NACEP) Accreditation Peer Reviewers for the 2011-12 accreditation review cycle.
April 2012	Co-guest taught IDE 641: Techniques in Educational Evaluation and graded final presentations based on strengths, limitations, feasibility, and problems of the designs.
October 28, 2012	Will participate in a joint presentation at the NACEP 2012 National Conference in October in Seattle, Washington, on research on Concurrent Enrollment Programs' student outcomes in college.
June 2012-2013	Serve on the NACEP Research Committee.

Professional Organizations:

National Alliance of Concurrent Enrollment Partnerships (NACEP)

Association for Training and Development (ASTD)

International Society for Performance Improvement (ISPI)

Continuing Education:

Syracuse University, *Diversity Training*

Syracuse University, *Performance Partnership for Staff Improvement*

Syracuse University, *Conflict Resolution*

Syracuse University, *Situational Leadership*

Syracuse University, *Assessing Supervisory Strengths*

Syracuse University, *Sexual Harassment Prevention for Supervisors and Managers*

Syracuse University, *Improving Quality (SUIQ) Course I.*

Syracuse University, *Improving Quality (SUIQ) Course II.*

Syracuse University, *Improving Quality (SUIQ) Course III.*