

Rowan University

Rowan Digital Works

Theses and Dissertations

5-1-1998

The predictability of the SAT

Melissa Mickiewicz
Rowan University

Follow this and additional works at: <https://rdw.rowan.edu/etd>



Part of the [Educational Psychology Commons](#)

Recommended Citation

Mickiewicz, Melissa, "The predictability of the SAT" (1998). *Theses and Dissertations*. 1953.
<https://rdw.rowan.edu/etd/1953>

This Thesis is brought to you for free and open access by Rowan Digital Works. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Rowan Digital Works. For more information, please contact graduateresearch@rowan.edu.

The Predictability Of The SAT's

by
Melissa Mickiewicz

A Thesis

Submitted in partial fulfillment of the requirements of the
Masters of Arts Degree in the Graduate Division
of Rowan University
May, 1998

Approved by _____

Date Approved 5/1/98

ABSTRACT

Melissa Mickiewicz
The Predictability of the SAT's
May, 1998
Dr. Klanderman
School Psychology Graduate Program

The purpose of this study is to look at the correlation of overall freshman grade point average and SAT scores to overall junior grade point average and SAT scores. Research has shown that SAT scores have a high correlation with freshman grade point average, but there is conflicting results to the correlations of grade point average beyond the freshman year. Data was collected from two graduating classes from a private religious university. SAT scores, overall freshman grade point average and overall junior grade point average was obtained from the university for 148 students. The data was analyzed using the Pearson's Correlations. Analysis of results showed extraordinary stability of independently calculated grade point averages (GPAs) from freshman to junior year and no decline in the validity of Scholastic Aptitude Tests (SATs) as a predictor of these GPAs over the three years. These results are interpreted as support for the view that the individual difference assessed by SATs changes very little over a three year period of college. The stability of results of the correlation of the SATs in predicting college grade point averages beyond the freshman year is in support of more recent research conducted. The study does not support the "simplex decline" theory proposed and supported from 1960-1987.

MINI ABSTRACT

Melissa Mickiewicz
The Predictability of the SAT's
May, 1998
Dr. Klanderman
School Psychology Graduate Program

The predictability of grade point average beyond the freshman year using the SATs as a predictor has shown conflicting results. The analysis of results from this study show a very stable and extraordinary predictability of junior grade point average using the SATs when compared with the correlation of SATs and freshman grade point average. These results support current research on this topic.

TABLE OF CONTENTS

Chapter One: The Problem	
Need	1
Purpose	3
Hypothesis.	3
Background.	4
Definitions.	5
Assumptions & Limitations	7
Overview	7
Chapter Two: Review of Literature	
SATs vs. freshman and senior GPA.	9
SAT vs freshman GPA	12
SATs and college admission	14
Summary	16
Chapter Three: Design of the Study	
Sample	18
Method	18
Procedures.	19
Testable Hypothesis	20
Summary	20
Chapter Four: Analysis of Results	
Null Hypothesis	21
Alternative Hypothesis	25
Summary	25
Chapter Five: Summary and Conclusions	
Summary.	28
Conclusions	30
Discussion	31
Implications for Further Research	34
References	36

Chapter One

Need

The importance of SAT scores and grade point averages is a common concern for every high school and college student. The exact implication of making the grade from freshmen year to senior year, has led many researchers to study just that: Is there a correlation or relationship between SAT scores and grade point average beyond the freshmen year? Several studies show that there is indeed a higher correlation between freshmen grades and SAT scores. Research on SAT scores and senior overall grade point average show conflicting results. Some studies show that the SAT's predict senior grade point average, other do not.

The reliability and predictability of the college grade point average (GPA) has long been a concern of college admissions officers. There are hundreds of correlations reported between high school grades, college entrance examines, and college grades. Many of these studies use first quarter or first semester averages, and a good many others use first year averages, and still a very few use three or four year cumulative averages. Studies using freshman averages to predict junior and senior grade point averages (GPA) are very limited. Humphreys (1960) was the first to try to give

meaning to what he termed the "simplex decline" of a correlation between independently calculated GPA's. Humphrey found a pattern that existed when looking at GPA's of two different years which correlated lower as a function of the time between the GPA's. His findings showed that when correlating freshmen to sophomore averages there was a higher correlation than when correlating freshmen to junior averages or freshmen to senior averages. Humphreys suggested the simplex decline in GPA correlations occurs because students change during their four years of college in such a way that alters the students' ability, with amount to change proportional to passage of time.

Humphreys (1968) later found a parallel simplex decline in the validity of Scholastic Achievement Test (SAT) scores and high school rank (HSR) as a predictor of successive GPA's so that the high school predictors were best correlated with freshmen GPA and declined to correlate least well with senior GPA. The title of his paper "The Fleeting Nature of the Prediction of College Academic Success", conveys the pessimistic conclusion that Humphreys drew from the two simplex declines taken together. His conclusion being that the prediction of academic success in college is limited by the instability of performance over the college years.

This interpretation was later reevaluated by Humphreys and Tabor (1973). Their study showed that Graduate Record Examination (GRE) aptitude tests taken during the senior year of college correlated higher with freshmen GPA than senior GPA. Because the GRE's are very similar to the Scholastic Aptitude Test (SAT) taken in high school, the implication of this postdiction study was that students do not change much over four years of college with regards to the kind of skills assessed by the SAT. However, the GPA criterion changes so that the skills tapped by the SAT's

are less relevant to junior or senior GPA performance than to that of freshman GPA performance. More recently, Wilson (1983) reviewed the literature and concluded that the preponderance of the evidence supports the criterion-is-changing rather than people-are-changing interpretation of the simplex decline of the GPA.

Purpose

The purpose of this study is to look at the correlation of grade point averages to that of SAT scores of students attending a private university in the Northeast region. The SAT scores are a steady factor used in selection of students for admission by the university. SAT scores have proven to correlate higher with freshmen averages, but there are conflicting results to the correlation when the variable of junior or senior averages is added to the equation.

Hypothesis

This study is intended to support the simplex decline theory proposed by Humphrey (1960) and later by Wilson (1983). It is hypothesized that the SAT scores are merely a good predictor of general knowledge, similar to classes taken by freshmen at universities. Hopefully, the results will man be a useful basis for Admission Officers when looking at SAT scores of students applying to the university. The SAT scores are a good predictor of freshmen grade point average, but the students overall grade point average upon graduation shows conflicting results. This is why the research will be

focusing not only on freshmen grades but also on junior grades. Should the SAT scores be relied on so heavily in admissions?

This study will have subjects that are randomly selected from a private university population. Age, and ethnic background will not be taken into account. The data will be collected from the university registrar data base to ensure a random selection. However, the criterion that the student must meet would be to have been a university student from freshmen to senior year. This will exclude any transfer students from other colleges or universities. The reason for this is to ensure that the grades were received from the same faculty at the university so the criterion for the grade point average will be the same.

There will also be no separate sections for different majors. All students will be in the same sample group. Although this could cause controversy because some believe that different majors are more difficult than others, for the purpose of this study, the researcher will be looking at university students as a whole, and not separated by major.

Background

The Scholastic Aptitude Test was developed by Carl Brigham who designed his own objective admissions test for students applying to Princeton University. The college board put Brigham in charge of a committee to develop a test that could be used on a wider population of schools and students (Leman, 1995). In 1926, the first SAT test was given to over 8,000 students on a trial basis and was not used for admission criterion. Since its incorporation, the SAT has undergone continuing

development and extensive research of high technical quality. It should be noted that the SAT is chiefly employed as one source of information to aid in assessing the individual's *current readiness* for college work (Anastasi, 1988). It is also used for admissions, placement, and counseling of college students. College boards publications repeatedly emphasize that the SAT measures developed abilities, despite some of the excess meanings popularly associated with the term "aptitude" (Anastasi, 1988). Anastasi (1988) stresses that the SAT is designed to assess broadly applicable intellectual skills and knowledge that develop slowly over time through the individual's experiences both in and out of school. Unlike achievement tests, the SAT is not tied to the content of any special course of study, but to that of common curricular topics.

Scores are reported for Verbal (V) and Math(M) with the mean score of 500 for each section. The reliability for both V and M sections are regularly assessed by several appropriate procedures (College Boards, 1985). Parallel forms of the test are continuously under stringent technical validations and reliabilities so that there will never be two of the same test form given year to year. Test questions are rearranged and changed to ensure confidentiality of the test questions. Because the SAT's are a part of everyday life for high school students, very strict measures are taken to secure the appropriateness and honesty of the test results .

Definitions

Simplex Decline - A decline that occurs when you compare two or more variables. The decline exists when time is increased between the variables your are measuring. In the example

given, the GPA of freshmen is closer to sophomore averages than it is to junior averages and furthest to senior averages.

Correlation - A correlation expresses the degree or correspondence, or relationship, between two sets of variables. A zero correlation indicates no relationship exists, or that chance might have played a role. A perfect positive correlation would be +1.0.

Constant *N* - The same individual was used in obtaining freshman, junior, and SAT scores.

Scholastic Aptitude Test (SAT) - A test developed by the College Board testing program in 1926. It was developed for use in the admission, placement, and counseling of college students.

Graduate Record Exam (GRE) - A series of tests originated in 1936, now it is conducted by the Educational Testing Service. Test results are used by universities to aid in making admission and placement decisions and in selecting recipients for scholarships, fellowships, and special appointment.

Assumptions & Limitations

The university population itself is limited because it represents those students who met the criteria for admission by the University. All colleges and universities have their own criterion for admission, but this study will concentrate on the overall university population.

Human nature and the fact that every person has a different background, different goals in life, and different personalities can cause differences in grades. Intellectual maturity, study habits, and seriousness of studying are all factors that are not being measured. There have been hundreds of studies done on predicting grade point average based on SAT scores that do not include variables such as the ones mentioned above. Thus, this research can be justified in utilizing the variables of SAT scores, freshmen grade point average, and their prediction on junior averages.

Overview

Chapter One focused on the simplex decline in grade point average, the high correlation of SAT score to freshmen grade point average, and the heavy emphasis admission officers place on SAT scores. In Chapter Two, the literature specific to SAT scores and grade point averages will be reviewed in full detail. In Chapter Three, the design of the study will be discussed including the variables, selection, measures

and the design itself. The testable hypotheses and analysis will also be established in Chapter Three.

In Chapter Four, there will be an analysis of results. This analysis will include a restatement of the hypotheses, interpretation of results, statements of significance, graphs, and a summary. In the final chapter, there will be a summary and conclusion, discussion, and implications for further research.

Chapter Two

The topic of using SAT scores to predict college grade point average has been studied extensively. In the following chapter, research that is related to this study will be reviewed in detail. The first section will review research that used SAT scores to predict freshmen and senior grade point average. The second section will review research that used SAT scores to predict freshmen grade point average. The third and final section will review research that used SAT scores for college admissions.

Using SAT scores to predict freshmen and senior grade point average

In 1967, Lloyd Humphreys published research titled "The Fleeting Nature Of The Prediction Of College Academic Success." In this study, Humphreys collected grade point averages from eight semesters of work from 1,600 students at the University of Illinois. Data from high school rank and SAT scores were also collected. The results of this study showed that the correlation between high school rank and semester one grades to be .51. When high school rank and semester eight were correlated, it was only .25. The data suggests that people are changing and that "aptitude for college work" is far from being stable (Humphreys, 1967). When

Humphreys correlated SAT scores with semester one, he found a correlation of .47. when he looked at SAT score and semester eight, the correlation was .21. This clearly indicates that both high school rank and SAT scores are good at predicting freshman grade point averages. The closer students get to their senior year, high school rank and SAT scores do not appear to correlate with grades. Humphreys concluded that the difference can be attributed to intellectual maturity and motivation. He proposed that admission officers should rely on criterion other than grades, high school rank, or SAT scores. Humphreys believed that "the finding of good non-academic predictors" would be a better measure than the traditional initial academic performance (Humphreys, 1967).

Richard Butler and Clark McCauley conducted research in 1987 titled "Extraordinary Stability and Ordinary Predictability of Academic Success at the United States Military Academy". 1,249 students from the United States Military Academy were the subjects for this study. SAT scores, high school rank, and grade point average from first year, second year, third year, and fourth year were obtained. When looking at SAT score and freshmen grade point average, the correlation was .36. SAT scores compared to senior grade point average showed a correlation of .32. High school rank and freshmen grade point average had a correlation of .38. A correlation of .41 was reported for high school rank and senior grade point average. The United States Military Academy data showed a stability of grade point averages performance that far exceeded anything previously reported in the literature. Butler and McCauley (1987) explains the extremely high consistency in academic performance over four years of undergraduate study in three factors. First being the United States Military Academy is a non-civilian institute where the cadets work in a very competitive

atmosphere. Each cadet receives a report of grade point average and class rank for each semester. Second, the cadets, though no longer tested every day, are still tested considerably more often than are students in civilian institutions. Third, the cadets take a common core of courses amounting to approximately 105 course hours. The Academy also differs from most civilian institutions in that different instructors teaching the same course use the same syllabus and the same examinations. Thus the extraordinary stability of the academic performance at the United States Military Academy may be attributed to greater motivation of students from frequent testing and competitive ranking and to the greater reliability of grading that comes from more frequent and more standardized testing (Butler & McCauley, 1987). This research showed conflicting results from Humphreys 1967 study. Ironically, Humphreys suggested that the low correlation between SAT scores and senior year grades were because of lack of motivation and maturity. Butler and McCauley (1987) proposed that maturity and motivation is why they found a high correlation between senior grade point average and SAT scores.

Krocker, Mortlock, and Johnson (1994) published research titled "The Relationship Of Success Predictors To Common Core Course Performance For Elementary Education Majors". This study looked at 160 Purdue University Education graduates. SAT scores, second semester freshmen grade point average, overall senior grade point average, and high school rank were obtained. The correlation between senior overall grade point average and SAT scores was .43. The correlation between freshmen grade point average and SAT scores was .44. High school rank correlated with SAT scores was .56. These results support the study by Bulter and McCauley (1987). The SAT scores are a good predictor of college

success. Krockover, Mortlock, and Johnson (1994) concluded that it may be that high school rank predicts grades better because it takes both ability and motivation into account. Thus, how well students do in high school (rank) might have as much to do with motivation as ability. This study demonstrates that SAT's are a valid predictor of school success.

SAT Scores and Freshman Grade Point Average

Wainer, Saka, and Donoghue (1993) published research titled "The Validity of the SAT at the University of Hawaii: A Riddle Wrapped in an Enigma". This study looked at SAT scores, high school grade point average, and freshmen overall grade point average. 1,444 students were used as subjects. The results were very similar to most studies looking at SAT scores and freshmen grade point average. The correlation for high school rank and SAT scores was .54. Correlations of SAT scores and freshmen grade point average was .44. This shows that there is a high correlation between SAT scores, freshmen grade point average, and high school rank.

A similar study was conducted by Goldman and Slaughter (1976) titled "Why College Grade Point Average Is Difficult To Predict". This study looked at 245 freshmen enrolled at the University of California. SAT scores, freshmen grades and high school rank were obtained. They received a high correlation of .49 when comparing SAT scores with grade point average. A correlation of .44 was obtained for SAT scores and high school rank. When the researchers correlated SAT scores, Grade point average and high school rank, they received a .70. This evidence supports

the findings from Wainer, Saka, and Donoghue (1993). Goldman and Slaughter concluded that SAT are a good predictor is grade point average for the freshmen year. However, they believe that the validity in predicting grade point average beyond would result in shortcomings due to criterion of grade point average and not because of the SAT test.

Rose, Hall, Bolen and Webster (1996) also conducted research exploring SAT scores with freshmen grade point average. 202 freshmen students from University of East Carolina were the participants. SAT scores and Grade point average were obtain. Using Pearsons correlations, grade point average and SAT scores resulted in a correlation of .39. This shows that there is a significant correlation between the two variables. Not surprisingly, Rose, Hall, Bolen, and Webster concluded that SAT scores are a good predictor in freshmen grade point average. They also believe that "high achievers" who are motivated tend to score higher on the SAT's and get better grades. Thus, the SAT is a good predictor for a persons readiness for college courses at the freshmen level. This same conclusion appears to be the same in almost all studies done in this area.

Stricker, Rock, and Burton (1988) conducted research on SAT scores and freshmen grade point average on a large university in the Northeast. 4,351 students were subjects. SAT scores, freshmen grade point average and high school rank were obtained. This study concentrated on sex difference between SAT scores and freshmen grade point averages. The results of this study are important to note. The study did not find a significant difference in grade point average and SAT score between men and women (only .10, and .11 consecutively). However they did find a significant

correlation in SAT scores and grade point average. They concluded that the minimal sex differences in over and underprediction are consistent with previous findings about the absence of sex differences. However, the researcher stress that although the underprediction for women was small, they could be adversely affected if decisions about admissions, scholarships, and similar academic matters were made solely on the bases of grade predictions from the SAT (Stricker, Rock, and Burton, 1996).

A study was conducted by William Sedlack and Javaune Adams-Gaston (1992) on the predictability of academic success of student athletes using SAT scores. Their results differed from Wainer, et.al. Sedlack and Adams-Gaston (1992) looked at a specific group of people, and not the entire freshman class. They obtained SAT scores and freshmen grade point average from 105 student athletes. Surprisingly, the correlation was .03, showing very little correlation, if not any. Sedlack and Adams-Gaston (1992) concluded that the SAT scores should not be used in selecting or predicting the early success of student athletes. Schools would be doing a great disservice to its student athlete population if the SAT's were used to deny the rights of any student athlete to compete in the first year. One limitation of this study is that they used a limited and specific population of subjects. However, this study does show a contradictory findings to most other studies done in this area.

SAT Scores and College Admission

U.S. News & World Reports (1997) published a cover article on the SAT's.

The title "The test of merit that fails the standard" was part of a cover story on the Best Colleges 1998. The author reports on how influential the SAT has become on deciding which applicants to admit into colleges and Universities around the country. The admissions board uses the SAT score by helping them to predict how well a student will perform at the college level. But many questions are being raised as to how well it does that and if it does unfairly hurt the chances of many worthy students.

The SAT's influential role in college admissions is based largely on a perception, in and outside the worlds of high school and college. That the test is fair, that it rewards students who deserve to be rewarded. But in many instances, according to Toch and Walthall (1997), the SAT is not meritocratic. The heavy reliance of some colleges on the test leaves a number of deserving students, including many women, blacks and Hispanics, with fewer chances to win a share of the millions of dollars in scholarships awarded every year. The authors also present that the SAT's primary focus is to help colleges identify the best of their applicants by predicting their performance in college, especially their first-year grades. As we have seen by the many research papers presented, the SAT does fairly predict freshman year grade point average.

Toch and Walthall (1997) also report that the National Merit scholarship program (the most renowned college scholarship program), has relied solely on the PSAT (a preliminary SAT that is identical to the SAT) to make the first cut in the competition for \$27 million dollars in scholarships. When the authors looked at many selective schools, they found that the SAT is a bigger factor in admissions than the College Boards recommend.

Similar reports were published by Lemann (1995) in the *Atlantic*

Monthly, and Smith (1994) in *Phi Delta Kappan*. Both articles share the same concern as the above mentioned article from *U.S. New & World Reports*. Smith (1994) reports the SAT test is the primary score used by universities and colleges for admissions. Because of the test importance, the author has been helping students prepare for the most important exam they will take. He helps them achieve scores that will help students gain admissions into the colleges they choose.

Lemann (1995) reports that the Educational Testing Service developed the SAT test as a means of testing developed ability rather than IQ. He believes that this countries colleges and universities are misusing the test in the large emphasis on the admissions process. "In America, perhaps only race is a more sensitive subject then the way we sort ourselves out in the struggle for success...At the center of that struggle are higher education and the Educational Testing Service, founder of the SAT" (Lemann, 1995).

The implications of these report shows that college admissions are relying heavily on the SAT's in the selection process. Although statistically, the SAT have proven to predict freshmen grade point averages, there are contradictory results to predict grade point averages beyond the freshmen year.

Summary

The SAT tests were designed as a good predictor of a students readiness for college. As the research results show, the SAT tests are a solid prediction in freshman

grade point average. With the exception of one study using a select group of student athletes, the SAT are doing what they are intended to do. However, looking at research conducted on the long term prediction of overall senior grade point averages, the results are contradictory. Several studies show that the SAT's do predict senior grade point average, others report that the SAT's do not. Looking at reports done on college admissions, it is imperative to investigate the selection process more thoroughly. If SAT scores are the primary focus on admissions, is the test predicting a students overall achievement at the college level? Or is it just a good indicator of the freshmen year? The following research, will help support the validity of the prediction of grade point average beyond the freshman year.

Chapter Three

Sample

The population for this study consisted of 1996 and 1997 college undergraduate seniors from a private University in the Northeast Region of the United States. The sample size was 148 seniors who had at one time, declared psychology as their major. The schools enrollment is approximately 5,200 students with 500 students who declared Psychology as a major. The sample included 76 females and 62 males. All students had attended the University for all four years of study. The age range of students was 20 to 23. The students' ethnic background or living arrangements (on or off campus or commuter) was not available.

Method

This was a correlational study of the relationship of SAT scores and grade

point averages. Student SAT scores, overall freshman grade point average and overall junior grade point average were used. The dependent variable is the students SAT scores. The independent variable is freshman and junior grades. SAT scores were obtained from the university admissions office and grade point averages were obtained from the university's registrars office. Grade point averages are based on a 4.0 scale: A = 4.0, B = 3.0, C = 2.0, D = 1.0 and F = Failure. Overall grade point average for freshman year is a combination of Fall and Spring semesters for freshmen year. Overall junior grade point average is the students grade point average from Fall and Spring semesters of the students' junior year only (not cumulative). The Pearson Product Moment Correlation was used to calculate the correlation coefficient. The statistical significance of the coefficient was measured at the .01 significant level.

Permission to obtain the information for this study was approved by the Admissions and Registrar's office at the university and was collected by an undergraduate research assistant in the psychology department. The names of the students or social security numbers were not disclosed at any time. Only sex, SAT scores and grade point averages were made available.

Procedures

The data was collected by looking at transcripts from college students who at one time, were majoring in psychology attending the university from 1994-1997. Names and social security numbers were not included in the print out to maintain confidentiality. Data collected included SAT scores, freshman G.P.A., junior G.P.A., and sex. It was checked and rechecked for accuracy by two undergraduates assistants

who worked in the psychology department. The data was then checked over by the researcher to ensure accuracy. The data was recorded into the computer using the SPSS-X (The Statistical Package for the Social Sciences) program. To insure accuracy of the data, an assistant aided the researcher in the data entry. A correlation for the data was made. Tables were used to visualize the data.

Testable Hypothesis

The Null Hypothesis for this study is: There is a decline in the correlation of Junior grade point average and SAT scores as compared to freshman grade point average and SAT scores. The Alternative Hypothesis: There is not a decline in correlation between junior grade point average and SAT scores as compared to freshman grade point average and SAT scores.

Summary

The data used for this study was obtained from a private university. Sex, SAT scores, overall freshman grade point average, and overall junior grade point average were used. Pearson's Product Moment Correlation was used as the statistical analysis for the data. Output was compared and translated to graphs and charts. This data was then used to compare and verify the hypothesis made about the study.

Chapter Four

Null Hypothesis Analysis of Results

As stated in chapter one, the null hypothesis is based on Humphrey's findings. He concluded there was a "simplex decline" in the predictability of grades beyond the freshman year. This hypothesis would conclude that there is a positive correlation in SAT scores and overall freshman grade point average, but not a positive correlation in SAT scores and overall junior grade point average.

The results of Humphrey's study showed a correlation of .47 when comparing SAT scores with freshman grade point average. When SAT scores and senior grade point average were correlated, his findings showed a correlation of .21. However, it must be noted that Humphrey's study was based on 1,600 students where the present study is based on 148 students. The present study does not support the null hypothesis based on Humphrey's findings.

Table 1 contains means and standard deviations for SAT-V(verbal) , SAT-M (math), GPA 1 (freshman overall grade point average), and GPA 2 (junior overall grade point average). The total population tested was 148 (N=148). There were 76

females and 62 males. The researcher did not separate by sex for correlational purposes. Both male and female are together in N=148.

TABLE 1
Means and Standard Deviations of SAT-V, SAT-M, GPA 1, GPA2
N=148

	Mean	Standard Deviation
SAT-V	552	69
SAT-M	633	53
GPA 1	2.72	.48
GPA2	2.80	.49

Note: SAT-V = Scholastic Aptitude Test - Verbal subscale; SAT-M = Scholastic Aptitude Test - Quantitative subscale; GPA 1 = Freshman overall grade point average; GPA 2 = Junior overall grade point average

Table 2 contains the intercorrelates of the criteria and the validity coefficients for the criteria in Table 1. The first result of significance was the extremely high consistency of grade point average from freshman year to junior year. The data from the two grade point averages were very similar and showed a mere trace of a "simplex decline", however, the correlations of GPA 1 and GPA 2 was .89. With such high consistencies of GPA performance from freshman to junior year, it is not surprising that the SAT-V and SAT-M were as valid for the junior year as for the freshman year

grade point average. The validity for the correlation between freshman overall grade point average and junior overall grade point average with the two SAT score's is a clear indication that statistically, Humphrey's "simplex decline" does not hold true for the current set of data.

TABLE 2
Interrcorrelations of SAT-V, SAT-M, GPA 1, and GPA 2. (N = 148)

	SAT-V	SAT-M	GPA 1	GPA 2
SAT -V	-----	.34	.30	.30
SAT-M	.25	-----	.41	.42
GPA 1	.36	.35	-----	.89
GPA 2	.32	.39	.93	-----

Note: The correlation above the diagonal are for the class of 1997, and those below are for the class of 1996. All correlations are significantly greater than zero ($p < .05$, one-tailed). GPA 1 = overall freshman grade point average; GPA 2 = overall junior grade point average; SAT-V = Scholastic Aptitude Test - Verbal subscale; SAT-M = Scholastic Aptitude Test - Quantitative subscale.

The data for the class of 1996 class of 1996 (Table 2) shows that for SAT-V there is a slight decline from GPA 1 (.36) to GPA 2 (.32). However, statistically, this is not significant enough to term it a "simplex decline". The class of 1997 shows that for SAT-V, there is no increase from GPA 1 (.30) to GPA 2 (.30). Reviewing SAT-M, the data from the class of 1996 shows a slight increase from GPA 1 (.35) to GPA 2

(.39). The data from the class of 1997 also shows a slight increase from GPA 1 (.41) to GPA 2 (.42).

Table 3 contains composite data for graduates of the class of 1996 and 1997 that are comparable to the validity coefficients of Table 2. The validity coefficients are by year as in Table 2 but show the same stability of validity coefficients over the three year period that was noted in Table 2. In particular, SAT-V and SAT-M composite score showed no tendency to decline in correlation over the three year period. Although, the class of 1997 did show a slight increase from GPA 1 to GPA 2.

TABLE 3

Composite correlations of SAT scores and GPA'1 and GPA 2 for data from the class of 1996 & 1997 (N = 148)

	1996		1997	
	GPA 1	GPA 2	GPA 1	GPA 2
SAT - V & M	.71	.71	.71	.72

Note: All correlations are significantly greater than zero ($p < .05$, one-tailed). GPA 1 = overall freshman grade point average; GPA 2 = overall junior grade point average; SAT - V & -M = Scholastic Aptitude Test - subscales Verbal and Quantitative.

Reviewing the Null Hypothesis stated in chapter three, it is evident that this current set of data rejects the null hypothesis. The data is too consistent for there to be a "simplex decline" as was proposed by the researcher. A simplex decline would

mean that there is a lower correlation between SAT and junior grade point when compared to SAT and freshman grade point average. The correlation results from the data are consistent and very significant across all three years (freshman to junior year). This would result in a rejection of the "simplex decline" theory proposed by Humphrey's study.

Alternative Hypothesis Analysis of Results

As stated in chapter three, the alternative hypothesis states that there will not be a decline in correlation between junior grade point average and SAT scores as compared to freshman grade point average and SAT scores. The analysis of results of the data from this study supports this hypothesis. Table 3 shows the correlations of both SAT and junior grade point average are significant and are almost exact to that of the correlation of SAT and freshman grade point average.. This shows that from the freshman year to the junior year, there is no decrease in correlation that is significant to be termed a "simplex decline". Even when the classes of subjects are broken up, as shown by Table 2, there is still no significant decline in correlation between junior and freshman grade point average when correlated with SAT scores. Therefore, the alternative hypothesis is accepted as being valid.

Summary

The null hypothesis states: There is a decline in the correlation of junior grade

point average and SAT's as compared to freshman grade point average and SAT's scores. An analysis of results from the data presented indicates that the null hypothesis is rejected. Table 4 shows the correlations of the data showing that there is not a decline from freshman grade point average to junior grade point average when correlated with SAT scores. This results in a rejection of the null hypothesis which states that there would be a decline.

TABLE 4

Summary of analysis of data correlating SAT scores with freshman and junior grade point average (N = 148)

	GPA 1	GPA 2
SAT -T	.71	.72

Note: All correlations are significantly greater than zero ($p < .05$, one-tailed). GPA 1 = overall freshman grade point average; GPA 2 = overall junior grade point average; SAT - t = total Scholastic Aptitude test score (both verbal and qualitative).

If the correlation of the overall junior grade point average was significantly lower than the overall freshman grade point average, then the null hypothesis would have been accepted. However, the correlations are significantly close and almost exact which lead to the rejection of the null hypothesis. To make the study complete, the researcher explored the different options such as separating the SAT scores into verbal and qualitative as well as separating the subjects by graduating class. This was

to see if the data would have yielded a different result that would lead to accepting the null hypothesis. Again, the results did not support the "simplex decline" theory.

The alternative hypothesis states there is not a decline in correlation between junior grade point average and SAT scores as compared to freshman grade point average and SAT scores. Table 4 clearly indicates that the analysis of data from this study supports the alternative hypothesis. There is no significant decline when looking at SAT scores and freshman grade point average compared to SAT scores and junior grade point average. There is a significance in the numbers being almost exact. This shows a positive correlation in the data. The results clearly indicate a positive correlation when looking at SAT score with freshman grade point average and SAT scores with junior grade point average. Therefore, the alternative hypothesis is accepted.

Chapter Five

Summary and Conclusions

Summary

The researcher began this endeavor by reviewing numerous studies that have been published on Scholastic Aptitude Tests and the predictability of grade point average at the college level using these scores. The earliest research conducted by Humphrey (1960) clearly indicated a decline in the correlation between SAT scores and freshman grade point average when compared to SAT scores and junior grade point average. Humphrey's termed this as a "simplex decline" in the predictability of grades beyond the freshman year using the SAT scores.

Further research by Humphrey's (1968) supported his findings in his "simplex decline theory. When later reevaluated by Humphrey's and Tabor (1973), his conclusions were once again supported. Together they concluded that students do not change much over the four years of college with regard to the kind of skills assessed by the SAT. However, the GPA criterion changes so that skills tapped by the SAT are less relevant to junior and senior year GPA performance than to that of freshman GPA performance (Humphrey, 1973).

More recent research into the simplex decline theory was supported by Wilson (1983). Wilson concluded that the overwhelming amount of evidence supports the interpretations of the "simplex decline" theory. The consistency in findings from researchers from 1960 to 1983 led the researcher to also support the "simplex decline" theory.

The current study hypothesized that the SAT scores are merely a good predictor of general knowledge, similar to classes taken by freshman at colleges and universities. The SAT scores were predicted to be a good indication of freshman overall grade point average, but not of overall junior grade point average. This hypothesis appeared to be consistent with previous research as well as the originators and distributors of the Scholastic Aptitude Tests.

Reviewing the analysis of data from this study shows that there is not a "simplex decline" in the predictability of SAT scores beyond the freshman year. The results showed a stability of GPA performance over the three years of college that far exceeded anything previously reported in the literature that was reviewed by the researcher. Wilson (1983) suggests from his review that adjacent semester correlations of about .60 may prove to be typical and cited Rogers (1925) for the estimate that adjacent year GPA correlations are likely to be in the neighborhood of .70. In contrast, the correlations found in this study between GPA's more distant in time were no lower than .89. Therefore, the predictability of SAT scores over the grade point averages from year one to year three, would have to yield a significant positive correlation.

The alternative hypothesis was based on research more current than 1983. Butler and McCauley (1987) conducted research based on Humphrey's "simplex

decline" theory. This study showed conflicting results from Humphreys 1967 study. Butler and McCauley concluded that SAT scores and high school rank were excellent predictors of college grades beyond the freshman year.

In more recent years, Krockner, Mortlock, and Johnson (1994) published research looked at 160 graduates. SAT scores and senior overall grade point average correlations were .43. The correlation between SAT scores and freshman grade point average was .44. They concluded that the SAT scores are a good predictor in college grades beyond the freshman year.

The current research accepted the alternative hypothesis that was based on the previous studies. the correlations for SAT scores and freshman overall grade point average was .71. The correlations between SAT scores and overall junior grade point average was .72. This clearly supports the previous research conducted by Butler and McCauley (1987) and Krockner, Mortlock, and Johnson (1994). The results from the current study do not lend support to the null hypothesis of a "simplex decline" based on Humphrey's findings which led many researchers to study the predictability of SAT scores and grade point average. However, the current study supports more recent findings of a positive correlation in the predictability of college grade beyond the freshman year based on SAT scores.

Conclusions

The researcher of the study concludes the predictability of college grade point average based on SAT scores is significant and valid. The analysis of results based on SAT scores and freshman overall grade point average and SAT scores and overall

junior grade point average showed conclusive and significant correlations. The correlations between SAT scores and overall freshman grade point average was found to be .71. The correlation of SAT score and overall junior grade point average was .72. Such high correlations support the consistency of grades over an extended period of time. Because of the consistency, the SAT scores have shown to be a good predictor in college grades beyond the freshman year.

Discussion

The explanation for this extremely high correlations in the current study is not obvious. Following Butler and McCauley (1987), the researcher suggests that the greater consistency may be attributed to three factors. First, the university from which the data was received is a small private university with religious background. Second, the requirements to be accepted and the core courses required are different from that of state schools. Third, the number of students was significantly lower than most research published and reviewed for this study.

Humphreys (1960), Humphreys and Tabor (1973), and Wilson (1983), all conducted research on public state schools. The current study was based on a private religious university. There may be several reasons for the difference in results between the current study and those previously cited. To begin with, the private university has different core courses than that of state schools. Part of the core courses required for graduation is 3 religious classes and 4 philosophy classes. State schools do not require these types of courses.

Another factor to consider is the size of classrooms the students are taught in.

At the private university, the largest class size freshman year is 25. Once a student gets into their major courses, that number drops to 15. There were no statistics for class size in any of the previous research, however, by looking at the number of subjects, it can be assumed the state schools have a large enrollment. This could have a direct effect on the outcome of this study. If students have different required core courses, and class size is much smaller, the consistency in grade point average can be justified.

The Number of subjects utilized for this study was significantly lower than other studies cited. A total number of subjects for the current study was 148. Humphreys (1967) based his research on approximately 1,600 students. The results for the current study disproved the "simplex decline" in grade point average found by Humphreys. Wilson (1983) found only two reports of validity coefficients that did not decline for GPA's beyond the freshman year. These were small-scale exceptions to the pattern of decline reported in larger and better controlled studies.

The general implication of the extremely consistent GPA performance and the stable validity of predictors such as the SAT's is to support Wilson's (1983) argument that the kind of skills assessed by predictors such as the SAT's are stable over the three years of college. Wilson suggested that the preponderance of evidence supports the criterion-is-changing as opposed to the people-are-changing interpretation of the usual simplex decline in GPA correlations and predictive validities from freshman to senior year. The data from the current study shows just how extremely stable these skills are.

Humphreys (1967) concluded that the change in intellectual performance during the college years was a result of continuing maturation which proceeds at a differential rate from one person to another or it could be from the environment the

college students are engaged in. Because of the difficulty in distinguishing between the environmental issues or the intellectual performance, whether it be aptitude or achievement, there is no direct evidence concerning these issues. Therefore, Humphreys (1967) assumed that the reason for the "simplex decline" is from changes in the intellectual level of the group as a whole. His person-is-changing theory is based on his finding that there is a good deal of instability in intellectual performance during the four year undergraduate period. As a result, the correlations of predictors for this criteria shows a great deal of shrinkage over a period of time. Humphreys (1967) believed that senior performance is not predicted well enough from freshman information for one to be at all content with the admissions practices of selection.

In contrast, the findings from this study show the opposite. The correlations show no decline. The intellectual difference of the group as a whole may have changed from 1967 to the present. There are more universities and colleges to choose from and the admissions rates among higher education institutions have increase from 1967. With the increase in applicants, the admissions processes may have also changed from Humphreys' study. As more current research would suggest, the predictors used, such as the SAT's, have a high correlation with GPA's beyond the freshman year, whereas research conducted further in the past would support the "simplex decline" theory.

Butler and McCauley (1987) found results similar to the current study. The results showed an extremely high consistency in GPA over four years of college (.89) and showed the predictors such as SAT and high school rank had a very stable validity coefficients across the four years. Butler and McCauley (1987) research was based on 1,249 students at the United States Military Academy. Two aspects about this study

to note are that the number of subjects was much greater than the current study, and secondly, the subjects were from a private institution. The results showed no simple decline as proposed by Humphreys (1968), the amount of subjects far exceeded the current research, and both Butler and McCauley and the current study had subjects from private institutions. This would lead the researcher to believe the current study, although smaller in scale, is similar to more current research conducted on the predictability of GPA beyond the freshman year using the SAT as the predictor.

Implications for Further Research

The topic of SAT's for use in admissions has been greatly debated since the test's incorporation. The meaning of the test scores and the predictability of grades based on the test scores have led many researchers to study this delicate and highly controversial topic. To further investigate the predictability of grade point average beyond the freshman year using SAT as a predictor, several recommendations would be made.

The first suggestion made would be to have a large population from which one can draw a diverse random sample. The sample should be large enough to withstand criticism from other researchers as not to be considered "small-scale" and "not well controlled". Most research has focused on over 1,000 subjects. This can be easily accomplished with help of the registrar's office at most large schools. All studies reviewed by the researcher for this project that had under 800 subjects, found there to

be no "simplex decline" in GPA beyond the freshman year. These results could be because they are more recent studies, or that the population is limited.

Another suggestion might be to compare the difference between public and private colleges and universities. The researcher noted that the studies cited that were from private institutions, including the current study, all disproved the "simplex decline" theory proposed from Humphrey's (1968). Although more recent studies used public and private institutions and yield the same results, it would be interesting to note any difference between public and private institutions and the difference in the predictability of GPA beyond the freshman year using the SAT's.

Most recent studies have looked at SAT's and how they predict freshman grade point average. Future efforts should be directed towards the predictability of grade point average beyond the freshman year as this current study was designed. The predictability of freshman grade point average and SAT scores is not in dispute. All research shows a positive correlation between the two variables. However, looking beyond the freshman year is when controversy arises.

References

- Anastasi, A. (1988). *Psychological Testing* (6th ed.). New York: Macmillan.
- Angoff, W. H., & Dyer, H.S. (1971). The admissions testing program. In W.H. Angoff (Ed.), *The College Board Admissions Testing Program* (p.1-14). Princeton: College Entrance Examination Board.
- Bracey, G. (1995). Record-level SAT's: course related. *Phi Delta Kappan*, v79 n7, 566-568.
- Bridges, C. (1974). *The Reliability of USMA grades* (Report No. 1A3.07-75-001). West Point, NY: Office of the Director of Institutional Research, United States Military Academy.
- College Board. (1985-1986a.). *ATP guide for high schools and colleges*. New York: College Entrance Examine Boards.
- Educational Testing Service. (1994). Bulletin for the Scholastic Aptitude Test, Princeton, New Jersey.
- English, C. (1995) Academic measures available in sophomore year can predict application and admission to dietetic supervised practice programs. *Journal of the American Dietetic Association*, v95 n8, 904-908.
- Goldman, R.D., & Slaughter, R.E. (1976). Why college GPA is hard to predict. *Journal of Educational Psychology*, 68, 9-14.
- Humphreys, L.G. (1960). Investigations of the Simplex. *Psychometrika*, 25, 313-323.
- Humphreys, L.G. (1968). The fleeting nature of the prediction of college academic success. *Journal of Educational Psychology*, 59, 375-380.
- Humphreys, L.G., Levy, J., & Tabor, T. (1973). Predictability of academic grades for students of high and low academic promise. *Educational and Psychological Measurement*, 33, 385-392.
- Kaplan, R.M. (1982). Nader's raid on the testing industry: Is it in the interest of the consumer? *American Psychologist*, 37, 15-23.

- Lavin,, D.E. (1965). *The prediction of academic performance*. New York: Sage
- Lemann, N. (1995). The structure of success in America. *Atlantic Monthly*, 276, 41-54.
- Lemann, N. (1995). The Great Sorting (History of the Educational Testing Service) *The Atlantic Monthly*, 276, 3, 84-97.
- Rose, R. et.al. (1996). Locus of Control and College students Approaches to Learning. *Psychological Reports*, 79, 163-171.
- Saka, T. (1991). High school GPA, SAT scores and college academic achievement for University of Hawaii freshman. *Pacific Educational Research Journal*, 7, 19-32.
- Sedlack, W. & Adams-Gaston, J. (1993). Predicting the Academic Success of Student-Athletes using SAT and Noncognitive Variables. *Journal of Counseling & Development*, 70, 724-727.
- Shaughnessy, et.al (1995). Prediction of success in college calculus: Personality, Scholastic Aptitude Test, and screening scores. *Psychological Reports*, 1360-1362.
- Smith, M. (1994). Repugnant is to aversion....a look at ETS and the new SAT I. *Phi Delta Kappan*, 75, 10, 752-757.
- Stricker, L., Rock, D., & Burton, N. (1993). Sex Differences in Predictions of College Grades From Scholastic Aptitude Test Scores. *Journal of Educational Psychology*, 85, 4, 710-718.
- Tosh, T., & Whitehall, M. (1997). The test of merit fails that standard. *U.S. News & World Report*, 123, 8, 94-96.
- Veldman, D.J. (1968). Effects of Sex, aptitudes, and attitudes on the academic achievement of college freshman. *Journal of Educational Measurements*, 5, 245-249.
- Wainer, H., Saka, T., & Donoghue, J. (1993). The Validity of the SAT at the University of Hawaii: A riddle Wrapped in an Enigma. *Educational Evaluation and Policy Analysis*, 15,1, 91-98.
- Wilson, K.M. (1983). *A review of research on the prediction of academic performance after the freshmen year* (RR-83-11). Princeton, NJ: Educational Testing Service.