THE TEXAS ASSESSMENT OF ACADEMIC SKILLS (TAAS) TEST SCORES

AS PREDICTORS OF ACADEMIC SUCCESS OF FIRST-YEAR CLARENDON COLLEGE STUDENTS

DISSERTATION

Presented to the Graduate Council of the University of North Texas in Partial Fulfillment of the Requirements For the Degree of

DOCTOR OF PHILOSOPHY

By

James William Anglin, B.S., M. Ed.

Denton, Texas

August, 1996
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The problem in this study was to determine the relationship between the scores on the three parts (reading, writing, and mathematics) of the Texas Assessment of Academic Skills Test (TAAS) and the academic success of first-year students at Clarendon College, Clarendon, Texas. High school grade-point average and gender were also included in the study.

The purpose of the study was to develop an equation to predict first-year college grade-point average at Clarendon College. The predictor variables were the three parts of the TAAS Test (reading, writing, and mathematics), high school grade-point average, and gender. The equation was developed through multiple correlation/multiple regression multivariate procedures. All statistical analyses were calculated through sub-programs of the Statistical Package for the Social Sciences (SPSS).

The study was limited to using only 1992/1993 Texas high school graduates who had entered Clarendon College in the fall semesters of 1992 and 1993 directly following high school graduation. A search of Clarendon College records produced 115 students from these groups who fully met all standards defined for the study.
Two predictor equations were developed. One developed through a simple regression command included all five predictor variables. The second equation was produced through a stepwise procedure. This equation included only high school grade-point average and the mathematics score from the TAAS Test. The variables TAAS reading, TAAS writing, and gender were not found to be significant when used in conjunction with the other predictor variables.

The strength of each predictor variable was evaluated using students from the freshman class of 1994-95 at Clarendon College. Each of these students met the same basic standards used to establish the prediction equations. The two prediction equations were found to be equal in predictive strength. There was less than one percent difference in the variance accounted for between the two equations. Neither equation showed itself to be all powerful in terms of variance accounted for. Each did, however, predict first-year college grade point average to within two standard errors 93 percent of the time.

Recommendations were made that further studies be conducted to find the ideal predictor equation for Clarendon College. Specific recommendations included bringing a more diverse mix of predictor variables into the study. A recommendation was also made to include more of the student body (out-of-state, part-time, etc.) in future studies.
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CHAPTER I

INTRODUCTION TO THE STUDY

Background of the Study

The idea of predicting the future success of students graduating from high school has long been an interest of scholars and educators. The idea itself has great merit; however, finding consistent predictors has been and continues to be like the proverbial needle in the haystack.

Early predictive studies tended to concentrate on the relationship between high school grades and academic success for first-year college students. In fact, studies continue to show high school grades to be the single most reliable predictors of academic success of first-year college students. Although this tool gave counselors some definite guidelines by which to counsel students, scholars began to consider other predictors that might also be useful in predicting academic success at the college level.

Researchers have generally found that a stronger predictive argument may be made when combining more than one predictor. The purpose of the study, the nature of the predictors, and the cost will generally limit the number of predictors used in any particular study.

For several years the state laws of Texas concerning public education have required that all students graduating from its public high schools must pass an exit test in order to receive a high school diploma. This test is presently known as the Texas
Assessment of Academic Skills (TAAS) Test. It was originally called the Texas Educational Assessment of Minimum Skills (TEAMS) Test. This testing program was developed because of the passage of Texas House Bill 72 (1984), which was passed by the Second Called Session of the Sixty-Eighth Texas Legislature. The first testing was to take place starting with the 1985-86 school year. The law says that the learning objectives contained in the document House Bill 72 will be measured by a three-test battery consisting of (a) Exit Level Reading, (b) Exit Level Writing, and (c) Exit Level Mathematics.

Assuming that there are logical reasons for requiring the test, and its contents, one might ask whether or not the test results are useful in academic predicting. A required test of this nature should tell us something about the student. What about the scores at the low end of the passing window? What about the middle scores? And what about the high scores? What do these scores tell us about the students? Also, do they tell us anything about the vocations for which the students may be best suited? These are just some of the questions one might ask concerning the TAAS test results.

Of particular interest has been the question concerning the relationship between the grade-point averages (GPAs) of Clarendon College students and their TAAS scores. If a sound, dependable relationship can be established in this area, perhaps the college can do a more credible job of placing students in the proper classes and programs. This information could be valuable to the college counselors, program directors, heads of departments, high schools counselors, and the college students themselves.
Purpose of the Study

The purpose of this study is to develop a predictor equation that may be used in counseling prospective Clarendon College students. "The prediction equation is an excellent device for distributing useful information to counselors and parents" (Wilson, 1963, p. 89).

Statement of the Problem

The problem of this study is to determine the relationship between the scores on the different TAAS tests and the academic success of first-year students at Clarendon College, Clarendon, Texas. Are the scores from one part of the TAAS test a better predictor than the other scores, or is there a combination of TAAS test scores that forms a more reliable predictor?

Need for the Study

According to several scholars, the problem of predicting college success has probably received more public attention than any other single problem in education (Bloom & Peters, 1961). Vast amounts of time, money, and effort have been expended in finding better ways in which to predict the academic success of college students. Thousands of studies have been published, and thousands more have been completed but never published. This may seem like a waste; however, when one considers that graduation from high school and entry into college or other special training is one of the most critical points in a person's life, the pursuit of a dependable predictor is logical.
In recent years accountability has become a major issue of concern among educators, because legislators and taxpayers are beginning to question the efficiency and quality of our educational system. While the idea of quality control is not new, the original set of educational standards has changed to an inventory of accountability indicators. Effectiveness and productivity are the two major categories through which accountability is assessed in today's educational system (Sharp, 1994).

With more and more emphasis on postsecondary training and education, colleges are seeing tens of thousands of students entering schools and academic programs without regard to potential success. Although many colleges make some effort to place students in proper classes, far too many students find themselves in programs or classes for which they are not prepared. These students tend to drop out rather than seek proper levels of challenge for which they may be prepared. In fact, a recent release by the American College Testing Service showed that 31% of college freshmen enrolled at the average liberal arts college in the fall of 1992 dropped out by their sophomore year. Hardesty (1986) pointed out that during the first 2 years of the administration of the Preprofessional Skills Test (given to prospective teachers in Texas) about 28% of those students tested showed a critical weakness in reading, writing and mathematics.

Colleges and universities need an accurate way to determine the potential success of each student and to direct students into classes and programs for which they are better suited. The goal is not to develop a prediction device that will replace the admissions committee, but, one that will enable the committee to make judgments based on more objective data than are currently available (Wilson, 1963). Errors stemming from gross
underestimates or overestimates of a student’s potential achievement not only leads to failure, but they preclude educational challenge in its best sense (Bloom & Peters, 1963). The problem in academic prediction is to prevent gross errors and to cut waste so that real educational challenges can be offered and mastered.

Many major studies in recent years tend to show that excellence in education in the United States is taking on a new, more serious, meaning. Special interest groups are targeting both the educational standards and their expectations for change. Some of this activity has caused various legislative bodies to try to satisfy the need for a better educational system and also to appease their constituents. Sharp (1994), in his discussion of accountability, cited Texas State Representative Ric Williams in a 1992 letter to Texas community college presidents:

My interest is in developing a funding mechanism supported by all, irrespective of political party philosophy, geographical location or cultural background. I believe that the public will support investments in education when they are convinced that the investment is based on performance, achievement, improvement, and whatever one uses to describe what measurably happens to the student, not the institution. (p. 1)

Sharp (1994) noted a major legislative move by the state of Florida. The state legislature passed a law aimed directly toward its 2-year colleges and their accountability. The law is titled Community Colleges Efficiency and Effectiveness (Florida HB 2497, 1992). Grey and Keener (1993) cited a passage from this legislation:
“It is the intent of the legislature that a management and accountability process be implemented which provides for the systematic improvement and assessment of the quality and efficiency of the state community college system. Accordingly, the State Board of Community Colleges and the individual community colleges’ Boards of Trustees shall develop and implement a plan to improve and evaluate the instructional and administrative efficiency of the State Community College System.” (p. 1)

Increasingly, community colleges are trying to direct students into classes and programs for which they are better suited by carefully screening their high school transcripts, using placement test scores, using college entrance test scores, or some combination of the factors above (Weber, 1985). However, regardless of how serious a college is in properly placing students, those who are designing models and making plans must be careful what they do. Begle (1979) stated that “almost never do affective, nonintellective, or teacher variables add anything to the predictive power of previous achievement in school” (p. 97). Along these same lines, (Callas, 1981) warned that educators must carefully select the variables that they use to determine placement of students so that each variable will add to the predictability of success for the student.

Hypotheses

To carry out the purpose of this study and to address the research questions, the following hypotheses are examined.

Hypothesis 1. There is a functional relationship between TAASM and GPA.
Hypothesis 2. There is a functional relationship between TAASW and GPA.

Hypothesis 3. There is a functional relationship between TAASR and GPA.

Hypothesis 4. There is a functional relationship between HSGPA and GPA.

Hypothesis 5. There is a functional relationship between gender and GPA.

Delimitations of the Study

This study does not attempt to measure all the demographic variables that might affect the college GPA. Information concerning the types of classes in which students were enrolled in their first year in college was not utilized. No distinction was made for what could be considered more or less stringent loads, more difficult, comprehensive classes, or remedial classes. In this study, no purely vocational students were included. Also, only graduates of Texas high schools were considered in the study. This study is an attempt to determine to what extent the five variables identified in the study may be used in the prediction of academic success of first-year students at Clarendon College.

Limitations of the Study

The nature of the predictive variables selected for this study preclude assigning subjects or conditions randomly or manipulating the variables. Furthermore, the high school records failed to show how the different high schools calculated grade-point averages, or how different courses may have been weighed. There is no way to tell how this might affect the study.
Definitions of Terms

Academic Success—Progress as defined by the Clarendon College Student Handbook (1992-93) for full-time students (student must enroll in 12 or more semester hours and complete 9 or more semester hours with a GPA of 1.5 or greater).

Clarendon College—A public junior college (enrollment of approximately 750 students) located in Clarendon, Texas.

GPA—The grade-point average at the end of the first year of college.

Criterion (dependent) Variable—A factor that changes as one or more predictor (independent) variables change if a hypothesized relationship with the predictor variable exists (Van Dalen, 1973).

Full-time Freshman Student—First-year college students enrolled in 12 or more semester hours in the fall and spring semesters directly following graduation from a Texas public high school.

High School GPA—The high school grade-point average at the time of graduation.

Multiple Regression—A predicting method that uses more than one predictor variable to predict on a criterion variable (Hopkins, 1980).

Predictor Equation—A mathematical formula in which the predicted values of the criterion variable ($Y'$) can be computed using assigned weights for adjustments of the predictor variables' values obtained from a multiple regression analysis (Pedhazur, 1982). The formula is usually expressed as follows:

$$ Y' = a + b_1 X_1 + b_2 X_2 + \ldots + b_n X_n $$
Gender--(male, female).

TAAS--Texas Assessment of Academic Skills Test (formerly called TEAMS). An exit-level test consisting of three parts, with each part having several objectives.

TAASM--Scores from the mathematics section of the TAAS Test. This section of the TAAS is titled "Mathematics Objectives and Measurement Specifications"; it consists of three domains and 13 objectives. Domain I is Concepts. The objectives cover various numerical, algebraic, geometric, statistical, and measurement concepts. Domain II is operations, and its objectives include solving problems using all four of the fundamental mathematical operations. Domain III is Problem Solving. The objectives include estimations, strategies, mathematical representations, and evaluations.

TAASW--Scores from the writing section of the TAAS Test. This section is titled "English Language Arts Writing Objectives and Measurement Specifications"; it consists of one domain and seven objectives. Domain I is Written Communication. The objectives include all areas of good writing that one finds on most standardized writing tests.

TAASR--Scores from the reading section of the TAAS Test. This section is titled "English Language Arts Reading Objectives and Measurement Specifications"; it consists of one domain with six objectives. Domain I is Reading Comprehension. The objectives include the basic ideas that are part of standardized reading comprehension tests.

TEA--The Texas Education Agency.

TEAMS--The exit level of the Texas Educational Assessment of Minimum Skills Test as mandated by Texas House Bill 72 (1984).
Theory--The basic aim of science. A theory is a set of interrelated constructs, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting phenomena (Kerlinger, 1986).

Variable--A measure or trait that is capable of variation, either in quality or quantity. Variables differ according to whether values are discrete (having a fixed set of values), or continuous (capable of having any value) (Cornett & Beckner, 1975).
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

An extensive search and review of many documents, including ERIC, Dissertation Abstracts International, Resources in Education, Current Index to Journals in Education, Social Science Index, Comprehensive Dissertation Index Supplements, and various Texas state documents, failed to uncover studies dealing with the Texas Assessment of Academic Skills Test (TAAS) as a predictor (independent) variable. A total of 25 research documents addressing the Texas Educational Assessment of Minimum Skills Test (TEAMS) was found; however, 9 of these documents used the TEAMS test results as the criterion (dependent) variable, while the other 16 used the test scores for other purposes. None were used as predictors. The literature search revealed 16 studies dealing with the Texas Assessment of Academic Skills Test (TAAS). In 11 of those studies the TAAS scores were used to measure the results of some school activity (teaching, administrative, etc.), and the other 5 were used for other purposes. As with the TEAMS, none were used as predictors.

Predictive studies have been made for college students to help predict success in anything from a single beginning course to the acquiring of a Ph.D. In conducting these studies, researchers have used numerous variables in the search for what may or may not affect success in a given venture. Because this study deals with the prediction of academic
success of certain first-year college students at Clarendon College, this researcher was especially concerned with other studies that have dealt with the success of first-year college students. However, research was not restricted to first-year college students.

Bloom and Peters (1961) led an extensive study involving data from 125 schools, 600 colleges, and more than 25,000 students in an attempt to develop predictors of academic success on the college level. According to Bloom and Peters (1961), one source of variation in academic grades is the judgment by teachers about the quality of a student’s academic achievement. Teachers tend to overemphasize this source of variation, and they tend to view grades with great suspicion. However, Bloom and Peters think that high school grade averages may have a reliability as high as +0.85.

The Bloom and Peters (1961) study was designed to examine some methods through which the use of high school grades for prediction of college academic success would be improved. The authors stated that estimates of the likelihood of college success are critical, because, according to such estimates, some high school graduates decide to go to college and others decide not to go. Some young people are admitted, whereas others are not. Such decisions have far-reaching consequences for the individual, the schools and colleges, and the nation in general. These consequences make it imperative that we have good estimates, and good estimates can be made only if we have good data.

In their efforts to improve the prediction of college academic success, Bloom and Peters (1961) examined codification and the use of experience records. They cited Chauncey and Frederiksen’s (1952) study, which reported that, at both Princeton and Yale Universities, studies have been made of every high school that sends large numbers of
students to those universities. Correlations in rank-in-class estimates were made on the basis of the achievement of those former students from the different high schools (p. 98). Chauncey and Frederiksen found that the rank-in-class correlation for a specific school or type of school tended to correlate with freshmen grades at the +0.60 level.

A study by Astin (1975) examined predictions of success or failure in college based on those who completed school and those who dropped out. He used many predictive variables, including age, gender, race, high school grades, SAT or ACT scores, extracurricula achievement in high school, highest college degree planned, daily activities, probable field of study, career choices, expectations about college days, rank in high school graduation class, academic standards of high school, religious preferences, student concern about finances, and parents' income.

In recent years there has been an effort to direct more minorities into postsecondary education. However, minorities tend to score lower on college board examinations and to have lower high school grade point averages (Petrie, 1993). This has led to numerous charges that standardized tests are biased against minorities. The college board tests have also been criticized for being biased against females. As a result of these charges, more studies are being done by researchers trying to find better means of predicting success at the college level, especially for minorities and females.

Saundra Tomlinson-Clark (1994) led one such study dealing with the female college student. The major purpose of her study was to examine the influence of pre-college and college variables on the adjustment and achievement of the female student at a certain coeducational university. The variables used in this study included high
school, grade point averages, involvement in school and other activities, college leadership activities, and the number of cocurricular involvements. The regression equations predicting academic achievement for this study were nonsignificant. However, other researchers (Larose & Roy, 1991; Tracey & Sedlacek, 1984, 1985) have shown that, for many students, nonacademic factors are often better predictors of college success than are traditional academic measures. Also, leadership involvement has been directly linked to positive college outcomes (Chambers, 1992; Clark, 1985; Tracey & Sedlacek, 1984, 1985, 1987), as reported by Tomlinson-Clark (1994).

Another attempt to improve the ability to predict college academic performance was the use of grade adjustment rather than the actual grade and rank-in-class (rather than grade point average). This approach has been shown to improve slightly the correlation between high school grades and college grades. It would consider an average student coming out of a high school whose students do well in college to be a better prospect than an average student coming out of a high school whose graduates do not do well in college. Of course, rank-in-class could be misleading (3rd out of 8 might not be as good as 3rd out of 800). In a split study using adjusted grades, Burnham (1959) found conflicting coefficients. In one of the studies Burnham used Yale freshman grade point averages for students from high schools that had sent several students to Yale University over a period of years. In this study the correlation coefficient was +0.76. The second part of the study used Yale University freshman students from high schools that had sent very few students to Yale. This study showed only a +0.42 correlation between adjusted high school grades and the grades that students earned at Yale as freshmen. A comparison of these two
studies might lead one to think that the adjusted grade approach is not dependable when only limited data are available, but that it may be good when a lot of data are available.

The approach to the adjustment of grades in order to improve prediction has involved many different ideas. Toops (1933) suggested that, for the purpose of prediction, the two most important reasons for grades to be noncomparable are that grade distributions vary and that the intelligence distributions of students may not be comparable. Toops suggested a method called the "transmutation of marks." This procedure was designed to reflect differences in the intelligence level of the student population being compared. Reitz (1934) took another approach to the adjustment of grades to improve the prediction of college grades at the University of Chicago. This was done through the use of scholastic aptitude scores to adjust the grades of individuals entering the university.

A few years ago, the National Collegiate Athletic Association (NCAA) passed certain rules governing the participation of freshmen students in athletic events at the Division I schools. Cries of bias and prejudice immediately went out across the nation, charging that these rules were directed toward minorities. The charges were and still are that the requirement for higher SAT and ACT scores and better high school grade point averages will prevent thousands of athletes from going to the schools of their choice, thereby preventing them from receiving an education. Those complaining further argued that these kinds of requirements have nothing to do with the academic success of the student athlete at the college level. In fact Walter, Smith, Hoey, Wilhelm, and Miller
(1987) found that academic variables predict fewer than 20 percent of student athletes college grades. Other studies tend to support this argument.

Petrie (1993), cited a number of studies dealing with college athletes (relative to minority and nonminority) and academic achievement (p. 418). According to Lang, Dunham, and Albert (1988), Sedlacek and Adams-Gaston (1992), and Sellers (1992), the college admission tests (SAT/ACT) are often unrelated to college GPA for minority students. As a result of these findings and others, researchers have been investigating non-academic variables in an effort to find better predictors of academic success at the college level.

Petrie's (1993) study involved 95 Division I football players at a large public, predominantly white Midwestern universities. Variables considered in the study included negative life stress, positive life stress, social support, college GPA at the end of the first term, and the composite ACT score at the time of admission. The purpose of the study was to investigate the effects of academic and non-academic variables on the academic performance of both minority and non minority football players. Social support alone predicted the GPA of the black players. By understanding what variables predict academic success, counselors and other college officials can better assist students as they progress through school (Petrie, 1993).
The Influence of Texas Assessment of Academic Skills (TAAS) Mathematics Subtest Scores on College Academic Success

A comprehensive review of the literature failed to reveal any research that examined the influence of the mathematics scores from the TAAS on the academic performance of college students. Although there are few of these particular studies, a number of research projects have dealt with various types of mathematic scores. Some attention has been directed toward grades in high school math classes, ACT and SAT math subtest scores, NMSQT scores, College Placement Test scores, and the Metropolitan Achievement Test Mathematics score. These variables have been used in various applications and with varying degrees of success. This leaves little consensus on the validity of such test scores and the role that they may play in predicting the future success of students. Astin (1971), O'Keefe (1984), and others have made the observation that using SAT/ACT subtest scores adds little to the predictive power over that provided by SAT/ACT Composite Scores.

Edwards (1971) conducted a study to find predictors of success in remediation programs in mathematics for the public junior college. The study included as two of its predictor variables a score on attitude toward mathematics and the number of credit hours of college remedial mathematics. A regression analysis of the data showed that mathematics test scores, mathematics attitude scores, and high school GPA were the significant predictors at the 0.05 level for this sample.

Chissom and Lanier (1975) attempted to discover the relationship between SAT scores and high school GPAs to college GPAs. Using nearly 700 freshmen students at
Georgia Southern College, this team used high school GPA and SAT/ACT subtest scores as predictor variables. The results showed that, whereas SAT-Math contributed well in the total prediction, it was not a good single predictor of academic success for this sample. Pedersen (1975) also found SAT-Math scores to have low predictive validity in relationship to grades in college chemistry.

According to Burke (1991), Suddart and Wirt (1974) found that SAT subtest scores, high school rank, and performance in selected high school classes accurately predicted academic performance in remedial and college level courses for English, mathematics, and chemistry at the Purdue University Lafayette Campus. However, Hogrebe (1980) did not find SAT-Math subtest scores to be significantly related to first-quarter college GPA in that study. Snowman, Leitner, Snyder, and Lockhart (1980), did find that the ACT scores were a significant contributor to the prediction equation in their study.

A research study completed by Daunis (1988) focused on finding a collection of predictor variables that could be used to determine proper placement of college students into entry-level mathematics courses. The study used two placement examinations published by the Mathematical Association of America, credits in high school mathematics, mathematics scores from the SAT, and high school GPA as predictor variables. The placement test scores and the SAT-Math scores failed to produce consistent correlation in this study.

Sims's (1989) study used samples from four community colleges in North Carolina. Its purpose was to find a relationship between the admission/placement test
scores of developmental students in English, mathematics, and reading comprehension in
the community college and the developmental student's overall college GPA at
graduation. The regression model failed to yield a specific relationship. The data showed,
however, that, the higher the admission/placement test score, the higher the final college
GPA. Wonnacott (1989) found no support for ability in mathematics as a predictor of
college grade point average. But standardized mathematics test scores were significantly
predictive in a study by Russell (1989) for predicting final grades in an individualized
computer course.

A study by Lott (1990) concentrated on the relationship of certain factors to the
academic success of students in developmental studies mathematics. Its purpose was to
determine which of several variables could be used in predicting success in developmental
mathematics. Included among the predictor variables were SAT-Math scores. The study
sample was selected from community college students enrolled in developmental
mathematics courses. The analysis of the data showed a significant relationship between
SAT-Math scores and the academic success of this sample. Clark (1994) also found that
the SAT-Math scores could be used as an important variable to help predict group
outcomes on college placement tests.

Burke (1991) found high school mathematic grades to have a strong influence on
the prediction of success in college algebra. However, Sedlacek and Adams-Gaston
(1992) found that SAT-Math scores were not closely related to first-term grades of a
sample of male and female college athletes. Young and Sowa (1992) also found SAT-
Math scores to be a poor indicator of academic success for black athletes. Petrie (1993)
stated that SAT/ACT scores are often unrelated to the college GPA of athletes of color,
but are good predictors of success for white college football players.

One of the purposes of Brady's (1994) study was to analyze how required college
preparatory courses in mathematics, reading, and writing affect college academic success.
College GPA, the number of degree credits earned, and the reenrollment rates were
measured as determinants of success. The mathematics scores failed to yield a strong
relationship to the criterion variables in the study.

May (1994) investigated the Texas Academic Skills Program (TASP) testing
programs of reading, writing, and mathematics scores to ascertain their potential for
predicting academic success in college. The study investigated both the PRE-TASP
scores and the TASP scores as predictors of grades in 18 freshman and sophomore classes
that had minimum TASP Test scores as prerequisites. The study sample was 200 students
enrolled in a multicampus community college in the spring of 1993. A regression analysis
showed that the TASP math score had a correlation of +0.549 with course grades.

The Relationship of the Reading Scores From the TAAS Test
on College Academic Achievement

A search of the literature provided no studies in which the TAAS test reading
scores were used as predictors of academic success at the college level. There are studies
in which reading scores of various types were used as possible predictors of future
academic success. Reading is such a complex activity that it is difficult to determine the
importance of each component process in reading competence or failure. Some experts think that reading and writing skills cannot be separate.

The Edwards (1971) study was designed to determine factors or a combination of factors that would best predict success in remedial mathematics at a public community college. The dependent variables were successfully remediated college students and unsuccessfully remediated college students. Predictor variables included standardized reading test scores and sentence test scores. The regression analysis indicated that the successfully remediated college student scored significantly higher at the +0.05 level for reading and sentence test scores.

A study by DeSoto and DeSoto (1983) examined the relationship between reading achievement and the ability to process verbal information in achieving and nonachieving readers in fourth-grade classes in urban schools. Verbal processing abilities were evaluated with 10 instruments, which included measure of memory span; associative learning; semantics association; automatic word processing; and time taken to name pictures, read words, and pronounce pseudowords. Except for automatic word processing, the performance of the achieving readers was superior to that of the nonachieving readers on all of the verbal processing measures (partial correlation was applied to the regression to control for intelligence). Dumont and Jones (1983) found that reading pretest scores were the strongest predictors for success in a remedial college reading course. Blustein (1986) stated that research findings indicate that intellectual factors such as intelligence, aptitude, reading ability, and previous grades are the best predictors of academic success (Blustein, 1986; Dettloff, 1982; Hazard & Danner, 1974).
In a study concerning the readability of advanced algebra textbooks, Wanserski (1989) found that less capable readers did significantly poorer at the +0.01 level on illustrative passages. Those students who were good readers experienced significantly higher success. Adomanis (1989) also found poor reading ability to be a factor in student failures. This was a case study to determine possible reasons why students were failing the Maryland Test of Citizenship Skills (MTCS). Adomanis found that the failing students' academic and personal profiles showed that all had below average verbal and reading ability in elementary school.

In a study to find predictors of success in an individualized computer course, Russell (1989) included standardized reading test scores among the 10 predictor variables. Results of the study showed that the reading scores were the third strongest predictor of success in this study. Wonnacott (1989) found that reading skills were significantly related to academic success at Glen Oaks Community College, but were less so than at other community colleges where similar research has been conducted.

The Sims (1989) study combined samples from four community colleges in North Carolina. Its purpose was to discern whether there was a relationship between the admission/placement test scores of developmental students in English, mathematics, and reading comprehension in the community college and the developmental students' overall college GPA at graduation. The linear regression analysis used to determine this relationship failed to yield a specific relationship; however, the data did show that generally, the higher the admission/placement score, the higher the final overall GPA.
A study by Hite (1993) examined the relationship of cognitive style and the gender of unsuccessful first-time examinees to performance on reading comprehension tasks as measured by a required college examination. The purpose of this study was to determine whether gender and cognitive style (field dependence/independence) affect performance on the reading test of the Florida College Level Academic Skills Test (CLAST-R) for retake examinees. The predictor variable was the Comprehension Test of the Nelson-Denny Reading Test (NDRT). A regression analysis showed that the NDRT is a significant predictor of CLAST-R (R square of +0.14).

Su (1994) investigated the relationship between elementary students' reading achievement and their content area performance. A multiple regression analysis was used to predict the influence of reading on content area performance at the same grade level or at later grade levels. A significant relationship between reading achievement and content area performance was found. Also, reading scores at earlier grades make a significant contribution to predicting content area performance for later grades. This correlation did appear to become weaker as children's grade level increased.

In a study designed to determine whether there is a difference in the academic reading success between students not required to take the College Placement Examination and those required to take it, Tuten (1994) found the following results: Those students who met all entrance requirements earned higher grades in core courses requiring college-level reading skills than those who had to take the placement examination. For those who met all entrance criteria, there was a significant correlation between their college GPA and their SAT-Verbal subtest score and their predicted college
GPA. However, no significant correlation was found between the College Placement Examination-Reading subtest scores and the grade point average earned in core courses requiring college-level reading skills.

A dissertation by Brady (1994) analyzed how required sequenced college preparatory courses in mathematics, reading, and writing affect students’ academic success and how they might add to a theoretical model for predicting student retention in a community college. Academic success was judged by college GPA, the number of degree credits earned, and the reenrollment rate. The predictor variables included E-ASSET scores in reading. The reading scores were found to be fairly strong predictors of academic success, but were not as influential in predicting retention.

A study by May (1994) used the Texas Academic Skills Program (TASP) Test reading scores and the PRE-TASP Test reading scores as predictors on a sample of students from a multicampus community college. The study determined that the reading scores of the TASP Test had a correlation of +0.541 with college grades for this study.

The Impact of the Texas Assessment of Academic Skills (TAAS) Test Writing Scores on Academic Success

A search of the literature revealed a number of studies that addressed the impact of various writing factors on future academic success. The search did not reveal any studies using the TAAS-Writing scores as predictors of future academic success.

In a 1982 study, Hogrebe attempted to determine which students are most likely to succeed in a college developmental studies program. This study examined the relationship
between four sets of predictor variables and three sets of criterion variables. Among the predictor variables was a writing sample. The criterion variables included (a) first-quarter college GPA, (b) whether or not the student satisfactorily completed the developmental course, and (c) the number of times the student was absent from the developmental class. This study did not find a strong correlation between the writing sample and success in the developmental program.

Dumont and Jones (1983) were looking for student characteristics that discriminate between those who are successfully remediated as a result of a college remedial studies program and those who are not. The researchers hoped to find both long-term and short-term predictors for success in such a program. Short-term was defined as completing the remedial courses with a C or better. Long-term was defined as completing the next related course with a C or better. There were a number of predictor variables, including pretest scores in the subject area. A strong correlation existed between success in the remedial college composition course and the composition pretest scores.

In a developmental studies program at the University of Georgia, Dwinell (1985) investigated the relationship between standardized test scores and locally developed test scores to college course placement and academic success. The criterion variables for the study were the college course grade and the exit rate from college developmental course work. The predictor variables included a writing sample and the Basis Skills Examination (BSE) scores. A regression analysis was used to evaluate the relationships, and the results indicated that only the BSE-English and SAT-Verbal test scores contributed a significant
level of variance in passing the developmental English course. The BSE-English score
was not a strong predictor of success in estimating success in college English. The writing
sample was not a significant factor for either.

A study by Wonnacott (1989) dealt with the relationships between the reading
ability, writing ability, mathematics ability, study skills, age, gender, and first-semester
grade point averages of Glen Oaks Community College students. The research sample of
374 consisted of both full-time and part-time students enrolled during the fall semester of
1988. The ASSET instrument was used to measure basic skills and study habits. A
Pearson product-moment correlation coefficient was computed to assess the relationship
between the predictor variable of writing score and the criterion variable of first-semester
college GPA. The correlation was found to be very weak.

In a 1990 study, Swanson examined students' use of selected message design logic
and message goal structure in their response to a regulative writing task. The study used
the Crockett Role Category Questionnaire (RCQ), a single setting, and a single regulative
communication task. The study examined the relationships among writers' uses of
message design logic (expressive, conventional, or rhetorical), goal structure (minimal,
unifunctional, or multifunctional), and gender. Results indicated significant positive
relationships between writers' scores on the RCQ and their choice of level of message
design logic and type of goal structure.

Vrba (1992) examined the writing portion of the Texas Academic Skills Program
(TASP) in relation to instructional methods. This research indicated that writing ability is
strongly related to reading ability. It further suggested that student performances are influenced by the student’s confidence in writing ability and previous writing instruction.

In another study of the Texas Academic Skills Program (TASP), May (1994) sought to determine its values as a predictor of grades in a community college. The purpose was to determine the predictive strength of each subtest of the TASP in relation to 18 freshman and sophomore classes that required a minimum score on the TASP as a prerequisite. A random sample of 200 students produced a +0.318 correlation between TASP writing scores and grades for those 18 college courses.

The Brady (1994) study at Florida International University had two major purposes. One purpose was to analyze how required sequenced college preparatory courses in mathematics, reading, and writing affect a student’s academic success in college. College GPA, the number of degree credits earned, and the reenrollment rate was defined as determinants of academic success. A series of logistic regressions used the variables E-ASSET scores in math, reading, and writing and a number of other variables in the prediction. The results showed that the treatment group had a significantly higher college GPA than the control group. There was no significant difference in the number of degree credits earned and the reenrollment rates between the groups. The writing score was not a strong predictor for this group.
Gender has been one of the most popular variables in educational studies. Although it is often found to be nonsignificant in a particular study, it remains an important variable for consideration. The political and social attitudes of the world almost demand it.

A study by Kubiniec (1970) compared the relative efficacy of various self-concept measures as predictors of “relative academic success.” The self-concept domains were the Phenomenal Self (self-description and self-evaluation) and the Phenomenal Environment (academic activities and academic goals). A sample of 468 freshmen students was assigned to one of the four criterion groups on the basis of “relative academic success” (predicted-actual grade point average) and remaining in school for three consecutive semesters. The differences in self scores among the four criterion groups were analyzed by multiple discriminant analysis, separately by gender. The results showed that (a) Phenomenal Self measures were able to separate the men’s criterion groups, but not the women’s; (b) Phenomenal Environment measures were able to separate both the men’s and women’s criterion groups; (c) Phenomenal Self variables were more efficacious than Phenomenal Environment variables in separating the men’s groups, whereas Phenomenal Environment variables were more efficacious than Phenomenal Self variables in separating the women’s groups; and (d) Self-Evaluation variables were more useful than Self-Description variables in separating the men’s criterion groups. Neither subset was useful in separating the women’s criterion groups. However, a study by Cherdack (1971)
showed that SAT scores generally correlate with college achievement at a higher rate for both white and minority women than for men (Bradford, 1987).

Bradford (1987) cited a 1971 study by Feller in which Feller examined the effects of rural-urban background and social class on scholastic performance in college and the differences when controlled for social class, gender, and measured intelligence. These data were originally collected for research at Stanford University from 1958 to 1965 and at the University of Oregon from 1961 to 1967. Feller's findings showed that urban non-middle class females were the highest achievers from this group. However, a study by Diaz (1994) of first-year Latino college students found no significant gender relationship.

Rodwick and Grady (1976) included gender among 15 predictor variables in a study to find variables related in any way to success in remedial college-level courses in mathematics, English, or reading. The study sample was made up of fourteen hundred students enrolled at El Paso Community College in Colorado. Results from the analysis showed that only gender correlated ($r = +0.59$) with academic success for this study.

A study by Sherman (1979) concentrated on predicting mathematics performance in high school boys and girls. The study started with math grades for 305 (approximately evenly divided by gender) first-year high school students with scores from three cognitive tests (Test of Academic Progress, Quick Word Test, and Space Relations Tests of the Differential Aptitude Test) and eight Fennema-Sherman Mathematics Aptitude Scales. The purpose was to predict performance for the second, third and fifth year. The study found that ninth-grade scores significantly predicted mathematics performance from 1 to 3
years later for boys and girls. Spatial visualization significantly predicted geometry grades for girls, but not for boys over the 3-year period.

In a study of grade point average, retention, and developmental characteristics of college freshmen, Albritten (1983) found no significant net relationship between persistence and gender. But Dalton (1976), using a sample of freshmen from Indiana University, found that females were more predictable than males in regard to academic achievement. Skelton (1994) found that female athletes had a higher graduation rate than both male athletes and the general non-athlete students at Delta State University for school years 1984 to 1988.

A study by Wonnacott (1989) found that gender was definitely related to academic success at Glen Oaks Community College, but less so than at other community colleges where similar studies have been made. The Stariha (1989) study of productivity factors influencing the achievement and interest in mathematics of college-bound high school seniors included gender as a predictor variable. This study showed gender to be a significant predictor of success and interest in mathematics for this sample. However, Bradford (1987) found no significant relationship between gender and academic achievement in a study at the University of North Texas. Bigby (1989) also failed to find gender to be an important factor in a study of relationships between the General Education Development Test and success in a community college in the state of Washington. Hite (1993) concluded that gender was not a factor in the performance on the reading test of the Florida College Level Academic Skills Test for retake examinees.
Landry (1990) hypothesized that the spatial ability of perceptual acuity is positively related to the automatization of mathematical operations, that gender differences exist in the automatization of mathematics, and that the gender of the subject moderates the relation between acuity and math automatization. The results indicated a strong relationship between gender and perceptual acuity and math automatization. Results further indicated that there is a difference in math automatization by grade as well as by gender. Math automatization scores increase at a linear rate across grades and at the same rate for both males and females. Males performed better at this task, but this was moderated by perceptual acuity. Other findings from this study included the fact that perceptual acuity, as a predictor of math automatization, contributes more for females than it does for males.

A study by Swanson (1990) found a significant positive relationship between writers' scores on the Crockett Role Category Questionnaire and their choice of level of message design logic type of goal structure, and between writers' gender and message design logic. No significant relationship was found between gender and writers' use of a particular type of goal structure. The study was found to contribute to an emerging theory of gender-linked differences in discursive practices.

In a study by Burns (1990) an effort was made to determine whether taking a mathematics course during the senior year of high school would improve a student's grade in college algebra. The study used freshmen students enrolled in college algebra in the Mississippi community college system in 1988-1989. Predictor variables were gender and whether or not the student had completed a math course in the senior year of high school.
The criterion variables were ACT Mathematics subtest scores and the final grade in college algebra. In this study, the females scored significantly higher in college algebra than did the males. Further results of the study showed that males generally outscore females on standardized tests such as the ACT, but that females continue to maintain higher college GPAs.

Pruett (1994) studied the relationship of gender bias to mathematics and science achievement. The purpose of the study was to explore the relationships among gender, physical home and school environment, formative affective environment, analytical affective predisposition, and analytical performance in order to develop a model to explain the relationship of gender bias to mathematics and science achievement. The primary focus of the research was the relationship of gender. A weak relationship was demonstrated between gender and analytical curriculum. After controlling for all intermediary variables, gender had an impact on both science and mathematics achievement. Females scored lower than males in mathematics and much lower than males in science courses.

A study by Moore (1994) focused on a population of high-risk students admitted to Northern Arizona University by exception to the standard admission policy. The objective of the study was to assist higher educational professionals in identifying and selecting students who do not meet admission standards, but who still have the probability of academic success. Results of this study indicated that gender predicted a significant difference in the performance and persistence of these students admitted by exception.
The purpose of a study by Muelder (1994) was to determine (a) how school board members who had worked with female superintendents rate the performance of male and female superintendents on specific skills related to their job; and (b) whether school board members who have worked with both male and female superintendents have a gender preference in the employment of future superintendents. The data supported the hypothesis that there is a significant difference in how school board members rate the performance of female versus male superintendents. Board members rated the females significantly higher, at the 95% confidence level, in 24 out of the 27 items rated. The females also scored higher on the 3 remaining items, but not at the significant level. The study also showed that the females were rated higher in three subscales scores, "management," "relations with associates," and "overall performance," at the 95% confidence interval.

The Impact of High School Grade Point Average on Academic Success in College

High school grades were the major focus point in early predictive studies and were found to be good indicators of a person's potential to do college level work. Over the years researchers have added other variables to predictive studies, hoping to enhance their efforts to predict future academic outcomes. An important thing to remember about high school grades as predictors of future academic success is that, when they have been used, they are almost always the strongest individual predictors for success in future academic endeavors.
It is often difficult to find adequate studies dealing with various activities; however, many studies deal with high school grades and their relationship to success of future academic endeavors. A few such studies are cited in this literature review.

Bloom and Peters (1961) mentioned a study conducted by Lincoln in 1917 that found a correlation of +0.69 between high school standing and freshman college standing for 253 Harvard University students who had reached junior or senior classification. Another study cited by Bloom and Peters is the Jordan (1922) study conducted in 1920 at the University of Arkansas. Jordan found the correlation between high school senior grades and college freshman grades to be +0.50. Segal (1934) reviewed the literature of college predictive studies up to 1933 and summarized the findings for 20 of these studies, using high school grade averages. Segal cited 48 coefficients that ranged from +0.29 to +0.69, with a median of +0.55.

After a fairly comprehensive examination of academic predictive and assessment literature, Fricke (1975) summed up his 1956 study with this conclusion: For over 40 years college achievement has been predicted from high school achievement, and the correlation coefficient has consistently averaged around +0.55. For 45 years college achievement has been predicted from standardized tests of academic ability, and the correlation coefficient has averaged around +0.45. When college achievement is predicted from a combination of high school achievement and ability test scores, the multiple correlation coefficients have consistently averaged around +0.64.

There have been hundreds of predictive studies concerning college achievement since 1933, and almost all of them have included high school grades (Bloom & Peters, 1961).
In most of these studies the researchers found that high school grades were the best single measurement from which to predict success in college. Some of the often-mentioned studies are those conducted by Astin (1971, 1975), Blustein (1986), Dettloft (1982), Hazard and Danner (1974), Lavin (1965), Munday (1967), Thornell and Jones (1986), and Travers (1949).

Although high school grades have consistently been found to be the best single predictor of academic success in college, Bloom and Peters (1961) make a concerned statement.

The fact that high school grades have shown to be the best single evidence from which to predict college achievement does not alter the fact that the level and precision of predictions from high school grades have remained relatively low and stable. The College Board Report of 1957 (Fishman), for example, cites fifteen correlations between high school grades and average college grades. The correlations ranged from +0.30 to +0.59, with a median of +0.41. (P. 9)

In an Ohio State University study, Mayhew (1965) used freshmen students to correlate certain variable affects with freshman college GPAs. The study used student SAT scores, The American Council of Educational Psychological Examination scores, and the Ohio State University Psychological Test. Correlating these scores with college freshman GPAs produced a +0.47 mark. After adding the students' high school ranking and scholastic aptitude scores to the study, the correlations ranged from +0.37 to +0.83, with an average of +0.62.
In one of the most comprehensive studies ever conducted, involving more than 36,000 freshmen college students, Astin (1971) concluded that high school grades were the best predictors of success in the freshman year of college. Astin found that high school grades correlated with freshman college grades at +0.51 for males and at +0.52 for females. When aptitude test scores were added into the study with high school grades, the correlation for males increased to +0.52 and for females to +0.55. After adding college selection to this study, the correlation for males rose to +0.54 and for females to +0.58. Finally, after adding personal characteristics that included demographics of biological information, the correlation of males rose to +0.59 and for females the correlation rose to +0.61.

Cherdack (1971) used SAT scores and high school grades in a study designed to answer several questions. The study was designed to check the effectiveness of the two variables in predicting the freshman grades of disadvantaged students and minority students; to examine the validity of the same predictors of gender and ethnic background; and to see whether or not the common white regression equation applied to minority students would accurately predict their performance. The study showed that high school grades were a better predictor for both minorities and whites; that the verbal score from the SAT was more consistent for whites than for minorities; and that the verbal SAT correlation for both white and minority females was generally higher than for males (Bradford, 1987).

In a study by Chissom and Lanier (1975), an attempt was made to determine the validity of students' SAT scores and high school grade point averages as predictors of
college freshman course grades and overall college grade point averages. Subjects of the study were 669 freshmen students at Georgia Southern College who had enrolled in and completed either English I or freshman mathematics during the fall quarter of 1973. Predictor variables were high school grade point average and SAT-Verbal and SAT-Math scores. A stepwise regression analysis showed a significant correlation between each predictor variable and the criterion variable course grade. The largest contribution was made by high school grade point average, followed by SAT-Math and SAT-Verbal. It was evident that HSGPA was the most valid predictor.

Some researchers have gone back as far as elementary school grades to try to find something that might be used to predict academic success at the college level. One team, headed by B. H. Lloyd (1980), did a comparison of student performance at the college level with their performance on their elementary achievement tests. The researchers determined that there is strong support for the idea that proficiency in elementary school, as well as high school, no matter the size, has a very significant relationship to college academic performance. This study also revealed that this relationship is generally higher for females than for males.

High school grades have consistently been found to be good predictors of future academic success; however, they have not been consistent in some studies. O'Keefe (1980) stated that high school grades are the best predictor of future academic performance. Russell (1989) found that high school grades were the best predictor for success in an individualized computer course. However, Admomanis (1989) found that HSGPA was not strongly related to students' failing the Maryland Test of Citizenship.
Skills. Funches (1967) concluded that HSGPA was not an acceptable predictor of college performance at Jackson State College, and Daunis (1988) also found HSGPA to be a poor predictor of success in entry-level college mathematics classes.

A study by Stariha (1989) examined factors influencing the achievement and interest in mathematics of college-bound high school seniors. The study used data from the College Board Admissions Testing Program's Scholastic Aptitude Test in 1982-1983. Data included SAT mathematics and verbal scores, Mathematics Achievement Test Level I or Level II scores, and analyses from the Student Descriptive Questionnaires (SDQ). The regression model for this study showed that high school grades were significant predictors of success in mathematics for students in this study; however, high school grades were not found to be significant for predicting interest in mathematics for these students.

The purpose of a study by Lott (1990) was to determine which of several selected variables can be used to predict those community college students who will be successful in developmental studies mathematics. Several variables were found to be useful in this prediction. For those students who had completed the college preparatory curriculum, high school grade point average was one of the strongest predictors for success. High school grades were also significant in the prediction of success for those who had not completed the college preparatory curriculum. Students who had graduated prior to 1988, or who had a GED, were found to have a significant relationship between academic success and the variables race and high school grades.
In her doctoral study, Burke (1991) cited the work of Suddart and Wirt (1974). These two researchers at Purdue University Lafayette Campus were able to accurately predict both short-range and long-range academic success in remedial and regular college-level English, mathematics, and chemistry classes. For correlating variables, these researchers used SAT subtest scores, high school rank, and performance on selected high school classes as predictors. Young and Sowa (1992) found high school grades and community involvement to be the best predictors of academic success for black college student athletes (Petrie, 1993).

Chesborough (1993) used a sample of 70 male scholarship athletes (football and basketball) in a study of retention. The purpose of this study was to examine the personal and social conditions described by Tinto’s theoretical model of dropout prevention that are related to three defined measures of academic success—college GPA, mathematics and English GPA, and percentage of credits passed. High school grade point average was included with a number of other predictor variables. The study revealed that high school GPA was significantly related to college GPA and mathematics and English GPA.

The primary purpose of the Clark (1994) study was to determine the relationship between high school graduates’ college placement test results and attributes that are associated with high school cognitive achievement. High school grade point average was one of several predictor variables included in this study. The results indicated that high school grade point average is an important variable that can help predict group outcomes on college placement tests.
Summary

An extensive review of the literature revealed many studies related to predicting academic success at various levels of the educational process including college level. Studies have been made to predict academic success at the college level for anything from success in a beginning course to the acquiring of a Ph.D.

Early researchers concentrated on the power of high school academic success as a predictor of academic success at the college level. Later, researchers began to add factors such as gender, economic stability of the family, parents' education, and various types of college entrance test scores and placement test scores in order to find more dependable predictive equations.

No studies using the Texas Assessment of Academic Skills Test (TAAS) as predictors of academic success at the college level were found. The results of those studies that were examined indicate that there may not be a magic formula. What seems to work at one institution, or for one purpose, does not necessarily work in the same way in other applications. The most consistent individual predictors were found to be high school grades followed by various types of achievement scores in mathematics.
CHAPTER III

RESEARCH DESIGN

Introduction

The purpose of this study was to develop a predictor equation using multiple regression analysis; therefore, a correlation-predictive design was selected. With this type of research (expost facto), it is not possible to manipulate variables or to randomly assign subjects or conditions (Kerlinger, 1964).

To develop a predictor equation using multiple regression analysis, it is necessary to have a representative sample of potential applicants for whom scores on the predictors as well as the criterion are available. The regression equation developed on the basis of the sample can then be used in predicting criterion scores for future applicants (Englehart, 1972; Pedhazur, 1982).

The advantage of multiple regression is that it indicates both the combined effects of a set of independent variables and the separate effects of each independent variable when the others are controlled (Lewis-Beck, 1980). The predictor equation for this study was developed through multiple regression multivariate analysis. The principal variables of concern were the three subtest scores (reading, writing, and mathematics) from the TAAS test. Other variables evaluated in this study were gender and high school grade point average (HSGPA). These variables were evaluated as predictors of potential
academic success of certain first-year students at Clarendon College as measured by college freshman grade point averages (GPAs).

Population/Sample

The subjects of this study were first-year students at Clarendon College, Clarendon, Texas. These students were recent graduates of Texas public high schools. Only graduates of Texas schools were considered because the TAAS scores from these graduates make up the major emphasis of the study. Additional requirements for these students included having entered Clarendon College for the fall semester after high school graduation; having enrolled in 12 or more semester hours of work with Clarendon College each semester (fall/spring) directly following high school graduation; and having progressed satisfactorily as determined by the college grade point average (GPA) and the college handbook. Satisfactory progress is defined (for full-time students) as completing 9 or more semester hours of work each semester with at least a 1.5 GPA (Clarendon College Student Handbook, 1992-1993).

Variables

The criterion variable is the GPA, each student's grade point average for the fall and spring semesters of his or her first year of college. The predictor variables include TAASW--TAAS writing test score; TAASR--TAAS reading test score; TAASM--TAAS mathematics test score; HSGPA--high school grade point average at time of graduation; and Gender--male/female.
Data Collection

The college admission records of all freshmen students entering Clarendon College for the fall semester 1992 and the fall semester 1993 were searched for the following conditions: The student’s record had to show the student to be a recent graduate of a Texas high school. The student had to be entering the freshman year of college the semester after graduating from high school. The student’s record had to show scores from all three parts of the TAAS Test, and it had to include the high school grade point average at time of graduation. The high school grades were obtained from official high school transcripts on file. TAAS scores were obtained either from high school transcripts or from separate documents in the student’s files. After selecting those students who fit the above conditions, the researcher examined their college transcripts to determine which of the students met all other requirements defined for the study. Only students who met all requirements of the study were selected to be included.

The data for this study were collected in such a way as to be non-identifiable as to a particular individual. No names or social security numbers were used. Also, data were randomly selected from the files until all files were searched.

Statistical Procedure

The data were treated to a multiple correlation/multiple regression multivariate procedure to determine the following: (a) the relationship between each predictor variable and the criterion variable; (b) the interrelationship between the predictor variables; (c) the
overall relationship between one or more predictor variables and the criterion variable; and
(d) the combination of variables that can be used to best predict the criterion variable.

Data for this study were processed through the multiple correlation/multiple regression subprograms of the Statistical Package for the Social Sciences (SPSS). The regression subprograms of SPSS combine both standard and stepwise procedures. The program calculates the means and standard deviations for all variables. It does the Pearson product-moment correlation coefficients; partial regression coefficients at each step; and the multiple R and R-squares, the standard error of estimates, the degrees of freedom, and F value at each step in the regression for all variables in the equation. The SPSS program also provides a summary output table.

Statistical Model

This research was designed to develop a predictor equation to help predict the potential academic success of certain first-year students at Clarendon College. The criterion variable was the first-year college grade point average (GPA), while the predictor variables consisted of the scores from the three parts of the Texas Assessment of Academic Skills Test (TAAS), the high school grade point average, and the gender of the student. Of particular importance was the potential value that the TAAS scores might have in predicting academic success at Clarendon College.

If a predictor equation is to be useful, and used for its intended purpose, it must be built around variables that are readily available and simple to apply. Counselors, advisors,
and the students will not expend effort to use a predictor equation unless the predictors are quickly available.

The model for statistical application in this case is the multiple regression technique. Multiple regression analysis is a powerful tool for predicting the part that various variables may play in the final outcome of a projected study. As powerful as it may be, certain precautions must be observed when one uses multiple regression analysis.

Hinkle, Wiersma, and Jurs (1988) stated that, in general, the variables selected should correlate highly with the criterion variable but have low correlation among themselves. With this restriction, including more than five or six predictor variables rarely produces a substantial increase in the multiple R. Kerlinger (1986) warned against intercorrelation among predictor variables:

If one finds three or four independent variables that are not substantially correlated with the dependent variable and are not highly correlated with each other, one is lucky. But it becomes more and more difficult to find other independent variables that are not in effect redundant with the three or four. (P. 453)

Researchers may still use (with confidence) independent variables that have correlation among themselves by controlling for extraneous variance. Pedhazur (1982) observed as follows:

Control is control of variance. Statistical control means that one uses statistical methods to identify, isolate, or nullify variance in a dependent variable that is presumably “caused” by one or more independent variables
that are extraneous to the particular relation of relations under study.

Statistical control is particularly important when one is interested in the joint or mutual effects of more than one independent variable on a dependent variable because one has to be able to sort out and control the effects of some variables while studying the effects of other variables.

(P. 98)

Multiple regression and related forms of analysis provide ways to achieve such control.

Predictor Equation

The formula for the predictor equation (using all five predictors) can be expressed as follows:

\[ Y_1 = A + B_1 X_1 + B_2 X_2 + B_3 X_3 + B_4 X_4 + B_5 X_5 \]

Where \( Y_1 \) = the predicted value of the criterion variable (GPA);

\( A \) = the regression constant (y - intercept);

\( B_1 \) = the partial correlation coefficient for TAASM;

\( X_1 \) = the actual TAASM score;

\( B_2 \) = the partial correlation coefficient for TAASR;

\( X_2 \) = the actual TAASR score;

\( B_3 \) = the partial correlation coefficient for TAASW;
\( X_3 \) = the actual TAASW score;

\( B_4 \) = the partial correlation coefficient for HSGPA;

\( X_4 \) = the actual high school grade point average;

\( B_5 \) = the partial correlation coefficient for the variable Gender;

\( X_5 \) = the Gender code.

The predictor equation shows all five predictor variables; however, in practice, a researcher may not wish to use those variables that contribute little or nothing to the strength of the prediction.
CHAPTER IV

ANALYSIS OF THE DATA

Introduction

A search of the student files provided 115 students who met all of the conditions previously defined for the study. There were 43 females and 72 males. The desired information from this sample was used to develop the prediction equations. The results of such predictions may be generalized to the population under the assumption that the data sample is a typical sample of the Texas high school graduates who normally enroll in Clarendon Junior College programs.

Findings

The collected data were processed through the SPSS statistical program to determine various desired information. The range, mean, and standard deviation of each variable in the study were determined and are illustrated in Table 1.

The criterion variable (first-year college GPA) for the study ranged from 1.55 to 4.00, with a mean of 2.838 and a standard deviation of 0.631. The predictor variable HSGPA ranged from 70.0 to 99.9, with a mean of 85.3 and a standard deviation of 6.3. Predictor variable TAASM ranged from 1390 to 2070, with a mean of 1649.4 and a standard deviation of 138.6. For predictor TAASR, scores ranged from 1450 to 2270, with a mean of 1677.4 and a standard deviation of 151.5. Predictor TAASW scores
ranged from 1410 to 2250 and had a mean of 1668.6 and a standard deviation of 148.4.

The Gender predictor ranged from 1 to 2 with a mean of 1.374 and a standard deviation of 0.486.

Table 1

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std dev</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion variable GPA</td>
<td>2.8380</td>
<td>0.631</td>
<td>1.550</td>
<td>4.000</td>
</tr>
<tr>
<td>Predictor variable HSGPA</td>
<td>85.330</td>
<td>6.267</td>
<td>70.00</td>
<td>99.900</td>
</tr>
<tr>
<td>Predictor variable TAASM</td>
<td>1649.4</td>
<td>138.58</td>
<td>1390.0</td>
<td>2070.000</td>
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<tr>
<td>Predictor variable TAASR</td>
<td>1677.4</td>
<td>151.461</td>
<td>1450.0</td>
<td>2270.000</td>
</tr>
<tr>
<td>Predictor variable TAASW</td>
<td>1668.6</td>
<td>148.353</td>
<td>1410.0</td>
<td>2250.000</td>
</tr>
<tr>
<td>Predictor variable Gender</td>
<td>1.3740</td>
<td>.486</td>
<td>1.000</td>
<td>2.000</td>
</tr>
</tbody>
</table>

In order to establish the relationship between the criterion variable and the predictor variables, Pearson product-moment correlation coefficients were found using SPSS computer subprograms. This procedure also produced the various relationships between the predictor variables. All correlations were found to be positive. This information is shown in Table 2.
Table 2

Pearson Product-Moment Correlation Coefficients for Variables GPA, HSGPA, TAASM, TAASR, TAASW, and Gender

<table>
<thead>
<tr>
<th>Correlations:</th>
<th>GPA</th>
<th>TAASM</th>
<th>TAASW</th>
<th>TAASR</th>
<th>HSGPA</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA</td>
<td>1.0000</td>
<td>.5241**</td>
<td>.3934**</td>
<td>.3160**</td>
<td>.5784**</td>
<td>.2207*</td>
</tr>
<tr>
<td>TAASM</td>
<td>.5241**</td>
<td>1.0000</td>
<td>.6335**</td>
<td>.4265**</td>
<td>.4442**</td>
<td>.1128</td>
</tr>
<tr>
<td>TAASW</td>
<td>.3934**</td>
<td>.6335**</td>
<td>1.0000</td>
<td>.3515**</td>
<td>.3520**</td>
<td>.0069</td>
</tr>
<tr>
<td>TAASR</td>
<td>.3160**</td>
<td>.4265**</td>
<td>.3515**</td>
<td>1.0000</td>
<td>.3472**</td>
<td>.1397</td>
</tr>
<tr>
<td>HSGPA</td>
<td>.5784**</td>
<td>.4442**</td>
<td>.3520**</td>
<td>.3472**</td>
<td>1.0000</td>
<td>.2268*</td>
</tr>
<tr>
<td>Gender</td>
<td>.2207*</td>
<td>.1128</td>
<td>.0669</td>
<td>.1397</td>
<td>.2268*</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Note. N of cases: 115  1-tailed Signif: * - .01 ** - .001

The highest correlation (significant at the 0.001 level) between the criterion variable (GPA) and the predictor variables was between GPA and high school grade point average (HSGPA), with a score of 0.5784. Close to this was TAASM (math scores) at 0.5241, followed by TAASW (writing), with a score of 0.3934, and TAASR (reading) with a score of 0.3160. Predictor variable Gender was significantly correlated with GPA at the 0.01 level, with a score of 0.2207. Significant interactions were also found between various predictor variables. At the 0.001 level of significance, TAASM was correlated with TAASW at 0.6335; TAASM correlated with HSGPA at 0.4442; and TAASM correlated with TAASR at 0.4265. TAASR also correlated with HSGPA at the 0.001 level, with a score of 0.2268. At the 0.01 level of significance, HSGPA and Gender correlated with a score of 0.2268. This information is shown in Table 2.
Regression Analysis

The next step in the analysis was to develop the prediction equation for predictive and counseling purposes. In order to provide the most accurate prediction equation from the available information, two regression models were developed and evaluated. One model is referred to as the restricted model and the other one as the full model. Each equation was developed by the SPSS statistical package from input of data and instructions from the programmer.

The first prediction equation (defined here as the full model) was established by the SPSS statistical package, using regular regression analysis procedures. In this procedure, all predictor variables are evaluated and appear in the prediction equation. These variables, their r-square values and partial regression coefficients (identified by B) are noted in Table 3. The r-square values listed in the table represent the approximate percentage of change accounted for in each step of the regression analysis. The partial regression coefficients (identified by B) are indicators or weights that each predictor variable has with the criterion variable and represent the expected change in the criterion variable with each unit of change in the predictor variable when all other variables are controlled. The full model equation is defined as follows: \[ Y' = -3.4908 + 0.0405 (HSGPA) + 0.0013 (TAASM) + 0.1168 (Gender) + 0.0002 (TAASW) + 0.0001 (TAASR). \]
Table 3

Full Model Multiple Regression Analysis (N=115)

| Multiple R | .65826 |
| R Square   | .43331 |
| Adjusted R Square | .40731 |
| Standard Error  | .48540 |

Analysis of variance

<table>
<thead>
<tr>
<th>DF</th>
<th>Sum of squares</th>
<th>Mean square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>5</td>
<td>19.63702</td>
</tr>
<tr>
<td>Residual</td>
<td>109</td>
<td>25.68170</td>
</tr>
</tbody>
</table>

\[ F = 16.66895 \quad \text{Signif } F = .0000 \]

---- Variables in the equation ----

<table>
<thead>
<tr>
<th>Variable</th>
<th>( B )</th>
<th>SE B</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.116784</td>
<td>.096326</td>
<td>.090011</td>
<td>1.212</td>
<td>.2280</td>
</tr>
<tr>
<td>TAASW</td>
<td>2.256448E-04</td>
<td>4.00289E-04</td>
<td>.053093</td>
<td>.564</td>
<td>.5741</td>
</tr>
<tr>
<td>TAASR</td>
<td>8.384855E-05</td>
<td>3.40793E-04</td>
<td>.020142</td>
<td>.246</td>
<td>.8061</td>
</tr>
<tr>
<td>HSGPA</td>
<td>.040463</td>
<td>.008429</td>
<td>.402156</td>
<td>4.801</td>
<td>.0000</td>
</tr>
<tr>
<td>TAASM</td>
<td>.001333</td>
<td>.56562E-04</td>
<td>.293044</td>
<td>2.920</td>
<td>.0043</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-3.490846</td>
<td>.740217</td>
<td></td>
<td>-4.716</td>
<td>.0000</td>
</tr>
</tbody>
</table>

A second prediction equation (defined here as the restricted model) was developed by a SPSS subprogram using the stepwise regression analysis procedure (previously defined in this study). Those predictor variables contributing insufficient \( F \) levels or tolerance levels were rejected by the computer program and are not included in the prediction equation. For this study the predictor variables Gender, TAASW, and TAASR
were rejected by the stepwise procedure for inclusion in the prediction equation. Only predictors HSGPA and TAASM were found to be significant for inclusion in this equation. These variables, their $r$-square values and partial regression coefficients (identified as B) are noted in Table 4. The $r$-square values listed represent the proportion of variation in the criterion variable that can be explained by the linear combination of the predictor variables. The partial regression coefficients (identified by B) are indicators or weights that each predictor variable has with the criterion variable and represent the expected change in the criterion variable with each unit change in the predictor variable when all other variables are controlled. The restricted model equation is defined as: $Y' = -3.35557 + 0.0433 \text{(HSGPA)} + 0.0015 \text{(TAASM)}$.

Evaluating the Prediction Equations

In order to determine the strength and usefulness of the prediction equations, they were tested and evaluated, using data from the freshman class at Clarendon Junior College for the 1994-1995 school year. Only data from students fitting the model used to establish the prediction equations were used in this evaluation.

Table 4

<table>
<thead>
<tr>
<th>Restricted Model Multiple Regression Analysis (N=115)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple R</td>
</tr>
<tr>
<td>R Square</td>
</tr>
<tr>
<td>Adjusted R Square</td>
</tr>
<tr>
<td>Standard Error</td>
</tr>
</tbody>
</table>
### Analysis of variance

<table>
<thead>
<tr>
<th></th>
<th>DF</th>
<th>Sum of squares</th>
<th>Mean square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2</td>
<td>19.19147</td>
<td>9.59573</td>
</tr>
<tr>
<td>Residual</td>
<td>112</td>
<td>26.12725</td>
<td>.23328</td>
</tr>
</tbody>
</table>

\[ F = 41.13414 \]  \text{Signif } F = 0.0000

### Variables in the equation

<table>
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<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAASM</td>
<td>0.001514</td>
<td>3.64354E-04</td>
<td>.332786</td>
<td>4.156</td>
<td>.0001</td>
</tr>
<tr>
<td>HSGPA</td>
<td>0.043325</td>
<td>0.008057</td>
<td>.430600</td>
<td>5.377</td>
<td>.00000</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-3.355674</td>
<td>0.684670</td>
<td>-4.901</td>
<td>0.00000</td>
<td></td>
</tr>
</tbody>
</table>

### Variables not in the equation

- TAASW
- TAASR
- Gender

Fifty-two students from this class were found to fit the model used to develop the prediction equations. The required data from these students' files were read into each prediction equation and a prediction made. The results of the predictions using the full model prediction equation are displayed in Table 5. The table shows the earned GPA for the first year of college, the predicted GPA from the equation, the difference between the predicted and earned GPAs, those earned GPAs falling within one standard error of the prediction, those earned GPAs falling within two standard errors of the prediction, and those earned GPAs falling outside of two standard errors of the prediction.
Table 5

Earned First Year College GPAs Compared to Predicted GPAs Using the Full Model Predictor Equation (N=52)

<table>
<thead>
<tr>
<th>Earned GPA</th>
<th>Predicted GPA</th>
<th>Difference</th>
<th>1-SE</th>
<th>2-SEs</th>
<th>Over 2-SEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.68</td>
<td>3.10</td>
<td>0.42</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.64</td>
<td>2.79</td>
<td>1.15</td>
<td>------</td>
<td>------</td>
<td>***</td>
</tr>
<tr>
<td>2.92</td>
<td>2.50</td>
<td>0.42</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.75</td>
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<td>------</td>
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</tr>
<tr>
<td>4.000</td>
<td>2.92</td>
<td>-1.08</td>
<td>------</td>
<td>------</td>
<td>***</td>
</tr>
<tr>
<td>3.06</td>
<td>3.54</td>
<td>0.48</td>
<td>*</td>
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<tr>
<td>2.54</td>
<td>2.89</td>
<td>0.35</td>
<td>*</td>
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<td></td>
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<tr>
<td>1.89</td>
<td>2.49</td>
<td>0.60</td>
<td>------</td>
<td>**</td>
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</tr>
<tr>
<td>3.00</td>
<td>3.20</td>
<td>0.20</td>
<td>*</td>
<td></td>
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</tr>
<tr>
<td>3.11</td>
<td>3.18</td>
<td>0.17</td>
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<td></td>
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<tr>
<td>2.68</td>
<td>3.10</td>
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<td>*</td>
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<td>2.65</td>
<td>-0.61</td>
<td>------</td>
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<tr>
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<td>2.18</td>
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<td>3.11</td>
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<td>---</td>
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<td>2.81</td>
<td>0.22</td>
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<tr>
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<td>2.72</td>
<td>2.17</td>
<td>-0.55</td>
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<tr>
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<td>0.94</td>
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</tr>
<tr>
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<td>2.30</td>
<td>0.15</td>
<td>*</td>
<td></td>
<td></td>
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<tr>
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<td>3.13</td>
<td>-0.71</td>
<td>-----</td>
<td>**</td>
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</tr>
<tr>
<td>2.07</td>
<td>3.24</td>
<td>1.17</td>
<td>-----</td>
<td>-----</td>
<td>***</td>
</tr>
<tr>
<td>3.63</td>
<td>3.30</td>
<td>-0.33</td>
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<td>2.37</td>
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<td>2.34</td>
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<td>0.14</td>
<td>*</td>
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<tr>
<td>2.29</td>
<td>2.85</td>
<td>0.56</td>
<td>-----</td>
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<td>2.27</td>
<td>2.80</td>
<td>0.53</td>
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<td>1.58</td>
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<td>*</td>
<td></td>
<td></td>
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<td>2.00</td>
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<td>0.68</td>
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<tr>
<td>3.39</td>
<td>3.02</td>
<td>-0.37</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5 indicates that 32 (62%) of the earned GPA scores fell within one standard error of the predicted GPA scores. Another 16 (31%) of the earned GPA scores fell within two standard errors of the predicted GPA scores; and 4 (7%) of the earned GPA scores fell outside of two standard errors of the predicted GPA scores.

Table 6 shows the results of the prediction process using the restricted model prediction equation. This table shows the earned GPAs, the predicted GPAs, the difference between the earned and predicted GPAs; and those earned GPAs falling within one standard error, within two standard errors, and those falling outside two standard errors of the predicted GPAs. The table shows that 31 (60%) of the earned GPAs fell within one standard error of the predicted GPAs. Another 17 (33%) of the earned GPAs fell within two standard errors of the predicted GPAs; and 4 (7%) of the earned GPAs fell outside of two standard errors of the predicted GPAs.
Table 6

Earned GPAs of First-Year College Compared to the Predicted GPAs Using the Restricted Model Equation (N=52)

<table>
<thead>
<tr>
<th>Earned GPA</th>
<th>Predicted GPA</th>
<th>Difference</th>
<th>1-SE</th>
<th>2-SEs</th>
<th>Over 2-SEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.68</td>
<td>3.07</td>
<td>0.39</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.64</td>
<td>2.78</td>
<td>1.14</td>
<td>------</td>
<td>------</td>
<td>***</td>
</tr>
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Testing Hypotheses

The SPSS statistical package performs various tests and provides readouts of such tests according to the users's wishes. These tests include the E test to determine whether the multiple R is statistically significant and the t test to determine the relative importance of each predictor variable. A significant value for each test is also given. In each case the hypothesis is tested in the null. Table 4 illustrates these values for the full model multiple regression analysis.

An examination of Table 3, the full model regression analysis, indicates that Multiple R = 0.65826. To test the significance of this score we use the F distribution with 5 and 109 degrees of freedom. Testing the null hypothesis for Multiple R (population) = 0 gives an E value of 16.66895. Assuming a significance level of 0.05, the critical value of E is less than 3.00. The computed value of $E = 16.66895$ exceeds the critical value, which leads to a rejection of the null hypothesis. The probability statement is that the probability that $R = 0.65826$ would have occurred by chance, if the null hypothesis were true, is less than 0.05. The significant E value = 0.0000, which indicates that the probability is actually less than 0.0001. Thus, we conclude that, in the population, the correlation between the

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Note. Standard Error = 0.48
criterion variable (GPA) and the combined predictor variables (HSGPA, TAASM, TAASW, TAASR, and Gender) is different from zero. 

The relative importance of each predictor variable was evaluated using the $t$ test. Assuming a significance level of 0.05, the critical value of $t$ for 109 degrees of freedom is 1.984.

**Hypothesis 1.** There is a functional relationship between TAASM and GPA. The null hypothesis is that there is no functional relationship between TAASM and GPA.

Since the computed value ($t = 2.920$) for this hypothesis exceeds the critical value of 1.984, the null hypothesis is rejected. The associated probability statement would be that the probability that the regression coefficient of 0.001333 for TAASM would have occurred by chance, if the null hypothesis were true, is less than 0.05. The printout indicates that the "significant $t$" is actually 0.0043.

**Hypothesis 2.** There is a functional relationship between TAASW and GPA. The null hypothesis is that there is no functional relationship between TAASW and GPA.

Since the computed value ($t = 0.564$) for this hypothesis is less than the critical value of 1.984, the null hypothesis would not be rejected. The associated probability statement would be that the regression coefficient of 0.00026 for TAASW would have occurred by chance, if the null hypothesis were true, is greater than 0.05. The printout indicates that the "significant $t$" is actually 0.5741.
Hypothesis 3. There is a functional relationship between TAASR and GPA. The null for 3: There is no functional relationship between TAASR and GPA.

Since the computed value ($t = 0.246$) for this hypothesis is less than the critical value of 1.984, the null hypothesis would not be rejected. The probability statement would be that the probability of the regression coefficient of 0.0000838 for TAASR would have occurred by chance, if the null hypothesis were true, is greater than 0.05. The printout indicates that the “significant $t$” is actually 0.8061.

Hypothesis 4. There is a functional relationship between HSGPA and GPA. The null for 4: There is no functional relationship between HSGPA and GPA.

Since the computed value ($t = 4.801$) exceeds the critical value of 1.984, the null hypothesis would be rejected. The associated probability statement would be that the probability of the regression coefficient of 0.040463 for HSGPA would have occurred by chance, if the null hypothesis were true, is less than 0.05. The printout indicates that the “significant $t$” is actually 0.0000.

Hypothesis 5. There is a functional relationship between Gender and GPA. The null for 5: There is no functional relationship between Gender and GPA.

Since the computed value ($t = 1.212$) is less than the critical value of 1.984, the null hypothesis would not be rejected. The associated probability statement would be that the probability that the regression coefficient of 0.116784 for Gender would have occurred by chance, if the null hypothesis were true, is greater than 0.05. The printout indicates that the “significant $t$” is actually 0.2280.
Thus, one may conclude that, in the population, the $t$ values for the predictors TAASM and HSGPA indicate that they are significant contributors to the regression, but that TAASW, TAASR, and Gender are not. Therefore, TAASW, TAASR, and Gender can be dropped from the equation.

If TAASW, TAASR, and Gender are dropped from the prediction equation, the entire solution must be redone using only predictors TAASM and HSGPA. This was accomplished when the stepwise procedure was used in developing the restricted model prediction equation.

Summary

Only students meeting all standards defined for the study were selected to be included in the study. All data collected were compatible with the multiple correlation/multiple regression technique. Of the students, 115 were selected to be in the sample used to develop the prediction equations. Data from 52 students were selected to test and evaluate the equations for predictive strength and usefulness. A stepwise multiple correlation/multiple regression analysis produced a Pearson R correlation coefficient matrix of all variables involved. Significant correlations were identified for both the 0.001 and the 0.01 levels of confidence.

Two prediction equations were developed (each using the SPSS statistical package). One prediction equation, defined as the full model, used all five predictor variables defined for the study. The second prediction equation, generated through a
stepwise procedure, used only predictors HSGPA and TAASM in the final output. The two equations provided approximately equal prediction strengths.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Study

An extensive search of the literature indicated that predictive studies are popular. The literature also indicated that the subject matter of these studies is broad and extensive. This researcher was interested in predictive research related to academic success at the college level. Many of these studies are cited in the body of this paper.

The earliest of these studies tended to concentrate on high school grade point averages and the male student. Later studies included the female student and a wide range of predictive variables. Most recent studies have almost always included Gender whenever appropriate and practical.

This study is similar to many of the studies cited in the review of literature in that it is predictive in nature; however, it is different also. This study was especially designed to test the predictive power of the Texas Assessment of Academic Skills (TAAS) subtest mathematics scores (TAASM), subtest reading scores (TAASR), and subtest writing scores (TAASW) for first-year Clarendon College students in Clarendon, Texas. No record of studies dealing with the predictive power of these TAAS scores was found in the literature search.
The purpose of this study was to develop a prediction equation that could be of benefit in counseling prospective students for Clarendon College. The major impetus was to develop an instrument that might predict first-year college academic achievement immediately following high school graduation.

First-year college grade point average (GPA) was chosen as the criterion, or dependent variable, to be used as the measure of academic achievement. The predictor, or independent variables, chosen for this study included the three parts of the Texas Assessment of Academic Skills Test (TAAS), which are defined in this study as TAASM (mathematics), TAASR (reading), and TAASW (writing). High school grade point average and the sex of the student were also selected as predictor variables. TAAS scores were selected to be included in this study for two major reasons. One is that this researcher has had a long-term interest in the predictive powers of such a required test. Also, these scores are readily available to the high school counselor, the college counselor, the parents, and the students. High school grade point average and Gender of the student also fit the test of availability. Information on predictor variables must be readily available if they are to be used.

Review of the Procedure

Within standards defined for the study, certain data were gathered from the records of students who entered Clarendon College for the fall semesters of 1992 and 1993. Of these students, 115 were found fully to fit the model defined for the study, and,
therefore, become the study sample. Data from these students’ files were used to develop
the prediction equations.

A correlation/predictive design was chosen for the study. All data pertinent to the
study were subjected to a frequency subprogram of a multiple correlation multiple
regression analysis to obtain various statistics for the development of a student profile.
All data were subjected to a multiple correlation/multiple regression analysis to determine
the predictor variable or combination of predictor variables that could be used to most
accurately predict first-year GPA’s for Clarendon College students. From this
information, two prediction equations were developed to predict first-year GPAs for
Clarendon College students. The first prediction equation, called the full model, utilized
all five predictor variables. The second prediction equation, referred to as the restricted
model, was generated by a stepwise procedure command and ended with only two
predictor variables (HSGPA and TAASM). The predictive power or usefulness of the
equations was evaluated using data from certain freshmen students who entered Clarendon
College the fall semester of 1994. Of these students, 52 were found to fit the model
previously designed for the study. The required information from these students’ files was
entered into each prediction equation, and a prediction of first-year college GPA was
attained.

The SPSS statistical package tested all hypotheses in the null and provided all
statistics necessary to analyze and interpret the data. The means, standard deviations,
Pearson product correlation coefficients, stepwise processing of each variable, regression
analysis, and summary output tables were provided for each variable. The summary
output tables provided all necessary values for determining the amount of variance accounted for by each predictor variable. Also, the tables provided all necessary values to establish the prediction equations.

Conclusions

The high school grade point average (HSGPA) was positively correlated with GPA at the 0.001 level of confidence and was identified as the single most important predictor variable in this study, with a 0.5784 correlation. The results of this study are similar to other studies using this predictor variable. The literature indicated that, almost without exception, high school grades are the single best predictor of future academic success. The statistical test for this variable led to the rejection of the null hypothesis relating to no functional relationship between HSGPA and GPA.

The TAASM (math scores) ranked second in this study with a 0.5241 correlation at the 0.001 level of confidence. Although one might suspect that math scores would be good predictors, the literature does not support such thinking. The literature indicated that many different types of math scores have been used in various applications. The results have varied from having little influence in the general education area to being important in predicting success in the sciences, mathematics, engineering, and technology. For this study it can be concluded that TAASM (math scores) is a significant predictor of future academic success. Therefore, the null hypothesis relating to no functional relationship between TAASM (math scores) and GPA was rejected.
The literature indicated that writing skills greatly influence outcomes in areas where writing composition is required. At the same time, these skills have not been found to greatly influence outcomes in which writing composition is not required. This particular study found TAASW (writing) correlated with GPA at 0.3934 significant at the 0.001 level. The null hypothesis relating to no functional relationship between TAASW (writing) and GPA was not rejected. Therefore, it may be assumed that TAASW (writing) is not a significant predictor of GPA when used in conjunction with the other four predictors.

The TAASR (reading) was also correlated at the 0.001 level of confidence with GPA, with a correlation of 0.3160. This researcher had a preconceived idea that TAASR (reading) would be a much stronger predictor than it was in this study. The literature showed that reading skills are generally significantly related to academic success. For this study, predictor variable TAASR (reading) did not make a strong showing when used in conjunction with the other four predictor variables. The null hypothesis relating to no functional relationship between TAASR and GPA was not rejected.

The literature shows that predictor variable Gender is an inconsistent overall predictor. It is much like writing skills. In certain applications variable Gender is very strong, whereas in other applications it has no measurable bearing on the outcome. In this study variable Gender correlated with GPA at the 0.01 level, with a correlation of 0.2207. In this study the variable Gender was not a significant predictor when used in conjunction with the other four predictors. The null hypothesis relating to no functional relationship between Gender and GPA was not rejected.
Two prediction equations were developed through this study. Results of the study showed both equations to be sufficiently powerful for use in the counseling and admission processes for prospective Clarendon College students. However, neither of the equations predicted a failure among the students used in evaluating the equations, although there were some.

While statistically significant, neither of the resulting prediction equations for this study proved, from a practical sense, to be the ideal predictor of academic success for first-year students at Clarendon College. However, these equations and the study are hereby offered to the general body of knowledge.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. It is recommended that the present study be replicated at Clarendon College over a number of years. A longitudinal study has the potential to verify these results.

2. It is recommended that additional predictor equations be developed for Clarendon College, with the addition of predictor variables to those that were used. A good starting point would be to add SAT/ACT test scores and college placement scores.

3. It is recommended that studies using log-linear models be made. This will make it easier to find relationships among variables that are categorical in nature.

4. It is recommended that studies be made to include out-of-state students at Clarendon College. This would require a different design from the study made, especially in terms of predictor variables.
5. It is recommended that studies using discriminant analysis be made. This will allow a more generous use of predictor variables that fall in the nominal and ordinal scale of measurement. Many of these variables may be important in predicting how a person may respond in a particular situation.

6. It is recommended that future studies might include some combination of the following variables: housing (campus/off campus), married/single, full- or part-time student, self-concepts, self-appraisal, leadership ability, availability of a support person/s, preference of long-term goals to short-term or immediate needs, definition of occupational choices, and financial aid/no financial aid.
REFERENCES


