

SURVEY OF COLLEGE ENTRANCE EXAM PREPARATION METHODS

by

Robin Faulk Donaldson

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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## **ABSTRACT**

Robin Faulk Donaldson. SURVEY OF COLLEGE ADMISSION TEST PREPARATION METHODS. Under the direction of Dr. David E. Holder, Assistant Professor, School of Education, March 2013. This study surveyed college freshman to determine which types of preparation if any they had before taking either the SAT and/or ACT to decide if a certain type of preparation increased their scores. Students indicated whether they used online resources, self-help resources, school workshops and/or private tutoring before taking either test. The ACT scores were converted to SAT scores so that the data would be uniform. The mean SAT score was computed for those who used preparation and those who did not and comparisons were made. Each individual type of preparation was compared to no preparation. Finally, a correlation was computed between SAT scores and high school grade point averages. The research did not show that students who used preparation performed better than those who did not.

Key Terms: College Entrance Exams, SAT, ACT, GPA, Shadow Education

## **DEDICATION**

I would like to dedicate this dissertation to my family for their support and understanding when I was not as accessible as I should have been. I dedicate it to my wonderful husband, Ricky, and my precious sons, Joshua and Timothy. I thank them for preparing the meals and cleaning the house, so I could study. I also dedicate this dissertation to my sister, Shirley Hendrix, and brother, Randy Faulk. My mother became very ill after I began this journey, and I appreciate their understanding when perhaps I could not be as attentive as I should have been. I would also like to dedicate this dissertation to my late parents who instilled in me a desire to become a lifelong learner and to always seek ways to better myself.

I dedicate this dissertation to the wonderful people with whom I teach at Green Sea Floyds High School as well as the great students whom I teach. They have been supportive and encouraging every time I became uncertain. I am blessed to have a profession I love and a place I love in which to practice it.

I also dedicate this dissertation to the Ladies Sunday School Class at New Home Baptist Church in Conway, South Carolina. These ladies lifted me up in prayer as I daily strived to complete this project.

Most importantly, I dedicate this work to my Lord and Savior, Jesus Christ. If not for His Presence in my life, I would not have been able to complete this degree. “I can do all things through Christ which strengtheneth me” (Phillipians 4:13, KJV). I hold on to this verse when days are dark and there seems to be no way out; then a light appears, so I can see my way.

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## **CHAPTER ONE: INTRODUCTION**

High school seniors begin their final year with great anticipation and trepidation of what the future holds. Many of them plan to attend college, get their degrees, and find careers which will bring them prosperity and security. Thus, the question that is often foremost in their minds is “How do I accomplish these goals?” One of the first steps in doing so is to take one of two college admissions tests. The SAT I Reasoning Test, once called the Scholastic Aptitude Test, is the oldest admission test, established in 1926 (Blackwell, 2001). The second is the ACT; originally known as American College Testing, it was established in 1959 (“ACT: The First Fifty Years: 1959-2009,” 2009). Both of these tests are accepted at almost all universities in the United States. Thus, for high school students who wish to pursue college degrees, attaining certain scores for a given college is paramount. Also, many scholarships such as the Legislative Incentive for Future Excellence (LIFE) Scholarship in South Carolina are dependent upon minimum scores; a combined score of 1100 on the reading and mathematics for the SAT and a composite score of 24 on the ACT (“South Carolina Commission on Higher Learning,” 2013).

### **Background**

From its conception, the SAT has seen a great deal of criticism and been the topic of much controversy. Its creator, Carl Brigham, has been criticized for devising a test that is biased and favors Caucasian males (Blackwell, 2001). While the SAT has had many makeovers since its birth, many critics still believe it favors certain groups. To overcome such bias, tutorials and strategies have

been developed to help students meet the necessary score requirements for given colleges. Benderly (2007) stated that through cognitive advances in psychology “the SAT is a measure of developed abilities rather than of fixed aptitudes, as once thought. Intellectual development is now known to develop as a function of socioeconomic background, educational background and other opportunities” (p. 2). If this is indeed true, teaching one to perform well on the SAT is possible. “The ACT is a curriculum-based achievement test that measures what students need to know to be ready for entry-level college-credit courses” (“What Kind of Interpretations Can Be Made Based on ACT Scores,” 2008, p. 1). If it is an achievement test, then certain standards can be taught to increase one’s score on it as well.

While the SAT score is cumulative with a possibility of 800 points on each of three parts (critical reading, mathematics, and writing) for a total possible score of 2400 points, the ACT is a composite test with four sections (English, mathematics, reading, and science reasoning) worth 36 points each. Both testing organizations have published benchmark readiness scores for rising college freshmen. “The college readiness benchmark (1550 composite) was calculated as the SAT score associated with a 65 percent probability of earning a first-year GPA of 2.67 (B-) or higher” (Wyatt, Kobrin, Wiley, Camara, & Proestler, 2011, p. 5). The ACT has developed benchmark scores to determine college readiness as well. “The ACT-established college readiness benchmark scores for all four subjects tested are English (18), math (22), reading (21), and science (24)” (Noda, 2007, p. 1). Studies indicate “a student attaining those benchmark scores has at

least a 50 percent chance of receiving a B or higher or about a 75 percent chance of receiving a C or higher in a beginning level college course in the corresponding subject (English composition, Algebra, Social Science, and Biology)” (Noda, 2007, p.1). Accordingly, if these scores are indicative of college readiness, then schools should try to make certain students attain them. “Educators, families, communities, and policymakers all have the responsibility to ensure that all students, including those from low-income backgrounds, graduate from high school ready for college success” (Wyatt et al., 2011, p. 22).

Colleges report scores for accepted students and the middle fifty percent are reported by the College Board to give students an idea of the scores needed on either of the two tests to receive acceptance in a particular school (“College Board,” 2013). Once a student chooses a college that he or she would like to attend, he or she should begin to work towards meeting the college admission test requirement.

To ensure students pass the college admission tests, the SAT or the ACT, shadow education is often provided. Shadow education is education that is provided outside of the school by parents and guardians to either remediate or enrich (Buchmann, Condron, & Roscigno, 2010). Since the college entrance tests are a part of the competition that students who apply to selective schools face, “preparation courses, tutoring and other related activities constitute a clear example of shadow education” (Buchmann et al, 2010, p. 438). Shadow education can cause inequalities with respect to opportunities because not all students can afford it. Public schools need to compensate for such inequalities by

offering preparation classes during the school day and after school for all students.

### **Problem Statement**

Educators, parents, and students believe that either the SAT or ACT plays a monumental role of a high school senior's future. Some believe that students should perform well simply because students have been in school for twelve years and doing well on this test is simply the natural progression in one's life. Others believe that students must be prepared for such a test and they put forth time, money, and effort ensuring students receive such preparation. However, not every student has the resources necessary to help him or her attain the needed score to fulfill his or her educational dreams.

This study is prompted by the fact that college admission and scholarships depend upon targeted scores on the SAT and ACT, and all students do not have the same advantages in preparing for these tests. In the United States, "high-socioeconomic parents have more opportunities to influence the trajectories of their own children" (Buchmann et al., 2010, p. 436). Buchmann et al. (2010) found that test preparation affects enrollment at selective colleges. If preparation does affect student scores, then all students should have an opportunity to take classes that will aid them in achieving their goals.

### **Purpose Statement**

The purpose of this correlative study is to determine if preparation for college admission tests increases scores. This quantitative study will analyze the scores of college admission tests (the SAT and the ACT) of students with similar

GPA's to determine if students who had preparation for the tests performed better. Preparation for the tests includes test-prep manuals, private tutoring, online tutorials, and preparation classes. This study may encourage education administrators to offer test preparation classes for college-bound students.

### **Significance of the Study**

Giving all students the equal opportunity to further their education is not only morally right but it is mandated in the *No Child Left Behind Legislature* ("NCLB," 2001). This study will examine if a relationship exists between preparing for the SAT or the ACT and the achieved scores. If a correlation exists, schools and school districts may see the need for the implementation of test preparation courses to ensure students are ready for these tests. The researcher will also look at specific preparation methods in an attempt to ascertain if one preparation method is more successful than another. This information helps educators, parents, and students make informed decisions when choosing preparation methods for the SAT and/or the ACT.

### **Research Questions**

This study is proposed to determine if preparation for college entrance exams can increase students' scores thereby allowing them more education opportunities and scholarships.

**RQ1:** What is the correlation between college entrance exam scores of students who use self-paced manuals and tests and those who do not?

**RQ2:** What is the correlation between college entrance exam scores of students who take online test preparatory classes and those who do not?

**RQ3:** What is the correlation between college entrance exam scores of students who participate in school sponsored test preparatory classes and those who do not?

**RQ4:** What is the correlation between college entrance exam scores of students who have private tutoring and those who do not?

### **Hypotheses**

The following are the research hypotheses:

**H<sub>1</sub>:** Students who use self-paced manuals and tests in preparation for taking tests score higher on college entrance exams.

**H<sub>2</sub>:** Students who participate in online test preparatory classes score higher on college entrance exams.

**H<sub>3</sub>:** Students who participate in school sponsored test preparatory classes for taking tests score higher on college entrance exams.

**H<sub>4</sub>:** Students who have private tutoring in preparation for taking tests score higher on college entrance exams.

**H<sub>5</sub>:** Students who participate in various preparation methods for taking tests score higher on college entrance exams.

Alternatively, the following are the null hypotheses.

**H<sub>01</sub>:** Students who use self-paced manuals and tests in preparation for taking tests do not score higher on college entrance exams.

**H<sub>02</sub>:** Students who participate in online test preparatory classes do not score higher on college entrance exams.



**H<sub>03</sub>:** Students who participate in school sponsored test preparatory classes do not score higher on college entrance exams.

**H<sub>04</sub>:** Students who have private tutoring in preparation for taking tests do not score higher on college entrance exams.

**H<sub>05</sub>:** Students who participate in various preparation methods for taking tests do not score higher on college entrance exams.

### **Identification of Variables**

The independent variables for this study are college admission preparatory classes, online preparatory classes, preparatory manuals and texts, private tutoring, and high school grade point averages. The dependent variables are the scores from college entrance exams.

### **Definitions of Key Terms**

***College Entrance Exams*** (College Admission Tests) – Most four-year colleges require a college entrance exam for admission purposes. The two that are used by most colleges are the SAT and the ACT. For purposes of this research, ACT scores were converted to SAT scores using the *ACT* (2008) concordance chart. These scores were then used for the correlations conducted in this research.

***SAT*** – The SAT is a college admission test published by the College Board. Originally the SAT was called the Scholastic Aptitude Test, later the name was changed to Scholastic Assessment Test, but now is known simply as the SAT Reasoning Test (“College Board,” 2012). The SAT is a cumulative test based on three areas: Critical Reading, Mathematics, and Writing. Students’ SAT

scores were combined with converted ACT scores for correlation with students' college exam preparation methods.

*ACT* – The ACT is a college admission test published by the ACT organization. Originally, it was called the American College Testing but it is simply known as ACT today (“ACT: The First Fifty Years: 1959-2009,” 2009, p. 14). It is composed of four tests in English, Mathematics, Reading, and Science Reasoning. The ACT is a composite score wherein each test receives a score of 1-36. Students' converted ACT scores were combined with SAT scores for correlation with students' college exam preparation methods.

*HSGPA* – The HSGPA is the grade point average a student acquires in high school. For purposes of this study, the HSGPA used will be based on a 4.0 scale.

*Shadow Education* – Shadow education “refers to educational activities, such as tutoring and extra classes, occurring outside of the formal channels of an educational system” (Buchmann et al., 2010, p. 436). These activities are designed to improve student performance and are usually provided by parents and other resources outside of school.

### **Research Summary**

This study involved doing ex post facto research by asking students to complete surveys to determine the preparatory techniques they used in getting ready to take the SAT or ACT. Students were asked to describe whether they took traditional classes, online classes, or self-taught classes using manuals and texts. The results of these surveys were correlated to their SAT/ACT scores to

determine if students who did prepare had higher scores than those who did not. This researcher studied the scores and preparation methods of students with HSGPAs less than 3.0 to determine if all students with similar HSGPAs should engage in preparatory techniques before taking the SAT or ACT.

This study occurred at a private university during the Freshman Seminar. Students were asked by various college instructors to complete a survey on behalf of this research student. The results from the survey were correlated with students' college admission scores and HSGPAs.

### **Assumptions**

This study assumed that students read the survey questions carefully and answered them honestly. This study also assumed private tutors provide instruction in This study assumed that students provided correct data and information. This study also assumed that high school workshops were comparable.

### **Limitations**

This study was limited in that only a sample of students was studied. The sample was approximately 26% of the total freshman population at this university. These students were chosen using the cluster method. This study also depended upon the honesty of students completing the surveys and their understanding of what preparation methods included. Since it is ex post facto research, the internal validity is lower (Ary, Jacobs, Razavieh, & Sorensen, 2008, p. 362). The college where the study took place is a private university in Virginia which may imply that the students who took the survey do not reflect the entire freshman population

across the United States even though 58% of the students are out of state  
("College Board," 2013).

## CHAPTER TWO: REVIEW OF THE LITERATURE

### Introduction

Since the 1950s, literature has been written about the effects of coaching on the Scholastic Aptitude Test (SAT) (Dear, 1958). The SAT is one of two main tests used to determine admission in four-year universities and colleges. Since its invention, the SAT's format as well as its purpose has changed significantly. It has become an instrument used to admit or reject students into colleges. Since it is so important to the high school student who has great ambitions for college, scoring high on it is paramount. As a result of its importance, students have sought ways to prepare for it. Thus, SAT preparation methods are in great demand. However, one must wonder if using such preparation methods provides students with misguided confidence for college readiness. Even students with learning disabilities are using SAT preparation techniques to improve their scores. Advocates for students with learning disabilities do not believe such a test should disallow students from attending college (Lindstrom & Gregg, 2007). Since "youth without disabilities are more than four and one-half times as likely as youth with disabilities to be currently taking courses at a 4-year college," one must wonder if it is because of the admission exams (Lindstrom & Gregg, 2007, p. 85). Regardless, such exams cause much anxiety for all students including those with learning disabilities. Effective preparation lessens the anxiety, so that the students may be more successful on the test. Familiarity with the exam gives students confidence they can be successful.

## **History and Purpose of the SAT**

The SAT was born in 1926. Since that time, it has received much criticism and has been at the root of much conversation and debate. Before World War I, tests were not used for entry into college. However, Carl Campbell Brigham, a Princeton University professor, decided that tests used to place soldiers during the war could also be used to place students into college. The war tests began as a result of the Intelligence Quotient (IQ) tests invented by Frenchman Stephen Benet (Blackwell, 2001). Brigham pushed to make undergraduate testing mandatory (Blackwell, 2001). “In 1925, the College Board – the panel that regulated admission into the Ivy League schools – assigned [Brigham] to draw up a universal entry exam. The result was the Scholastic Aptitude Test (SAT)” (Blackwell, 2001, p. 2). The first test, similar to the current one, graded students on a scale of 200 to 800. Questions included subjects such as vocabulary, analogies, reading comprehension, geometry, and algebra. Originally, there was an essay question, but it was removed in the 1950s. In 1994, ten open-ended math questions were added and in 2005, an essay was put back on the test.

Brigham has been criticized for creating a very racial test which many people believe still exists.

To some critics of the SAT, the test has never been free from the original sin of Brigham’s racism. But Brigham renounced his beliefs in the inferiority of non-‘Nordic’ people in the ‘30s and conceded that education and social status do, in fact, influence test scores (Blackwell, 2001, p. 2).

Brigham developed his tests at Princeton University. After the Second World War, the Educational Testing Service (ETS) was officially developed, received a charter and came into existence. ETS was located at Princeton University. Henry Chauncey was named as its president. The ETS not only invented tests, but it was also responsible for research. Some of the research centered on the test items themselves and other research centered on the students taking the tests. ETS also made the pencil a requirement for all tests, so that the tests could be graded through a test-reading machine. Eventually, the ETS also began to write tests for graduate school, law school and Foreign Service exams. It grew so quickly until the need to relocate became inevitable, and ETS moved to a 360-acre campus in 1958 (Blackwell, 2011).

As the years have passed, ETS has become less secretive about how tests are written. “In 1994, it entered the test-coaching business itself with guides advertising, ‘We prepare the tests – let us prepare you!’” (Blackwell, 2001, p. 5). ETS is still writing tests that determine where a child will attend school and that child’s potential scholarship money. Therefore, coaching the SAT has grown into an important concept for schools, parents, and students (Blackwell, 2001).

The SAT has been revised several times partially since it has been noted as a biased test because it culturally favors males from a high socioeconomic class in its questions. An attempt to meet the needs of colleges sparked its last change which took place in March 2005. The test now contains ten sections that require three hours and forty-five minutes to take excluding breaks and filling out forms. Regardless of the criticism, the SAT is a data collection tool that is a standardized

test and provides the same information about every student (“The New SAT, 2006). “Although the government is working hard to set a uniform standard among high school curricula, some schools still have much different curricula and academic standards from others” (“The New SAT,” 2006, p. 30). Colleges believe using only transcripts is unfair because of the diverse backgrounds from which students come. A student who is ranked in the top five percent at a very small school may have abilities and skills comparable to a student ranked in the top twenty percent at another school. Thus, there is a need for a standardized test. Yet, by the same token, a test should not destroy the opportunities for a student who has worked very hard during his or her high school years. However, a student who finds the SAT difficult and unpredictable may do poorly on the test, and thus lose scholarships and admission opportunities. In years past, the SAT was thought to be a pure aptitude test, which is no longer true. Benderly (2007) said that through cognitive advances in psychology “the SAT is a measure of developed abilities rather than of fixed aptitudes, as once thought. Intellectual development is now known to develop as a function of socioeconomic background, educational background, and other opportunities” (p. 2). If this is indeed true, teaching students to perform well on the SAT is very possible. Therefore, identifying the characteristics and preparations of high SAT scorers in order to prepare all students seemingly has the potential to increase students’ scores and thus provide them with more educational opportunities. Powers (1993) stated, “The rate at which new test preparation resources are developed and marketed appears far greater than the rate at which adequate information is



generated about the effectiveness of these offerings” (p. 24). Thus, a great need exists to determine which resources are beneficial and which are not. Much money and time may be spent on books and programs that do not help students improve their SAT scores.

### **Chronological Studies on Coaching the SAT**

Briggs (2005) purported, “Coaching can be defined as systematic test preparation for a student or group of students that involves the following: content review, item drill and practice, and an emphasis on specific test-taking strategies and general test wiseness” (p. 89). As the SAT has grown in importance for acceptance into college, coaching has been a popular option for students. As a result there have been many studies conducted to determine its effectiveness. Also, the different types of coaching have been scrutinized to ascertain which is more effective.

Dear (1958) conducted a study from November 1956 to March 1957 in which 10 schools participated in a program to coach students for the SAT. Each week the students would attend one session on mathematics preparation and one session on verbal preparation. In addition students would have one hour of homework each week related to the SAT preparation sessions. The main findings were that “the coached students showed no significant gains over control students on the verbal part of the SAT; the coached group showed a gain of about 26 points over the pooled control group of the math part of the SAT” (Dear, 1958, p. 319). On the January 1957 test, the coached group showed a gain of 21 points overall (Dear, 1958).

According to Messick and Jungeblut (1981), an exhaustive review of studies of coaching for the Scholastic Aptitude Test revealed them to be methodologically flawed in a variety of ways. Despite these flaws and the attendant noise obscuring the results, some definite regularities emerged relating the size of score effects associated with coaching to the amount of student contact time entailed in the coaching programs (p. 191).

For their study, Messick and Jungeblut (1981) looked at all of the available coaching studies conducted up to that point before determining their approach to the study. They then looked at how much time a student invested in a coaching program before getting results. Their results appeared to be nonlinear.

However, with arithmetically increasing amounts of score effect being associated with geometrically increasing amounts of student contact time, which in these data may also be serving as a proxy for increasing curriculum emphases on content knowledge and skill development as opposed to item review and practice,” one may see a connection between time invested and the coaching program (Messick & Jungeblut, 1981, p. 191).

Becker conducted research in 1990 that demonstrated positive results for coaching. She found an increase in mathematics scores but not verbal scores as a result. “However, considerable variability in results for 48 studies reflected the fact that not all coaching is necessarily effective and that all studies of coaching do not provide similar views of coaching’s effectiveness” (Becker, 1990, p. 373).

In conducting her research, Becker (1990) used the standardized mean-change measure to evaluate the effectiveness of coaching. The subjects were divided into groups who received coaching and those who did not. “Nineteen characteristics of the sample, the coaching intervention, and the design and reporting of coaching studies, were coded” (Becker, 1990, p. 382). These nineteen characteristics were divided into three major types: study characteristics, sample characteristics, and coaching-intervention characteristics. The study characteristics were divided into six variables related to design and reporting; the sample characteristics were divided into selectivity and voluntariness; and the coaching-intervention characteristics were divided into eleven types which include types of previous preparation, types of instruction, and the areas of instruction (Becker, 1990).

Becker (1990) found that “coaching produced larger changes and somewhat more spread in changes than simply retaking the SAT” (p. 391). However, she notes that coaching is not well reported. It is difficult to absolutely be certain if some students have been coached or not. She ascertains that more research in this area is definitely needed. Becker (1990) advised those doing future research: “Furthermore, primary researchers investigating interventions purported to be ‘coaching’ should provide detailed descriptions of the activities involved, materials used, and time spent in instruction. It is difficult to make specific recommendations about what constitutes ‘coaching’” (p. 408).

The *College Board* (1999) surveyed a sample of students who took the 1995-96 SAT. This SAT was a new version; its format had changed. The College Board sent out a survey to 6,700 students chosen using a stratified random sample

method. Of those surveyed, 4,200 responded. Of those responding, 12 percent said they had attended coaching programs that were not sponsored by their schools. Some of the programs were sponsored by colleges or organizations.

As part of this study, students answered questions which indicated such characteristics as anxiety and motivation. Since the *College Board* (1999) conducted the study, it had access to the respondents' previous scores as well as their final scores. The College Board used the students' first scores to classify them by ability levels. The College Board also used information from the student questionnaire that students completed when initially registering for the SAT. Since this information was dependent upon the students correctly submitting the information, the College Board re-contacted 350 of the students and repeated some of the questions to check for consistency ("College Board," 1999).

Once all of the material was gathered, the College Board employed six different methods to look for correlations between coaching and SAT scores. By using the different methods, the results were different. However, the College Board did find two similar things regardless of the method of analysis. The first finding was that "there is an effect of coaching, and as with the previous version of the SAT, the effect is larger for the math than for the verbal part of the exam" (Powers & Rock, 1999, p. 112). A second finding was "the variability among the estimates computed here – 21 to 34 points over all programs for verbal and math scores combined – is far less than the discrepancy between these estimates and the claims made by the Kaplan and Princeton Review programs, for example" (Powers & Rock, 1999, p. 112). A concern with this research is that there was no

way to document and verify the coaching experiences that the students said they had. However, the largeness of the group and the different methods of analysis employed lend validity to the research.

Sheth and Lehr (2001) studied the influences of SAT scores in the fall of 2001. The purpose of their study was to find out “if there were some aspects of someone’s high school or college record that could be used to effectively predict their SAT score” (Sheth & Lehr, 2001, p. 1). The motivation behind the research was to determine if the SAT is an accurate predictor of how a person will perform in college. There have been controversial findings in the past with most results demonstrating that it does not indicate a person’s college success. One of Sheth and Lehr’s focuses was on students who had been tutored before taking the SAT. Of the seventy-nine students they surveyed at Pennsylvania State University, only thirty-six students had been tutored. They used a Bernoulli variable with 1 representing those who had been tutored and a 0 for those who had not been tutored. They noted that they did not take into consideration the amount of tutoring a student may have had. Certainly a person who has had a year-long tutor cannot be compared to a student who only had three tutorial sessions. However, Sheth and Lehr (2001) predicted there would be a strong correlation between high SAT scores and tutoring, but their study did not confirm their predictions. “The correlation between this variable (tutoring) and the SAT score is only .0191 which is somewhat surprising given its ostensibly linked nature” (p. 13). Pennsylvania State University has high admission standards; and therefore, the majority of students who apply are well prepared for standardized tests (Sheth

& Lehr, 2001). Sheth and Lehr (2001) should have extended their study to other colleges and included more students. This researcher believes their study was very limited because Sheth and Lehr (2001) only had seventy-nine participants from a university that has an enrollment of thousands.

Beal (2007) from the University of Southern California along with Walles, Arroyo, and Woolf from the University of Massachusetts-Amherst conducted a study with high school students to determine if math skills would improve using an online tutorial program. Math problems were taken from previously administered SAT tests to form a pretest for geometry students. This test was a paper-and-pencil test. Another form of the test was devised with similar problems to use as the post-test.

Two geometry classes from the same school were chosen to use as subjects for the research. The experimental group worked with the Wayang Outpost web-based interactive tutoring system. This system provided individualized multimedia instruction. Students were given a series of math problems and could choose interactive hints which would help them solve the problems. The students could receive all of the hints that were available or choose to answer to the problem at any time. The experimental group worked with the online program two days, fifty minutes each day. While the experimental group was working online, the control group continued with math activities in class. Both groups were given the post-test on the same day. The tests were scored in a method similar to the SAT. Three points were given for each correct answer and one point was subtracted for each incorrect answer (Beal,

2007). “The overall scores of students in the control and on-line tutoring groups on the paper-and-pencil pretest were compared with a one-way analysis of variance” (Beal, 2007, p. 47). Results were interesting. The control group performed higher on the pre-test which indicated these students may have been more proficient than the experimental group. However, when looking for improvement, this group improved very little on the geometry questions or the algebra questions. The experimental group improved significantly on the geometry questions but not on the algebra questions. However, geometry skills were the only ones addressed on the online tutoring program. Yet, if one could find a correlation between students’ scores and preparation using online programs, one might determine online programs are effective in improving student’s SAT scores (Beal, 2007).

Students in the experimental group were then divided according to pre-test performance. One subgroup was composed of the higher level students and the other group was composed of the lower level students. Students at the lower level showed much more improvement than those at the higher level. One might not be surprised by these results because the lower level students have more to gain than higher level students (Beal, 2007). Usually, raising high scores is more difficult than raising low scores (Beal, 2007).

A concern this researcher found with this study is that it was done in only a few days. This researcher would have liked to have seen if the results were long-lasting. Also, the students in the control group may have sought answers to the type of math questions that were on the pretest. The study did not discuss

measures to ensure the control group did not receive any tutoring that may have made the results of the experiment unreliable. Sometimes, this researcher feels as if she is being rated. The teacher in the control group may have felt his or her teaching methods were being attacked. If so, having seen the pretest, she or he may have taught the same standards that were being taught on the online tutorial even though the research does not comment about the content of the control group's lessons. Clarity would have been beneficial to this researcher.

Holthaus (2008) conducted a study to determine if there is a significant improvement in math SAT scores with coaching. Holthaus (2008) studied students from diverse ethnic groups with military parents. He studied students who had taken the PSAT in the fall of 2006 and the SAT in the spring or summer of 2007. Holthaus (2008) used the PSAT scores as the preliminary scores and the SAT scores as the final scores. Holthaus (2008) coached students prior to the SAT test. If the student planned to take the March test, he or she was coached the month prior to the test. There were ten thirty minute coaching sessions prior to the SAT held during the school day, so that all students had an opportunity to attend (Holthaus, 2008).

The study was a quasi-experimental quantitative study using the pretest and posttest control design. There were thirty-three participants in the study. Fifty-five percent participated in the coaching sessions and forty-five percent did not. A comparison of their pretest posttest results was done (Holthaus, 2008). Previous research had shown "the scores of coached students improved 15-18 points in mathematics; this study showed a greater gain than that among coached



students, but there was no significant difference in the scores of coached and uncoached students” (Holthaus, 2008, p. 69). This study has much potential. However, the group of students was too small especially for a quantitative project. The researcher himself also noted that longer coaching sessions might have been beneficial as well.

### **SAT Accommodations for Students with Learning Disabilities**

Students who have learning disabilities and receive accommodations in the classroom may also receive accommodations on the SAT. Students must apply for and submit proof of accommodations. Students’ Individualized Education Plans (IEPs) or 504 Plans usually are sent for review by the College Board (Fuller & Wehmann, 2003). “The Student Eligibility Form, as well as the SAT Program Registration and fee, must be submitted by the registration deadline” (Fuller & Wehman, 2003, p.195). Not everyone who asks is given accommodations. Accommodations may include extended time or having the test read aloud. A test for which accommodations are given was flagged in past years to indicate the student received the accommodation. However, since 2002 (Fuller & Wehman, 2003) tests have not been flagged. The purpose behind giving students accommodations is to make certain no one has a handicap with respect to the test. Because tests are no longer flagged, some students attempt to get diagnosed with learning disabilities just to receive the extra time on the test (Fuller & Wehman, 2003). Thus, the College Board must be careful to whom they give accommodations.

Lindstrom & Gregg (2007) studied the newest version of the SAT released in March 2005; approximately 50,000 students took it. Out of that group a random sample of 2,476 was chosen who tested with standard administration time limits and another sample of 2,476 was chosen who received extended time due to a disability. After careful analysis of these students' tests, "results provided compelling evidence in support of the inference that the Critical Reading, Math and Writing sections comprising the SAT reflect the same underlying constructs across both samples, suggesting that students in both groups respond to the items in a similar manner" (Lindstrom & Gregg, 2007, p. 92). These results differ from previous studies on the different versions of the SAT which had indicated extended time gave students with learning disabilities an advantage.

Students with learning difficulties often have difficulty remembering SAT vocabulary. Terrill, Scruggs, and Mastropieri (2004) studied the results of a teacher who wanted to know if mnemonic strategies would help students with vocabulary. The teacher employed the keyword method to help her students. "The keyword method is a multistep process for improving the retrieval link between known and unknown information" (Terrill, Scruggs, & Mastropieri, 2004, p. 288). This teacher taught students with learning disabilities for six weeks using the keyword method and the traditional method. After the end of the instructional period, students remembered 92% of the words taught using the keyword method and only 49% of the words using the traditional method. Using such methods has the potential to greatly increase students' SAT Critical Reading scores (Terrill, Scruggs, & Mastropieri, 2004).

## **Tutorial Programs Available**

There are many programs available from which a high school student may choose to prepare for the SAT. The *College Board* (2008) offers an SAT online course as well as a preparation book. The *College Board* also has practice questions and a practice test on its website that students may access for no charge. The Princeton Review offers “private tutoring, small group tutoring, classroom courses, and online programs” (“The Princeton Review,” 2008). *Kaplan Test Prep and Admissions* (2008) offers several programs as well. The Princeton Review and Kaplan Test Prep guarantee that students’ scores will increase. Such programs have profited greatly. “The Princeton Review, one of the largest companies in this market, earned \$110.4 million in revenue for its test preparation services in 2009” (Buchemann, Condrón, & Roscigno, 2010, p. 435). Because of the costs, however, these programs are not available to all students (Buchemann, Condrón, & Roscigno, 2010).

While many believe coaching to be an effective way to improve one’s SAT scores, one must be careful when analyzing the statistics. There are many products and people who claim that they can quickly improve a student’s scores. One must check the validity of such people and resources. Powers (1993) stated, “Consumers apparently are more easily convinced about the effectiveness of special test preparation than are others who research the topic” (p. 24). One of the most common “misconceptions is that simple test-score gains from one occasion to another are an adequate reflection of the effects of coaching” (Powers, 1993, p. 24). One must make certain the validity of such improvement is due to the

coaching and no other variables “because of practice with taking tests, measurement error , and real growth in abilities, an individual’s test scores will vary from one test administration to another, regardless of any intervening test preparation” (Powers, 1993, p. 24).

Briggs (2001) warned that consumers must be careful about the promises of commercial test preparation programs for two reasons. First, any estimate of a commercial program effect must be made relative to a control group of students who did *not* prepare for the test with a commercial program. If test preparation companies or private tutors advertise only the average score gains of the students who make use of their services,

the “effect” of this preparation is misleading. A second related problem is that students are not assigned randomly to test preparation conditions, but self-select themselves into two groups: those receiving the preparatory “treatment,” and those receiving the preparatory “control.” Because the two groups of students may differ along important characteristics related to admissions test performance, any comparison of average score gains that does not control for such differences will be biased. (Briggs, 2001, pp. 1).

Therefore, it is imperative that one does his or her research before choosing a preparatory program or tutor to assist in increasing SAT scores.

While many studies concerning the effectiveness of coaching for the SAT have been conducted, many questions still exist. The research demonstrates that there are several differences in the findings. Also, with the many preparatory

programs available to students, determining which ones are the most effective is difficult. While research concerning specific types of coaching such as classroom tutorials, online programs, textbook tutorials, etc. need to be conducted, research with respect to tutoring students with learning disabilities is also necessary.

Students with disabilities need to know how to take these tests that can be half the way to success. Since SAT scores for students with disabilities are significantly lower because of the inherent characteristics of the disability, it then becomes imperative for students to have an intimate knowledge of what limitations the disability imposes. This knowledge and the guidance of educational professionals become the foundation for developing a personal test taking strategy. Practice testing can help reveal important facts about what to include in a personal test taking strategy (Fuller & Wehman, 2003, p. 195).

Educators need to be aware of the available programs for students with learning disabilities. Mattson (2007) conducted research in the Southwestern United States and found that “Scholastic Aptitude Test scores failed to predict success as measured by college GPA” (p. 9). Thus, the purpose of the SAT seems only to allow colleges to turn students down for admission; it is not a real indicator of how well students will perform once they are in college. Tutorials and accommodations will allow colleges to see the true abilities of the students with learning disabilities and prevent students from attempting to seek a learning disability diagnosis for college admission test purposes (Mattson, 2007).

## **Socioeconomic Status and the SAT**

Bowen, Chingos, and McPherson (2009) studied students in North Carolina to determine if socioeconomic status (SES) was related to SAT scores. They established that it was a keen indicator of performance. They found that “both black male and female test-takers had SAT scores that were almost one standard deviation lower than the SAT score for a comparable white man (and just over a half a standard deviation lower than the score for a comparable white woman)” (Bowen, Chingos, & McPherson, 2009, p. 126). Hispanics also performed lower than whites but not as much as blacks. Bowen, Chingos, and McPherson (2009) also found that a parent’s educational background had a profound effect on a student’s SAT performance. “This important finding demonstrates again that highly educated parents have a major impact on the skills that their children take to high school, to college, and then on into life” (Bowen, Chingos, McPherson, 2009, p.126). While SES and race predict HSGPA as well, “in general, the impact on SAT scores is somewhat greater” ( Bowen, Chingos, & McPherson, 2009, p. 127).

## **ACT Origin**

The other college admission test is the ACT, once known as American College Testing. E.F. Lindquist and his associates credited with founding the ACT (“ACT: A Brief History,” 2009). Lindquist served on the advisory committee for the SAT. He was very unhappy with the SAT. He felt that the SAT was an Intelligence Quotient (IQ) test rather than an achievement test. Since the economy had improved in the United States and more people were finishing high

school and going to college, Lindquist felt that something needed to change (“ACT: A Brief History,” 2009). As a professor and researcher, Lindquist was well respected throughout the educational community. He invented one of the first educational scoring machines (“ACT: A Brief History,” 2009). Therefore, when he and his friend, Ted McCarrel, voiced their plans for a new test, they were well received. “On September 8, 1959, the American College Testing Program made its debut at simultaneous press conferences, one conducted by Lindquist at the Hotel Biltmore in New York City and the other conducted by McCarrel in Iowa City” (“ACT: A Brief History,” 2009, p. 13). Over 75,000 students took the first ACT in November of 1959 (“ACT: A Brief History,” 2009). The test was similar to the Iowa Test of Educational Development since Lindquist and his friends were from Iowa and had worked with developing that test. The goals of Lindquist’s new test were as follows:

1. Measure as directly as possible the skills and abilities required for college success.
2. Require that students perform tasks comparable to those performed in college work.
3. Require students to interpret and to evaluate critically the kind of material they will read and study in college. (“ACT: A Brief History,” 2009, p. 14)

The ACT has continued to evolve in the last fifty years. One of its most important changes came in the 1990s when the organization implemented the Educational Planning and Assessment System (EPAS). (“ACT: A Brief History,”

2009). With this program, came the implementation of pre-assessments for the ACT. The first was the P-ACT, later renamed PLAN and the second was the EXPLORE. The PLAN is given in high school and is more than just a practice test for the ACT (“ACT; A Brief History,” 2009). “The name PLAN succinctly captured the program’s focus on helping students make post-high school plans, whether those plans included college or other options” (“ACT: A Brief History,” 2009, p. 96). The EXPLORE made its appearance in 1992 and was given to eighth graders. Its purpose follows:

- To introduce students to career options at an earlier stage
- To help students prepare high school course plans
- To identify levels of educational development as guides to academic intervention
- To foster improved effectiveness of curriculum for both high school and postsecondary preparation (“ACT: A Brief History,” 2009, p. 96).

The EPAS is more than just a college admission test. Its purpose is to guide students towards the right career path. The information received from students help determine students’ interests and suggest possible career choices for them.

Both EXPLORE and PLAN have college readiness scores to determine if students who plan to attend college are on the right path. The ACT organization has grown tremendously since its inception (“ACT: A Brief History,” 2009).

### **ACT College Readiness Research**

The ACT is composed of four tests with an optional writing test that is not required by all colleges for admission. The four tests are English, mathematics,



reading, and science reasoning. A student receives a score of 1 to 36 on each test. The four scores are then averaged to yield a composite score. In 2009, about 45% of all high school graduates took the ACT, which is approximately 1.48 million students (“ACT,” 2010). Of these students, only 23 percent met the college-readiness benchmark scores in all four subjects (“ACT,” 2010). “The ACT-established college readiness benchmark scores for all four subjects tested are English (18), math (22), reading (21), and science (24)” (Noda, 2007). These benchmarks are used as predictors of collegiate success. According to the *ACT* (2010), “students who meet a benchmark on the ACT have approximately a 50 percent chance of earning a B or better and approximately a 75 percent chance of earning a C or better in the corresponding college course or courses.” When a student does not do well on the ACT or meet the requisite scores, he or she may be placed in a remedial class which does not count towards a college degree but must be satisfactorily completed before a student is allowed to take college level courses in certain disciplines. Because these courses cost students time and money, they often seek preparation methods to improve their scores (Noda, 2007).

### **Purpose of College Admission Tests**

There have been many studies that have attempted to identify variables that lead to collegiate success. College admission tests have been studied to see if they are indicators. For example, the ACT organization has attempted to find a test score that will indicate collegiate success based on its test. The ACT is a reliable and valid test with reliability coefficients of the four subtests ranging

from .85 to .92 (“ACT,” 2007). Even though the ACT has published college readiness scores, students may be accepted at many colleges with lower scores.

With approximately 56% of students completing degrees at four year colleges and only 32% at two-year colleges, there is concern that students are not receiving the skills needed for college (Wyatt, Kobrin, Wiley, Camara & Proestler, 2011). Such concern has sparked many initiatives. “One of the most comprehensive and far-reaching initiatives is the Common Core Standards and assessments, which is a major effort to establish consistent content and performance standards related to college readiness” (Wyatt et al., 2011, p. 7). College admission tests attempt to provide benchmark scores to aid the educational community in determining ways to ensure students are prepared for college.

If all high schools taught with the same rigor and used the same standards, then HSGPAs would be more reliable as indicators of college success. However, “high schools can greatly vary in the academic performance of their students, the standards held by their teachers, the percentage of students going on the college, teacher qualifications, class size, and the availability of rigorous courses” (Mattern, Shaw, & Kobrin, 2011, p. 642). These differences in the high schools can make a great difference in the knowledge a student has when he or she enters college. Throughout the years, grade inflation was also become problematic. “HSGPAs have steadily increased over the past 20 years, with no subsequent increase in SAT Verbal scores and a slight increase in SAT Math scores” (Mattern & al., 2011, p.642). The inflation of grades has made it difficult for

colleges to determine if students are prepared for college. Thus, colleges have to rely on standardized tests because they are the same throughout the nation (Mattern & al., 2011).

### **Shadow Education for College Admission Tests**

Shadow education is education received outside of school. Preparation for such tests as the SAT or ACT qualifies as shadow education. “When the [SAT] was introduced in 1926, proponents maintained that requiring the exam would level the playing field and reduce the importance of social origins for access to college” (Buchmann & al., 2010, p. 439). However, with costly preparation opportunities, it has not leveled the field. Students from high socioeconomic backgrounds clearly have a tremendous advantage over students who cannot afford such opportunities. Buchmann et al. (2010) found that “test preparation has no significant impact on enrollment in less than four-year and nonselective institutions, yet has a positive effect on enrollment in selective and highly selective institutions” (p. 462). Everyone in America is supposed to have an opportunity for an equal education. However “if researchers do not attend to the growth of shadow education, they will surely miss an important process through which inequality might manifest” (Buchman & al., 2010, p. 458).

### **Race Differences in Preparation**

African Americans benefit more from test preparation than do Caucasians according to Alon (2010) who analyzed data from the Buchmann et al. (2010) study about shadow education. Surprisingly, Alon (2010) found that “blacks and Hispanics are more likely than whites from comparable backgrounds to utilize test

preparation” (p. 463). On the SAT, there used to be a gap of 250 points between African Americans and Caucasians, but today that gap has narrowed to 200 points (Alon, 2010). One factor influencing this may be the use of preparation; “84 percent of blacks used at least one form of preparation compared to only 68 percent of whites, and they were also more likely than whites to be engaged in multiple test preparation activities” (Alon, 2010, p. 463). Perhaps blacks use more preparation methods because they are more likely to get acceptance into elite colleges with lower scores than whites because of the Affirmative Action Policy (Alon, 2010). Therefore, if they can improve their scores minimally, their prospects may greatly increase. Investing money in preparation methods may open doors to opportunities for blacks that whites would not have with the same score increases.

Since minorities are under-represented at many universities, these universities may give them special admission consideration. In fact, the National Association for College Admission Counseling’s Commission “warns against allowing an overemphasis on SAT/ACT scores to ‘exacerbate existing disparities among under-represented students’” (Bowen, Chingos, & McPherson, 2009, p. 127). Therefore,

it is plausible that the preferential admissions treatment for under-represented minorities at elite institutions raises the education expectations of black high school students which consequently both fuels their motivation to improve test scores and shape their test preparation strategies”(Alon, 2010, p. 468).

Thus, black students with low scores may actually believe they have an edge at getting accepted to selective universities, which is the reason they seek test preparation. These students realize that a degree from a selective university will increase their job opportunities. Therefore, test preparation may be very important to these students who wish for acceptance at selective universities (Alon, 2010).

One of the most interesting outcomes of Alon's study (2010) is that whites and Asians with high scores will use preparation methods more than blacks and Hispanics with high scores. The reason is because the whites and Asians are competing for very selective schools and realize they must increase their scores. However, blacks and Hispanics with high scores on their first tests will probably get accepted into selective schools because of the Affirmative Action Policy; therefore, they spend less money on preparation methods.(Alon, 2010). "As the U.S. population becomes more diverse, race-sensitive admissions must be treated as an integral and important element in the structural context of any comprehensive theory about commitment to higher education" (Alon, 2010, p. 463). Therefore, the Affirmative Action Policy may need to be examined. Students realize their options and understand the expectations of colleges and this realization often drives the preparation methods that they seek (Alon, 2010).

### **Parent Involvement and Time**

Devin-Eller (2012) studied which students engage in test preparation methods for the SAT and ACT by using the *National Household Education Survey of 2007*. She finds that the gap between scores for blacks and whites exist even when family incomes are the same. One "possibility is that variation in use

of test prep is tied to broadly cultural differences in child rearing; that is, related in a complex way to cultural dispositions toward educational advantage” ( Devin-Eller, 2012, p. 462). Early childhood socialization may be instrumental to SAT/ACT scores twelve to fourteen years later. Some parents take a more active role in determining their children’s lives. “In particular, higher income or more highly educated parents may deploy test prep to facilitate the transition to college, either to bolster the chances of already competitive children or to ameliorate other college application weaknesses” (Devin-Eller, 2012, p. 462).

Devin-Eller (2012) also speculates that time may be a contributing factor. Some students do not give themselves enough time to adequately prepare for these tests, so preparation does not make a great difference in their scores. A student who prepares the same amount as another student but does so over a shorter period of time may not do as well. Therefore, the question arises as to which grade level a student should begin to prepare. Presently, “black 11th graders have the highest predicted probability of prep” (Devin-Eller, 2012, p. 474). Devin-Eller (2012) also found that students whose parents are active in school activities participate in preparation more than those whose parents do not. A possible reason is that active parents seem to be more aware of opportunities for preparation offered by educators and schools.

### **National Association for College Admission Counseling**

The National Association for College Admission Counseling (NACAC) strives to help students in their postsecondary endeavors. A part of their work

includes researching the effects of coaching on the SAT and ACT. According to the NACAC, a consensus has been reached which includes the following:

- Coaching has a positive effect on the SAT performance, but the magnitude of the effect is small.
- The effect of coaching is larger on the math section of the exam (10-20 points) than it is for the critical reading section (5-10 points).
- There is mixed evidence with respect to the effect of coaching on ACT performance. Only two studies have been conducted. The most recent evidence indicates that only private tutoring has a small effect of .4 points on the math section of the exam (Briggs, 2009. p. 12).

The results of the NACAC's research suggest that coaching may not yield the results that test preparation companies claim. Another concern found by the NACAC is that scores may increase from one test to the next without any preparation (Briggs, 2009). Therefore, crediting a certain preparation method may be unwarranted. A student may naturally do better on a second test because of his or her course work and maturity.

### **Test Prep Methods and Companies**

Many students are taking the ACT and SAT multiple times hoping to achieve the highest score possible. One of the possible results is “the number of perfect ACT scores for the Class of 2010 is more than twice the perfect scorers in the Class of 2006; 588 out of 1.5 million who took the test in 2010 versus 216 out of 1.2 million in 2006” (Smith, 2010). Part of the increase in these scores is not only thought to be a result of taking multiple tests but also using various test

preparation methods. These preparation methods and/or companies have become major businesses in the United States.

Kaplan is one of the major organizations that offer test preparation. This organization was created in 1938. “With a comprehensive menu of online offerings and a complete array of books, Kaplan offers preparation for more than ninety standardized tests, including entrance exams for secondary school, college and graduate school, as well as professional licensing exams” (“Kaplan Test Prep,” 2011, para. 7). Kaplan surveyed colleges and found that 90 percent still require either the SAT or ACT and they feel confident that these tests indicate the success of potential college students (“Kaplan Test Prep,” 2011).

The Academic Approach is another test preparation company. This company claims “students see an average increase of 386 points on the SAT (2,400 points possible) and 5.4 points on the ACT (36 points possible)” (“The Academic Approach,” 2008, p. 766). The Academic Approach promises to prepare students for college as well as preparing them for the tests. It says its instructors focus on “critical thinking and problem solving, rather than gimmicks and tricks” (“The Academic Approach,” 2008, p. 766). It also offers a weekly blog wherein students can ask questions and receive feedback informally.

Founded in 1981, the Princeton Review is another popular test preparation organization. Princeton Review publishes manuals that students may purchase to study by themselves, but it also offers private tutoring online as well as other online resources. A course with the Princeton Review includes “forty-eight hours of in-class instruction, six practice tests, 40-60 hours of video lessons and a



money-back guarantee” (“Princeton Review,” 2013, p. 1). It guarantees 150 point increase on the SAT given the student meets certain requirements. In 2010, the Princeton Review began a program in conjunction with Union Plus for union members and their families. These members have access to the Princeton Review and other resources for ensuring their children are ready for college (“The Princeton Review & Union,” 2010). The purpose is to allow union members to have access to preparation methods for a discounted price (“The Princeton Review & Union,” 2010).

Grockit is a relatively new test preparation method (Hua, 2010). Founded in 2006 by Roy Gilbert, it is gaining popularity with students (Hua, 2010). “The web-based test-prep service allows students to sign up with online tutors for group or one-on-one lessons” (Hua, 2010, p. 12). Its social aspect as well as its gaming method appeal to students (Hua, 2010). Since the preparation is online, the costs are less than those spent on private tutors and classes. The private tutoring sessions do require a fee but the study groups are free. (Hua, 2010, p. 12). Riley, a student from Hawaii, said, “I was no longer sitting alone at the library or at home reading an SAT prep book. I was playing games and learning about math, English, and writing with people from all over the world” (Hua, 2010, p. 13). Since students enjoy video games, Grockit really appeals to them (Hua, 2010).

Learning centers such as Sylvan and Huntington also offer SAT and ACT preparation classes. Sylvan promises to “tailor a personalized plan that builds the skills, habits and attitudes your teenager needs to score higher on test day and apply to college with confidence” (“Sylvan Learning Center,” 2013, p. 1).

Huntington (2013) offers three different programs depending upon how much time a student has to spend preparing for these tests. Huntington claims their “SAT test preparation program prepares students for the demands of the SAT, including academic knowledge, time-management, and test-taking strategies” (2013, p. 1). These programs are usually available in most cities; however, rural areas may not have access to them. They are more expensive than some of the online programs.

Knowledge offers SAT/ACT Power Prep online. Power Prep is “120 interactive, multimedia video lessons” (“Knowledge,” 2013, para. 1). This program boasts that it allows students the opportunity to plan their own preparation. “The Student-Centered Learning Model lets [students] group test preparation into logically organized, short study periods that maximize study time” (“Knowledge,” 2013, p. 1). This program has a fourteen day guarantee.

Triumph College Admissions (TCA) offers preparation for the SAT and ACT. This program is online as well; however, schools that purchase the program may also receive individual student books, teacher manuals, etc. The program is designed to give teachers feedback on how often students are using the program as well as feedback on their improvement. The TCA program says it can “prepare students in as little as 10 hours” (TCA, 2013, p. 1). This program tests students, identifies their weaknesses, and develops an individualized improvement program based on those weaknesses. This researcher has used the TCA program and found that it can be helpful. However, students failed to use the program

outside of school. Unless the researcher required lessons and quizzes be completed, students lacked the motivation to use this program.

One on One Learning offers an individualized approach to preparing for the SAT and/or the SAT. One on One administers a diagnostic test for each student and develops a plan for students to follow. This organization also offers workshops using research-based strategies (“One on One Learning,” 2013, p. 1). This researcher has attended their workshops and found them to be informative. Music is played throughout the workshop and students seem to be engaged and enjoy it. This has been one of the few workshops where students have asked that the presenters return.

The writers of the SAT and ACT also offer preparation. The College Board offers many types of preparation for the SAT. It has its own preparation book, *The Official SAT Study Guide*, and an online prep class that schools or parents may purchase. The College Board also offers a free practice test that students may download, take, and then enter answers online. It will score the test for free. The College Board also has a “Question of the Day” that it will email students (College Board, 2013). The ACT also offers its own preparation. It, too, offers an online preparation course which includes a “diagnostic test and personalized study path” (“ACT,” 2013, p. 1). Like the College Board, the ACT offers a “Question of the Day” and its own preparation book, *The Real ACT Prep Guide* (ACT, 2013).

Many schools also offer preparation for the SAT and/or ACT. Some schools have preparation classes that last for a semester, some hire consultants to

come in and offer workshops for students, and some offer afterschool tutorials for students. Teachers may order practice tests from College Board or the ACT, administer these tests, score them, and review the answers. They believe practicing the tests will lessen anxiety and increase scores. Students will go to the test administration site knowing for to expect. “Students studying for the SAT need to supplement their daily practice with weekly or bi-weekly simulated tests that replicate the testing conditions as closely as possible” (Feldman, 2012, p. 1). Familiarity with the test before test day should give students more confidence to perform well.

### **Summary**

Research has shown that preparation for the SAT or ACT may be minimally beneficial. Determining which type of preparation works best is problematic. While students are preparing for these important tests, they are also in classes studying various subjects. Thus, difficulty arises in trying to determine if their scores are the results of preparation or knowledge received in the classroom. However, familiarity with the tests does lessen students’ anxiety in that they know what to expect and can more readily maneuver through the tests (Feldman, 2012).

Research also indicates that math is the area in which the most gain is shown. However, raising a student’s scores by a few points may help him or her get accepted into the college of his or her choice. The NACAC asked 245 colleges if raising one’s score twenty points would increase one’s chance for admissions. Of those 245 colleges, 117 responded. “These results indicate that

some cases more than one third of postsecondary institutions agreed that a score increase on the SAT-M of 20 points, or a score increase on the SAT-CR of 10 points, would significantly improve a student's likelihood of admission" ("NACAC," 2009, p. 19). These responses encourage students to seek coaching for these tests. However, the number of points one increases seems to be much less than many of the popular preparation companies claim ("NACAC," 2009).

While some colleges and universities have stopped requiring students to submit SAT or ACT scores for admissions, these scores still serve a great purpose. "Tests such as the SAT or ACT are not only useful for the purpose of standardization but are also useful for measuring cognitive skills that are linked to educational outcomes" (Mattern et al., 2011, p.643). Since these tests may indicate college success, many educators question whether or not students should prepare for them. Preparation for these tests could cause invalid results which will lead to students' unsuccessfulness in college.

## **CHAPTER THREE: METHODOLOGY**

### **Introduction**

The purpose of this study is to survey entering freshman and to examine their SAT and/or ACT scores. The survey asked students to answer questions about the type(s) of methods they used when preparing for their college admission exams. The researcher wants to determine which, if any, methods of preparation the students used before taking the college admission tests, and determine if those methods correlated to an increase in scores. If a correlation was found, then the educational community might consider implementing these preparation methods for all students.

### **Design**

An ex post facto research method was used in this study to determine the different types of college admission test preparation students used before taking the SAT or ACT or both. This method was chosen because the participants are recent high school graduates who have taken college admission tests and are entering college in the fall. The independent variables cannot be controlled. When this occurs, “one should consider alternative explanations, such as (1) common cause, (2) reverse causality, and (3) the presence of other independent variables” (Ary et al., 2006. p. 362). Therefore, several independent variables were studied to validate outcomes. Once the data was gathered from students, a causal-comparative study design was used to determine if preparation increased test scores as correlated with high school GPAs.

## **Research Questions**

The purpose of this study is to determine if preparation for either the SAT or the ACT can increase students' scores thereby allowing them more education opportunities and scholarships.

**RQ1:** What is the correlation between college entrance exam scores of students who use self-paced manuals and tests and those who do not?

**RQ2:** What is the correlation between college entrance exam scores of students who take online test preparatory classes and those who do not?

**RQ3:** What is the correlation between college entrance exam scores of students who participate in school sponsored test preparatory classes and those who do not?

**RQ4:** What is the correlation between college entrance exam scores of students who have private tutoring and those who do not?

## **Hypotheses**

The following are the research hypotheses:

**H<sub>1</sub>:** Students who use self-paced manuals and tests in preparation for taking tests score higher on college entrance exams.

**H<sub>2</sub>:** Students who participate in online test preparatory classes score higher on college entrance exams.

**H<sub>3</sub>:** Students who participate in school sponsored test preparatory classes for taking tests score higher on college entrance exams.

**H<sub>4</sub>:** Students who have private tutoring in preparation for taking tests score higher on college entrance exams.

**H<sub>5</sub>:** Students who participate in various preparation methods for taking tests score higher on college entrance exams.

Alternatively, the following are the null hypotheses.

**H<sub>01</sub>:** Students who use self-paced manuals and tests in preparation for taking tests do not score higher on college entrance exams.

**H<sub>02</sub>:** Students who participate in online test preparatory classes do not score higher on college entrance exams.

**H<sub>03</sub>:** Students who participate in school sponsored test preparatory classes do not score higher on college entrance exams.

**H<sub>04</sub>:** Students who have private tutoring in preparation for taking tests do not score higher on college entrance exams.

**H<sub>05</sub>:** Students who participate in various preparation methods for taking tests do not score higher on college entrance exams.

### **Participants**

Participants were recent high school graduates who were attending their College Freshman Seminar. These students were eighteen years of age or older. These students were asked to voluntarily take a survey which provided information about the preparation they participated in before taking the SAT and/or ACT. Both genders and various races were represented. Over seven hundred students participated in the survey. Of these, six hundred ninety-six completed everything correctly and were used to complete the study. These students were entering a private university in Virginia.



According to the College Board, the students in the freshman class at this university consist of “7% Black African American, 1% Asian, 3% Hispanic, 69% White, 6% Non-Resident Alien, 2% two or more races, 52% female and 48% male” (2013). The majority (58%) of the students are out of state and the majority of students (78%) are in the top half of their graduating class. The middle fifty percent of freshman at this university have the following college admission scores: SAT Critical Reading, 470-580; SAT Math, 460-570; SAT Writing, 450-570; and ACT Composite, 20-26 (“College Board,” 2013). More students submitted SAT (83%) scores than ACT (34%) scores (College Board, 2013). Some students took both tests and submitted both.

### **Setting**

The setting was a college campus where students were attending a college seminar in preparation for their first year. The college is a private coed university accredited by the Southern Association of Colleges and Schools (College Board, 2013). There are over 11,000 undergraduates with over 2,600 freshmen (College Board, 2013). Students watched a PowerPoint in which the survey was explained and they were asked to voluntarily take a survey. Students took the survey in various classrooms with different instructors from the university. Students were given consent forms to sign and return as well as copies of the consent forms for them to keep. They completed the surveys, signed the consent forms, and returned them to the instructors. The instructors returned the forms to the Center for Academic Support and Advising where they were collected and held by the Coordinator of the Freshman Seminar for the researcher.

## **Instrumentation**

The instruments used for measurement were surveys, HSGPAs, the SAT, and the ACT. The SAT and ACT are national tests used for college admission. The ACT is a reliable and valid test with reliability coefficients of the four subtests ranging from .85 to .92 (“ACT,” 2007). HSGPAs are high school grade point averages based on a 4.0 scale. The *ACT* (2008) provided a concordance chart that converts an ACT score to a corresponding SAT. This chart was used to convert the scores of students who only had ACT scores to SAT scores so that the correlations could be uniform.

## **Procedures**

Approval from the Institutional Review Board (IRB) of Liberty University was sought and received. After receiving IRB approval, permission from the college was sought to implement the research surveys. After receiving approval from the college, this researcher worked with the Freshman Seminar Committee to have students complete the surveys. Students were given consent forms to read and sign with information about the research and how it was to be used. While the surveys did require students’ names and identification numbers so that ACT/SAT scores could be correlated to the correct students, any identifiable information was removed before analyzing the data. Students watched a slide in a PowerPoint presentation presented by the Freshman Seminar Committee and instructors. This slide showed and explained the purpose of the research and identified the researcher. The students were given the researcher’s phone number and email address in case they wanted to ask questions before completing the

surveys. Instructors were given packets made by the researcher that contained surveys, consent forms and copies of consent forms. The instructors distributed the surveys in their various classrooms, asked students to voluntarily complete them, and return them to the instructors. Students kept copies of the consent forms in case they had questions. The instructors returned the forms to the Center for Academic Support and Advising. The surveys remained there until collected by the researcher. The following are the questions that the students were asked.

1. Did you purchase textbooks and/or software to help you prepare for the SAT and/or ACT? Yes or No  
If you circled yes, please list the textbooks and /or software below.

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2. Did you use an online program such as CollegeBoard, ACT Prep, TCA, etc., to help prepare for the SAT and/or ACT? Yes or No  
If you circled yes, please list the program below.

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3. Did you attend a workshop or take a class at your school to help you prepare for the SAT and/or ACT? Yes or No  
If you circled yes, please indicate the type of workshop or class in which you participate.

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4. Did you seek private tutoring through an independent consultant or learning center such as Sylvan or Huntington? Yes or No  
If you circled yes, please list the type of private tutoring you had below.

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5. If you used more than one preparation method, please rank which method was the most valuable with 1 representing the best. If you used more than two texts and one was more beneficial than the other, please indicate that as well.

The researcher then began the task of correlating the data in an excel spreadsheet. She used the numerical value 1 for yes and the numerical value 2 for no. After all of the information from the surveys was entered into the spreadsheet, the Dean of the Center for Academic Support and Advising provided each

student's HSGPA and SAT/ACT scores. All identifying information was removed from the spreadsheets. The researcher then began comparing the data using the SPSS software. Observations and conclusions were drawn as a result of the data.

### **Data Analysis**

Data from the surveys, HSGPAs, and SAT or ACT scores were put in excel spreadsheets. Any identifying information was removed from the database. ACT scores were converted to SAT scores using the ACT-SAT Concordance Reference Sheet (2008) provided by the ACT organization. The Analysis of Variance Test (ANOVA) was used to determine if there were differences between the group that used preparation methods and the group that did not use preparation methods to ensure that both groups were comparable. The preparation group was broken into smaller groups by the types of preparation methods used. Then a two sample t-test was performed and analyzed for each group based on preparation method used and the group that used no preparation. The two sample t-test is used to compare the means of independent groups (Blumen, 1998). SAT and ACT scores are normally distributed (Crossman, 2013). Finally, the Pearson Product Correlation was used to determine if a linear relationship exists between college entrance exam scores and HSGPAs as suggested by the literature.

## **CHAPTER FOUR: FINDINGS**

### **Introduction**

This chapter discusses the results from the correlative study which analyzed college entrance exam scores of students who used preparation methods before taking an admissions test and those who did not use any preparation before taking a test. The ANOVA was used to determine if there were significant differences between the two broad groups – those who used preparation methods and those who did not use any preparation methods. Then a two sample z-test was computed for each preparation group and compared to the non-preparation group. The means of each individual group were compared to the non-preparation group as well. Finally, the Pearson's Correlation Coefficient Test was used to determine if HSGPAs were correlated to college entrance exams regardless of whether preparation methods were used or not used.

This study began by asking college freshman to complete a survey. After completion of the surveys, the university supplied SAT and/or ACT scores as well as high school HSGPAs of students who participated in the study. Over 700 students participated in the survey but only 674 students were used in the analysis because of incomplete surveys or missing data.

### **Differences Between Groups**

The ANOVA was conducted to determine if there were significant differences between the two groups that were studied by testing the following null hypothesis.

The first group was the group that used no preparation methods before taking either the SAT and/or the ACT. The second group was the group that did use preparation methods before taking the SAT and/or the ACT. The F value is .907 and the significance value is .644. Using the degrees of freedom for the numerator (57) and the degrees of freedom for the denominator (61), the F value can be tested. According to the F Distribution chart (Ary, et al., 2006) at a .01 significance level, the null hypothesis will not be rejected if  $F < 1.6$ . In the results below, the  $F = .907$ . Since .907 is less than 1.6, the null hypothesis is not rejected. Therefore, there is no significant difference between the group of students who used preparation methods and the group who did not use preparation methods. Accordingly, these two groups can be compared.

Table 1

*Preparation and No Preparation - ANOVA*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1948707.129	57	34187.844	.907	.644
Within Groups	2299348.333	61	37694.235		
Total	4248055.462	118			

**Analysis of Research Questions and Null Hypotheses**

**RQ1:** What is the correlation between college entrance exam scores of students who use self-paced manuals and tests and those who do not?

**H<sub>1</sub>:** Students who use self-paced manuals and tests in preparation for taking tests score higher on college entrance exams.

$H_{01}$ : Students who use self-paced manuals and tests in preparation for taking tests do not score higher on college entrance exams.

Table 2

t-Test: Two-Sample Assuming Unequal Variances

	Question 1	No Prep
Mean	1053.099644	1098.067227
Variance	34088.29004	36000.47002
Observations	281	119
Hypothesized Mean Difference	0	
df	217	
t Stat	-2.184242369	
P(T<=t) one-tail	0.015007933	
t Critical one-tail	2.343654675	
P(T<=t) two-tail	0.030015866	
t Critical two-tail	2.598675017	

Using the converted scores from Appendix G for students who participated in preparatory classes and the converted scores from Appendix E for students who did not use any preparation for college entrance exams, a two sample t-test at the .01 level was computed in Microsoft Excel 2010. The variances were assumed to be unequal. At the .01 level of significance, the null hypothesis is not rejected because  $0.03 > 0.01$ . The critical value at the .01 level is 2.60. Since  $-2.18 < 2.60$ , the null hypothesis is not rejected. The mean score for students who participated in preparatory classes is 1053 and the mean score for students who received no preparation is 1098. Therefore, there is not significant evidence that studying manuals and guides increases college entrance scores.

**RQ2:** What is the correlation between college entrance exam scores of students who take online test preparatory classes and those who do not?

**H<sub>2</sub>:** Students who participate in online test preparatory classes score higher on college entrance exams.

**H<sub>02</sub>:** Students who participate in online test preparatory classes do not score higher on college entrance exams.

Table 3  
*t-Test: Two-Sample Assuming Unequal Variances*

	Question Two	No Prep
Mean	1046.347607	1098.067227
Variance	27833.84856	36000.47002
Observations	397	119
Hypothesized Mean Difference	0	
df	176	
t Stat	-2.679250154	
P(T<=t) one-tail	0.004039313	
t Critical one-tail	2.347721685	
P(T<=t) two-tail	0.008078626	
t Critical two-tail	2.604051686	

Using the converted scores from Appendix H for students who participated in online test preparatory classes and converted scores from Appendix E for students who did not use any preparation for college entrance exams, a two sample t-test at the .01 level was computed in Microsoft Excel 2010. At the .01 level of significance, the null hypothesis is rejected because  $0.008 < 0.01$ . However, the critical value at the .01 level is -2.60. Since  $2.68 > 2.5758$ , the null hypothesis is rejected. This implies that online preparatory classes may have increased college entrance scores. However, the mean of students who used online classes is 1046 compared to 1098 of those who did not.



**RQ3:** What is the correlation between college entrance exam scores of students who participate in school-sponsored test preparatory classes and those who do not?

**H<sub>3</sub>:** Students who participate in school sponsored test preparatory classes score higher on college entrance exams.

**H<sub>031</sub>:** Students who participate in school sponsored test preparatory classes do not score higher on college entrance exams.

Table 4  
*t-Test: Two-Sample Assuming Unequal Variances*

	Question 3	No Prep
Mean	1034.86842	1098.067227
Variance	33161.3158	36000.47002
Observations	76	119
Hypothesized Mean Difference	0	
df	165	
t Stat	-2.32502895	
P(T<=t) one-tail	0.01064409	
t Critical one-tail	2.34915992	
P(T<=t) two-tail	0.02128818	
t Critical two-tail	2.60595379	

Using the converted scores from Appendix I for students who used study guides and manuals, and converted scores from Appendix E for students who did not use any preparation for college entrance exams, a two sample t-test at the .01 level was computed in Microsoft Excel 2010. At the .01 level of significance, the null hypothesis is not rejected because  $0.02 > 0.01$ . The critical value at the .01 level is 2.61. Since  $2.33 < 2.61$ , the null hypothesis is not rejected. The mean score of students who used study guides and manuals is 1035 and those who used

no preparation is 1098. Therefore, there is not significant evidence that participating in preparatory classes increases college entrance scores.

**RQ4:** What is the correlation between college entrance exam scores of students who have private tutoring and those who do not?

**H<sub>4</sub>:** Students who have private tutoring in preparation for taking tests score higher on college entrance exams.

**H<sub>04</sub>:** Students who have private tutoring in preparation for taking tests do not score higher on college entrance exams.

Table 5  
*t-Test: Two-Sample Assuming Unequal Variances*

	Question 4	No Prep
Mean	1036.315789	1098.06723
Variance	29543.57895	36000.47
Observations	76	119
Hypothesized Mean Difference	0	
df	171	
t Stat	-2.348699918	
P(T<=t) one-tail	0.009990969	
t Critical one-tail	2.348352283	
P(T<=t) two-tail	0.019981939	
t Critical two-tail	2.604885623	

Using the converted scores from Appendix J for students who used private tutors and converted scores from Appendix E for students who did not use any preparation for college entrance exams, a two sample t-test at the .01 level was computed in Microsoft Excel 2010. At the .01 level of significance, the null hypothesis is not rejected because  $0.02 > 0.01$ . The critical value at the .01 level is 2.60. Since  $2.35 < 2.60$ , the null hypothesis is not rejected. The mean of students

who used private tutors is 1036, and the mean of those who used no preparation is 1098. Therefore, there is not significant evidence to suggest that using private tutors increases college entrance scores.

### All Preparation Methods

Table 6  
*t-Test: Two-Sample Assuming  
 Unequal Variances*

	<i>Prep</i>	<i>No Prep</i>
Mean	1058.45614	1098.067227
Variance	27300.9515	36000.47002
Observations	570	119
Hypothesized Mean Difference	0	
df	158	
t Stat	-2.116028279	
P(T<=t) one-tail	0.017954863	
t Critical one-tail	2.350180442	
P(T<=t) two-tail	0.035909726	
t Critical two-tail	2.607303692	

Using the converted scores from Appendix F for students who collectively used various types of preparation and converted scores from Appendix E for students who did not use any preparation for college entrance exams, a two sample t-test at the .01 level was computed in Microsoft Excel 2010. At the .01 level of significance, the null hypothesis is not rejected because  $0.035 > 0.01$ . The critical value at the .01 level is 2.61. Since  $2.12 < 2.61$ , the null hypothesis is not rejected. The mean of students who used preparation is 1058 and the mean score of students who did not use preparation is 1098. Therefore, there is not significant evidence to suggest that taking preparatory classes, online preparatory classes, using study guides and manuals, or using private tutors increase college entrance scores.

## SAT Math

Table 7  
*t-Test: Two-Sample Assuming  
Unequal Variances*

	Prep M	No Prep M
Mean	532.9577465	553.1914894
Variance	8587.000227	11729.48982
Observations	497	94
Hypothesized Mean Difference	0	
df	120	
t Stat	-1.697622518	
P(T<=t) one-tail	0.046085483	
t Critical one-tail	2.357824613	
P(T<=t) two-tail	0.092170965	
t Critical two-tail	2.617421145	

The literature says that math increased as a result from preparation when reading did not. Therefore, using only the math scores from the students who only took the SAT a two sample t-test was performed. The scores may be found in Appendix L. At the .01 level of significance, the null hypothesis is not rejected because  $0.09 > 0.01$ . The critical value at the .01 level is 2.62. Since  $1.70 < 2.62$ , the null hypothesis is not rejected. The mean of students who used preparation is 533 and the mean score of students who did not use preparation is 553. Therefore, there is not significant evidence to suggest that preparation for the mathematics portion of the SAT improved the scores.

## SAT Reading

Table 8  
t-Test: Two-Sample  
Assuming Unequal Variances

	Prep SAT Reading	No Prep SAT Reading
Mean	522.9718876	545.106383
Variance	7738.83623	9522.031572
Observations	498	94
Hypothesized Mean Difference	0	
df	123	
t Stat	-2.047752642	
P(T<=t) one-tail	0.021356615	
t Critical one-tail	2.357047251	
P(T<=t) two-tail	0.042713229	
t Critical two-tail	2.616391776	

Using only the critical reading scores from the students who only took the SAT a two sample t-test was performed. The scores may be found in Appendix M. At the .01 level of significance, the null hypothesis is not rejected because  $0.04 > 0.01$ . The critical value at the .01 level is 2.62. Since  $-2.05 < 2.62$ , the null hypothesis is not rejected. The mean of students who used preparation is 523 and the mean score of students who did not use preparation is 545. Therefore, there is not significant evidence to suggest that preparation for the critical reading portion of the SAT improved the scores.

## HSGPA and SAT Scores

When variables were tested to determine if there were a correlation between HSGPAs and SAT/ACT scores as the literature indicates, a significant correlation was found at the .01 level, two-tailed test. Using the Pearson

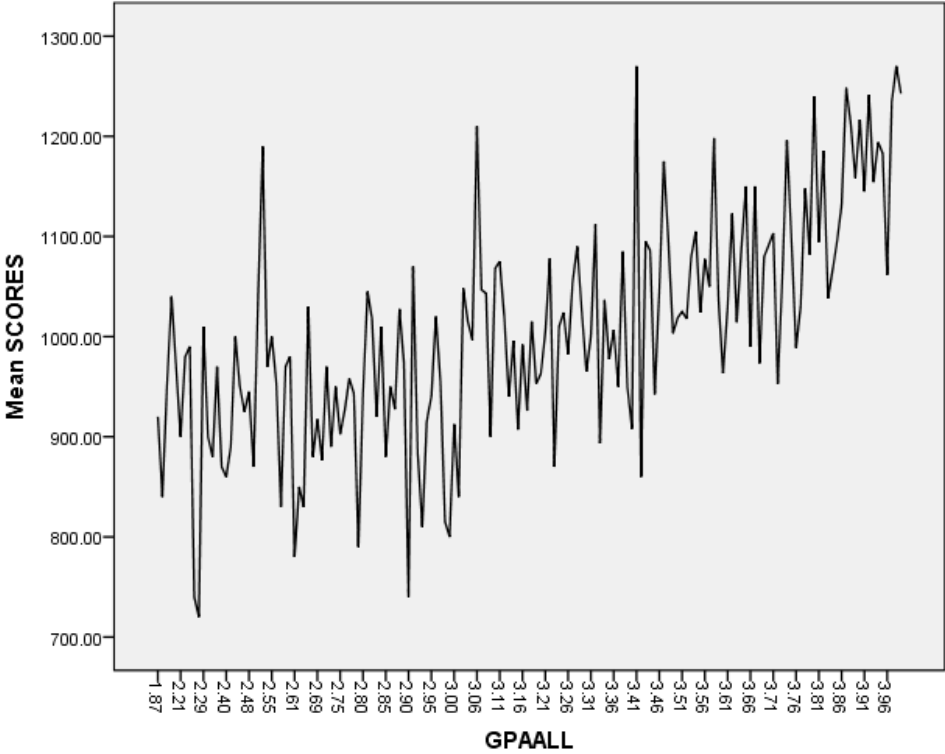
Correlation test, the correlation coefficient  $r$  was found to be .502 with a sample size of 687 subjects. The table and graph indicate a positive correlation between

Table 9  
Correlations

		HSGPA	Scores
GPA	Pearson Correlation	1	.502**
	Sig. (2-tailed)		.000
	N	687	687
scorescorr	Pearson Correlation	.502**	1
	Sig. (2-tailed)	.000	
	N	687	687

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Table 10  
SAT vs. HSGPAs Graph



### **Most Helpful Preparations**

Students were asked to list the preparation materials they found most helpful. One hundred of the students who responded listed the College Board resources as the most helpful. Since the College Board writes the SAT, this finding is not surprising. The second most helpful source was a preparation class. A few who responded with classes being the most helpful took these classes at college campuses; however, the majority took preparatory classes offered through their schools. Sixty students chose classes as the most helpful resource. Fifty-six students indicated they thought various preparatory books were the most helpful. Thirty-five students received private tutoring and twenty students used various practice tests. Students indicated other helpful sources such as vocabulary flashcards, workshops and learning centers.

## CHAPTER FIVE: DISCUSSION

### Introduction

For over fifteen years, this researcher has coached and tutored students for either the SAT or the ACT with various results. She has worked individually with students, provided lessons and workshops for faculty, and taught semester classes in preparation skills and strategies. Accordingly, this research study has been conducted to determine if preparation raises scores and if there are preparation methods that help students more than others. As an advocate for students, this researcher continuously looks for the best way to help them. Students who plan to attend four-year colleges and universities realize that they must take college admission tests. Often, they take the tests more than once – especially when they do not receive the scores they feel are needed to get into the college of their choice. Because of the anxiety that surrounds these tests, many students seek help to improve their scores. Thus, preparing for the SAT and/or ACT has become a competitive market. The *College Helper* (2011) states, “According to research, 2 million students spend approximately \$2.5 billion a year on test preparation and tutoring” (p. 1). With so much money spent on test preparation, research is certainly needed to determine if the expense is worthwhile.

### Summary of the Research Results

Research Question One asks if there is a correlation of college entrance scores of students who use self-paced manuals and study guides and those who do not. A two sample t-Test was computed and the null hypothesis was not rejected thereby indicating that the manuals and guides did not increase scores. Actually,



the mean score for students who used manuals and guides was 59 points lower than those who used no preparation. This implies that using self-paced manuals and study guides does not increase SAT or ACT scores.

Research Question Two asks if there is a correlation of college entrance scores of students who participate in online test preparatory methods and those who do not. A two sample t-test was computed and the null hypothesis was not rejected thereby indicating that the online classes did not increase scores. The mean SAT score of students who used online test preparatory methods was 52 points lower than those who did not use preparation. This implies that online test preparatory classes do not increase college entrance exam scores.

Research Question Three asks if there is a correlation of college entrance scores of students who participate in school-sponsored preparatory classes. A two sample t-test was computed and the null hypothesis was rejected thereby suggesting that school sponsored preparatory classes did increase scores. However, the mean SAT score of students who participate in school sponsored preparatory classes was 54 points less than those who did not use preparation. This implies that school-sponsored preparatory classes do not increase college entrance exam scores.

Research Question Four asks if there is a correlation of college entrance scores of students who have private tutoring. A two sample t-test was computed and the null hypothesis was not rejected thereby indicating that using self-paced manuals and materials did not increase scores. The mean SAT score of students who used private tutoring was 62 points less than those who did not use

preparation. This implies that private tutoring does not increase college entrance exam scores.

The scores of students who used any preparation method were correlated to the scores of students who used no preparation and the results still indicated that the non-preparation group outperformed the preparation group. The SAT mathematics and critical reading scores without the converted ACT scores were also compared. Again, the non-preparation group outperformed the preparation group. There was not even an increase in the mathematics scores as previous research has indicated might occur.

Of the four preparation methods studied, only one, the school-sponsored preparatory class, suggested it actually increased scores according to the test statistic. However, the mean score was still lower than the mean score of students who used no preparation.

### **Implications**

These results differ from the researcher's expectations and past observations which imply that a Type II error may have occurred. A Type II error occurs when the researcher "retains the null hypothesis and declares that there is insufficient evidence for concluding that one method is better than the other" (Ary et al., 2006, p. 182). Preparation may increase college admission test scores even though these results do not indicate it for various reasons.

One explanation may be confidence. The non-preparation group may have been more confident of their test taking abilities which may be the reason they did not seek preparation before taking the tests. However, the preparation

group may have had more anxiety which initiated their desire to seek help. Had the preparation group not have received help before taking the tests, their scores may have been even lower. Research is needed to determine if students who do not seek help before taking college admission tests are more confident. Parsons, Croft and Harrison (2009) studied first year engineering students to determine if confidence made a difference in their performance; the results indicated that confidence did indeed make a difference. “Students with higher confidence in mathematics achieved higher marks in first year engineering mathematics” (Parsons, Croft, and Harrison, 2009, p. 62). The same results might be found for students who have higher confidence in taking college admission tests.

Practice for such life-determining tests may also reflect a gender bias. While in this research, gender was not a consideration, it could very well be significant with respect to which group seeks preparation. Throughout their schooling, boys and girls face different expectations and rewards. Even with the knowledge that each gender should be treated equally, teachers “still select classroom activities based on the perceived needs and interests of boys and praise boys for succeeding in literacy activities that girls regularly complete successfully” (Sanford, 2006, p. 312). Perhaps these expectations carry over into preparation for college admission tests. Boys may feel more confident than girls because their learning needs have often determined classroom instruction. Girls may feel more confident because they may assume their abilities are greater since lessons seem to personalize to the needs of the boys. Therefore, determining

whether males or females are more likely to seek preparation and the reasons why would be another interesting aspect of this study.

These results support research that states that coaching or using preparation methods for the SAT and/or ACT yield minimal results. Students, parents, and educators should be careful when choosing preparation for the SAT and/or ACT. As indicated by the research, a student's HSGPA is positively correlated to SAT and/or ACT scores. This suggests that studying and doing well in one's classes will help with the college admission tests when the time comes to take them.

### **Limitations**

This study may be limited in that it was conducted at only one college. Repeating the study at multiple colleges would lend validity to the results. Another concern is that there is no way to verify the answers that the students gave. One would assume that students were honest since there was no reason to lie. However, determining if all preparation methods are similar is not possible. For example, a workshop at one school may be much longer and more in depth than at another school. When a student responds that he or she used online preparation methods, he or she does not indicate how much time he or she actually spends preparing. One student may log ten hours of preparation while another student may log one hundred hours of preparation.

### **Recommendation for Future Research**

Since this study was limited to one location, it should be repeated at other colleges and universities to see if the same results are found. Also, time should be

considered when asking students which preparation methods they used. Some students may have prepared much longer than did others. Perhaps a question which would indicate the number of hours would be helpful as well.

Research could also be done to see if gender determines preparation. This study did not look at gender to see if more females or more males used various preparation methods before taking college admission tests. There have been many studies to look at the differences that gender makes in performance of tests, but rarely has gender been looked at as a variable in test preparation methods. Also, if one were to research gender preparation methods, one might also find a preferential method by one gender or the other. Wehrwein, Lujan and DiCarlo (2007) found that “92.98% males and 75.27% of females preferred multiple modes of presentation” (p. 44). This finding could imply that males may need various methods to prepare for testing. Thus, preparation may have been more successful had learning styles been considered.

Race could also be a factor in determining which group seeks preparation more often. Alon studies Buchmann et al’s work and notes that in their study “84 percent of blacks used at least one form of preparation compared to only 68 percent of whites, and were also more likely than whites to be engaged in multiple test preparation activities” (2010. p. 465). Perhaps African Americans seek preparation more often because they usually perform lower on standardized tests than do Caucasians (Alon, 2010). Thompson (2007) says, “Each year, when standardized test scores are published for California students, the same message tends to surface: In general, the scores of blacks and Latinos trail those of other

groups, especially whites” (p. 22). As a result, lower scores become expected rather than challenged. She suggests that educators need to change their attitudes and expectations if scores of minorities are to increase. Bowen et al. (2009) also found that “both black male and female test-takers had SAT scores that were almost one standard deviation lower than the SAT score for a comparable white man (and just over a half a standard deviation lower than the score for a comparable white woman)” (p. 126). With such accepted differences in scores based on race, one might assume that African Americans need more preparation than Caucasians and perhaps they are offered more opportunities. This may be the reason Alon (2010) found that higher performing African Americans seek more preparation than higher performing Caucasians.

Time with respect to when one begins test prep is another variable that lacks research. Devine-Eller (2012) suggests that test prep “must be undertaken with the proper amount of lead time – not so little that it is rushed, and not so much that the skills training atrophies” (p. 463). Two students may each spend fifty hours using test prep; one spreads the fifty hours out over a six month period while the other does it all in one month. Which student is better prepared? This might offer insight to when a student should begin test preparation. This researcher has a personal bias; she likes to begin preparation when students are in the tenth grade. Students are then aware of the format of the test and as they take their classes they can begin to make connections to skills and strategies learned in her preparation class.

The socio-economic status (SES) of students was not researched in this survey. One would assume that students from affluent backgrounds would seek preparation more often because worry over cost is eliminated. However, one might also assume that students from such backgrounds may not be concerned with scholarships and are therefore happy with whatever minimal score is necessary to enter the college of their choice. Regardless, research seems to indicate that students from affluent backgrounds outperform others. While SES predicts HSGPA, “in general, the impact on SAT scores is somewhat greater” (Bowen et al., 2009, p. 127). Since students from such backgrounds do well, research needs to be conducted to determine if they do well because of preparation or because their affluent backgrounds allow them to have better educational opportunities.

### **Conclusion**

The results of this study indicate that preparation methods for the SAT and/or ACT do not yield the results that the test preparation companies claim. However, there are many factors that need to be considered. Confidence levels of test-takers, gender, race, time, and SES need to be taken into consideration. Therefore, more research and study is suggested. However, parents, students, and schools should be careful when preparing for these tests. With college admission at most colleges and universities relying on certain SAT and/or ACT scores, students should have the best opportunities for performing well. In this study, college admission scores are positively correlated to HSGPAs as suggested by the literature, (Bowen et al., 2009) which indicates that studying and performing well

in the classroom seem to be the best preparation one can do for admission tests. Often preparation concentrates on test-taking strategies rather than academic skills and knowledge. A student who has a high HSGPA should have the academic skills and knowledge needed to be successful on the college admission tests. Therefore, taking challenging, rigorous classes may be the best preparation method one can pursue.



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## Appendix A

### IRB APPLICATION

IRB Application # \_\_\_\_\_ **1380** \_\_\_\_\_

#### I. APPLICATION INSTRUCTIONS

- To submit a protocol, complete each section of this form and email it and any accompanying materials (i.e. consent forms and instruments) to [irb@liberty.edu](mailto:irb@liberty.edu). For more information on what to submit and how, please see our website at: [www.liberty.edu/irb](http://www.liberty.edu/irb). Please note that we can only accept our forms in Microsoft Word format.
- In addition, please submit one signed copy of the fourth page of the protocol form, which is the Investigator's Agreement. Also submit the second page if a departmental signature is required for your study. Signed materials can be submitted by mail, fax (434-522-0506), or email (scanned document to [irb@liberty.edu](mailto:irb@liberty.edu)). Signed materials can also be submitted via regular mail or in person to our office: Campus North, Suite 1582.
- Please be sure to use the grey form fields to complete this document; do not change the format of the application. You are able to move quickly through the document by using the "Tab" key.
- **Note: Applications with the following problems will be returned immediately for revisions: 1) Grammar/spelling/punctuation errors, 2) A lack of professionalism (lack of consistency/clarity) on the application itself or any supporting documents, 3) Incomplete applications. Failure to minimize these errors will cause delays in your processing time.**

#### II. BASIC PROTOCOL INFORMATION

Protocol Title: **Survey of College Admission Tests**

Principal Investigator (PI): **Robin F. Donaldson**

Professional Title: **Teacher**

School/Department: **LU - Education Dept.**

Mailing Address: **196 R. L. Faulk Lane Tabor City, NC 28463**

Telephone: **910 653-4743**

LU Email: **rfdonaldson@liberty.edu**

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Check all that apply:  Faculty  Graduate Student  Undergraduate Student  Staff

This research is for:  Class Project  Master's Thesis  Doctoral Dissertation

Faculty Research  Other (describe):

Have you defended and passed your dissertation proposal?  Yes  No  N/A

If no, what is your defense date?

Faculty Advisor: **Dr. David Holder**

School/Department: **Liberty University School of Education**

---

Telephone: **434-582-2445**

LU Email: **deholder@liberty.edu**

Non-key Personnel:



Name and Title: **Dr. Brian Yates**

School/Department:

Telephone: **434-592-4108**,

LU Email: **bcyates@liberty.edu**

**Consultants:**

Name and Title: **Dr. David Holder**

School/Department: **Liberty University School of Education**

Telephone: **434-582-2445**

LU Email: **deholder@liberty.edu**

**Liberty University Participants:**

Do you intend to use LU students, staff, or faculty as participants in your study? If you do not intend to use LU participants in your study, please indicate "no" and proceed to the section titled "Funding Source."

If yes, please list the department and classes you hope to enlist, and the number of participants you

would like to enroll.  No  Yes

**Center for Academic Support and Advising Services**

Department      Class(es)

In order to process your request to use LU participants, we must ensure that you have contacted the appropriate department and gained permission to collect data from them. Please obtain the original signature of the department chair in order to verify this.

Signature of **Department Chair**

Date

**Funding Source:** If research is funded please provide the following:

Grant Name (or name of the funding source): **N/A**

Funding Period (month/year):

Grant Number:

**Anticipated start and completion dates for collecting and analyzing data: August 16-17, 2012**

**III. OTHER STUDY MATERIALS AND CONSIDERATIONS**

**Does this project call for (more detail will be required later):**

Use of voice, video, digital, or image recordings?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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Participant compensation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Advertising for participants?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
More than minimal psychological stress?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Confidential material (questionnaires, photos, etc.)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Extra costs to the participants (tests, hospitalization, etc.)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
The inclusion of pregnant women?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
More than minimal risk? *	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Alcohol consumption?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Waiver of Informed Consent?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
The use of protected health information (obtained from healthcare practitioners or institutions)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
VO2 Max Exercise?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
The use of blood?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Total amount of blood	
Over time period (days)	

The use of rDNA or Biohazardous materials?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
The use of human tissue or cell lines?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
The use of other fluids that could mask the presence of blood (including urine and feces)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
The use of an <b>Investigational New Drug (IND) or an Approved Drug for an Unapproved Use?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Drug name, IND number, and company:
The use of an <b>Investigational Medical Device or an Approved Medical Device for an Unapproved Use?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Device name, IDE number, and company:
The use of <b>Radiation or Radioisotopes?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

*\*Minimal risk is defined as “the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.” [45 CFR 46.102(i)]*

#### IV. INVESTIGATOR AGREEMENT & SIGNATURE PAGE\*

BY SIGNING THIS DOCUMENT, THE INVESTIGATOR AGREES:

1. That no participants will be recruited or entered under the protocol until the Investigator has received the final approval or exemption email from the Chair of the Institutional Review Board.
2. That no participants will be recruited or entered under the protocol until all key personnel for the project have been properly educated on the protocol for the study.
3. That any modifications of the protocol or consent form will not be initiated without prior written approval, by email, from the IRB and the faculty advisor, except when necessary to eliminate immediate hazards to the participants.
4. The PI agrees to carry out the protocol as stated in the approved application: all participants will be recruited and consented as stated in the protocol approved or exempted by the IRB. If written consent is required, all participants will be consented by signing a copy of the approved consent form.
5. That any unanticipated problems involving risks to participants or others participating in the approved protocol, which must be in accordance with the [Liberty Way](#) (and/or the [Honor Code](#)) and the [Confidentiality Statement](#), will be promptly reported in writing to the IRB.
6. That the IRB office will be notified within 30 days of a change in the PI for the study.
7. That the IRB office will be notified within 30 days of the completion of this study.
8. That the PI will inform the IRB and complete all necessary reports should he/she terminate University Association.
9. To maintain records and keep informed consent documents for **three years** after completion of the project, even if the PI terminates association with the University.
10. That he/she has access to copies of [45 CFR 46](#) and the [Belmont Report](#).

Principal Investigator (Printed)

Principal Investigator (Signature)

Date

#### FOR STUDENT PROPOSALS ONLY

BY SIGNING THIS DOCUMENT, THE FACULTY ADVISOR AGREES:

1. To assume responsibility for the oversight of the student's current investigation, as outlined in the approved IRB application.
2. To work with the investigator, and the Institutional Review Board, as needed, in maintaining compliance with this agreement.
3. That the Principal Investigator is qualified to perform this study.
4. **That by signing this document you verify you have carefully read this application and approve of the procedures described herein, and also verify that the application complies with all instructions listed above.** If you have any questions, please contact our office ([irb@liberty.edu](mailto:irb@liberty.edu)).

**Dr. David E. Holder**

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Faculty Advisor (Printed)

Faculty Advisor (Original Signature)

Date

**\*The Institutional Review Board reserves the right to terminate this study at any time if, in its opinion, (1) the risks of further experimentation are prohibitive, or (2) the above agreement is breached.**

#### V. PURPOSE

1. **Purpose of the Research:** Write an original, brief, non-technical description of the purpose of your project. Include in your description: Your research hypothesis or question, a narrative that explains the major constructs of your study, and how the data will advance your research hypothesis or question. This section should be easy to read for someone not familiar with your academic discipline.

**This study will research preparation methods used by students who take college admission tests – SAT and ACT to determine if such methods increase scores. If they do, then schools or parents should consider providing preparation for all students. Some students have access to shadow education while others do not. Shadow education is education offered to students outside of the classroom by parents, guardians, etc. If preparation methods do increase scores, then all students should have the opportunity to participate in them.**

#### **VI. PARTICIPANT INCLUSION/EXCLUSION CRITERIA**

1. **Population:** From where/whom will the data be collected? Address each area in non-scientific language.
2. **The inclusion criteria for the participant population including gender, age ranges, ethnic background, health status and any other applicable information:** *Provide a rationale for targeting this population.*
3. **The exclusion criteria for participants:**
4. **Explain the rationale for the involvement of any special population** (Examples: children, specific focus on ethnic populations, mentally retarded, lower socio-economic status, prisoners).
5. **Provide the maximum number of participants you seek approval to enroll from all participant populations you intend to use and justify the sample size.** You will not be approved to enroll a number greater than this. If, at a later time, it becomes apparent you need to increase your sample size, you will need to submit a Change in Protocol Form.
6. **For NIH, federal, or state-funded protocols only:** Researchers sometimes believe their particular project is not appropriate for certain types of participants. These may include, for example: women, minorities, and children. If you believe your project should not include one or more of these groups, please provide your justification for their exclusion. Your justification will be reviewed according to the applicable NIH, federal, or state guidelines.

**The subjects will be 18 years or older and will be rising college freshman. All genders and races will be included. The only requirement is that each participant took either the ACT or SAT. The test scores and GPAs will come from the college after students have taken the survey. This researcher will submit a list of participants with names and identification numbers in order to receive the information. All identifying data will be removed before submitting final dissertation.**

7. **Types of Participants:** Check all that apply:

Normal Volunteers (Age 18-65)

- Minors (under age 18)
- Over age 65
- University Students
- Inpatients
- Outpatients
- Patient Controls
- Fetuses
- Cognitively Disabled
- Physically Disabled
- Pregnant Women
- Participants Incapable of Giving Consent
- Prisoners or Institutional Individuals
- Other Potentially Elevated Risk Populations

## VII. RECRUITMENT OF PARTICIPANTS

1. **Contacting Participants:** Describe in detail *how* you will contact participants regarding this study. Please provide all materials used to contact participants in this study. These materials could include letters, emails, flyers, advertisements, etc. If you will contact participants verbally, please provide a script that outlines what you will say to participants.  
**Students will be asked to complete surveys by their Freshman Seminar instructors. I will provide all of the information a head of time.**  
**Script- "The purpose of this research is to determine if preparation methods increase SAT or ACT scores. You are being asked to complete a short survey about your personal preparation methods. You are asked to complete the survey and sign a consent form which will give the researcher permission to get your SAT or ACT scores and your high school GPAs from Liberty University. You must be 18 years of age or older in order to participate. Your scores will be correlated to your surveys to determine if preparation actually increases scores. All identifying information will be removed before any reporting is done. Everyone who participates in this survey will have his or her name entered into a drawing for \$100 Walmart gift card." I will prepare a powerpoint for instructors to use before administering the survey, so students will actually hear me via the computer.**
2. **Location of Recruitment:** Describe the location, setting, and timing of recruitment.  
**IIStudents will be asked to participate during their Freshmen Seminars at Liberty University. The seminars take place on campus in classrooms. Instructors will administer the surveys either August 16 or 17, 2012.**
3. **Screening Procedures:** Describe any screening procedures you will use when recruiting your participant population.  
**Any student under the age of 18 will be told not to participate because they would need parental permission.**
4. **Relationships:** State the relationship between the Principal Investigator, Faculty Advisor (if applicable) and Participants. Do any of the researchers have positions of authority over the participants, such as grading authority, professional authority, etc.? Are there any relevant financial relationships? If yes, please answer number 5 below.  
**The Principal Investigator does not have any authority over the students.**
5. **Safeguarding for Conflicts of Interest:** What safeguards are in place to reduce the likelihood of compromising the integrity of the research? (Examples: Addressing the conflicts in the consent process, emphasizing the pre-existing relationship will not be impacted by participation in research, etc.).

## VIII. RESEARCH PROCEDURES

1. **Description of the Research\*:** Write an original, non-technical, step-by-step description of what your participants will be required to do during your study and data collection process.. Do not copy the abstract/entire contents of your proposal. (*Describe all steps the participants*

will follow. What do the data consist of? Include a description of any media use here, justifying why it is necessary to use it to collect data).

During the Freshman Seminar sessions at Liberty, students will be asked to volunteer to complete surveys that ask them about the preparation methods if any that they used before taking the SAT or ACT. Instructors will administer the survey during the Freshman Seminar. Each student who takes the survey will be asked to sign a consent form. Each will be given a copy of the consent form to keep as well. The survey should only take about five minutes to complete.

This researcher will then look for correlations between the survey results and SAT/ACT scores. She will also look for correlations between High School GPAs and scores. Liberty University will furnish these for the researcher.

\*Also, please submit one copy of all instruments, surveys, interview questions or outlines,

bservation checklists, etc. to [irb@liberty.edu](mailto:irb@liberty.edu) with this application.

2. **Location of the Study:** Please describe the location in which the study will be conducted (Be specific; include city and state). **Liberty University, Classrooms, Lynchburg, VA**
3. **Will participant data be collected anonymously?** Describe.

**Students will be asked to identify themselves for the purpose of correlating their high school gpas and ACT/SAT scores. After that has occurred, all identifying information will be removed.**

#### IX. DATA ANALYSIS

1. **Estimated number of participants to be enrolled in this protocol or sample size for archival data: 1200**
2. **Describe what will be done with the data and resulting analysis:** This researcher will look for correlations between the survey results and SAT/ACT scores. She will also look for correlations between High School GPAs and scores. Liberty University will furnish these for the researcher.

#### X. PROCESS OF OBTAINING INFORMED CONSENT

1. **Consent Procedures:** Describe in detail how you will obtain consent from participants and/or parents/guardians. Attach a copy of all Informed Consent/Assent Agreements. The IRB needs to ensure participants are properly informed and are participating in a voluntary manner. *Consider these areas: amount of time spent with participants, privacy, appropriateness of individual obtaining consent, participant comprehension of the informed consent procedure, and adequate setting.* For a consent template and information on informed consent, please see our [website](#). If you believe your project qualifies for a Waiver of Consent, note that here, go to section XV, and answer its questions. **Students will be shown a powerpoint in which I describe the purpose of my study and the necessity for the surveys. The instructors who are conducting the Freshman Seminar at Liberty University will show the powerpoint prior to distributing the surveys and consent forms. If a student still has a question about the survey, he or she may either email, text, or phone me prior to completing the survey and signing the consent form. This information will be included in the powerpoint. The consent forms will be distributed with the surveys and the instructors will be asked to collect them. They will be printed on yellow paper and the surveys on white paper in order to keep them separate.**
2. **Deception:** Are there any aspects of the study kept secret from the participants (e.g. the full purpose of the study)?

- a.  No
- b.  Yes
  - i. Describe:

**3. Is any deception used in the study?**

- a.  No
- b.  Yes
  - i. If yes, describe the deception involved and the debrief procedures. Attach a post-experiment debriefing statement and consent form offering participants the option of having the data destroyed:

**4. Will participants be debriefed?**

- a.  No
- b.  Yes
  - i. Attach a copy of your Debriefing Statement. If the answer to protocol question IX (3) is yes, then the investigator must debrief the participant. If your study includes participants from a participant pool, please include a debrief statement.

**XI. PARENTAL PERMISSION\***

**1. Does your study require parental permission?**

- a.  Yes
- b.  No

**2. Does your study entail greater than minimal risk, without potential for benefit?**

- a.  Yes (If so, consent of both parents is required)
- b.  No

\*Please refer to the Office for Human Research Protections (OHRP) regulations ([45 CFR 46.408](#))

to determine whether your project requires parental consent and/or child assent. This is particularly applicable if you are conducting education research.

**XII. ASSENT FROM CHILDREN AND WITNESS SIGNATURE**

**1. Is assent required for your study?** Assent is required unless the child is not capable (age, psychological state, sedation), or the research holds out the prospect of direct benefit that is only available within the context of the research. If the consent process (full or part) is waived, assent may be also. See our [website](#) for this information.

- a.  Yes
- b.  No

**2. Please attach assent document(s) to this application.**

**XIII. WAIVER OR MODIFICATION FOR REQUIRED ELEMENTS IN INFORMED CONSENT PROCESS**

**1. Waiver or modification for required elements in informed consent is sometimes used in research involving a deception element. See Waiver of Informed Consent on the IRB website (link above). If requesting a waiver of consent, please address the following:**

- a. Does the research pose greater than minimal risk to participants (greater than everyday activities)?
- b. Will the waiver adversely affect participants' rights and welfare? Please justify.



- c. Why would the research be impracticable without the waiver?
- d. How will participant debriefing occur (i.e. how will pertinent information about the real purposes of the study be reported to participants, if appropriate, at a later date)?

**XIV. CHECKLIST OF INFORMED CONSENT/ASSENT**

- 1. **Attach a copy of all informed consent/assent documents.** Please see our [Informed Consent materials](#) and Informed Consent template to develop your document.

**XV. WAIVER OF SIGNED INFORMED CONSENT DOCUMENT**

- 1. Waiver of signed consent is sometimes used in anonymous surveys or research involving secondary data. This does not eliminate the need for a consent document, but it does eliminate the need for a signature(s). If you are requesting a waiver of signed consent, please address the following (yes or no):
  - a. Does the research pose greater than minimal risk to participants (greater than every day activities)?
  - b. Does a breach of confidentiality constitute the principal risk to participants?
  - c. Would the signed consent form be the only record linking the participant and the research?
  - d. Does the research include any activities that would require signed consent in a non-research context?
  - e. Will you provide the participants with a written statement about the research (an information sheet that contains all the elements of the consent form but without the signature lines)?

**XVI. PARTICIPANT PRIVACY AND CONFIDENTIALITY**

- 1. **Privacy:** Describe what steps you will take to protect the privacy of your participants. Remember privacy is referring to persons and their interest in controlling access to their information. **I will submit my survey findings with students' names and Dr. Yates will link the surveys to the students' high school grades and scores. He will then de-identify the data, recode the data, and return the data to me. Any documents linking student identities to the coded data will be kept in his office. I will keep the surveys for three years locked in a filing cabinet in my home. After three years, they will be destroyed.**
- 2. **Confidentiality:** Please describe how you will protect the confidentiality of your participants. Remember confidentiality refers to agreements with the participant about how data are to be handled. Indicate whether the data are archival, anonymous, confidential, or confidentiality not assured and then provide the additional information requested in each section. The IRB asks that if it is possible for you to collect your data anonymously (i.e. without collecting the participants' identifiable information), please construct your study in this manner. Data collection in which the participant is not identifiable (i.e. anonymous) can be exempted in most cases.
  - a. **Are the data archival?\*** (Data already collected for another purpose).
    - i.  Yes (please answer i-iv below)
    - ii.  No (please skip to b in this section)

**\*Please note: if your study only includes archival data, answer no to 2-b, 2-c, 2-d, and leave 2-e blank.**

- b. **Are the data publicly accessible?**
  - i.  Yes (please skip to ii)
  - ii.  No (Please answer below)

1. Please describe how you will obtain access to this data and provide the board with proof of permission to access the data. **Dr. Gates said that once I have the surveys completed and can give him the identification numbers or names of the students who participated, he can write a query for the information and provide it to me with the IRB's approval.**
  
- c. **Will you receive the data stripped of identifying information, including names, postal addresses, telephone numbers, email addresses, social security numbers, medical record numbers, birth dates, etc.?**
  - i.  Yes (see below)
    1. Please describe who will link and strip the data. Please note that this person should have regular access to the data and he or she should be a neutral third party not involved in the study.
  - ii.  No (see below)
    1. If no, please describe what data will remain identifiable and why this information will not be removed. **I will need the data in order to correlate it to the information I receive from the surveys.**
  
- d. **Can the names of the participants be deduced from the data set?\***
  - i.  Yes (see below)
    1. Please describe.
    2. Initial the following: I will not attempt to deduce the identity of the participants in  
  
this study: \_\_\_\_\_
  - ii.  No (skip to iv)
  
- e. **Please provide the list of data fields you intend to use for your analysis and/or provide the original instruments used in the study.**
  
3. **Are the data you will collect anonymous?** (Data do not contain identifying information including names, postal addresses, telephone numbers, email addresses, social security numbers, medical record numbers, birth dates, etc., and cannot be linked to identifying information by use of codes or other means. If you are recording the participant on audio or videotape, etc., this is not considered anonymous data).
  - a.  Yes (see below)
    - i. Describe the process you will use to collect the data to ensure that it is anonymous.
  - b.  No (skip to c)
  
4. **Can the names of the participants be deduced from the data?\***
  - a.  Yes (see below)
    - i. Please describe: **The names will be on the data. However, once correlated the names will be removed.**
  - b.  No (skip to c)

**\*If you agree to the following, please type your initials: I will not attempt to deduce the identity of the participants in the study:**

5. **Are the data you will collect confidential?** (Confidential data contain identifying information and/or can be linked to identifying information by use of codes or other means). Please note that

if you will use participant data (such as photos, videos, etc.) for presentations beyond data analysis for the research study (classroom presentations, library archive, conference presentations, etc.) you will need to provide a materials release form to the participant.

- a.  Yes (see below)
  - i. Please describe the process you will use to collect the data and to ensure the confidentiality of the participants. Verify that the list linking codes to personal identifiers will be kept secure by stating where it will be kept and who will have access to the data. **Dr. Gates said that once I have the surveys completed and can give him the identification numbers or names of the students who participated, he can write a query for the information and provide it to me with the IRB's approval. I will keep the information locked away in a filing cabinet and computer files will be password protected. No one will have access to the information but me and my dissertation chair, Dr. David Holder.**
- b.  No (skip to d)

6. **Will you assure confidentiality in the study?** (For example, will you handle and store the data in such a way as to prevent a breach in confidentiality?) Please note that if you will use participant data (such as photos, videos, etc.) for presentations beyond analysis for the research study (classroom presentations, library archive, conference presentations, etc.) you need to provide a materials release form to the participant.

- a.  Yes (see below)
- b.  No (see below)
  - i. Please describe why confidentiality will not be assured.

7. **Please describe how you will maintain confidentiality of the data collected in your study.** This includes how you will keep your data secure (i.e. password protection, locked files), who will have access to the data, and methods for destroying the data once the three year time period for maintaining your data is up. **Everything will be password protected on my computer and locked up in a filing cabinet.**

8. **Media Use\*:** If you answer yes to any question below, in question VI (1), [Description of Research](#), please provide a description of how the media will be used and justify why it is necessary to use the media to collect data. Include a description in the Informed Consent document under "What you will do in the study."

- a. Will the participant be audio recorded?  Yes  No
- b. Will the participant be video recorded?  Yes  No
- c. Will the participant be photographed?  Yes  No
- d. Will the participant be audio recorded, video recorded, or photographed without their knowledge?  Yes  No
- e. If yes, please describe the deception and the debriefing procedures: Attach a post-experiment debriefing statement and a post-deception consent form offering participants the option of having their tape/photograph destroyed.
- f. If a participant withdraws from a study, how will you withdraw them from the audiotape, videotape, or photograph? Please include a description in the Informed Consent document under "How to withdraw from the study."

**\*Please note that all research-related data must be stored for a minimum of three years after the end date of the study, as required by federal regulations.**

## XVII. PARTICIPANT COMPENSATION

1. **Describe any compensation that participants will receive.** Please note that Liberty University Business Office policies might affect how you compensate participants. Please contact your department's business office to ensure your compensation procedures are allowable by these policies. **All of the participants will have their names entered into a drawing for a \$100 Walmart Gift card.**

#### **XVIII. PARTICIPANT RISKS AND BENEFITS**

1. **Risks:** There are always risks associated with research. If the research is minimal risk, which is no greater than every day activities, then please describe this fact. **Risks will be minimal and related to confidentiality.**
  - a. Describe the risks to participants and steps that will be taken to minimize those risks. Risks can be physical, psychological, economic, social, legal, etc. **The risks would be confidentiality. Students may be afraid someone will accidentally see their test scores and suffer embarrassment. Therefore, I will keep all files password protected and papers locked away in a filing cabinet.**
  - b. Where appropriate, describe any alternative procedures or treatments that might be advantageous to the participants.
  - c. Describe provisions for ensuring necessary medical or professional intervention in the event of adverse effects to participants or additional resources for participants.
2. **Benefits:** Describe the possible direct benefits to the participants. If there are no direct benefits, please state this fact. **There are not direct benefits to these participants but hopefully there will be to future students.**
  - a. Describe the possible benefits to society. In other words, how will doing this project be a positive contribution and for whom (keep in mind benefits may be to society, the knowledge base of this area, etc.)? **Parents, students, and schools will see the benefits for preparing students to take the college admission tests - SAT and ACT.**
3. **Investigator's evaluation of the risk-benefit ratio:** Please explain why you believe this study is still worth doing even with any identified risks. **The risks of this study are minimal. The main risk is that a student's ACT/SAT score or high school grade point average may be seen by someone other than the researcher. However, with proper precautions that should not occur and the research is very worthwhile. College admission and scholarships are often affected by ACT/SAT scores. If shadow education can improve these scores, then students should have the opportunity to participate in it. Also, as a result of this study, one or more types of preparation may surface as more effective than others. This would also be valuable to the student who needs a certain score to get a full scholarship.**

## Appendix B

### SAT/ACT Survey

Student's Full Name \_\_\_\_\_

Student's Liberty ID # \_\_\_\_\_

**Before applying to college, you took a college admission test, the SAT, ACT or both. You may or may not have prepared for the test(s). Below is a survey asking you to indicate the methods you used and which was the most beneficial to you. Please circle yes or no. If you circle yes, please complete the question by listing the specific text, program, class, etc. in which you participated.**

6. Did you purchase textbooks and/or software to help you prepare for the SAT and/or ACT? Yes or No

If you circled yes, please list the textbooks and /or software below.

---

7. Did you use an online program such as CollegeBoard, ACT Prep, TCA, etc., to help prepare for the SAT and/or ACT? Yes or No

If you circled yes, please list the program below.

---

8. Did you attend a workshop or take a class at your school to help you prepare for the SAT and/or ACT? Yes or No

If you circled yes, please indicate the type of workshop or class in which you participate.

---

9. Did you seek private tutoring through an independent consultant or learning center such as Sylvan or Huntington? Yes or No

If you circled yes, please list the type of private tutoring you had below.

---

10. If you used more than one preparation method, please rank which method was the most valuable with 1 representing the best. If you used more than two texts and one was more beneficial than the other, please indicate that as well.

1. \_\_\_\_\_ 4. \_\_\_\_\_

2. \_\_\_\_\_ 5. \_\_\_\_\_

3. \_\_\_\_\_

## Appendix C

### **CONSENT FORM**

College Admission Test Survey  
Robin Faulk Donaldson  
Liberty University  
Education Department

You are invited to be in a research study of college admission test preparation. You were selected as a possible participant because you have recently taken either the SAT or ACT. You must be 18 years of age or older to take part in this study. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Robin Faulk Donaldson, Graduate Student in the Education Department at Liberty University.

#### **Background Information:**

The purpose of this study is to determine if preparation methods improve college admission scores. Many colleges are selective and college admission scores are very important.

#### **Procedures:**

If you agree to be in this study, we would ask you to complete a survey. The survey should take about five minutes to complete. Your answers will be correlated to your SAT and/or ACT scores which will be obtained from school records.

#### **Risks and Benefits of being in the Study**

This study has minimal risks. The risks are no greater than those encountered in everyday life. The benefits to participation are that schools and school districts may see the necessity of implementing more preparation methods for all students regardless of race, gender, or socioeconomic status.

#### **Compensation:**

Everyone who participates will have his or her name entered in a drawing for a \$100 Walmart Gift Card.

**Confidentiality:**

The records of this study will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only researchers will have access to the records. Once scores are correlated with survey results, names will be removed.

**Voluntary Nature of the Study:**

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time with out affecting those relationships.

**Contacts and Questions:**

The researcher conducting this study is: Robin F. Donaldson, graduate student and Dr. David Holder, faculty advisor. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at Green Sea Floyds High School, 843-392-3131 or 910-653-4743, [rfdonaldson@liberty.edu](mailto:rfdonaldson@liberty.edu). Dr. Holder’s phone number is 434-582-2445 and his email is [deholder@liberty.edu](mailto:deholder@liberty.edu).

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Institutional Review Board, Dr. Fernando Garzon, Chair, 1971 University Blvd, Suite 1582, Lynchburg, VA 24502 or email at [fgarzon@liberty.edu](mailto:fgarzon@liberty.edu).

***You will be given a copy of this information to keep for your records.***

**Statement of Consent:**

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of Investigator: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix D

### SAT/ACT Concordance Chart

ACT Composite Score	SAT Score Critical Reading + Math (Single Score)	SAT Score Critical Reading + Math (Score Range)	ACT Score Combined English/Writing	SAT Score Writing (Single Score)	SAT Score Writing (Score Range)
36	1600	1600	36	800	800
35	1560	1540-1590	35	800	800
34	1510	1490-1530	34	770	770-790
33	1460	1440-1480	33	740	730-760
32	1420	1400-1430	32	720	710-720
31	1380	1360-1390	31	690	690-700
30	1340	1330-1350	30	670	660-680
29	1300	1290-1320	29	650	640-650
28	1260	1250-1280	28	630	620-630
27	1220	1210-1240	27	610	610
26	1190	1170-1200	26	590	590-600
25	1150	1130-1160	25	570	570-580
24	1110	1090-1120	24	550	550-560
23	1070	1050-1080	23	530	530-540
22	1030	1020-1040	22	510	510-520
21	990	980-1010	21	490	480-500
20	950	940-970	20	470	470
19	910	900-930	19	450	450-460
18	870	860-890	18	430	430-440
17	830	820-850	17	420	410-420
16	790	770-810	16	400	390-400
15	740	720-760	15	380	380
14	690	670-710	14	360	360-370
13	640	620-660	13	340	340-350
12	590	560-610	12	330	320-330
11	530	510-550	11	310	300-310

<http://www.act.org/aap/concordance/pdf/reference.pdf>



## Appendix E

### No Preparation

HSGPA	SAT Rdg	SAT M	SAT T	ACT E	ACT M	ACT R	ACT S	ACT T	ACT Converted
3.02				22	16	18	20	19	910
2.82	460	500	960						960
2.76	470	460	930						930
4	720	580	1300						1300
4				32	33	27	30	31	1380
3.47	700	750	1450	31	26	34	28	30	1340
3.04	540	470	1010						1010
3.34	330	320	650						650
2.77	440	370	810						810
4	740	750	1490	35	29	36	31	33	1490
3.93	520	480	1000	17	25	18	24	21	1000
4	640	800	1440						1440
3.4	380	460	840						840
3.11	520	690	1210						1210
3.81	520	600	1120						1120
3.74	600	560	1160						1160
3.67	610	710	1320	32	24	33	25	29	1320
2.05	520	520	1040						1040
3.81	570	620	1190						1190
3.46				27	18	34	21	25	1150
3.21				23	19	24	22	22	1030
2.81	520	510	1030						1030
3.17				28	21	25	25	25	1150
3.72				20	16	14	18	17	830
3.82	510	470	980						980
2.77	440	460	870						870
2.24	480	500	980						980
3.72	570	550	1120						1120
2.89	500	520	1020						1020
3.34	570	650	1220						1220
3.81	460	480	940						940
3.52	470	510	980	15	18	20	19	18	980
2.97				23	21	21	16	20	950
3.31	460	510	970	19	19	19	21	20	970
4				24	24	23	22	23	1070
3.94				26	24	31	26	27	1220
3.84	430	470	900						900
2.76	320	400	720	12	17	15	18	16	720
2.85				16	16	18	23	18	870

3				20	18	15	20	18	870
3.7	660	670	1330						1330
3.3				24	16	23	17	20	950
2.55	480	540	1020						1020
3.63	440	480	920	25	21	23	22	23	920
3.48	650	570	1220	25	27	21	21	24	1220
3.63	480	500	980						980
2.96	460	390	850						850
3.08	500	500	1000						1000
2.83				22	23	22	17	21	990
2.56	420	440	860						860
3.95	690	680	1370	29	34	36	30	32	1370
3.67	620	560	1180						1180
3.81				29	23	23	24	25	1150
3.88				25	27	32	30	29	1300
4	680	650	1330	33	30	36	33	33	1330
3.97				34	26	29	30	30	1340
4	760	800	1560						1560
3.77	400	570	970	29	22	34	21	27	970
2.89				23	17	24	19	21	990
3.8	590	580	1170						1170
3.94				35	30	34	30	32	1420
3.72	600	750	1350	22	18	23	16	20	1350
3.45				29	24	33	25	28	1260
2.99	550	720	1270						1270
2.69	490	450	940	21	20	21	19	20	940
2.92	430	390	820	18	17	18	15	17	820
3.43				25	24	29	22	25	1150
2.59	460	580	1040						1040
3.58	620	600	1220	27	31	31	28	29	1220
2.89	520	560	1080						1080
3.92	780	650	1430	36	35	35	35	35	1430
3.19	490	490	980						980
4				21	19	16	23	20	950
3.58	640	680	1320						1320
3.98	690	700	1390	30	30	33	27	30	1390
3.7				21	19	25	19	21	990
3.3	520	450	970						970
3.1	490	480	970						970
3.51	560	580	1140						1140
3.12	550	550	1100	21	23	26	25	24	1100
3.91				26	35	26	36	31	1380
3.1	540	540	1080						1080
2.21	410	490	900						900
4	650	640	1290	30	29	33	24	29	1290
3.92	670	700	1370	33	31	33	32	32	1370

3.56	590	480	1070						1070
3.07	600	670	1270						1270
3.45	650	650	1300						1300
3.8	550	740	1290						1290
3.17	460	460	860	23	20	22	21	22	860
4	630	700	1330						1330
4				34	28	34	26	31	1380
3.26				16	16	22	23	19	910
3.22	540	610	1150	26	24	31	25	27	1220
3.25	560	460	1020						1020
2.92	550	460	1010						1010
2.77	490	590	1080						1080
2.75	410	560	970						970
4	700	650	1350	31	28	27	27	28	1350
3.87	650	660	1310	32	29	26	24	28	1310
3.4	660	590	1250						1250
3.43	510	530	1040	23	25	25	26	25	1040
3.22	530	520	1050						1050
2.94	400	540	940						940
3.64	540	300	840						840
2.61	450	330	780						780
2.94	460	370	830						830
3.05	550	550	1100						1100
3.8	640	630	1270	27	28	31	24	28	1270
3.88	550	520	1070						1070
3.19	580	530	1110						1110
3.97	730	690	1420	30	34	32	29	31	1420
3.71	560	560	1120						1120
3.35	510	550	1060						1060
3.75	690	610	1300						1300
3.6	500	440	940						940
3.68	550	440	990	22	22	19	23	22	990
3.11	450	460	910						910
3.04	500	520	1020						1020

Appendix F

**Preparation**

HSGPA	SAT Rdg	SAT M	SAT T	ACT E	ACT M	ACT R	ACT S	ACT T	ACT Converted
3.52	500	420	920						920
3.94	640	600	1240	30	28	24	26	27	1240
3.21	480	420	900						900
2.77	530	430	960	18	23	18	25	21	960
2.99	500	460	930						930
4	460	530	990	18	23	18	25	21	990
2.43	500	500	1000	17	25	20	21	21	1000
2.82	460	500	960						960
3.14	540	530	1070						1070
3.5	340	210	550	12	16	13	18	15	550
3.72				23	26	26	24	24	1110
3.41	650	620	1270						1270
2.51	520	490	1010						1010
4				34	24	28	26	28	1260
2.65	460	570	1030						1030
3.94	620	670	1290						1290
3.58	550	540	1090	31	32	29	25	27	1090
3.08	430	380	810	14	18	15	17	16	810
4				32	33	27	30	31	1380
3.84	530	530	1060						1060
4	530	650	1180						1180
3.79	580	600	1180						1180
4	490	450	940						940
3.44	560	620	1180						1180
3.47	450	430	880						880
2.89	430	430	860						860
3.84	480	530	1010						1010
2.5				18	15	18	19	18	870
2.8	430	420	850						850
3.91	600	740	1340	29	25	33	24	28	1340
3.95	490	550	1040						1040
3.5	430	420	850	15	16	17	20	17	850
3.68	470	430	900						900
3.83	470	420	890						890
3.83	600	560	1160						1160
4	540	510	1050	23	28	21	22	24	1050
3.53	590	690	1280						1280
1.92	430	410	840						840
3.22	490	460	950						950
3.15	470	390	860	21	22	21	20	21	860

2.73	560	470	1030						1030
3.7	610	490	1100	20	27	21	23	23	1100
3.11	610	700	1310						1310
3.63	650	670	1320	24	26	26	23	25	1320
3.31	470	500	970	22	21	22	21	22	970
3.15	400	450	850						850
2.84	500	500	1000						1000
3.28	570	530	1100						1100
3.94	680	620	1300						1300
3.77	480	660	1140	26	18	18	22	21	1140
3.98	670	700	1370						1370
2.99	430	430	860						860
3.7	540	580	1120	27	25	28	30	28	1120
3.64	550	590	1140						1140
3.14	490	470	960						960
3.79	570	580	1150						1150
3.61	580	620	1200						1200
4	660	590	1250	27	26	31	34	30	1250
4	650	770	1420						1420
3.89	650	640	1290						1290
3.76	530	580	1110						1110
3.49	450	480	930						930
3.66	460	440	900	19	17	17	16	17	900
4	600	640	1240						1240
3.93	540	560	1100						1100
3.11	470	500	970						970
2.8	550	510	1060						1060
3.74	630	570	1200	23	24	24	24	24	1200
3.38	570	520	1070						1070
3.79	540	550	1090						1090
3.2	520	410	930						930
3.62	450	530	980						980
4				35	33	35	34	34	1510
3.15	460	530	990	22	18	22	22	21	990
2.98	360	260	620	16	16	16	18	17	620
3.59	490	540	1030	21	19	26	23	22	1030
3.74				28	26	27	24	26	1190
3.67	520	580	1100	20	25	24	24	23	1100
4	570	610	1180						1180
3.94	590	630	1220	28	26	30	25	27	1220
2.62	400	450	850	19	16	17	23	19	850
3.93	540	620	1160						1160
3.18	520	510	1030						1030
3.86	480	470	950	17	18	20	16	18	950
2.69	390	410	800	17	16	21	18	18	800
2.77				23	21	22	24	23	1070

3.54	460	580	1040						1040
2.375				20	15	21	16	18	870
2.88	470	520	990						990
3.78	630	760	1390	32	25	33	31	30	1390
3.17	420	350	770	21	16	19	18	19	770
3.31	540	520	1060	21	23	17	21	21	1060
2.81	500	560	1060						1060
2.83	430	420	850	16	24	18	18	19	850
3.11	400	480	880	16	14	21	18	17	880
2.85	490	470	960						960
3.37	640	570	1210						1210
3.82	730	510	1240						1240
3.97	640	610	1250	32	27	36	26	30	1250
3.64	510	590	1100						1100
2.71	440	390	830	15	19	15	20	17	830
3.63	400	440	840						840
4	660	650	1310						1310
4	630	580	1210						1210
3.57	570	480	1050						1050
3.16	470	550	1020						1020
2.94	410	400	810	21	16	22	18	19	810
2.63	410	420	830	15	19	17	17	17	830
3.72	540	540	1080						1080
3.97	550	530	1080						1080
4	640	680	1320						1320
3.01	430	410	840						840
4	670	740	1410	32	24	33	25	29	1410
3.3	410	430	840						840
3.97	560	630	1190	28	25	32	28	28	1190
3.84	530	440	970	14	21	20	16	18	970
3.9				24	24	26	25	25	1150
2.4461				23	18	20	17	20	950
3.28	560	580	1140						1140
3.32	650	580	1230	27	26	22	21	24	1230
3.82	630	680	1310						1310
3.42	430	380	810						810
3.93	560	570	1130						1130
3.51				29	25	33	29	29	1300
3.65	560	660	1220						1220
3.95				31	28	28	21	27	1220
3.24	530	500	1030						1030
3.53	440	440	880	15	19	20	19	18	880
2.56	450	450	900	20	21	20	23	21	900
2.97				13	15	15	17	15	740
3.8	560	740	1300	28	23	34	24	27	1300
3.33	440	440	880						880

3.45	520	480	1000	20	20	18	21	20	1000
3.12	490	470	960						960
3.45				24	25	21	26	24	1110
3.64	670	630	1300						1300
3.5	600	680	1280						1280
3.72				24	21	22	22	22	1030
2.78	480	500	980						980
3.59	370	490	860	20	15	23	18	19	860
3.3	530	540	1070						1070
2.98	470	540	1010						1010
3.78	490	600	1090	24	21	27	17	22	1090
3.6	540	460	1000						1000
3.97	610	520	1130						1130
3.33	400	490	890	20	16	24	19	20	890
3.88	680	610	1290	28	26	30	23	27	1290
2.8				26	22	19	19	22	1030
3.36	530	580	1110						1110
2.47	300	360	660	20	16	17	16	17	660
3.63	420	410	830	16	18	18	17	17	830
3.21				20	23	19	24	22	1030
3.44				21	19	21	22	21	990
2.88	650	600	1250						1250
3.92	520	590	1110	27	27	27	24	26	1110
3.8				26	27	33	30	29	1300
3.72	570	550	1120						1120
2.73	420	400	820						820
3.55	540	690	1230						1230
3.96				33	28	31	28	30	1340
3.59				22	24	28	21	24	1110
3	430	500	930						930
3.59	490	500	990						990
3.04	550	580	1130	22	24	23	22	23	1130
3.89	560	530	1090	30	28	25	27	28	1090
3.36	540	510	1050						1050
3.39	450	500	950						950
3.15	420	450	570	15	16	12	14	14	570
3.92	480	580	1060	24	22	25	17	22	1060
4	600	540	1140						1140
3.46	480	460	940						940
3.09	470	430	900	16	18	15	22	18	900
3.89	490	550	1040	23	23	28	21	24	1040
4	580	590	1170						1170
3.85	600	680	1280						1280
4	600	540	1140						1140
2.69	630	390	1020	23	28	25	24	25	1020
2.71	370	570	940						940

3.3	550	440	990						990
3.12	490	510	1000	20	19	22	21	21	1000
3.36	460	490	950						950
3.94	470	510	980	20	18	22	24	21	980
2.93	400	410	810	19	18	18	18	18	810
3.86	540	630	1170	30	24	33	25	28	1170
3.77	390	470	860						860
3.48	600	420	1020						1020
3.91	560	500	1060						1060
3.37	480	410	890	19	21	15	18	18	890
3.7	490	490	980	20	20	25	18	21	980
2.79	400	390	790						790
2.48	460	370	830						830
2.73				19	17	20	18	19	910
4	610	590	1200						1200
3.87	630	620	1250						1250
3.29	480	470	950						950
2.66	470	380	850	18	19	15	21	18	850
3.38	610	490	1100						1100
2.92	420	400	820						820
3.81	570	690	1260						1260
4	630	610	1240	33	28	27	23	28	1240
4	610	650	1260	32	33	31	25	30	1260
3.82	520	600	1120	28	21	24	18	23	1120
2.4	340	440	780	16	16	22	14	17	780
3.91	510	530	1040	23	23	20	22	22	1040
3.62	600	650	1250	31	28	32	26	29	1250
3.83				16	21	14	22	18	870
2.95	440	560	1000	23	23	27	20	23	1000
3.68	530	500	1030						1030
3.69	570	580	1150						1150
3.88	610	640	1250						1250
3.98	630	660	1290						1290
3.16	460	450	910						910
3.02	450	480	930						930
3.18	490	450	940						940
3.3	440	530	970						970
2.72	580	510	1090						1090
3.51	360	340	700	19	21	18	20	20	700
3.36	380	450	830						830
3.2	460	540	1000						1000
3.15	570	520	1090						1090
3.98				15	20	18	20	18	870
2.73	400	400	800	20	16	19	17	18	800
3.27	600	570	1170						1170
3.75	540	640	1180	26	18	29	22	24	1180



3.25	600	560	1160						1160
3.58	600	480	1080						1080
3.37	390	440	830	18	16	19	16	17	830
3.55	540	670	1210	17	19	25	25	22	1210
3.33	380	530	910						910
3.84	690	670	1360	24	28	28	25	26	1360
3.83	500	620	1120						1120
3.85				22	17	17	20	19	910
3.36				25	25	24	21	24	1110
3.7	600	560	1160	25	26	22	25	25	1160
3.48				21	17	22	19	20	950
3.83	580	600	1180	24	25	18	21	22	1180
3.75	450	600	1050						1050
3.84	580	530	1110	24	23	26	23	24	1110
3.49	460	430	890	20	18	18	14	18	890
3.66	580	500	1080	24	24	22	23	23	1080
2.56	580	420	1100						1100
3.9				26	26	28	26	27	1220
3.59	580	610	1190	32	27	32	24	29	1190
3.5				25	25	23	24	24	1110
3.96				27	16	29	16	22	1030
3.72	440	410	850	16	20	18	18	18	850
2.87	480	560	1040						1040
3.51	470	540	1030						1030
3.56				21	24	15	18	20	950
3.15	500	460	960						960
3.14				23	20	28	24	24	1110
3.22				20	19	21	18	20	950
3.11				29	18	31	26	26	1190
3.98	660	610	1270	25	27	28	23	26	1270
2.27				12	16	15	15	15	740
3.97				30	30	25	25	28	1260
3.98				27	33	33	32	31	1380
3.62	480	630	1110						1110
3.24				24	25	28	26	26	1190
2.72	490	410	900						900
3.76	320	410	730	17	22	22	25	22	730
3.73	550	490	1040						1040
3.92	690	700	1390						1390
3.19	430	420	850	17	20	18	17	18	850
3.98				26	27	29	26	27	1220
3.19	450	550	1000						1000
2.89				17	14	18	19	17	830
3.12	530	520	1050	22	21	22	23	22	1050
2.96	480	460	940	17	19	16	22	19	940
4	700	590	1290	35	35	33	31	34	1290

3.28	450	550	1000						1000
3.82	740	680	1420						1420
3.1	540	660	1200						1200
2.97	470	580	1050						1050
3.8	500	760	1260						1260
4	650	740	1390						1390
3.72	390	560	950						950
4	670	670	1340						1340
2.88	510	580	1090						1090
3.44				23	22	27	23	24	1110
4	590	700	1290	32	25	31	22	28	1290
3.95	490	540	1030						1030
3.5	600	620	1220						1220
2.71	400	460	860	17	20	22	20	20	860
3.72				31	26	28	22	27	1220
4	540	560	1100						1100
2.28	360	360	720						720
3.95	670	530	1200	29	28	25	23	26	1200
3.1	500	500	1000						1000
2.94	410	440	850	15	18	13	19	16	850
3.62	670	650	1320						1320
3.54	540	550	1090						1090
2.53	540	430	970						970
3.93				23	29	27	25	26	1190
3.18	540	620	1160	23	23	25	22	23	1160
3.51	620	490	1110						1110
3.63	540	580	1120	27	25	31	28	28	1120
3.11	560	580	1140						1140
3.58	610	590	1200						1200
3.55	430	420	850						850
2.88	520	490	1010						1010
3.5	390	490	880	21	17	22	23	21	880
2.76	570	560	1130						1130
4	610	550	1160						1160
3.22	500	580	1080						1080
4	610	670	1280	28	27	30	24	27	1280
3.16	510	540	1050						1050
3.17	410	450	860						860
2.82	500	410	910						910
3.85				22	24	21	21	22	1030
3.83	510	500	1010						1010
3.4	480	460	940						940
3.12	500	490	990	22	18	28	22	23	990
3.26	470	580	1050						1050
2.58				24	23	24	22	23	1070
3.95	550	690	1240						1240

2.97	580	540	1120						1120
3.02	400	490	890	21	16	21	21	20	890
3.29	500	430	930						930
3.84	500	550	1050						1050
4	590	610	1200						1200
3.71	540	540	1080						1080
3.94				27	25	32	27	28	1260
3.79				21	19	22	22	21	990
3.92	780	650	1430	36	35	35	35	35	1430
4	590	610	1200	25	19	24	24	23	1200
3.64	560	470	1030						1030
4	500	550	1050	26	20	22	17	21	1050
3.76	560	490	1050						1050
3.88	610	680	1290	25	26	32	24	27	1290
2.4	390	550	940						940
3.02	460	570	1030	26	23	30	23	26	1030
3.81	460	510	970						970
4	560	580	1140						1140
3.89				21	27	25	24	24	1110
2.48	520	540	1060						1060
3.13	550	460	1010						1010
2.82	460	510	970						970
3.65	640	520	1160	23	26	29	23	25	1160
3.56	640	560	1200						1200
4	590	680	1270						1270
3.04	470	430	900						900
3.02	620	510	1130						1130
3.62	500	460	960						960
3.86	570	620	1190						1190
2.16	450	520	970						970
3.96	570	540	1110						1110
2.75	410	460	870	18	14	20	21	18	870
2.59	500	520	1020						1020
3.52	670	630	1300						1300
3.08	670	650	1320						1320
4	650	600	1250						1250
3.23	410	460	870						870
3.62	420	410	830	15	17	16	20	17	830
3.77	650	500	1150						1150
3.91	510	590	1100	29	27	24	24	26	1100
2.72	470	450	920	19	18	15	20	18	920
3.81	550	540	1090						1090
2.99	420	350	770	17	16	18	18	17	770
4				33	27	31	25	29	1300
3.58	680	600	1280	34	30	34	31	32	1280
3.67	540	570	1110	30	25	24	23	26	1110

3.97	580	680	1260						1260
3.88	660	620	1280						1280
3.55	470	540	1010						1010
4	460	600	1060						1060
2.89	630	430	1060	17	24	17	19	19	1060
2.75	420	430	850	19	20	20	14	18	850
3.73	560	520	1080						1080
3.3	520	450	970						970
3.8	670	590	1260						1260
4	550	670	1220	25	25	26	24	25	1220
3.81	560	550	1110						1110
2.84	500	520	1020						1020
3.17	510	480	990						990
2.29	540	470	1010						1010
3.8	530	540	1070						1070
2.87				18	17	21	22	20	950
3.82	600	590	1190	30	27	32	27	29	1190
3.59	620	610	1230						1230
3.35				24	22	22	24	23	1070
3.19	500	440	940						940
2.87	370	470	840						840
3.18	460	470	930	20	18	17	20	19	930
2.42	450	440	890	15	16	16	23	18	890
4	480	460	940	24	19	15	16	19	940
3.85				27	28	32	28	29	1300
4	640	770	1410	36	32	36	31	34	1410
3.75	410	530	940						940
2.96	600	650	1250						1250
2.52	590	600	1190						1190
3.67	530	690	1220						1220
3.27	450	490	940						940
2.66	450	460	910	18	19	17	22	19	910
3.78	570	620	1190						1190
2.94	470	520	990						990
3.86				31	34	29	31	31	1380
3.59	470	360	830	13	17	14	21	16	830
2.99	500	500	1000						1000
3.81	440	470	910	11	17	14	11	13	910
3.79	490	510	1000						1000
4	530	520	1050						1050
2.58	430	440	870						870
3.96	530	490	1020						1020
3.35	500	440	940						940
3.82	570	720	1290	30	29	35	29	31	1290
3.56	550	540	1090						1090
2.02				23	18	20	19	20	950

3.86	450	560	1010						1010
2.88	600	670	1270						1270
3.93	740	700	1440						1440
2.47	630	560	1190						1190
3.97				32	27	31	25	29	1300
3.44	490	580	1070						1070
3.98	580	720	1300	34	27	36	26	31	1300
4	490	520	1010	33	23	28	27	28	1010
2.78	420	560	980						980
4	610	610	1220	28	28	20	25	25	1220
3.44	510	570	1080	24	20	26	20	23	1080
3.14	310	500	810						810
4	610	740	1350	34	26	32	24	29	1350
4	670	570	1240	30	29	32	27	30	1240
2.85	370	440	810	16	17	21	14	17	810
3.6	450	500	950	21	23	18	23	21	950
3.92	500	550	1050	21	23	20	22	22	1050
2.86				18	17	23	20	20	950
2.88				13	17	17	19	17	830
2.59	420	460	880	20	17	23	17	19	880
3.81	560	520	1080	31	24	27	24	27	1080
4	540	570	1110						1110
3.2	360	510	870						870
3.06	620	590	1210						1210
3.25	590	640	1230						1230
2.36	450	430	880	16	18	23	20	19	880
1.87	470	450	920						920
3.25	480	390	870	10	18	15	17	15	870
2.74	470	480	950						950
3.32	460	590	1050						1050
3	460	530	990						990
4	630	640	1270	32	24	28	24	27	1270
3.54	490	500	990						990
3.51	690	490	1180						1180
3.4	690	350	1040						1040
2.75	480	440	920						920
3.85				24	19	23	20	22	1030
3.35	340	500	840						840
4	630	650	1280	25	29	27	31	28	1280
4	540	650	1100						1100
3.87				24	19	23	22	22	1030
3.54				29	27	29	30	29	1300
3.24	420	440	860						860
3.75	540	470	1010						1010
3.14	480	550	1030	20	17	19	18	19	1030
2.88	500	410	910						910

2.55	440	540	980						980
3.51	460	390	850						850
3.96	420	410	830	16	17	20	21	19	830
3.94	410	510	920	18	19	22	19	20	920
3.89	600	620	1220						1220
2.96	490	520	1010	20	17	21	19	19	1010
3.24	540	420	960						960
3.78	550	520	1070						1070
3.63	560	530	1090						1090
3.51	460	430	890						890
3.37				19	16	16	19	18	870
3.48	540	580	1120	24	23	26	22	24	1120
3.36				21	18	24	20	21	990
3.86	500	430	930						930
3.64	490	540	1030						1030
3.22	720	570	1290						1290
3.69	520	460	980						980
4	730	740	1470	35	32	34	32	33	1470
3.21	380	470	850						850
3.87	560	750	1310						1310
3.74	530	620	1150						1150
3.94	520	570	1090	26	24	25	23	25	1090
2.78	380	490	870	18	20	28	21	22	870
2.57	490	340	830						830
3.25	370	470	840	21	18	25	21	21	840
2.87	410	470	880						880
2.37	420	550	970						970
3.4				18	18	16	18	18	870
3.1	550	500	1050	20	22	18	18	20	1050
3.97	670	550	1220	26	29	24	24	26	1220
2.91	550	520	1070						1070
2.9				15	16	15	13	15	740
3.47	680	540	1220	15	27	25	20	22	1220
4	580	740	1320						1320
3.5	660	580	1240	31	29	24	26	28	1240
3.05				19	18	20	21	20	950
3.69	550	560	1110						1110
3.91				24	20	15	21	20	950
3.29	570	690	1260						1260
3.65	490	580	1070						1070
3.89	670	530	1200						1200
3.76	520	560	1080						1080
3.52	420	440	860						860
3.26	410	480	890						890
3.47	530	620	1150						1150
3.81				29	29	27	24	27	1220

2.69	410	500	910						910
3.16	480	440	920						920
3.97	590	540	1130						1130
3.92	640	640	1280						1280
3.61	340	520	860						860
3.76				23	16	21	20	20	950
2.94				23	22	20	25	23	1070
2.99	540	440	980						980
3.16	510	550	1060						1060
3.88				33	27	32	29	30	1340
3.55	390	430	820						820
3.07	420	440	860	21	18	18	19	19	860
3.67	460	490	950						950
3.87	630	670	1300	35	26	32	28	30	1300
2.96	690	360	1050						1050
4	710	780	1490						1490
2.25	550	440	990						990
3.07	470	540	1010						1010
3.13	410	460	870	20	15	11	17	16	870
3.2	470	580	1050						1050
3.48	570	600	1170						1170
3.76	510	480	990						990
2.97	460	450	910	21	18	21	23	21	910
3.15	560	470	1030						1030
3.85	460	560	1020						1020
3.26	560	520	1080						1080
3.86	640	650	1290						1290
4	420	480	900						900
3.32				26	21	28	21	24	1110
2.8	370	460	830	17	15	17	14	16	830
3.1	540	570	1110						110
3.9	630	650	1280						1280
3.88	470	630	1100	22	16	25	24	22	1100
3.34	650	590	1240						1240
3.82	570	500	1070						1070
3.82	530	520	1050	14	17	16	20	17	1050
3.42	410	410	820	15	16	18	16	16	820
3.76	520	450	970	16	23	15	20	19	970
3.11	430	560	990						990
3.67	560	610	1170						1170
2.99	350	340	690	20	18	18	17	18	690
4	800	680	1480						1480
3.21	620	590	1210						1210
3.64	560	610	1170						1170
3.59	560	490	1050						1050
3.62	660	750	1410	35	32	35	31	33	1410

2.94	480	440	920	18	17	14	16	16	920
3.76				25	18	24	20	22	1030
3.19	420	420	840						840
4	600	710	1310	22	29	33	28	28	1310
3.49	560	630	1190						1190
3.71	560	550	1110	28	28	31	25	28	1110
3	440	420	860						860
2.88	450	420	870	18	16	17	17	17	870
3.42	490	460	950	19	16	17	18	18	950
2.35	490	410	900						900
3.29	490	470	960	16	19	23	16	19	960
3.78	410	590	1000						1000
2.95	400	480	880						880
3.96	520	520	1040						1040
3.98	720	620	1340	33	27	31	26	29	1340
3.32	620	440	1060						1060
3.87	640	650	1290						1290
3.28	570	550	1120						1120
2.82	620	610	1230	27	25	30	25	27	1230
3.74	620	660	1280						1280
3.05	460	480	940	19	19	21	20	20	940
3.02	690	710	1400						1400
3.93	490	570	1060						1060
3.52	470	560	1030						1030



## Appendix G

### Question One – Yes

HSGPA	SAT R	SAT M	SAT T	ACT E	ACT M	ACT R	ACT S	ACT T	Converted
3.94	640	600	1240	30	28	24	26	27	1240
2.77	530	430	960	18	23	18	25	21	960
2.43	500	500	1000	17	25	20	21	21	1000
3.72				23	23	26	24	24	110
2.51	520	490	1010						1010
4				34	24	28	26	28	1260
3.58	550	540	1090	31	32	29	25	27	1090
4	530	650	1180						1180
4	490	450	940						940
2.5				18	15	18	19	18	870
2.8	430	420	850						850
3.5	430	420	850	15	16	17	20	17	850
3.68	470	430	900						900
3.83	470	420	890						890
3.53	590	690	1280						1280
1.92	430	410	840						840
3.22	490	460	950						950
3.11	610	700	1310						1310
3.15	400	450	850						850
3.77	480	660	1140	26	18	18	22	21	1140
3.7	540	580	1120	27	25	28	30	28	1120
3.14	490	470	960						960
3.79	570	580	1150						1150
3.61	580	620	1200						1200
4	650	770	1420						1420
3.89	650	640	1290						1290
3.49	450	480	930						930
3.66	460	440	900	19	17	17	16	17	900
4	600	640	1240						1240
3.79	540	550	1090						1090
3.2	520	410	930						930
2.98	360	260	620	16	16	16	18	17	620
3.59	490	540	1030	21	19	26	23	22	1030
3.74				28	26	27	24	26	1190
3.67	520	580	1100	20	25	24	24	23	1100
4	570	610	1180						1180
3.94	590	630	1220	28	26	30	25	27	1220
2.62	400	450	850	19	16	17	23	19	850
3.93	540	620	1160						1160
3.18	520	510	1030						1030

3.86	480	470	950	17	18	20	16	18	950
2.69	390	410	800	17	16	21	18	18	800
2.375				20	15	21	16	18	870
2.88	470	520	990						990
3.78	630	760	1390	32	25	33	31	30	1390
2.83	430	420	850	16	24	18	18	19	850
3.82	730	510	1240						1240
4	660	650	1310						1310
4	630	580	1210						1210
3.57	570	480	1050						1050
2.94	410	400	810	21	16	22	18	19	810
3.97	550	530	1080						1080
4	640	680	1320						1320
3.01	430	410	840						840
3.84	530	440	970	14	21	20	16	18	970
2.4461				23	18	20	17	20	950
3.95				31	28	28	21	27	1220
3.24	530	500	1030						1030
3.53	440	440	880	15	19	20	19	18	880
2.56	450	450	900	20	21	20	23	21	900
2.97				13	15	15	17	15	740
3.8	560	740	1300	28	23	34	24	27	1300
3.12	490	470	960						960
3.64	670	630	1300						1300
3.5	600	680	1280						1280
3.59	370	490	860	20	15	23	18	19	860
3.3	530	540	1070						1070
3.78	490	600	1090	24	21	27	17	22	1090
3.6	540	460	1000						1000
3.97	610	520	1130						1130
2.47	300	360	660	20	16	17	16	17	660
3.63	420	410	830	16	18	18	17	17	830
3.21				20	23	19	24	22	1030
3.44				21	19	21	22	21	990
2.88	650	600	1250						1250
3.92	520	590	1110	27	27	27	24	26	1110
3.8				26	27	33	30	29	1300
3.55	540	690	1230						1230
3.96				33	28	31	28	30	1340
3.59				22	24	28	21	24	1110
3	430	500	930						930
3.89	560	530	1090	30	28	25	27	28	1090
3.39	450	500	950						950
3.92	480	580	1060	24	22	25	17	22	1060
4	600	540	1140						1140
3.46	480	460	940						940

4	580	590	1170						1170
3.36	460	490	950						950
3.94	470	510	980	20	18	22	24	21	980
3.77	390	470	860						860
3.91	560	500	1060						1060
3.37	480	410	890	19	21	15	18	18	890
2.79	400	390	790						790
2.48	460	370	830						830
2.66	470	380	850	18	19	15	21	18	850
3.38	610	490	1100						1100
2.92	420	400	820						820
3.81	570	690	1260						1260
4	630	610	1240	33	28	27	23	28	1240
2.4	340	440	780	16	16	22	14	17	780
3.91	510	530	1040	23	23	20	22	22	1040
3.62	600	650	1250	31	28	32	26	29	1250
3.83				16	21	14	22	18	870
3.68	530	500	1030						1030
3.98	630	660	1290						1290
3.51	360	340	700	19	21	18	20	20	700
3.36	380	450	830						830
3.15	570	520	1090						1090
3.98				15	20	18	20	18	870
3.27	600	570	1170						1170
3.75	540	640	1180	26	18	29	22	24	1180
3.36				25	25	24	21	24	111
2.56	580	420	1100						1100
3.59	580	610	1190	32	27	32	24	29	1190
3.96				27	16	29	16	22	1030
2.87	480	560	1040						1040
3.51	470	540	1030						1030
3.22				20	19	21	18	20	950
3.11				29	18	31	26	26	1190
3.98	660	610	1270	25	27	28	23	26	1270
3.97				30	30	25	25	28	1260
3.24				24	25	28	26	26	1190
3.73	550	490	1040						1040
3.19	430	420	850	17	20	18	17	18	850
2.89				17	14	18	19	17	830
2.96	480	460	940	17	19	16	22	19	940
3.82	740	680	1420						1420
3.8	500	760	1260						1260
4	650	740	1390						1390
3.72	390	560	950						950
4	670	670	1340						1340
3.44				23	22	27	23	24	1110

3.5	600	620	1220						1220
2.71	400	460	860	17	20	22	20	20	860
3.72				31	26	28	22	27	1220
4	540	560	1100						1100
3.95	670	530	1200	29	28	25	23	26	1200
3.62	670	650	1320						1320
3.54	540	550	1090						1090
2.53	540	430	970						970
3.93				23	29	27	25	26	1190
3.51	620	490	1110						1110
3.63	540	580	1120	27	25	31	28	28	1120
3.55	430	420	850						850
2.88	520	490	1010						1010
4	610	550	1160						1160
3.22	500	580	1080						1080
4	610	670	1280	28	27	30	24	27	1280
3.16	510	540	1050						1050
2.82	500	410	910						910
3.83	510	500	1010						1010
3.4	480	460	940						940
3.12	500	490	990	22	18	28	22	23	990
3.26	470	580	1050						1050
3.02	400	490	890	21	16	21	21	20	890
3.29	500	430	930						930
3.84	500	550	1050						1050
4	590	610	1200						1200
3.79				21	19	22	22	21	990
4	590	610	1200	25	19	24	24	23	1200
3.64	560	470	1030						1030
3.76	560	490	1050						1050
3.88	610	680	1290	25	26	32	24	27	1290
2.4	390	550	940						940
4	560	580	1140						1140
2.48	520	540	1060						1060
2.82	460	510	970						970
4	590	680	1270						1270
3.96	570	540	1110						1110
3.77	650	500	1150						1150
3.91	510	590	1100	29	27	24	24	26	1100
2.72	470	450	920	19	18	15	20	18	920
3.81	550	540	1090						1090
2.99	420	350	770	17	16	18	18	17	770
3.67	540	570	1110	30	25	24	23	26	1110
3.97	580	680	1260						1260
3.73	560	520	1080						1080
3.8	670	590	1260						1260

4	550	670	1220	25	25	26	24	25	1220
3.81	560	550	1110						1110
2.84	500	520	1020						1020
2.87				18	17	21	22	20	950
3.82	600	590	1190	30	27	32	27	29	1190
3.59	620	610	1230						1230
3.35				24	22	22	24	23	1070
2.87	370	470	840						840
2.42	450	440	890	15	16	16	23	18	890
4	480	460	940	24	19	15	16	19	940
3.85				27	28	32	28	29	1300
3.75	410	530	940						940
3.67	530	690	1220						1220
3.27	450	490	940						940
2.66	450	460	910	18	19	17	22	19	910
3.78	570	620	1190						1190
2.94	470	520	990						990
3.86				31	34	29	31	31	1380
3.81	440	470	910	11	17	14	11	13	910
3.79	490	510	1000						1000
4	530	520	1050						1050
3.82	570	720	1290	30	29	35	29	31	1290
2.02				23	18	20	19	20	950
3.86	450	560	1010						1010
3.93	740	700	1440						1440
2.47	630	560	1190						1190
4	490	520	1010	33	23	28	27	28	1010
3.14	310	500	810						810
4	610	740	1350	34	26	32	24	29	1350
4	670	570	1240	30	29	32	27	30	1240
2.88				13	17	17	19	17	830
3.81	560	520	1080	31	24	27	24	27	1080
4	540	570	1110						1110
3.2	360	510	870						870
3.25	480	390	870	10	18	15	17	15	870
3.32	460	590	1050						1050
3	460	530	990						990
4	630	640	1270	32	24	28	24	27	1270
3.54	490	500	990						990
3.51	690	490	1180						1180
3.4	690	350	1040						1040
3.85				24	19	23	20	22	1030
4	540	650	1100						1100
3.54				29	27	29	30	29	1300
3.24	420	440	860						860
2.55	440	540	980						980

3.51	460	390	850						850
2.96	490	520	1010	20	17	21	19	19	1010
3.78	550	520	1070						1070
3.63	560	530	1090						1090
3.37				19	16	16	19	18	870
3.48	540	580	1120	24	23	26	22	24	1120
3.21	380	470	850						850
3.87	560	750	1310						1310
3.74	530	620	1150						1150
3.94	520	570	1090	26	24	25	23	25	1090
2.78	380	490	870	18	20	28	21	22	870
2.57	490	340	830						830
3.25	370	470	840	21	18	25	21	21	840
2.87	410	470	880						880
2.37	420	550	970						970
3.4				18	18	16	18	18	870
3.97	670	550	1220	26	29	24	24	26	1220
2.91	550	520	1070						1070
4	580	740	1320						1320
3.91				24	20	15	21	20	950
3.29	570	690	1260						1260
3.65	490	580	1070						1070
3.26	410	480	890						890
3.47	530	620	1150						1150
3.16	480	440	920						920
3.76				23	16	21	20	20	950
3.88				33	27	32	29	30	1340
3.87	630	670	1300	35	26	32	28	30	1300
2.96	690	360	1050						1050
4	710	780	1490						1490
2.25	550	440	990						990
3.07	470	540	1010						1010
3.13	410	460	870	20	15	11	17	16	870
3.2	470	580	1050						1050
2.97	460	450	910	21	18	21	23	21	910
3.85	460	560	1020						1020
3.26	560	520	1080						1080
3.86	640	650	1290						1290
4	420	480	900						900
3.32				26	21	28	21	24	1110
2.8	370	460	830	17	15	17	14	16	830
3.1	540	570	1110						1110
3.42	410	410	820	15	16	18	16	16	820
3.67	560	610	1170						1170
3.64	560	610	1170						1170
3.59	560	490	1050						1050

3.62	660	750	1410	35	32	35	31	33	1410
3.76				25	18	24	20	22	1030
3.19	420	420	840						840
2.88	450	420	870	18	16	17	17	17	870
3.78	410	590	1000						1000
3.96	520	520	1040						1040
3.98	720	620	1340	33	27	31	26	29	1340
3.74	620	660	1280						1280
3.02	690	710	1400						1400
3.93	490	570	1060						1060
3.52	470	560	1030						1030

## Appendix H

### Question Two – Yes

HSGPA	SAT Rdg	SAT M	SAT T	ACT E	ACT M	ACT R	ACT S	ACT T	correlated scores
3.52	500	420	920						920
3.94	640	600	1240	30	28	24	26	27	1240
3.21	480	420	900						900
2.77	530	430	960	18	23	18	25	21	960
2.99	500	460	930						930
4	460	530	990	18	23	18	25	21	990
3.14	540	530	1070						1070
3.5	340	210	550	12	16	13	18	15	550
2.65	460	570	1030						1030
3.94	620	670	1290						1290
3.08	430	380	810	14	18	15	17	16	810
3.84	530	530	1060						1060
4	530	650	1180						1180
4	490	450	940						940
3.44	560	620	1180						1180
3.47	450	430	880						880
2.89	430	430	860						860
3.84	480	530	1010						1010
2.5				18	15	18	19	18	870
3.91	600	740	1340	29	25	33	24	28	1340
3.95	490	550	1040						1040
3.5	430	420	850	15	16	17	20	17	850
3.83	470	420	890						890
3.83	600	560	1160						1160
4	540	510	1050	23	28	21	22	24	1050
1.92	430	410	840						840
3.22	490	460	950						950
3.15	470	390	860	21	22	21	20	21	860
2.73	560	470	1030						1030
3.7	610	490	1100	20	27	21	23	23	1100
3.11	610	700	1310						1310
3.63	650	670	1320	24	26	26	23	25	1320
3.31	470	500	970	22	21	22	21	22	970
3.15	400	450	850						850
2.84	500	500	1000						1000
3.28	570	530	1100						1100
3.94	680	620	1300						1300
3.98	670	700	1370						1370
2.99	430	430	860						860
3.64	550	590	1140						1140



3.14	490	470	960						960
4	650	770	1420						1420
3.49	450	480	930						930
3.66	460	440	900	19	17	17	16	17	900
4	600	640	1240						1240
3.93	540	560	1100						1100
3.11	470	500	970						970
3.74	630	570	1200	23	24	24	24	24	1200
3.38	570	520	1070						1070
3.2	520	410	930						930
3.62	450	530	980						980
4				35	33	35	34	34	1510
3.15	460	530	990	22	18	22	22	21	990
2.98	360	260	620	16	16	16	18	17	620
3.59	490	540	1030	21	19	26	23	22	1030
3.67	520	580	1100	20	25	24	24	23	1100
3.93	540	620	1160						1160
3.18	520	510	1030						1030
3.86	480	470	950	17	18	20	16	18	950
2.69	390	410	800	17	16	21	18	18	800
2.77				23	21	22	24	23	1070
3.54	460	580	1040						1040
2.375				20	15	21	16	18	870
3.17	420	350	770	21	16	19	18	19	770
3.31	540	520	1060	21	23	17	21	21	1060
2.83	430	420	850	16	24	18	18	19	850
3.11	400	480	880	16	14	21	18	17	880
2.85	490	470	960						960
3.37	640	570	1210						1210
3.82	730	510	1240						1240
3.97	640	610	1250	32	27	36	26	30	1250
2.71	440	390	830	15	19	15	20	17	830
3.63	400	440	840						840
4	660	650	1310						1310
4	630	580	1210						1210
3.57	570	480	1050						1050
3.16	470	550	1020						1020
2.63	410	420	830	15	19	17	17	17	830
3.72	540	540	1080						1080
4	640	680	1320						1320
3.01	430	410	840						840
4	670	740	1410	32	24	33	25	29	1410
3.3	410	430	840						840
3.97	560	630	1190	28	25	32	28	28	1190
3.84	530	440	970	14	21	20	16	18	970
3.9				24	24	26	25	25	1150

2.4461				23	18	20	17	20	950
3.28	560	580	1140						1140
3.32	650	580	1230	27	26	22	21	24	1230
3.82	630	680	1310						1310
3.93	560	570	1130						1130
3.95				31	28	28	21	27	1220
2.56	450	450	900	20	21	20	23	21	900
2.97				13	15	15	17	15	740
3.8	560	740	1300	28	23	34	24	27	1300
3.33	440	440	880						880
3.12	490	470	960						960
3.45				24	25	21	26	24	1110
3.72				24	21	22	22	22	1030
3.3	530	540	1070						1070
2.98	470	540	1010						1010
3.78	490	600	1090	24	21	27	17	22	1090
3.6	540	460	1000						1000
3.97	610	520	1130						1130
3.33	400	490	890	20	16	24	19	20	890
2.8				26	22	19	19	22	1030
3.36	530	580	1110						1110
3.21				20	23	19	24	22	1030
3.44				21	19	21	22	21	990
2.88	650	600	1250						1250
3.92	520	590	1110	27	27	27	24	26	1110
3.8				26	27	33	30	29	1300
3.72	570	550	1120						1120
2.73	420	400	820						820
3.55	540	690	1230						1230
3.59				22	24	28	21	24	1110
3	430	500	930						930
3.59	490	500	990						990
3.04	550	580	1130	22	24	23	22	23	1130
3.89	560	530	1090	30	28	25	27	28	1090
3.36	540	510	1050						1050
3.15	420	450	570	15	16	12	14	14	570
4	600	540	1140						1140
3.46	480	460	940						940
3.09	470	430	900						900
3.89	490	550	1040						1040
4	580	590	1170						1170
3.85	600	680	1280						1280
4	600	540	1140						1140
2.69	630	390	1020	23	28	25	24	25	1020
2.71	370	570	940						940
3.3	550	440	990						990

3.12	490	510	1000	20	19	22	21	21	1000
3.94	470	510	980	20	18	22	24	21	980
2.93	400	410	810	19	18	18	18	18	810
3.86	540	630	1170	30	24	33	25	28	1170
3.77	390	470	860						860
3.48	600	420	1020						1020
3.91	560	500	1060						1060
3.37	480	410	890	19	21	15	18	18	890
3.7	490	490	980	20	20	25	18	21	980
2.79	400	390	790						790
2.73				19	17	20	18	19	910
4	610	590	1200						1200
3.87	630	620	1250						1250
3.29	480	470	950						950
2.66	470	380	850	18	19	15	21	18	850
2.92	420	400	820						820
3.81	570	690	1260						1260
4	610	650	1260	32	33	31	25	30	1260
3.82	520	600	1120	28	21	24	18	23	1120
2.4	340	440	780	16	16	22	14	17	780
3.91	510	530	1040	23	23	20	22	22	1040
2.95	440	560	1000	23	23	27	20	23	1000
3.68	530	500	1030						1030
3.88	610	640	1250						1250
3.98	630	660	1290						1290
3.16	460	450	910						910
3.02	450	480	930						930
3.18	490	450	940						940
3.3	440	530	970						970
2.72	580	510	1090						1090
3.36	380	450	830						830
3.2	460	540	1000						1000
3.15	570	520	1090						1090
2.73	400	400	800						800
3.75	540	640	1180	26	18	29	22	24	1180
3.25	600	560	1160						1160
3.37	390	440	830	18	16	19	16	17	830
3.55	540	670	1210	17	19	25	25	22	1210
3.33	380	530	910						910
3.84	690	670	1360	24	28	28	25	26	1360
3.83	500	620	1120						1120
3.85				22	17	17	20	19	910
3.7	600	560	1160	25	26	22	25	25	1160
3.83	580	600	1180	24	25	18	21	22	1180
3.75	450	600	1050						1050
3.84	580	530	1110	24	23	26	23	24	1110

3.49	460	430	890	20	18	18	14	18	890
3.66	580	500	1080	24	24	22	23	23	1080
3.96				27	16	29	16	22	1030
2.87	480	560	1040						1040
3.15	500	460	960						960
3.14				23	20	28	24	24	1110
3.22				20	19	21	18	20	950
3.98	660	610	1270	25	27	28	23	26	1270
3.98				27	33	33	32	31	1380
3.62	480	630	1110						1110
2.72	490	410	900						900
3.76	320	410	730	17	22	22	25	22	730
3.73	550	490	1040						1040
3.92	690	700	1390						1390
3.19	430	420	850	17	20	18	17	18	850
3.12	530	520	1050	22	21	22	23	22	1050
2.96	480	460	940	17	19	16	22	19	940
4	700	590	1290	35	35	33	31	34	1290
3.1	540	660	1200						1200
2.97	470	580	1050						1050
3.8	500	760	1260						1260
4	650	740	1390						1390
3.72	390	560	950						950
2.88	510	580	1090						1090
3.44				23	22	27	23	24	1110
4	590	700	1290	32	25	31	22	28	1290
3.95	490	540	1030						1030
2.71	400	460	860	17	20	22	20	20	860
3.72				31	26	28	22	27	1220
4	540	560	1100						1100
3.95	670	530	1200	29	28	25	23	26	1200
3.54	540	550	1090						1090
3.93				23	29	27	25	26	1190
3.18	540	620	1160	23	23	25	22	23	1160
3.63	540	580	1120	27	25	31	28	28	1120
3.11	560	580	1140						1140
3.58	610	590	1200						1200
3.5	390	490	880	21	17	22	23	21	880
2.76	570	560	1130						1130
3.22	500	580	1080						1080
4	610	670	1280	28	27	30	24	27	1280
3.17	410	450	860						860
3.83	510	500	1010						1010
3.4	480	460	940						940
2.97	580	540	1120						1120
3.02	400	490	890	21	16	21	21	20	890

3.29	500	430	930						930
3.84	500	550	1050						1050
3.94				27	25	32	27	28	1260
4	590	610	1200	25	19	24	24	23	1200
4	500	550	1050	26	20	22	17	21	1050
3.88	610	680	1290	25	26	32	24	27	1290
2.4	390	550	940						940
3.02	460	570	1030	26	23	30	23	26	1030
3.81	460	510	970						970
4	560	580	1140						1140
3.13	550	460	1010						1010
3.65	640	520	1160	23	26	29	23		1160
3.56	640	560	1200						1200
4	590	680	1270						1270
3.04	470	430	900						900
3.02	620	510	1130						1130
3.62	500	460	960						960
3.86	570	620	1190						1190
2.16	450	520	970						970
2.75	410	460	870	18	14	20	21	18	870
2.59	500	520	1020						1020
3.52	670	630	1300						1300
3.08	670	650	1320						1320
3.23	410	460	870						870
3.62	420	410	830	15	17	16	20	17	830
3.77	650	500	1150						1150
2.72	470	450	920	19	18	15	20	18	920
3.81	550	540	1090						1090
2.99	420	350	770	17	16	18	18	17	770
3.58	680	600	1280	34	30	34	31	32	1280
3.67	540	570	1110	30	25	24	23	26	1110
4	460	600	1060						1060
3.73	560	520	1080						1080
3.8	670	590	1260						1260
4	550	670	1220	25	25	26	24	25	1220
2.84	500	520	1020						1020
3.17	510	480	990						990
2.29	540	470	1010						1010
3.8	530	540	1070						1070
2.87				18	17	21	22	20	950
3.59	620	610	1230						1230
3.35				24	22	22	24	23	1070
3.19	500	440	940						940
2.87	370	470	840						840
3.18	460	470	930	20	18	17	20	19	930
4	480	460	940	24	19	15	16	19	940

3.75	410	530	940						940
2.96	600	650	1250						1250
2.52	590	600	1190						1190
3.67	530	690	1220						1220
3.27	450	490	940						940
3.78	570	620	1190						1190
2.94	470	520	990						990
3.59	470	360	830	13	17	14	21	16	830
2.99	500	500	100						100
3.81	440	470	910	11	17	14	11	13	910
3.79	490	510	1000						1000
4	530	520	1050						1050
2.58	430	440	870						870
3.96	530	490	1020						1020
3.35	500	440	940						940
3.56	550	540	1090						1090
2.88	600	670	1270						1270
3.93	740	700	1440						1440
3.98	580	720	1300	34	27	36	26	31	1300
4	490	520	1010	33	23	28	27	28	1010
2.78	420	560	980						980
4	610	610	1220	28	28	20	25	25	1220
3.44	510	570	1080	24	20	26	20	23	1080
4	610	740	1350	34	26	32	24	29	1350
4	670	570	1240	30	29	32	27	30	1240
2.85	370	440	810	16	17	21	14	17	810
3.6	450	500	950	21	23	18	23	21	950
3.92	500	550	1050	21	23	20	22	22	1050
2.86				18	17	23	20	20	950
2.59	420	460	880	20	17	23	17	19	880
3.81	560	520	1080	31	24	27	24	27	1080
4	540	570	1110						1110
3.2	360	510	870						870
3.25	590	640	1230						1230
2.36	450	430	880	16	18	23	20	19	880
2.74	470	480	950						950
3.32	460	590	1050						1050
3	460	530	990						990
4	630	640	1270	32	24	28	24	27	1270
3.51	690	490	1180						1180
2.75	480	440	920						920
3.35	340	500	840						840
4	630	650	1280	25	29	27	31	28	1280
4	540	650	1100						1100
3.24	420	440	860						860
3.14	480	550	1030	20	17	19	18	19	1030

2.88	500	410	910						910
2.55	440	540	980						980
3.51	460	390	850						850
3.89	600	620	1220						1220
2.96	490	520	1010	20	17	21	19	19	1010
3.24	540	420	960						960
3.78	550	520	1070						1070
3.63	560	530	1090						1090
3.51	460	430	890						890
3.36				21	18	24	20	21	990
3.86	500	430	930						930
3.64	490	540	1030						1030
3.22	720	570	1290						1290
3.69	520	460	980						980
4	730	740	1470	35	32	34	32	33	1470
3.21	380	470	850						850
3.94	520	570	1090	26	24	25	23	25	1090
2.57	490	340	830						830
2.87	410	470	880						880
2.37	420	550	970						970
3.97	670	550	1220	26	29	24	24	26	1220
2.91	550	520	1070						1070
2.9				15	16	15	13	15	740
4	580	740	1320						1320
3.5	660	580	1240	31	29	24	26	28	1240
3.05				19	18	20	21	20	950
3.69	550	560	1110						1110
3.76	520	560	1080						1080
3.52	420	440	860						860
3.26	410	480	890						890
3.47	530	620	1150						1150
2.69	410	500	910						910
3.16	480	440	920						920
3.97	590	540	1130						1130
3.61	340	520	860						860
3.76				23	16	21	20	20	950
2.99	540	440	980						980
3.16	510	550	1060						1060
3.55	390	430	820						820
3.07	420	440	860	21	18	18	19	19	860
3.67	460	490	950						950
3.87	630	670	1300	35	26	32	28	30	1300
2.96	690	360	1050						1050
3.07	470	540	1010						1010
3.13	410	460	870	20	15	11	17	16	870
3.2	470	580	1050						1050

3.48	570	600	1170						1170
2.97	460	450	910	21	18	21	23	21	910
3.15	560	470	1030						1030
3.85	460	560	1020						1020
3.86	640	650	1290						1290
4	420	480	900						900
3.1	540	570	1110						1110
3.9	630	650	1280						1280
3.88	470	630	1100	22	16	25	24	22	1100
3.34	650	590	1240						1240
3.82	570	500	1070						1070
3.82	530	520	1050	14	17	16	20	17	1050
3.76	520	450	970	16	23	15	20	19	970
3.11	430	560	990						990
3.67	560	610	1170						1170
4	800	680	1480						1480
3.21	620	590	1210						1210
3.59	560	490	1050						1050
2.94	480	440	920	18	17	14	16	16	920
3.19	420	420	840						840
4	600	710	1310	22	29	33	28	28	1310
3.49	560	630	1190						1190
3.71	560	550	1110	28	28	31	25	28	1110
3	440	420	860						860
3.42	490	460	950	19	16	17	18	18	950
2.35	490	410	900						900
3.29	490	470	960	16	19	23	16	19	960
3.78	410	590	1000						1000
2.95	400	480	880						880
3.32	620	440	1060						1060
3.28	570	550	1120						1120
2.82	620	610	1230	27	25	30	25	27	1230
3.74	620	660	1280						1280
3.05	460	480	940	19	19	21	20	20	940
3.52	470	560	1030						1030



## Appendix I

### Question Three – Yes

HSGPA	SAT Rdg	SAT M	SAT T	ACT E	ACT M	ACT R	ACT S	ACT T	ACT Conv
2.77	530	430	960	18	23	18	25	21	
2.99	500	460	930						
4	460	530	990	18	23	18	25	21	
2.51	520	490	1010						
4				32	33	27	30	31	
3.79	580	600	1180						
2.89	430	430	860						
3.84	480	530	1010						
2.5				18	15	18	19	18	
3.95	490	550	1040						
3.5	430	420	850	15	16	17	20	17	
3.68	470	430	900						
1.92	430	410	840						
3.22	490	460	950						
3.15	470	390	860	21	22	21	20	21	
2.73	560	470	1030						
3.31	470	500	970	22	21	22	21	22	
3.28	570	530	1100						
3.79	570	580	1150						
4	660	590	1250	27	26	31	34	30	
3.76	530	580	1110						
3.93	540	560	1100						
2.8	550	510	1060						
3.62	450	530	980						
3.59	490	540	1030	21	19	26	23	22	
3.67	520	580	1100	20	25	24	24	23	
2.69	390	410	800	17	16	21	18	18	
2.77				23	21	22	24	23	
3.54	460	580	1040						
2.375				20	15	21	16	18	
2.85	490	470	960						
3.97	640	610	1250	32	27	36	26	30	
3.64	510	590	1100						
2.94	410	400	810	21	16	22	18	19	
3.97	550	530	1080						
4	640	680	1320						
3.01	430	410	840						
3.3	410	430	840						

3.9				24	24	26	25	25
3.93	560	570	1130					
3.51				29	25	33	29	29
3.65	560	660	1220					
3.95				31	28	28	21	27
3.24	530	500	1030					
2.56	450	450	900	20	21	20	23	21
3.45	520	480	100	20	20	18	21	20
2.78	480	500	980					
2.98	470	540	1010					
3.78	490	600	1090	24	21	27	17	22
3.88	680	610	1290	28	26	30	23	27
3.21				20	23	19	24	22
3.44				21	19	21	22	21
3.72	570	550	1120					
3.96				33	28	31	28	30
3.46	480	460	940					
3.89	490	550	1040	23	23	28	21	24
4	600	540	1140					
2.69	630	390	1020	23	28	25	24	25
3.86	540	630	1170	30	24	33	25	28
3.77	390	470	860					
3.91	560	500	1060					
3.37	480	410	890	19	21	15	18	18
3.29	480	470	950					
3.38	610	490	1100					
2.92	420	400	820					
3.81	570	690	1260					
4	630	610	1240	33	28	27	23	28
3.82	520	600	1120	28	21	24	18	23
3.91	510	530	1040	23	23	20	22	22
3.62	600	650	1250	31	28	32	26	29
3.83				16	21	14	22	18
3.68	530	500	1030					
3.88	610	640	1250					
3.98	630	660	1290					
2.72	580	510	1090					
3.36	380	450	830					
3.75	540	640	1180	26	18	29	22	24
3.25	600	560	1160					
3.58	600	480	1080					
3.37	390	440	830	18	16	19	16	17
3.36				25	25	24	21	24
3.48				21	17	22	19	20
3.83	580	600	1180	24	25	18	21	22
3.84	580	530	1110	24	23	26	23	24

3.49	460	430	890	20	18	18	14	18
2.56	580	420	1100					
3.9				26	26	28	26	27
3.5				25	25	23	24	24
3.72	440	410	850	16	20	18	18	18
3.22				20	19	21	18	20
3.98	660	610	1270	25	27	28	23	26
2.27				12	16	15	15	15
3.98				27	33	33	32	31
3.24				24	25	28	26	26
3.73	550	490	1040					
3.98				26	27	29	26	27
3.19	450	550	1000					
3.28	450	550	1000					
3.8	500	760	1260					
4	650	740	1390					
3.44				23	22	27	23	24
2.28	360	360	720					
3.1	500	500	1000					
2.53	540	430	970					
3.93				23	29	27	25	26
3.55	430	420	850					
2.28	360	360	720					
3.1	500	500	1000					
2.53	540	430	970					
3.93				23	29	27	25	26
3.55	430	420	850					
2.76	570	560	1130					
3.85				22	24	21	21	22
3.4	480	460	940					
3.26	470	580	1050					
3.95	550	690	1240					
3.02	400	490	890	21	16	21	21	20
3.84	500	550	1050					
3.81	460	510	970					
4	560	580	1140					
3.89				21	27	25	24	24
2.48	520	540	1060					
3.65	640	520	1160	23	26	29	23	25
4	590	680	1270					
2.75	410	460	870	18	14	20	21	18
2.59	500	520	1020					
3.52	670	630	1300					
4	650	600	1250					
3.62	420	410	830	15	17	16	20	17
3.77	650	500	1150					

3.81	550	540	1090					
2.99	420	350	770	17	16	18	18	17
4				33	27	31	25	29
3.88	660	620	1280					
3.55	470	540	1010					
4	460	600	1060					
2.89	630	430	1060	17	24	17	19	19
2.75	420	430	850	19	20	20	14	18
3.73	560	520	1080					
3.81	560	550	1110					
2.84	500	520	1020					
3.8	530	540	1070					
3.82	600	590	1190	30	27	32	27	29
2.87	370	470	840					
2.42	450	440	890	15	16	16	23	18
4	640	770	1410	36	32	36	31	34
3.75	410	530	940					
2.96	600	650	1250					
2.52	590	600	1190					
2.66	450	460	910	18	19	17	22	19
3.78	570	620	1190					
2.94	470	520	990					
3.81	440	470	910	11	17	14	11	13
2.58	430	440	870					
3.35	500	440	940					
3.44	490	580	1070					
3.98	580	720	1300	34	27	36	26	31
2.78	420	560	980					
4	610	610	1220	28	28	20	25	25
3.6	450	500	950	21	23	18	23	21
2.86				18	17	23	20	20
3.81	560	520	1080	31	24	27	24	27
3.2	360	510	870					
3.06	620	590	1210					
1.87	470	450	920					
3.32	460	590	1050					
3.54	490	500	990					
3.51	690	490	1180					
3.4	690	350	1040					
3.87				24	19	23	22	22
3.75	540	470	1010					
2.55	440	540	980					
3.51	460	390	850					
3.94	410	510	920	18	19	22	19	20
2.96	490	520	1010	20	17	21	19	19
3.69	520	460	980					

2.57	490	340	830					
3.4				18	18	16	18	18
3.47	680	540	1220	15	27	25	20	22
3.5	660	580	1240	31	29	24	26	28
3.29	570	690	1260					
3.65	490	580	1070					
3.89	670	530	1200					
3.26	410	480	890					
3.81				29	29	27	24	27
2.69	410	500	910					
3.16	480	440	920					
3.92	640	640	1280					
3.61	340	520	860					
3.76				23	16	21	20	20
2.94				23	22	20	25	23
3.88				33	27	32	29	30
3.55	390	430	820					
3.87	630	670	1300	35	26	32	28	30
2.25	550	440	990					
3.07	470	540	1010					
3.13	410	460	870	20	15	11	17	16
3.2	470	580	1050					
3.48	570	600	1170					
2.97	460	450	910	21	18	21	23	21
3.86	640	650	1290					
2.8	370	460	830	17	15	17	14	16
3.82	570	500	1070					
3.67	560	610	1170					
3.62	660	750	1410	35	32	35	31	33
3.19	420	420	840					
2.88	450	420	870	18	16	17	17	17
2.35	490	410	900					
3.29	490	470	960	16	19	23	16	19
3.28	570	550	1120					
3.05	460	480	940	19	19	21	20	20

**Appendix J**

**Question Four – Yes**

HSGPA	SAT Rdg	SAT M	SAT T	ACT E	ACT M	ACT R	ACT S	ACT T	ACT Converted
4	460	530	990	18	23	18	25	21	990
3.41	650	620	1270						1270
4				32	33	27	30	31	1380
2.8	430	420	850						850
1.92	430	410	840						840
3.15	470	390	860	21	22	21	20	21	860
2.99	430	430	860						860
3.61	580	620	1200						1200
2.8	550	510	1060						1060
3.79	540	550	1090						1090
4	570	610	1180						1180
2.88	470	520	990						990
3.78	630	760	1390	32	25	33	31	30	1390
2.81	500	560	1060						1060
2.94	410	400	810	21	16	22	18	19	810
3.01	430	410	840						840
3.3	410	430	840						840
3.65	560	660	1220						1220
3.95				31	28	28	21	27	1220
3.33	440	440	880						880
3.33	400	490	890	20	16	24	19	20	890
2.8				26	22	19	19	22	1030
3.63	420	410	830	16	18	18	17	17	830
3.21				20	23	19	24	22	1030
3.8				26	27	33	30	29	1300
3.55	540	690	1230						1230
3.15	420	450	570	15	16	12	14	14	570
3.37	480	410	890	19	21	15	18	18	890
3.81	570	690	1260						1260
3.83				16	21	14	22	18	870
3.68	530	500	1030						1030
3.69	570	580	1150						1150
3.75	540	640	1180	26	18	29	22	24	1180
3.75	450	600	1050						1050
3.96				27	16	29	16	22	1030
3.72	440	410	850	16	20	18	18	18	850
3.11				29	18	31	26	26	1190
3.97				30	30	25	25	28	1260
3.8	500	760	1260						1260
3.44				23	22	27	23	24	1110

2.94	410	440	850	15	18	13	19	16	850
3.51	620	490	1110						1110
3.55	430	420	850						850
2.82	500	410	910						910
3.12	500	490	990	22	18	28	22	23	990
2.58				24	23	24	22	23	1070
3.02	400	490	890	21	16	21	21	20	890
3.71	540	540	1080						1080
3.77	650	500	1150						1150
3.8	670	590	1260						1260
2.87				18	17	21	22	20	950
2.47	630	560	1190						1190
3.97				32	27	31	25	29	1300
4	490	520	1010	33	23	28	27	28	1010
2.59	420	460	880	20	17	23	17	19	880
3.2	360	510	870						870
3.51	690	490	1180						1180
3.94	410	510	920	18	19	22	19	20	920
3.78	550	520	1070						1070
3.37				19	16	16	19	18	870
3.36				21	18	24	20	21	990
3.87	560	750	1310						1310
2.57	490	340	830						830
3.47	680	540	1220	15	27	25	20	22	1220
3.05				19	18	20	21	20	950
3.91				24	20	15	21	20	950
3.29	570	690	1260						1260
3.76				23	16	21	20	20	950
3.55	390	430	820						820
2.96	690	360	1050						1050
3.76	510	480	990						990
3.32				26	21	28	21	24	1110
3.1	540	570	1110						1110
3.42	410	410	820	15	16	18	16	16	820
2.88	450	420	870	18	16	17	17	17	870
3.87	640	650	1290						1290

## Appendix K

### SAT and HSGPA

HSGPA	SAT T	ACT T	ACT Correlated
3.52	920		920
3.94	1240	27	1240
3.21	900		900
2.77	960	21	960
3.02		19	910
2.99	930		930
4	990	21	990
2.43	1000	21	1000
2.82	960		960
2.76	930		930
3.14	1070		1070
3.5	550	15	550
4	1300		1300
3.72	23		23
3.41	1270		1270
2.51	1010		1010
4		28	1260
2.65	1030		1030
3.94	1290		1290
3.58	1090	27	1090
3.08	810	16	810
4		31	1380
3.84	1060		1060
4	1180		1180
3.79	1180		1180
4	940		940
3.44	1180		1180
3.47	880		880
2.89	860		860
3.84	1010		1010
2.5		18	870
3.47	1450	30	1450
2.8	850		850
3.91	1340	28	1340
3.95	1040		1040
3.5	850	17	850
3.68	900		900
3.83	890		890
3.83	1160		1160



3.04	1010		1010
4	1050	24	1050
3.53	1280		1280
1.92	840		840
3.22	950		950
3.15	860	21	860
2.73	1030		1030
3.7	1100	23	1100
3.11	1310		1310
3.34	650		650
3.63	1320	25	1320
2.77	810		810
3.31	970	22	970
3.15	850		850
2.84	1000		1000
3.28	1100		1100
3.94	1300		1300
3.77	1140	21	1140
3.98	1370		1370
2.99	860		860
3.7	1120	28	1120
3.64	1140		1140
3.14	960		960
3.79	1150		1150
3.61	1200		1200
4	1250	30	1250
4	1420		1420
3.89	1290		1290
3.76	1110		1110
3.49	930		930
4	1490	33	1490
3.66	900	17	900
4	1240		1240
3.93	1100		1100
3.11	970		970
2.8	1060		1060
3.74	1200	24	1200
3.38	1070		1070
3.79	1090		1090
3.2	930		930
3.62	980		980
3.93	1000	21	1000
4		34	1510
3.15	990	21	990
2.98	620	17	620
4	1440		1440

2.51		23	1070
3.59	1030	22	1030
3.74		26	1190
3.67	1100	23	1100
4	1180		1180
3.94	1220	27	1220
2.62	850	19	850
3.93	1160		1160
3.4	440		440
3.18	1030		1030
3.11	1210		1210
3.86	950	18	950
2.69	800	18	800
2.77		23	1070
3.54	1040		1040
2.375		18	870
2.88	990		990
3.78	1390	30	1390
3.17	770	19	770
3.31	1060	21	1060
2.81	1060		1060
2.83	850	19	850
3.11	880	17	880
2.85	960		960
3.37	1210		1210
3.82	1240		1240
3.97	1250	30	1250
3.64	1100		1100
2.71	830	17	830
3.63	840		840
4	1310		1310
4	1210		1210
3.57	1050		1050
3.16	1020		1020
2.94	810	19	810
3.81	1120		1120
2.63	830	17	830
3.72	1080		1080
3.97	1080		1080
4	1320		1320
3.74	1160		1160
3.01	840		840
3.67	1320	29	1320
2.05	1040		1040
4	1410	29	1410
3.3	840		840

3.81	1190		1190
3.97	1190	28	1190
3.46		25	1150
3.84	970	18	970
3.21		22	1030
3.9		25	1150
2.4461		20	950
3.28	1140		1140
3.32	1230	24	1230
3.82	1310		1310
2.81	1030		1030
3.42	810		810
3.93	1130		1130
3.51		29	1300
3.65	1220		1220
3.17		25	1150
3.95		27	1220
3.24	1030		1030
3.53	880	18	880
2.56	900	21	900
2.97		15	740
3.8	1300	27	1300
3.33	880		880
3.45	100	20	100
3.12	960		960
3.45		24	1110
3.64	1300		1300
3.5	1280		1280
3.72		22	1030
2.78	980		980
3.82	980		980
3.59	860	19	860
2.77	870		870
3.3	1070		1070
2.98	1010		1010
3.78	1090	22	1090
3.6	1000		1000
3.97	1130		1130
3.33	890	20	890
3.88	1290	27	1290
2.8		22	1030
3.36	1110		1110
2.47	660	17	660
3.63	830	17	830
3.21		22	1030
3.44		21	990

2.88	1250		1250
3.92	1110	26	1110
2.24	980		980
3.8		29	1300
3.72	1120		1120
2.89	1020		1020
2.73	820		820
3.34	1220		1220
3.55	1230		1230
3.81	940		940
3.96		30	1340
3.88		21	990
3.59		24	1110
3.52	980	18	980
3	930		930
2.97		20	950
3.59	990		990
3.04	1130	23	1130
3.89	1090	28	1090
3.36	1050		1050
3.31	970	20	970
3.39	950		950
3.15	570	14	570
4		23	1070
3.92	1060	22	1060
4	1140		1140
3.46	940		940
3.09	900	18	900
3.89	1040	24	1040
4	1170		1170
3.85	1280		1280
3.94		27	1220
4	1140		1140
2.69	1020	25	1020
2.71	940		940
3.3	990		990
3.12	1000	21	1000
3.36	950		950
3.84	900		900
3.94	980	21	980
2.93	810	18	810
3.86	1170	28	1170
3.77	860		860
3.48	1020		1020
3.91	1060		1060
3.37	890	18	890

3.7	980	21	980
2.79	790		790
2.48	830		830
2.73		19	910
4	1200		1200
3.87	1250		1250
2.76	720	16	720
2.85		18	870
3.29	950		950
3		18	870
2.66	850	18	850
3.38	1100		1100
2.92	820		820
3.7	1330		1330
3.81	1260		1260
4	1240	28	1240
4	1260	30	1260
3.82	1120	23	1120
2.4	780	17	780
3.91	1040	22	1040
3.3		20	950
3.62	1250	29	1250
3.83		18	870
2.95	1000	23	1000
2.55	1020		1020
3.68	1030		1030
3.63	920	23	920
3.69	1150		1150
3.88	1250		1250
3.48	1220	24	1220
3.98	1290		1290
3.16	910		910
3.02	930		930
3.18	940		940
3.63	980		980
3.3	970		970
2.96	850		850
3.08	1000		1000
2.72	1090		1090
3.51	700	20	700
3.36	830		830
3.2	1000		1000
3.15	1090		1090
3.98		18	870
2.73	800	18	800
3.27	1170		1170

3.75	1180	24	1180
2.83		21	990
3.25	1160		1160
2.56	860		860
3.58	1080		1080
3.95	1370	32	1370
3.37	830	17	830
3.55	1210	22	1210
3.33	910		910
3.84	1360	26	1360
3.83	1120		1120
3.85		19	910
3.67	1180		1180
3.36		24	1110
3.81		25	1150
3.7	1160	25	1160
3.48		20	950
3.83	1180	22	1180
3.75	1050		1050
3.84	1110	24	1110
3.49	890	18	890
3.66	1080	23	1080
2.56	1100		1100
3.9		27	1220
3.59	1190	29	1190
3.88		29	1300
3.5		24	1110
4	1330	33	1330
3.96		22	1030
3.72	850	18	850
2.87	1040		1040
3.51	1030		1030
3.56		20	950
3.15	960		960
3.14		24	1110
3.22		20	950
3.11		26	1190
3.98	1270	26	1270
2.27		15	740
3.97		28	1260
3.98		31	1380
3.62	1110		1110
3.24		26	1190
2.72	900		900
3.76	730	22	730
3.73	1040		1040

3.92	1390		1390
3.19	850	18	850
3.98		27	1220
3.19	1000		1000
2.89		17	830
3.12	1050	22	1050
2.96	940	19	940
4	1290	34	1290
3.28	1000		1000
4	1240	33	1240
3.82	1420		1420
3.1	1200		1200
2.97	1050		1050
3.8	1260		1260
4	1390		1390
3.72	950		950
4	1340		1340
2.88	1090		1090
3.44		24	1110
4	1290	28	1290
3.97		30	1340
3.95	1030		1030
3.5	1220		1220
2.71	860	20	860
3.72		27	1220
4	1100		1100
2.28	720		720
3.95	1200	26	1200
3.1	1000		1000
2.94	850	16	850
3.62	1320		1320
4	1560		1560
3.54	1090		1090
2.53	970		970
3.93		26	1190
3.18	1160	23	1160
3.51	1110		1110
3.77	970	27	970
3.63	1120	28	1120
3.11	1140		1140
3.58	1200		1200
2.89		21	990
3.55	850		850
2.88	1010		1010
3.5	880	21	880
3.8	1170		1170

2.76	1130		1130
4	1160		1160
3.22	1080		1080
4	1280	27	1280
3.16	1050		1050
3.94		32	1420
3.72	1350	20	1350
3.17	860		860
2.82	910		910
3.85		22	1030
3.45		28	1260
3.83	1010		1010
3.4	940		940
3.12	990	23	990
2.99	1270		1270
3.26	1050		1050
2.58		23	1070
3.95	1240		1240
2.97	1120		1120
3.02	890	20	890
3.29	930		930
3.84	1050		1050
2.69	940	20	940
2.92	820	17	820
4	1200		1200
3.71	1080		1080
3.43		25	1150
2.59	1040		1040
3.58	1220	29	1220
2.89	1080		1080
3.94		28	1260
3.79		21	990
3.92	1430	35	1430
4	1200	23	1200
3.64	1030		1030
4	1050	21	1050
3.76	1050		1050
3.88	1290	27	1290
3.19	980		980
2.4	940		940
3.02	1030	26	1030
3.81	970		970
4		20	950
4	1140		1140
3.89		24	1110
2.48	1060		1060



3.13	1010		1010
2.82	970		970
3.65	1160	25	1160
3.56	1200		1200
4	1270		1270
3.04	900		900
3.02	1130		1130
3.62	960		960
3.86	1190		1190
3.58	1320		1320
2.16	970		970
3.96	1110		1110
2.75	870	18	870
2.59	1020		1020
3.52	1300		1300
3.08	1320		1320
4	1250		1250
3.98	1390	30	1390
3.23	870		870
3.62	830	17	830
3.77	1150		1150
3.91	1100	26	1100
2.72	920	18	920
3.81	1090		1090
2.99	770	17	770
4		29	1300
3.58	1280	32	1280
3.7		21	990
3.67	1110	26	1110
3.97	1260		1260
3.88	1280		1280
3.55	1010		1010
4	1060		1060
2.89	1060	19	1060
2.75	850	18	850
3.73	1080		1080
3.3	970		970
3.8	1260		1260
3.1	970		970
4	1220	25	1220
3.81	1110		1110
2.84	1020		1020
3.17	990		990
3.51	1140		1140
2.29	1010		1010
3.8	1070		1070

2.87		20	950
3.82	1190	29	1190
3.12	1100	24	1100
3.59	1230		1230
3.35		23	1070
3.19	940		940
2.87	840		840
3.18	930	19	930
2.42	890	18	890
4	940	19	940
3.91		31	1380
3.1	1080		1080
3.85		29	1300
4	1410	34	1410
3.75	940		940
2.21	900		900
4	1290	29	1290
3.92	1370	32	1370
2.96	1250		1250
2.52	1190		1190
3.67	1220		1220
3.56	1070		1070
3.27	940		940
2.66	910	19	910
3.07	1270		1270
3.78	1190		1190
2.94	990		990
3.45	1300		1300
3.86		31	1380
3.59	830	16	830
3.8	1290		1290
3.17	860	22	860
2.99	100		100
3.81	910	13	910
3.79	1000		1000
4	1050		1050
2.58	870		870
3.96	1020		1020
3.35	940		940
3.82	1290	31	1290
3.56	1090		1090
2.02		20	950
3.86	1010		1010
2.88	1270		1270
3.93	1440		1440
2.47	1190		1190

3.97		29	1300
3.44	1070		1070
4	1330		1330
3.98	1300	31	1300
4		31	1380
4	1010	28	1010
2.78	980		980
4	1220	25	1220
3.44	1080	23	1080
3.14	810		810
4	1350	29	1350
4	1240	30	1240
2.85	810	17	810
3.6	950	21	950
3.92	1050	22	1050
2.86		20	950
2.88		17	830
2.59	880	19	880
3.81	1080	27	1080
4	1110		1110
3.2	870		870
3.06	1210		1210
3.25	1230		1230
2.36	880	19	880
1.87	920		920
3.26		19	910
3.25	870	15	870
2.74	950		950
3.32	1050		1050
3.22	1150	27	1150
3	990		990
3.25	1020		1020
4	1270	27	1270
3.54	990		990
3.51	1180		1180
3.4	1040		1040
2.75	920		920
3.85		22	1030
3.35	840		840
4	1280	28	1280
4	1100		1100
3.87		22	1030
3.54		29	1300
3.24	860		860
3.75	1010		1010
3.14	1030	19	1030

2.88	910		910
2.55	980		980
2.92	1010		1010
3.51	850		850
3.96	830	19	830
2.77	1080		1080
3.94	920	20	920
3.89	1220		1220
2.96	1010	19	1010
2.75	970		970
3.24	960		960
3.78	1070		1070
3.63	1090		1090
3.51	890		890
4	1350	28	1350
3.37		18	870
3.87	1310	28	1310
3.4	1250		1250
3.48	1120	24	1120
3.36		21	990
3.43	1040	25	1040
3.22	1050		1050
3.86	930		930
3.64	1030		1030
3.22	1290		1290
2.94	940		940
3.69	980		980
4	1470	33	1470
3.21	850		850
3.87	1310		1310
3.74	1150		1150
3.94	1090	25	1090
2.78	870	22	870
2.57	830		830
3.25	840	21	840
2.87	880		880
2.37	970		970
3.4		18	870
3.64	840		840
3.1	1050	20	1050
3.97	1220	26	1220
2.91	1070		1070
2.9		15	740
2.61	780		780
3.47	1220	22	1220
4	1320		1320

3.5	1240	28	1240
3.05		20	950
3.69	1110		1110
2.94	830		830
3.91		20	950
3.29	1260		1260
3.65	1070		1070
3.89	1200		1200
3.76	1080		1080
3.52	860		860
3.26	890		890
3.47	1150		1150
3.81		27	1220
2.69	910		910
3.16	920		920
3.97	1130		1130
3.05	1100		1100
3.92	1280		1280
3.61	860		860
3.76		20	950
2.94		23	1070
3.8	1270	28	1270
3.88	1070		1070
2.99	980		980
3.16	1060		1060
3.88		30	1340
3.19	1110		1110
3.55	820		820
3.07	860	19	860
3.67	950		950
3.87	1300	30	1300
2.96	1050		1050
4	1490		1490
2.25	990		990
3.07	1010		1010
3.13	870	16	870
3.2	1050		1050
3.48	1170		1170
3.76	990		990
2.97	910	21	910
3.15	1030		1030
3.85	1020		1020
3.26	1080		1080
3.86	1290		1290
4	900		900
3.32		24	1110

2.8	830	16	830
3.1	1110		1110
3.97	1420	31	1420
3.9	1280		1280
3.88	1100	22	1100
3.71	1120		1120
3.34	1240		1240
3.82	1070		1070
3.82	1050	17	1050
3.42	820	16	820
3.76	970	19	970
3.11	990		990
3.67	1170		1170
2.99	690	18	690
4	1480		1480
3.21	1210		1210
3.64	1170		1170
3.59	1050		1050
3.7	960		960
3.62	1410	33	1410
2.94	920	16	920
3.76		22	1030
3.35	1060		1060
3.75	1300		1300
3.19	840		840
4	1310	28	1310
3.49	1190		1190
3.71	1110		1110
3	860		860
2.88	870	17	870
3.42	950	18	950
2.35	900		900
3.29	960	19	960
3.78	1000		1000
2.95	880		880
3.6	940		940
3.68	990	22	990
3.96	1040		1040
3.98	1340	29	1340
3.11	910		910
3.32	1060		1060
3.87	1290		1290
3.28	1120		1120
2.82	1230	27	1230
3.74	1280		1280
3.05	940	20	940

3.02	1400	1400
3.04	1020	1020
3.93	1060	1060
3.52	1030	1030

## Appendix L

### SAT Mathematics Scores

prep M	no prep M
420	500
600	460
420	580
430	750
460	470
530	320
500	370
500	750
530	480
210	800
620	460
490	690
570	600
670	560
540	710
380	520
530	620
650	510
600	470
450	460
620	500
430	550
430	520
530	650
420	480
740	510
550	540
420	470
430	400
420	670
560	540
510	480
690	570
410	500
460	390
390	500
470	440
490	680
700	560
670	650



500	800
450	570
500	580
530	750
620	720
660	450
700	390
430	580
580	600
590	560
470	650
580	490
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580	590
610	560
630	650
450	660
620	590
510	530
470	520
410	540
580	300
520	330
760	370
350	550
520	630
560	520
420	530

480	690
470	560
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510	610
610	440
590	440
390	460
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## Appendix M

### SAT Critical Reading Scores

Prep SAT Reading	No Prep SAT Reading
500	460
640	470
480	720
530	700
500	540
460	330
500	440
460	740
540	520
340	640
650	380
520	520
460	520
620	600
550	610
430	520
530	570
530	520
580	510
490	440
560	480
450	570
430	500
480	570
430	460
600	470
490	460
430	430
470	320
470	660
600	480
540	440
590	650
430	480
490	460
470	500
560	420
610	690
610	620
650	680

470	760
400	400
500	590
570	600
680	550
480	490
670	430
430	460
540	620
550	520
490	780
570	490
580	640
660	690
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650	490
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600	410
540	650
470	670
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520	490
570	410
590	700
400	650
540	660
520	510
480	530
390	400
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470	450
630	460
420	550
540	640
500	550
430	580

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730	690
640	500
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