THE PREDICTIVE VALIDITY OF THE SHORT TEST OF EDUCATIONAL ABILITY FOR THREE VIRGINIA COMMUNITY COLLEGES

by

Roland McKinley Biesecker

Dissertation submitted to the Graduate Faculty of the

Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

in

Counseling and Student Personnel Services

APPROVED:

_____

T. H. Hohenshil, Chairman

_____	_____
J. L. Hoerner	C. O. McDaniels
_____	_____
J. M. Miles	S. A. Tschumi

May 1977

Blacksburg, Virginia

ACKNOWLEDGEMENTS

This writer wishes to communicate sincere appreciation to the people whose assistance made this research endeavor possible.

Special recognition is extended to the following: Dr. Tom Hohenshil, Major Professor, for his support of, confidence in, and concern for the writer.

Dr.'s Jim Hoerner, Carl McDaniels, Johnnie Miles, and Sally Tschumi, the remainder of the doctoral advisory committee, for their suggestions, recommendations, and persistence necessary to produce a dissertation to be proud of.

Dr. John Clem, a good friend and a just employer, for his consistent encouragement and his genuine interest in the successful completion of this dissertation.

Dr. Jack Lewis, for his personal time sacrificed in processing the data and for providing technical assistance toward understanding the Statistical Analysis System.

Dr. Edie Carter, for her technical assistance in analyzing the data and for her constant encouragement.

Dr. Flo Graham, for her expertise at proofreading the drafts and for being a good friend and a steady supporter.

Mrs. Sharon Moore, Ms. Debra Bond, and Mrs. Sherry Williams, the typists, who cooperated superbly and worked diligently to meet deadlines.

Rita Dixon, Ron Harriman, Peggy McConnell and Joe Sheffey for their loyal friendship and their steadfast encouragement.

Finally, to this writer's family great appreciation is expressed.

To his parents, Mr. and Mrs. Homer Charles Biesecker, who always encourage their two sons to be responsible and do their best, although hard work be involved.

To his wife, Windon, whose love, patience, understanding, and desire for him to succeed never failed in the pursuit of this degree.

To his children, Sally and Ann, who never really understood what "Daddy" was doing, but whose smiles, giggles, and love made it all worthwhile.

R.M.B.

TABLE OF CONTENTS

LIST OF TABLES

Table | Page

Chapter 1

Introduction

Within the framework of nearly every community college is a division which houses the counseling staff. Generally, as part of the student personnel services division, counseling is considered an important function of the college. Counselors are continually confronted with the difficult task of assisting students to choose from one of the various curricula.

For many adults money and time are limited, and the curricular decision is of the utmost importance. The counselor and student need as much information as possible to make well informed choices.

Standardized test data have been frequently utilized by counselors to provide students with information to assist them in career planning. Wattenbarger (1972) urged a realistic appraisal of students' past and present performance when selecting a career. Past performance data include academic records which reveal standardized test information. Present performance evaluations will most likely include the administration of a standardized test to determine the students' scholastic aptitude.

Before the decision to assess the scholastic aptitude of students and to assist students in selecting a course or curriculum, the scholastic aptitude test's predictive validity should be determined. Anderson (1971) stressed the importance of institutions substantiating the predictive validity of their testing programs.

Defining prediction, Willingham (1973) stated that "prediction is a formal methodology for dealing with various types of alternative decisions in student guidance (p. 136) . . . . [and] guidance is a process of evaluating alternatives" (p. 348).

Furthermore, Cronbach (1970) concluded that the purpose for pursuing the predictive validity of a student appraisal instrument should be to enable a counselor to increase the probability of a student's achievement. Examples of predictable and measurable categories of achievement that could clue the counselor to the student's potential performance are: the student's chances of graduating from college, the projected initial grade point average received the first quarter or semester in college, or a projected grade in a freshmen course. The chances in each category would be determined by a validity study of the criteria. Also, Cronbach (1971) stated that "testing is intended to reduce the number of incorrect predictions and hence the number of decisions that will be regretted later" (p. 448).

Regarding prediction, Dobbin and Turnbull (1965) called for "local validation of high school records and test data as predictors of academic success" (p. 22), in college courses. Similarly, Monroe (1972) condemned colleges which allow potentially useful secondary school academic data, currently housed in student records to be neglected.

In addition, Hinko (1971) found that on a majority of community college campuses, between five and ten percent of counselor

time was utilized by testing. With limited time available for this function, counselors need to have tests that have been determined as valid for the population being assessed.

Rationale

Testing for curriculum placement in the Virginia Community College System (VCCS) was studied from 1969 to 1973 by an ad hoc committee composed of a representative from each community college in the Commonwealth. The final conclusion reached by this committee was placed in the current community college system's policy manual. The conclusion reached was that "each college is required to present a plan . . . which will provide for proper course and curricular placement and which will assure serious attention to the validity, reliability, and practicality of whatever placement instruments are used" (Virginia Community College System Policy Manual, 1975, pp. 6-19). The manual does not dictate which instrument to use for placement purposes. In reviewing standardized test instruments to appraise interests and aptitudes of students and to eventually place junior college students, Opitz and Reed (1970) found only three suitable tests to study for possible use in the Virginia Community College System. They were: the American College Test, the Comparative Guidance and Placement Profile, and the Junior College Placement Profile. Likewise, the lack of standardized tests for junior colleges was pointed out by Monroe (1972). Similarly, Seibel (1967b) stated that many junior colleges are attempting to use data for counseling purposes from standardized tests

designed for four year institutions. Prior to the policy manual of 1975, in an attempt to find the best predictors for community college success, the scores received from the Comparative Guidance and Placement Test (CGP), the Sequential Tests of Educational Progress (STEP), and the School and College Ability Tests (SCAT) were used.

STEP (an achievement test) and SCAT (an aptitude test) are instruments administered to high school students in the eleventh grade, and the CGP (an aptitude and vocational interest battery) is administered to potential VCCS students either in their senior year at their high school or in large groups at the college in the summer prior to fall admission.

In 1973, the Board of Education for the Commonwealth of Virginia decided to discontinue use of STEP and SCAT. Due to expense, the time required to score, and the lengthy testing session, some of the Virginia Community Colleges also discontinued testing with the CGP.

The Science Research Associates' (SRA) Iowa Test of Educational Development and the Short Test of Educational Ability (STEA) were adopted by the Commonwealth (K-12). Currently, Level 5 of the STEA is administered to all high school students in the eleventh grade. The STEA score is transmitted to the college along with the student's high school transcript. According to SRA (1972) "The STEA series is designed to meet a specific information need--assessment of the student's present academic aptitude" (p. 72).

If a scholastic aptitude test is to be utilized as a placement tool for students in a community college setting, college officials

must understand what the test reveals and decide how the test results will be utilized. However, in this decision-making process college administrators must be aware of the academic needs and backgrounds of the two-year college student.

Willingham (1974) expressed an initial interest of the community college was to identify students who probably will have difficulty succeeding in college courses. Identification of these students was possible by using a scholastic aptitude test, but Cross (1971) contended the role of aptitude tests "will be used to help the student and not judge him" (p. 125).

The uniqueness and special academic needs of the community college student are to be considered in deciding what emphasis to place on the use of a scholastic aptitude test score. According to Janzen (1970), Johns (1970) and Preas (1969), if a scholastic aptitude test score is to be used as a part of the placement criteria, it should be used in assisting the student to select a course of study that is "congruent with his ability" (Preas, 1969:p. 1). Cross (1971), Hoyt (1966), Hoyt and Mundy (1969), Monroe (1972), Morrison and Ferrante (1973), Munday (1968) and O'Banion and Thurston (1972) each showed that the academic backgrounds of the students enrolling in community colleges are quite different from those who enroll in other types of colleges. Therefore, these students' placement into college courses require special attention. When testing the abilities of these students extreme caution should be observed in the interpretation of the scores. The test results are not to be used as absolutes in

deciding a student's enrollment (Collins, 1969). The best predictor of college achievement according to Cross (1971) is the test that measures the necessary skills utilized in the classroom. The ability to read and write are two of the classroom skills that directly influence students' grades, as defined by Lunneborg and Lunneborg (1969). These are appraised by aptitude testing, which measures ones' potential ability for achievement.

Therefore, the task before the Virginia Community Colleges is to identify an instrument that is efficient in forecasting a student's potential ability for achievement in college. Of utmost importance is the commitment to students that the test results will not be used as an absolute in deciding their future.

The Problem

As previously evidenced, the VCCS has mandated its institutions to develop guidelines for the course and curricular placement of students. The scores from the Short Test of Educational Ability are currently available to all community colleges in Virginia. This test score is potentially useful for placement purposes, but its efficiency at grade point average prediction for VCCS students has not been investigated. Therefore, this study researched the STEA, utilizing a population of VCCS students, to validate its predictability for fall quarter grade point averages.

Purpose of the Study

The Short Test of Educational Ability (STEA) is a scholastic aptitude test score available to all Virginia Community Colleges. The STEA score is currently transmitted to the college via the student's high school transcript. Because The 1975 VCCS Policy Manual requires a validity study of potential curricular placement tools, it was the purpose of this study to determine the STEA's validity for predicting a student's 1976 fall quarter grade point average using three VCCS institutions. These institutions represent colleges located in metropolitan and suburban cities and a rural town.

More specifically, the following research questions were designed to initiate the study.

1. To what extent can the first quarter g.p.a. in college be predicted from the STEA for students at three community colleges?

2. To what extent can the first quarter g.p.a. in community college be predicted for males and females from the STEA for each college?

3. To what extent can the first quarter g.p.a. in community college be predicted for white and non-white students from the STEA?

4. To what extent can the first quarter g.p.a. be predicted for students in each community college enrolled in either the college parallel curriculums or occupational technical curriculums from the STEA?

5. To what extent can the first quarter g.p.a. average at each community college be predicted for students from the STEA in combination with total high school g.p.a. and high school English grades?

6. To what extent can the first quarter g.p.a. be predicted for students at each community college from the STEA in combination with total high school g.p.a. and high school math grade?

7. To what extent can the first quarter g.p.a. be predicted for students at each community college from the STEA in combination with total high school g.p.a., high school math grade, and high school English grade?

8. To what extent can the first quarter g.p.a. be predicted for students at each community college from the total high school g.p.a., high school math grade, and high school English grade?

Significance of the Study

Significant relationships among the grade point averages, the students' high school data, and the Short Test of Educational Ability will provide the community colleges with the required predictive information for the colleges' placement programs. All community colleges will be informed of significant findings.

From the study's results, a regression equation and a prediction table can be established for first quarter grade point averages. College officials can decide when to refer a student to a developmental program or when to recommend a student for advanced placement. Students

can make realistic decisions regarding their course of study when provided predictive information.

The STEA can provide data that might be duplicated by the counselor in administering, scoring, and interpreting additional aptitude tests to groups or individuals. More of the counselor's time will be available for one-to-one or group counseling relationships.

Also, an evaluation of a student's potential grade point average can be made from the STEA; however, no Virginia Community College is using this information for predictive purposes. Finally, by using the STEA score, additional scholastic aptitude testing sessions and student expense for testing can be eliminated.

However, if non-significant relationships exist between STEA and the variables, the Short Test of Educational Ability should be questioned as a placement tool, and the State Board of Education of the Commonwealth of Virginia should be informed of the findings. Community colleges should continue the search for an instrument that has the possibility of predicting the first quarter grade point average in view of the requirements made by the Virginia Systems' administration.

Limitations of the Study

First quarter students who were 1976 Virginia high school graduates enrolled at three Virginia Community Colleges were selected for this study. For purposes of this study a metropolitan, a suburban, and a rural institution were selected. The study's sample was randomly

selected from first quarter 1976 Virginia high school graduates enrolled for the 1976 fall term at each community college. Therefore, the results should be generalized to only similar populations.

Definition of Terms

The following terms are pertinent to and are defined for use in this study.

1. Fall Quarter Grade Point Average - The numerical figure provided by the colleges' data processing centers. Taken into consideration are the student's credit hours attempted and grades received during fall quarter. The grade point average is based on a standard four-point scale of 4.00 equaling an "A" and 1.00 equaling a "D."

2. High School Courses - The last English and mathematics courses completed. The courses could have been completed in grade nine through grade twelve.

3. Scholastic Aptitude Test - General academic ability tests measuring one's ability in the verbal, numerical, and reasoning skills. Scholastic aptitude tests discussed are the American College Test, the Scholastic Aptitude Test, the Cooperative School and College Ability Test, the Comparative Guidance and Placement Test, the Washington Pre-College Differential Test, the Regents Scholarship Exam and the Short Test of Educational Ability.

4. Predictive Validity - "A straightforward empirical check on the value of a test" (Cronbach, 1972:p. 122). The value of the Short Test of Educational Ability for predicting community college

students' fall quarter grade point averages will be empirically examined in this study.

5. Standard Metropolitan Statistical Area (SMSA) - "A county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more, or 'twin cities' with a combined population of at least 50,000. In addition to the county, or counties, containing such a city or cities, contiguous counties are included in an SMSA if . . . they are socially and economically integrated with the central city." (U.S. Bureau of Census, p. App - 4)

6. Metropolitan Community College - A college that serves counties within a standard metropolitan statistical area, and the city housing the college has more than 100,000 inhabitants. In this study this city's population is 415,534 (1970 census).

7. Suburban Community College - A college that serves counties within a standard metropolitan statistical area, and the city housing the college has between 50,000 and 100,000 inhabitants. The college used as a suburban institution is located in a city of 70,751 inhabitants (1970 census).

8. Rural Community College - A college that serves no standard metropolitan statistical area.

9. Virginia Community College - A college which operates under the policies established by the Virginia State Board of Community Colleges and is so defined in The 1975 Virginia Community College System Policy Manual as a comprehensive community college (see

definition number 10). Three of these institutions were selected to represent a metropolitan, a suburban, and a rural campus.

10. Virginia Community College System (VCCS) - A network of comprehensive community colleges located throughout the Commonwealth of Virginia administered by the Virginia State Board of Community Colleges. As defined by the Code of Virginia Title 23-214 a

> Comprehensive community college means an institution of higher education which offers instruction in one or more of the following fields:
> (a) freshman and sophomore courses in arts and sciences acceptable for transfer in baccalaureate degree programs,
> (b) diversified technical curricula including programs leading to the associate degree,
> (c) vocational and technical education leading to employment,
> (d) courses in general and continuing education for adults in the above fields. (1975 Virginia Community College System Policy Manual, preface)

11. Occupational-Technical Curriculum - A VCCS program of study that awards an Associate in Applied Science Degree, or a certificate, or a Diploma upon its completion.

12. College-Parallel Curriculum - A VCCS program of study that awards an Associate in Science or an Associate in Arts degree upon its completion.

13. Non-Curricular - A classification of VCCS students who have not declared a program of study.

Summary and Organization of the Study

Virginia Community College administrators were urged in The 1975 VCCS Policy Manual to review course and curricular placement

methodology. Implicit in this review is the need to find a scholastic aptitude measure for use in the curricular advising of students. The results of a scholastic aptitude test administered in the eleventh grade, the STEA, is included in each high school transcript transmitted to a college; however, it has not been validated for Virginia Community College students to determine its efficacy at prediction of grade point average. This investigation is the first attempt to determine the predictive validity of the STEA within the VCCS.

In Chapter 1 the problem was introduced followed by the description of purpose and the study's limitations. The significance of the investigation was addressed, and the terms used throughout the study were operationally defined. Chapter 2 presents a selected literature review dealing with studies of prediction using standardized tests of scholastic aptitude. Chapter 3 includes the hypotheses, procedures for obtaining the samples, and the data for the study. Also, detailed information regarding statistical procedures used is discussed. The test publisher's research data for the Short Test of Educational Ability are included in Chapter 3. The results will be discussed in Chapter 4, followed by the study's conclusions in Chapter 5.

Chapter 2

Review of the Literature

This chapter offers a selective and representative review of the relevant literature needed to provide a research background for this study. It was compiled from independent library research and two computer-assisted searches by the Educational Resources Information Center. Introducing the chapter is a summary of a 1970 College Entrance Examination Board's testing commission. Supporting the testing commission's findings are studies conducted using two widely known standardized scholastic aptitude tests. Sections on the predictability of grades according to one's sex, race, and curriculum are followed by studies of grade prediction at two year institutions. The final topic addressed in this chapter is a summary of the research available on the Short Test of Educational Ability.

The Commission on Tests

The Commission on Tests was organized by the College Entrance Examination Board to study the current status of testing. One of its findings which is most pertinent to this study indicated that

> Aptitude tests . . . could be useful at or after college entrance in selecting, placing, or advising students . . . . Experiments indicated that although high school grades were as might be expected nearly always the best single predictor of college grades, adding aptitude scores to high school grades increased the accuracy of prediction. (College Entrance Examination Board, 1970:p. 17)

Specific studies were sought supporting this statement of The Commission on Tests. The following literature review was conducted using two widely administered instruments for measuring scholastic aptitude.

Using the Scholastic Aptitude Test (SAT) Dobbin and Turnbull (1965), Fincher (1974), Flora (1967), Floyd (1967), Lanier and Lightsey (1972), Stanley (1971), and Thomas (1971) found the initial college grade point average of students to be predictable when correlated with the SAT. The efficacy of the SAT as a predictor increased when high school data were introduced as a variable. In addition, the study by Lanier and Lightsey reported that, by using the SAT Verbal score and the high school grade point average, the need for tutorial assistance for students can be determined. Also, potential English majors can be advised as to the probability of their success based on the same criteria.

Studies researching the American College Testing Program (ACT) produced similar conclusions to the findings of The Commission on Tests. In correlational studies Adams, Highley, and Campbell (1976), Thomas (1971) and Zimmerman (1967) concluded that, when ACT scores are combined with high school academic data, the first term grade point average is predictable. Richards, Holland, and Lutz (1967) and Baird (1969) also significantly combined ACT scores and high school grade point averages. Both studies stated that the best predictor of current achievement is past performance.

In addition to studying the utilization of scholastic aptitude tests for prediction of college achievement, The Commission on Tests

investigated current testing practices in colleges. In a review of The Commission on Tests and its purpose, Carroll (1970) disapproved of the practice of colleges requiring more than one scholastic aptitude score and concluded that a recommendation be made to reduce the volume of testing required of college students. The significance of Carroll's remarks has implications for the Virginia Community College System. Currently, colleges within the VCCS are administering scholastic aptitude tests to prospective students in addition to ability test scores already on record from high school transcripts. Positive findings from this study, which would be supportive of The Commission on Tests' findings, could eliminate this duplication of effort.

In summary, data were presented that support The Commission on Tests' findings that secondary school grades are good predictors of college grades, and when the criterion of a scholastic aptitude test score was introduced as a variable, the predictability increased. Also presented was documentation encouraging the reduction of the number of times an incoming college student's scholastic aptitude is appraised at an institution.

Prediction Studies of the College Grades of Males and Females

A portion of this study attempts to determine the predictability of the college grade point averages of males and of females using their high school data and a scholastic aptitude test. Pertinent literature was reviewed that covered similar investigations.

Fincher (1974) analyzed the data collected on the SAT over a period of thirteen years and summarized that females' grades were more predictable than males. Moderate multiple correlation coefficients of .65 for females and .52 for males were reported by Baggaley (1974) when the criteria of secondary school rank and SAT composite scores were compared with freshmen grade point average. Additional research concurs that females' grades were more predictable than males when an aptitude test and high school academic data were the criteria used (Burton, 1976; Denty, 1972; Gross, Faggan and McCarthy, 1974; Lavin, 1965; Mathis, 1973).

In summary from the literature reviewed, females' grades received in college were more predictable than males' grades. The greater predictability of females' grades resulted when the research correlated the high school academic data and a test of scholastic aptitude.

Prediction Studies of College Grades by Student Race

A review of the literature reveals that a controversy has existed regarding the prediction of college grades by race using aptitude tests. Thorndike (1971) pointed out "the main focus of concern in the use of tests with minority groups has been in the use of tests as predictors" (p. 12). Continuing, Thorndike stated that researchers have difficulty obtaining test scores for different " . . . ethnic groups of students due to past pressures to avoid

discrimination" (p. 12); consequently, a meager number of studies addressing grade prediction of ethnic groups exist.

Cleary (1975) discussed the prediction of minority group grades and the lack of present studies and reminded researchers that "test interpretation is based on data, not a priori reasoning . . . . When a test is to be used on populations for which there are not relevant data, data must be obtained" (p. 17).

As a result of a literature review of the research conducted regarding student transition from high school to college, Cramer and Stevic (1972) stated that prediction by race is as judicious as prediction by sex. They concluded that

> A common system of prediction is relatively impractical, and the development of a separate system of prediction for each subgroup appears justified and desireable. And, since validity coefficients varied greatly among institutions for both blacks and whites, colleges and universities should frequently conduct their own validity studies. (p. 32)

Cramer and Stevic's recommendation to develop separate systems of prediction was further supported. Using prediction equations developed for white students, Cleary (1975) overpredicted the college grade point average of three out of every four black students at three integrated institutions. Similar findings were reported by Pfeifer and Sedlacek (1971) and discussed at length by Sedlacek (1974) who studied students enrolled at integrated colleges. Contrary to other prediction studies which supported high school data to be the strongest predictors of students' academic performance in college, Pfeifer and

Sedlacek (1971) found the best single predictor of college grades for black students to be the verbal portion of the SAT.

In contrast, Stanley and Porter (1967), Thomas and Stanley (1969) and Stanley (1971) studying predominately white and black colleges, efficiently predicted the college grade point averages for all students, regardless of race, by utilizing standardized tests scores and high school grades. In addition, Burton (1976) found positive relationships between the SAT, the high school grades and college grade point averages of white, as well as non-white students at an integrated institution.

In summary, predictions of college academic performance by race should be done cautiously, if at all. Arguments for and against the establishment of separate or common prediction equations according to race, and arguments regarding the variables to utilize in these prediction formulas were presented. The research results were not consistent when students at integrated, essentially all white, or all black colleges were compared. However, the standardized aptitude test score in combination with high school academic data were the most valid predictors of college academic performance.

Prediction Studies by Community College Curriculum

"A priori rationale," stated Hoyt (1966, p. 20), suggested that students enrolling in community college occupational programs have less ability than their counterparts selecting a transfer curriculum. However, Hoyt found that this rationale was in error and

that the aptitudes of the students were actually "remarkably homogeneous" (p. 23). ACT scores and high school grades were about equally efficient at grade point average prediction for the occupational and the college transfer curriculums of community college students. Munday (1969), through an analysis of student curriculums at five junior colleges, found the ACT to be an effective predictor of grades, regardless of curriculum. This standardized test score was a slightly better predictor for occupational-technical students. On the other hand, high school grades were a slightly better predictor for the transfer students. Munday concluded that "transfer and terminal students appear to be far more alike than different" at the two year institution (p. 122). A similar study by Lunneborg, Lunneborg, and Greenmun (1970) supports the findings of both Hoyt (1966) and Munday (1969).

Lunneborg and Lunneborg (1969) and Gell and Bleil (1971) found high school academic data to be a top predictor of grades for community college students. In the 1969 Lunneborg and Lunneborg study, the grade point averages of students enrolled in four curriculums (agriculture, auto mechanics, data processing, and secretarial studies) were predictable from high school English grade point average. For the engineering technology program, the high school math grade point average was the top predictor. Also, students' grade point averages in transfer curriculums were as predictable from secondary school academic data.

In summary, the college g.p.a. of students, regardless of curriculum (occupational-technical or college parallel), were equally predictable. The students' college g.p.a.'s in either curriculum were predictable using high school academic data and standardized test scores.

Prediction Studies at Two Year Colleges

Central to this study is the prediction of grade point averages for the two year college student from high school academic data and scholastic aptitude test scores. There were numerous studies conducted at the two year college to determine the relationship between an aptitude test and students' grades. A speculative reason for the majority of studies is that the Carnegie Commission on Student Personnel (McConnell, 1965), a landmark study of student personnel services, seriously criticized junior college student appraisal services. Furthermore, college officials were recommended by this study to advance the development of strong student appraisal programs. Expounding on the Carnegie Commission's recommendations, Collins (1967) and Raines (1966, 1970) appealed to colleges to develop a well-defined rationale for college testing and to validate any college appraisal program. Also, Seibel (1967a) visited sixty-three two-year colleges and similarly recommended that research regarding the standardized testing program in junior colleges be given serious attention.

Regarding testing programs in two-year colleges, Hill (1971) stated that the placement technique used must be able to justify the

expense of the measurement instrument. Expensive appraisal devices are not warranted in the community colleges because all students will be admitted. Hill continues by stating that the data used for predictors and collected from student files adds no cost. In conclusion, Hill states that "it behooves one to consider first the already available data as predictors" (p. 687).

Commonly, scholastic aptitude test scores are used by college officials as a predictor of the grade point average expected of a student; therefore, the following studies are presented by the title of the scholastic aptitude test used for predictive purposes. Presentation by test title demonstrates the various scholastic aptitude instruments currently being utilized on community college campuses. These aptitude tests in the following studies were required for admission to the two-year college, in addition to secondary academic data also required for admission, and were administered at student expense except where noted.

American College Testing Program (ACT)

Mathis (1973) derived moderate correlations (.54 for males and .64 for females) using ACT and first semester grade point average. Likewise, Root (1971) and Wilson and Blum (1968) found the strongest predictors of college grade point average to be the ACT composite scores and high school grade averages. However, in these two studies, a low level of the populations' variance was reported; Wilson and Blum, 36 percent, and Root, 14 percent.

Furthermore, using the ACT did not account for a large portion of the variance. In addition, the submitting of ACT scores was a requirement for admission to the two-year institution, a cost endured by the student.

Scholastic Aptitude Test (SAT)

Studies are reported here in which the SAT was the required standardized test for college admission, as were high school academic data. Investigating North Carolina community college students, Preas (1969) studied student grades and their relationships to the SAT math and verbal scores, total score on the English Cooperative Test, Cooperative Mathematics Pre-Test, high school rank, and high school grade point average. As a result, a regression equation was established, and the best predictor of the variables was found to be the high school grade point average. Campanile (1971) reported low, but significant correlations between SAT and first semester grade point average. Even though the relationship was positive and significance was established, limited predictability was indicated. In these two representative studies, the SAT was not a superior variable for the prediction of grades or grade point averages.

Cooperative School and College Ability Test (SCAT)

The SCAT was administered in high school at no expense to the students and transmitted to their colleges via high school transcripts. The studies described extracted the SCAT data from the permanent files of students.

Kilpatrick (1968) and Gold (1970), studying two California community colleges, established more competent grade predictors than the SCAT used singly as a predictor. At both colleges the SCAT when correlated with a locally constructed written essay test resulted in significant relationships for grade prediction. Kilpatrick found the Purdue Placement Test to be the highest predictor of grades followed by the high school English grade point average, and Gold stated a significant correlation (.88) for the SCAT and the Comparative Reading Test. Maier (1968) used first quarter English grades and SCAT verbal scores to establish confidence intervals (95 percent) for subsequent placement. Furthermore, these intervals included a narrow range in the standard error. In summary, the SCAT was not the top predictor in these three studies; however, in one study, when correlated with an additional academic variable, a high level of the population's variance was accounted for.

The Comparative Guidance and Placement Test (CGP)

The College Entrance Examination Board (CEEB) instituted the CGP in the fall 1967. The CGP was designed to be a coordinated system of academic and non-academic criteria useful to two-year colleges. CEEB (1968) reported that the test reveals three types of student data: (1) student's career interest patterns, (2) student's abilities in math, English, and reading, and (3) student's special abilities in relation to the college's academic programs. The student pays for and takes the exam prior to attending the community college.

Furthermore, research is not very plentiful concerning the CGP and was so reported by Carter (1974) and Reed (1972) in two Virginia community college institutional research reports. Carter attempted to collect additional CGP data by telephoning the Educational Testing Service (ETS) of the CEEB for assistance. ETS "confirmed the lack of published research using this program" (Carter, 1974:p. 2).

Studies have found that the aptitude measures on the CGP produce significant correlation coefficients when compared with the first term grades (Denty, 1972; DeVeechio, 1972; Tuscher, 1972).

Studying students in urban and rural community colleges, Teal (1972) found that the high school percentile rank was the best predictor of the first semester grade point average. Combining the CGP and fall semester grade point average revealed a moderate multiple correlation coefficient (.67). For CGP test scores and high school data this correlation had the lowest error of measurement (.572). Campanile (1971) and Clark (1973) found significant, but low correlations between the CGP and SAT in the prediction of grades at the community college. The CGP tended to have slightly higher correlation coefficients but not more significant than the SAT (Campanile, 1971). In two separate community college research reports, Reed (1972) and Trout (1971) contended that the CGP is an indicator of success in college course work and recommended its use for the placement of students in courses at their respective institutions.

Therefore, the aptitude portion of the CGP appears to have validity for predicting grades. Students are responsible for the

cost of this test which they take prior to college enrollment. As already evidenced, investigators utilizing the CGP cautioned educators that research was insufficient.

Other Studies

In addition to studies dealing with the well known standardized tests, there are some two-year college studies using less familiar testing tools. Jones (1967) and Lunneborg and Lunneborg (1969) correlated junior college grades and the Washington Pre-College Differential Test (WPC) and obtained significant relationships between grades and the general ability subtest of the WPC. A conclusion drawn was that these findings were as significant as other studies whose criteria for predicting college grade point average are high school academic data and an ability test.

Using the Regents Scholarship Exam, Clem (1968) and Morgenfeld (1968) found limited efficiency for predicting grades. Both stated that when combined with high school academic data, the exam was more effective at predicting college grades.

Barrileaux (1976) attempted to predict grades unsuccessfully by applying multiple correlations to high school rank, grade point averages, and scores from the Brown and Holtzman Survey of Study Habits and Attitudes (SSHA). Multiple regression analysis revealed a significant relationship between high school rank and college grade point average and demonstrated that the SSHA is not a strong predictor of grades. Johns (1971) also demonstrated the SSHA to be an ineffective predictor of grades.

Therefore, these studies using less familiar standardized tests concluded that secondary school data was an important variable to use in the prediction of grades or grade point averages. In addition there was documentation that high school grades predict more efficiently than a study habit survey.

In summary of the research conducted at the two-year college which attempted to predict grades or grade point averages numerous instruments were employed as predictive devices. The SAT, ACT, and CGP were entrance exams administered to students prior to their admission to college. Furthermore, the expense of the exams was borne by the students. Also, low to moderate correlations were found between aptitude tests and prediction variables. Better predictors than aptitude tests, used singly, were declared, and in only one study was the aptitude score the top predictor of college grade point averages.

Short Test of Educational Ability

Published research on the Short Test of Educational Ability (STEA) is minimal. The STEA (Level 5) was published in 1966 by Science Research Associates as a short form of the Tests of Educational Ability (TEA). Correlational data for the STEA was established with the TEA and the Primary Mental Abilities Test through concurrent validity studies. Not until Jones (1969) had there been any studies using academic criteria to establish predictive validity of the STEA.

In his 1969 study, Jones indicated a substantial relationship between the STEA score, academic grades, and standardized achievement test scores of seventh grade students. Jones and DeBlassie (1971) determined that the correlation between STEA and grade point average is higher than the correlation between STEA and separate school subjects. "The STEA series seems . . . to have attained the stated objectives: to provide a reliable estimate of educational ability within a short administration time," summarizes Jones (1971:p. 52). In addition, Jones (1969, 1970) found no significant relationships to exist between the STEA and academic performance among males as compared with females. Finally, in the 1969 study, Jones found the STEA to be as valid for predictive purposes for students in one social class as for students in another.

SRA (1970) reported that the STEA was validated concurrently with the Junior College Placement Program (JCPP). Using two groups of junior college freshmen the STEA and JCPP subtests in English usage, reading, and math revealed moderate correlation coefficients of .75, .72, and .74, respectively. Also in this study the STEA was positively correlated with the ACT composite score and the results were moderate coefficients of .75 and .76 for the two sample groups. These results demonstrate STEA's accomplishment at the prediction of academic achievement.

Summary

This chapter has revealed from the findings of The Commission on Tests, that an aptitude test score when combined with high school grades improves prediction, can be documented. The SAT and ACT were identified as moderate predictors of grades or grade point averages, increasing in efficiency at predicting when high school academic data were added as a variables. Also demonstrated, based on the same criteria, was that the grades of females are more predictable than males. However, initial study with the STEA revealed no difference in the predictability of grades by sex of seventh graders.

Prediction studies based on the race of students showed inconsistencies in regression formula development. However, the studies suggested that the criteria, scholastic aptitude tests and/or high school academic data, were efficient predictors of college g.p.a.'s regardless of race.

Analyses of the curriculums of community college students demonstrated that students' college g.p.a.'s in either occupational or college parallel curriculums were predictable from scholastic aptitude instruments and the secondary school academic record. Furthermore, these analyses suggested the community college students' aptitudes are more alike than different when categorized into curriculums.

Furthermore, the two-year student was tested with various aptitude instruments each revealing similar results, i.e., high school grades when correlated with a scholastic aptitude score increase the

accuracy of grade prediction. Questioned was the practice of having the students bear the cost of the tests when potentially useful data are housed in the students' permanent records. This practice was particularly challenged in the two-year community college. Finally, data were presented indicating the STEA to be a potentially useful tool for measuring the scholastic aptitude of a student in the two-year college.

In view of the fact that a scholastic aptitude test increases in predictability as secondary school academic data are used as variables, and in view of the fact that the STEA has not been validated for the VCCS, the method of investigation here will be to study the fall quarter, 1976, grade point averages in relation to the STEA score and high school academic data. The method follows in Chapter 3.

Chapter 3

Methodology

The hypotheses to be tested are presented in this chapter. Also described are the setting and the subjects used for the study as are descriptions of the instrument used to measure scholastic aptitude, the data collection procedures, and the computer program used to process the data.

Hypotheses

The following hypotheses stated in null form were tested:

1. There is not a statistically significant relationship between the students' fall quarter g.p.a. and their scores on the STEA at all three community colleges.

2. There is not a statistically significant relationship between male and female fall quarter g.p.a.'s and their scores from the STEA at all three community colleges.

3. There is not a statistically significant relationship between white and non-white students' fall quarter g.p.a.'s and their scores from the STEA.

4. There is not a statistically significant relationship between students' fall quarter g.p.a.'s in either the college parallel curriculums or occupational-technical curriculums, and their scores on the STEA at all three community colleges.

5. The multiple correlation using the STEA, total high school g.p.a., and high school English grade to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

6. The multiple correlation using the STEA, total high school g.p.a., and high school math grade to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

7. The multiple correlation using the STEA, total high school g.p.a., high school English, and high school math grades to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

8. The multiple correlation using the total high school g.p.a., high school English, and high school math grades to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

Setting and Sample

This investigation was conducted during the academic year 1976-77 at three community colleges within the Virginia Community College System (VCCS).

In April 1966, the Virginia General Assembly passed legislation that created the Department of Community Colleges and a State Board for Community Colleges. This Act by the General Assembly (Title 23, Chapter 16, Sections 23-214 through 23-231) gave power to the State Board of Community Colleges to create, govern, and oversee the community colleges established in the Commonwealth of Virginia. According to The 1975 VCCS Policy Manual, the community college program will serve adults with the needed education for their

preparation for employment through a post-high school education, and thereby create more responsible citizens in the Commonwealth. Since its inception, the VCCS has grown to include twenty-three colleges incorporating thirty-five campuses.

For this study three colleges were selected based on size and location within the Virginia system of community colleges. The colleges represent a large metropolitan campus, a medium-sized suburban campus, and a small rural campus. The colleges requested not to be identified. Therefore, to provide anonymity, the colleges will be referred to as metropolitan, suburban, and rural.

The metropolitan college, created in 1972, began operation with 1067 students. There were 12,209 students served during the 1975-76 academic year. The college's special offerings, in addition to the general curricula found at each of the state's community colleges, are Associate and Applied Science Degrees in Civil Engineering, Construction, Air Conditioning, Environmental Science, Dental Laboratory, and Recreation Leadership. Self-reported, the population served is over a half million with an anticipated growth by 1990 to more than three-fourths of a million people.

The suburban institution began operation in 1967 with 512 students. By the end of the 1975 academic year, 4,885 students had registered for classes. This college specializes in the following technical curricula and awards Associate in Applied Science Degrees at their completion. They are as follows: Commercial Art, Data Processing, Mechanical Engineering, Nuclear Engineering, Medical

Laboratory, Medical Records, and Radiology. Within its geographical service area, this institution reports serving more than 170,000 people.

The rural college evolved from a local vocational-technical school in 1969. There were 637 students enrolled in its first classes as a community college. During the 1975-76 school year, this institution enrolled 2,265 students. This college awards Associate in Applied Science Degrees for these specific areas of instruction not found at all Virginia community colleges. They are as follows: Automotive Technology, Drafting and Design, Industrial Technology, Instrumentation, Machine Shop, and Community Social Services. The college reports serving a population of approximately 120,000.

Therefore, the selection of the three institutions constitutes a stratified random sample based on the city size served by the college. A random sample of one hundred 1976 Virginia high school graduates who were enrolled for the 1976 fall quarter at each institution was selected for the study. The population from which the sample was drawn at the metropolitan campus was 579, at the suburban institution 368, and at the rural college 216. Respectively, this represents 7 percent, 12 percent, and 9 percent of the total enrollment for the 1976 fall quarter at the three colleges. Table 1 compares selected demographic variables of the sample with the three institutions and with the VCCS.

1976 high school graduates were selected because the permanent records of only this group reflect the STEA score administered in the

Table 1

A Comparison of Random Sample Data and Selected Demographic Variables With Three Community Colleges and With the Virginia Community College System

Demographic Variable	Random Sample of 1976 Virginia High School Graduates			Total 1976 Fall Quarter Enrollment[a]			
	Metro	Suburban	Rural	VCCS	Metro	Sub	Rural
Sex							
Male	40	51	52	42851	3762	1709	1319
Female	60	49	48	42613	4128	1350	1004
Race							
White	65	93	99	70676	4968	2565	2201
Non-White	35	7	1	14788	2922	494	122
Curriculum							
Occupational/Tech.	73	58	63	27909	3276	1339	1163
College Parallel	18	41	19	12395	447	647	263
Non-Curricular	9	1	18	45160	4167	1073	897
1976 Virginia high school graduates who were first time students	100	100	100	[b]	579	368	216
Total Fall 1976 Enrollment				85464	7890	3059	2323

[a]Source: Student Enrollment Booklet--Fall Quarter 1976, Virginia Department of Community Colleges, December, 1976.

[b]Figure not available for VCCS, the three individual institutions provided these data.

eleventh grade in 1974. This is the first group to submit this score to the institutions.

Short Test of Educational Ability

One of the independent variables utilized in the study was a test of scholastic aptitude, the Short Test of Educational Ability (Level 5).

This instrument is administered in the eleventh grade as the measurement of aptitude portion of the achievement battery, The Iowa Test of Educational Development. This twenty minute aptitude test has fifty-five items taken from the Tests of Educational Ability in the following categories:

1. Verbal Meaning (15 items) employs vocabulary words.

2. Arithmetic Reasoning (10 items) consists of simple math reasoning items.

3. Letter Series (15 items) presents a series of letters requiring a student to determine the pattern.

4. Symbol Manipulation (15 items) presents symbols (a, b, c, d), and a student indicates the change in value of one symbol when the value of the other symbol(s) is increased or decreased.

The STEA score is reported in a grade-based quotient, a national percentile, and a stanine. For this study stanines will be used.

Basic descriptive and technical information for the fifth level of the STEA as reported by the SRA Interpretive Manual was as follows:

Based on the Kuder Richardson formula #20, the test reliability of this level of STEA is .94. With a standard error of 3.90 I.Q. points, the mean is a quotient of 109 and the standard deviation is 16 for this test level. Converted to stanine statistics, which are standard scores, the mean is five and the standard deviation is two.

This writer was fortunate to receive personal assistance from Dr. W. Paul Jones who designed the STEA and is a test consultant for Science Research Associates, Inc. Dr. Jones recalled that some of the initial reviews regarding the STEA were not complimentary. The reviews' major concern regarded the lack of predictive validity studies with the test although concurrent validity had been established. The scores Dr. Jones recommended be used in counseling and research are the stanine or percentile, and of the two the stanine is preferred. Dr. Jones strongly recommended that local validity studies be done to establish local norms.

Data Collection Procedure

After the one hundred subjects were randomly selected at each institution, the following data were collected for each student:

1. Total high school grade point average
2. Last high school grade in English
3. Last high school grade in math
4. STEA (Stanine Score)
5. Sex
6. Race

7. 1976 fall quarter grade point average
8. Curriculum

Treatment of Data

The CORR Procedure and The GLM Procedure, two statistical analyses located in the Statistical Analysis System (Barr, Goodnight, Sall, and Helwig, 1976:pp. 92-96, 127-144) were selected to test the null hypotheses. Pearson product moment correlation coefficients were used to test hypotheses one, two, three, and four. This statistical procedure determined if there is a positive or negative relationship and the degree of that relationship between the variables to the .05 level of significance.

The GLM Analysis was used to test hypotheses five, six, seven, and eight. Through this procedure the statistical significance (.05) of each of the independent variables noted in the hypotheses was determined.

Summary

In this chapter the null hypotheses, the college participating in the study, and the sample were described. Also, the structure of the STEA, the procedure used to collect the dependent and independent variables, and the computer program used to process the data were discussed. Results of the study will be reported in Chapter 4.

Chapter 4

RESULTS OF THE STUDY

Chapter 4 contains the results of the data analyses generated in this study. First, a summary of the plan of data analysis is presented. Second, the correlation matrices and the multiple regression equations produced are reported. Concluding this chapter are the results of the tests of the eight hypotheses and the prediction equations developed for each community college.

Plan of Data Analysis

In order to test the hypotheses, it was necessary to collect the STEA score, 1976 fall quarter grade point average (fall quarter g.p.a.) and secondary school academic data for each student in the sample group of 1976 high school graduates at each of the three community colleges. Once identified, the sample at each institution was divided into subgroups by the students' sex, race, and curricular division. For each college and subgroup there were a criterion variable (fall quarter g.p.a.) and four independent variables (total high school g.p.a., last high school English and math grades, and the STEA score).

Correlation coefficients were computed using the Statistical Analysis System's (Barr, et al., 1976) "Correlation Procedure" (pp. 92-96). The "General Linear Model Procedure" (pp. 127-144) of the

Statistical Analysis System was utilized to calculate the regression equations. Each of the eight hypotheses was tested at the .05 level of significance. Also, the significance level of .05 was established for the multiple regressions.

In this study's results correlation coefficients are termed high, moderate, and low. These terms were defined by Downie and Heath (1974, p. 97), ". . . an r of .8 and above is considered a high coefficient, and r of .5 is considered moderate and an r of .3 and below is considered a low coefficient."

Correlation Matrices

Correlation coefficients, or validity coefficients as termed by Cronbach (1970), and levels of significance are listed in eight tables for the four independent variables and for the criterion variable by each college (Table 2), by sex at each college (Tables 3, 4, and 5), by curricular division at each college (Tables 6, 7, and 8) and by race using all colleges (Table 9). There were significant relationships between fall quarter g.p.a. and STEA for: (1) each college (Table 2), (2) females at each college (Tables 3, 4, and 5), (3) males at the suburban institution (Table 4), (4) white students (Table 6), and occupational technical students at each institution (Tables 7, 8, and 9).

Multiple Regressions

Multiple correlation coefficients were computed by combining the fall quarter g.p.a. and secondary school academic data. Three and

four variable multiple regression analyses were computed for each college. The significance levels for the variables incorporated in the multiple regressions are reported with the regression analysis in Tables 10 and 11.

Testing the Hypotheses

This section presents each hypothesis and the results of the data analysis.

Hypothesis One

There is not a statistically significant relationship between the students' fall quarter g.p.a. and their scores on the STEA at all three community colleges.

To test this hypothesis validity coefficients for the fall quarter g.p.a. and the STEA were computed for each college (Table 2). While the correlation coefficients for the two variables were relatively low at each college, they were significant at the .05 level. Therefore, the hypothesis was rejected.

Hypothesis Two

There is not a statistically significant relationship between male and female fall quarter g.p.a.'s and their scores from the STEA at all three community colleges.

To test this hypothesis Pearson product moment correlation coefficients were computed and significance level attained for fall

Table 2

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for Each of the Three Community Colleges

	HSGPA	HSMATH	HSENG	STEA
Metropolitan (N = 100)				
FQGPA[a]	.45*	.46*	.26*	.30*
STEA	.34*	.11	.08	
HSENG	.46*	.27*		
HSMATH	.49*			
Surburban (N = 100)				
FQGPA[a]	.69*	.42*	.53*	.43*
STEA	.40*	.15	.26*	
HSENG	.59*	.36*		
HSMATH	.57*			
Rural (N = 100)				
FQGPA[a]	.29*	.26*	.14	.21*
STEA	.49*	.27*	.25*	
HSENG	.61*	.29*		
HSMATH	.48			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$P < .05$.

quarter g.p.a.'s and STEA scores for male and female students. The correlation coefficients by the sex of the students are shown for each college in Tables 3, 4, and 5. At the suburban college, there were moderately low and significant ($p < .05$) correlations between the two variables, .44 for females and .47 for males. Validity coefficients of .44 for males at metropolitan and suburban community colleges and .29 at the rural institution were significant ($p < .05$). However, the coefficients of .30 for males at the metropolitan college and .20 for males at the rural institution were not significant. Therefore, the hypothesis failed to be rejected because the results at all three colleges were not significant.

Hypothesis Three

> There is not a statistically significant relationship between white and non-white students' fall quarter g.p.a.'s and their scores from the STEA.

To test this hypothesis correlation coefficients were computed for students from the three colleges by race (Table 6). The correlation between the fall quarter g.p.a. and STEA Score (.30) was significant ($p < .05$) for white students. There was not a significant relationship between the fall quarter g.p.a. and the STEA for non-white students. Therefore, this hypothesis failed to be rejected.

Hypothesis Four

> There is not a statistically significant relationship between students' fall quarter g.p.a.'s in either the

Table 3

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for the Metropolitan Community College by Sex

	Male (N = 40)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.34*	.42*	.11	.30
STEA	.44*	.11	-.004	
HSENG	.39*	.30		
HSMATH	.41*			

	Female (N = 60)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.50*	.43*	.36*	.44*
STEA	.37*	.24	.20	
HSENG	.51*	.22		
HSMATH	.52*			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$P < .05$.

Table 4

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for the Suburban Community College by Sex

	Male (N = 51)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.69*	.45*	.49*	.47*
STEA	.45*	.22	.31*	
HSENG	.51*	.31*		
HSMATH	.61*			

	Female (N = 49)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.67*	.35*	.54*	.44*
STEA	.45*	.11	.29*	
HSENG	.62*	.39*		
HSMATH	.51*			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$P < .05$.

Table 5

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for the Rural Community College by Sex

	Male (N = 52)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.29*	.28*	.12	.20
STEA	.50*	.24	.27	
HSENG	.64*	.32*		
HSMATH	.46*			

	Female (N = 48)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.27	.25	.40	.29*
STEA	.61*	.33*	.53*	
HSENG	.58*	.30*		
HSMATH	.53*			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$P < .05$.

Table 6

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for the Three Community Colleges by Race

	White (N = 257)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.48*	.39*	.33*	.30*
STEA	.36*	.25*	.20*	
HSENG	.59*	.36*		
HSMATH	.57*			

	Non-White (N = 43)			
	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.21	.37*	-.05	-.005
STEA	.13	-.05	.11	
HSENG	.41*	.14		
HSMATH	.50*			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$P < .05$.

college parallel curriculums or occupational technical curriculums, and their scores on the STEA at all three community colleges.

To test this hypothesis the students from the three community colleges were classified into one of the following curricular divisions: (1) occupational-technical, (2) college parallel, and (3) non-curricular. Correlation coefficients were computed for the data stated in the hypothesis. These validity coefficients were significant ($p < .05$) only for the occupational-technical division at each of the three colleges (Tables 7, 8, and 9). At each institution there was not a significant relationship between the variables stated in the hypothesis for the college parallel and non-curricular groups. Only one student was classified as non-curricular at the suburban institution; therefore, a correlation matrix was not computed. This hypothesis failed to be rejected.

Hypothesis Five

The multiple correlation using the STEA, total high school g.p.a., and high school English grade to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

To test this hypothesis, a regression analysis composed of the three independent variables stated in the hypothesis was computed for each college. The results are shown in Table 10. At the metropolitan and suburban institutions this multiple regression analysis was

Table 7

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for the Metropolitan Community College by Curricular Division

	HSGPA	HSMATH	HSENG	STEA
Occupational/Technical (N = 73)				
FQGPA[a]	.45*	.45*	.15	.32*
STEA	.33*	.10	.15	
HSENG	.42*	.14		
HSMATH	.45*			
College Parallel (N = 18)				
FQGPA[a]	.49*	.65*	.41	.29
STEA	.20	.26	-.25	
HSENG	.51*	.46		
HSMATH	.64*			
Non-Curricular (N = 9)				
FQGPA[a]	.41	.46	.51	.43
STEA	.48	.23	.15	
HSENG	.65	.73*		
HSMATH	.80*			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$p < .05$.

Table 8

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for the Suburban Community College by Curricular Division

Occupational/Technical (N = 58)

	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.66*	.41*	.63*	.54*
STEA	.42*	.15	.25	
HSENG	.57*	.27		
HSMATH	.44*			

College Parallel (N = 41)

	HSGPA	HSMATH	HSENG	STEA
FQGPA[a]	.72*	.41*	.37*	.23
STEA	.36*	.23	.26	
HSENG	.60*	.48*		
HSMATH	.72*			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$P < .05$.

Table 9

Correlation Matrices for the Four Predictor Variables With Fall Quarter G.P.A. for the Rural Community College by Curricular Division

	HSGPA	HSMATH	HSENG	STEA
Occupational/Technical (N = 63)				
FQGPA[a]	.20	.26*	-.04	.29*
STEA	.54*	.26*	.23	
HSENG	.59*	.20		
HSMATH	.49*			
College Parallel (N = 19)				
FQGPA[a]	.52*	.35	.54*	.35
STEA	.30	.29	.25	
HSENG	.81*	.45		
HSMATH	.56*			
Non-Curricular (N = 18)				
FQGPA[a]	.46	.15	.42	-.24
STEA	.50*	.11	.20	
HSENG	.48*	.47*		
HSMATH	.43			

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

[a]Criterion Variable.

*$P < .05$.

Table 10

Multiple Regressions Using Combinations of Three Independent Variables to Predict Fall Quarter G.P.A. for Each of the Three Community Colleges

Dependent Variable	Independent Variable	F	df	P<	R^2
	Metropolitan (N = 100)				
	STEA, HSGPA, & HSENG	9.51	99	.0001	.23
FQGPA	STEA, HSGPA, & HSMATH	14.21	99	.0001	.31
	HSGPA, HSMATH, HSENG	12.34	99	.0001	.28
	Suburban (N = 100)				
	STEA, HSGPA, & HSENG	35.56	99	.0001	.52
FQGPA	STEA, HSGPA, & HSMATH	32.95	99	.0001	.50
	HSGPA, HSMATH, & HSENG	32.24	99	.0001	.50
	Rural (N = 100)				
	STEA, HSGPA, & HSENG	3.13	99	.03	.09
FQGPA	STEA, HSGPA, & HSMATH	3.84	99	.01	.11
	HSGPA, HSMATH, & HSENG	3.71	99	.01	.10

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

significant at the $p < .0001$ level. At the rural college, the level of significance was $p < .03$. The hypothesis was rejected.

Hypothesis Six

The multiple correlation using the STEA, total high school g.p.a., and high school math grade to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

To test this hypothesis the three variables stated in the hypothesis were subjected to multiple regression analyses (Table 10). The results at the metropolitan and suburban institutions were significant at the $p < .0001$ level, and the rural college at $p < .01$. The hypothesis was rejected.

Hypothesis Seven

The multiple correlation using the STEA, total high school g.p.a., high school English, and high school math grade to predict fall quarter g.p.a. at all three community colleges will not be significant.

To test this hypothesis, a four variable multiple regression analysis was computed for each college. The results of the multiple regression analyses were significant at the metropolitan, suburban, and rural colleges at the following levels: $p < .0001$, $p < .0001$, and $p < .03$ (Table 11). The hypothesis was rejected.

Table 11

Multiple Regression Using Four Independent Variables to Predict Fall Quarter G.P.A. for Each of the Three Community Colleges

Dependent Variable	Independent Variable	F	df	P<	R^2
	Metropolitan (N = 100)				
FQGPA	STEA, HSGPA				
	HSENG, & HSMATH	10.69	99	.0001	.31
	Suburban (N = 100)				
FQGPA	STEA, HSGPA				
	HSENG, & HSMATH	26.56	99	.0001	.53
	Rural (N = 100)				
FQGPA	STEA, HSGPA				
	HSENG, & HSMATH	2.89	99	.03	.11

NOTE: FQGPA: 1976 fall quarter g.p.a.
HSGPA: high school g.p.a.
HSMATH: high school math grade
HSENG: high school English grade
STEA: Short Test of Educational Ability

Hypothesis Eight

The multiple correlation using the total high school g.p.a., high school English, and high school math grade to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

Table 10 reports the multiple regression equations to test this hypothesis. The results for the metropolitan and suburban institutions were significant at the $p < .0001$ level of significance. The multiple R for the rural institution was significant at the $p < .01$ level. This hypothesis was rejected.

Prediction Equations

From the multiple regression analyses, three and four variable regression equations were produced. Since all hypotheses involving the four multiple correlations were rejected, four prediction formulae were generated for each college. In addition, for each equation, the standard error of measurement (Syx) was also generated. The multiple regression equations computed to predict fall quarter g.p.a. at the three colleges are presented.

Metropolitan Community College

1. $\bar{Y} = .1021(X_1) + .6520(X_2) + .0951(X_3) - .0549$

   Syx = .93

   where:

   $\bar{Y}$ = Predicted fall quarter grade point average

   X_1 = STEA score

   X_2 = Total high school g.p.a.

   X_3 = High school English grade

   -.0549 = Constant

2. $\bar{Y} = .117(X_1) + .4088(X_2) + .3250(X_3) + .0905$

   Syx = .88

   where:

   $\bar{Y}$ = Predicted fall quarter grade point aver ge

   X_1 = STEA score

   X_2 = Total high school g.p.a.

   X_3 = High school math grade

   .0905 = Constant

3. $\bar{Y} = .5023(X_1) + .3081(X_2) + .0536(X_3) + .3079$

   Syx = .90

   where:

   $\bar{Y}$ = Predicted fall quarter grade point average

   X_1 = Total high school g.p.a.

   X_2 = High school math grade

   X_3 = High school English grade

   .3079 = Constant

4. $\overline{Y} = .3579(X_1) + .3216(X_2) + .0735(X_3) + .1144(X_4) + .0372$

Syx = .77

where:

$\overline{Y}$ = Predicted fall quarter grade point average

X_1 = Total high school g.p.a.

X_2 = High school math grade

X_3 = High school English grade

X_4 = STEA score

.0372 = Constant

Suburban Community College

1. $\overline{Y} = .980(X_1) + .7591(X_2) + .1820(X_3) - .6893$

Syx = .60

where:

$\overline{Y}$ = Predicted fall quarter grade point average

X_1 = STEA score

X_2 = Total high school g.p.a.

X_3 = High school English grade

-.6893 = Constant

2. $\overline{Y} = .1047(X_1) + .8608(X_2) + .0459(X_3) - .6006$

   Syx = .62

   where:

   $\overline{Y}$ = Predicted fall quarter grade point average

   X_1 = STEA score

   X_2 = Total high school g.p.a.

   X_3 = High school math grade

   -.6006 = Constant

3. $\overline{Y} = .8340(X_1) + .0217(X_2) + .1891(X_3) - .4349$

   Syx = .62

   where:

   $\overline{Y}$ = Predicted fall quarter grade point average

   X_1 = Total high school g.p.a.

   X_2 = High school math grade

   X_3 = High school English grade

   -.4349 = Constant

4. $\overline{Y} = .7181(X_1) + .0393(X_2) + .1799(X_3) + .1006(X_4) - .6731$

   Syx = .61

   where:

   $\overline{Y}$ = Predicted fall quarter grade point average

   X_1 = Total high school g.p.a.

   X_2 = High school math grade

   X_3 = High school English grade

   X_4 = STEA score

   -.6731 = Constant

Rural Community College

1. $\overline{Y} = .5899(X_1) + .5674(X_2) + .0571(X_3) + .7848$

   Syx = 1.10

   where:

   $\overline{Y}$ = Predicted fall quarter grade point average

   X_1 = STEA score

   X_2 = Total high school g.p.a.

   X_3 = High school English grade

   .7848 = Constant

2. $\overline{Y} = .0570(X_1) + .3345(X_2) + .1710(X_3) + .8941$

   Syx = 1.09

   where:

   $\overline{Y}$ = Predicted fall quarter grade point average

   X_1 = STEA score

   X_2 = Total high school g.p.a.

   X_3 = High school math grade

   .8941 = Constant

3. $\overline{Y} = .4955(X_1) + .1740(X_2) - .0633(X_3) + .9304$

   Syx = 1.09

   where:

   $\overline{Y}$ = Predicted fall quarter grade point average

   X_1 = Total high school g.p.a.

   X_2 = High school math grade

   X_3 = High school English grade

   .9304 = Constant

4. $\overline{Y} = .4101(X_1) + .1708(X_2) - .0562(X_3) + .1548(X_4) + .8729$

Syx = 1.08

where:

$\overline{Y}$ = Predicted fall quarter grade point average

X_1 = Total high school g.p.a.

X_2 = High school math grade

X_3 = High school English grade

X_4 = STEA score

.8729 = Constant

Discussion

From these regression equations it should be noted that the STEA was a positive contributor to the prediction of fall quarter g.p.a. at each of the colleges. The STEA was superior only once to the high school g.p.a. as a positive contributor in the twelve community college regression equations for the prediction of fall quarter g.p.a.'s (rural community college, equation #1).

Of utmost importance are the standard errors of estimate in the multiple regression equations. In view of the fact that students' grades are assigned on a 4-point scale, standard errors reported for all the colleges (Tables 10 and 11), will form confidence intervals of more than a full letter grade. This could limit the use of the equations as meaningful predictions. The range of standard errors of estimates for this study was .61 to 1.21.

Summary

Chapter 4 has presented the results of this study. The Statistical Analysis System was used to analyze the data and compute both correlation coefficients and multiple regression equations. These computations tested the eight hypotheses of which five were rejected and three failed to be rejected. The prediction equations for each institution were generated; however, the size of the standard error of estimates necessitated caution in their use.

Chapter 5

Summary, Conclusions, and Recommendations

The purposes of this chapter are to present a summarization of the study. The results of the data analysis and the conclusions which may be drawn are also discussed. In addition, recommendations are offered for future research and for utilization of the study.

Summary

Purpose

The Short Test of Educational Ability (STEA) is a scholastic aptitude test score available to all Virginia Community Colleges. The STEA score is currently transmitted to the college via the student's high school transcript. Because The 1975 Virginia Community College System Policy Manual requires a validity study of potential curricular placement tools, it was the purpose of this study to determine the STEA's validity for predicting students' 1976 fall quarter grade point average.

Design

This investigation was conducted during the academic year 1976-77 at three community colleges within the Virginia Community College System (VCCS). The samples used in this study were drawn from 1976 Virginia high school graduates enrolled for the first time for fall quarter, 1976, at a metropolitan, a suburban, and a rural

community college. One hundred subjects were randomly selected from each institution.

After the subjects were selected, the following data were collected from the permanent files of the students at each community college: (1) total high school grade point average, (2) last high school grade in English, (3) last high school grade in math, (4) STEA score, (5) sex, (6) race, (7) curriculum, and (8) 1976 fall quarter grade point average (g.p.a.).

Pearson product moment correlations and multiple regression coefficients were generated by the Statistical Analysis System (Barr, et al., 1976) utilizing its "Correlational Procedure" (pp. 92-96) and the "General Linear Model Procedure" (pp. 127-144). Also, regression equations were calculated from those data which were found to be statistically significant.

Results

The results of this study as they relate to the eight hypotheses were as follows:

1. There is not a statistically significant relationship between the students' fall quarter g.p.a. and their scores on the STEA at all three community colleges.

A significant relationship was found between the students' 1976 fall quarter g.p.a. and their scores on the STEA at the three colleges. All three validity coefficients were significant at the $p < .05$ level. The null hypothesis was rejected.

2. There is not a statistically significant relationship between male and female fall quarter g.p.a.'s and their scores from the STEA at all three community colleges.

The correlation matrices for the STEA scores and the 1976 fall quarter g.p.a. for males and females were computed. At only one college was a significant relationship at the .05 level generated. The hypothesis failed to be rejected.

3. There is not a statistically significant relationship between white and non-white students' fall quarter g.p.a.'s and their scores from the STEA.

A significant relationship, $p < .05$, existed between the STEA and the criterion variable (fall quarter g.p.a.) for white students. There was not a significant validity coefficient between the criterion variable and the STEA for non-white students. The hypothesis failed to be rejected.

4. There is not a statistically significant relationship between students' fall quarter g.p.a.'s in either the college parallel curriculums or occupational technical curriculums, and their scores on the STEA at all three community colleges.

The STEA scores and the fall quarter g.p.a., when correlated for occupational-technical students at each college, proved to be significant at the $p < .05$ level for all colleges. The same correlational procedures for college parallel students and non-

curricular students at each institution were not significant. The hypothesis failed to be rejected.

5. The multiple correlation using the STEA, total high school g.p.a., and high school English grade to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

The multiple correlation coefficients between the fall quarter g.p.a. (criterion variable) and the STEA score, total high school g.p.a., and high school English grade were significant at the metropolitan college ($p < .0001$), suburban college ($p < .0001$), and rural college ($p < .03$). The hypothesis was rejected.

6. The multiple correlation using the STEA, total high school g.p.a., and high school math grade to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

The multiple correlation coefficients generated between the criterion variable and the STEA score, total high school g.p.a., and math grade were significant at the metropolitan college ($p < .0001$), suburban campus ($p < .0001$), and the rural institution ($p < .01$) The hypothesis was rejected.

7. The multiple correlation using the STEA, total high school g.p.a., high school English, and high school math grades to predict fall quarter g.p.a. at all three community colleges will not be significant.

The multiple correlation coefficients between the fall quarter g.p.a. and the STEA score, total high school g.p.a., high school English, and high school math grade were significant at the metropolitan and suburban colleges ($p < .0001$) and the rural campus ($p < .01$). The hypothesis was rejected.

8. The multiple correlation using the total high school g.p.a., high school English, and high school math grades to predict fall quarter g.p.a.'s at all three community colleges will not be significant.

The multiple correlation coefficients between the criterion variable and the total high school g.p.a., high school English, and high school math grades were significant at the metropolitan and suburban campus ($p < .0001$) and the rural campus ($p < .03$). The hypothesis was rejected.

Discussion of the Results of the Study

Correlation Matrices

Validity coefficients between the STEA score and the criterion variable, fall quarter grade point average, were generally low (Tables 2-9). Significant correlations of greater magnitude were found between the criterion variable and high school academic data (Tables 2-9). The highest correlation was between the fall quarter g.p.a. and total high school g.p.a. at the suburban institution for students enrolled in the college parallel curriculum (.72).

A review of the literature suggested that high school academic data were more valid predictors for college grade point averages than were scholastic aptitude tests (Baird, 1969; Clem, 1968; College Entrance Examination Board, 1970; Morgenfeld, 1969; Preas, 1969; Richards, Holland & Lutz, 1967; Teal, 1972).

It would appear that the STEA should not be used to predict the fall quarter g.p.a. since the validity coefficient of greatest magnitude between the two variables was only a moderate .54 (Table 8). The size of that coefficient only accounts for twenty-nine percent of the variance. In other words, only 29 percent of the variance in the fall quarter g.p.a. is predicted by the STEA. A greater percentage of the variance must be accounted for to make sound predictions (Campanile, 1971; Clem, 1968; Cronbach, 1970; Denty, 1972).

Multiple Correlations

The results of the multiple regression equations are shown in Tables 10 and 11. These findings revealed that a higher level of variance (R^2) was accounted for when the STEA was combined with high school academic data. The fact that the value of a scholastic aptitude test for prediction purposes increased when combined with high school academic data has been demonstrated by the past research efforts of Adams, Highley and Campbell (1976), Clem (1968), Morgenfeld (1968), and Thomas (1971).

The regression equations developed in this study could be of value to community college personnel at the three institutions in predicting fall quarter grade point averages for students matriculating

directly from high school. These regression equations should be used with caution due to the grade point average span computed by applying the standard errors of estimate and due to the lack of magnitude of the R^2s (Tables 10 and 11).

Prediction by Sex

Using the STEA, college fall quarter g.p.a.'s were more predictable for females than for males at two of the three colleges (Tables 3 and 5). For males and females the only significant test for the STEA and fall quarter g.p.a. ($p < .05$) was found at the suburban institution (Table 3). At this institution the STEA and fall quarter g.p.a. correlated slightly higher and was slightly more significant for males (.47, $p < .0004$) than for females (.44, $p < .0015$).

At the metropolitan institution the highest correlated variable with the fall quarter g.p.a. for males, was high school math (.42), followed by a correlation of .34 between fall quarter g.p.a. and total high school g.p.a. The highest correlation coefficient for females was the total high school g.p.a. with the fall quarter g.p.a. (.50). The next highest validity correlations with the criterion variable were STEA (.44), high school math grade (.43), and high school English grade (.36). At this institution, females' fall quarter g.p.a.'s were more predictable than males' based on high school academic data and the STEA. This is demonstrated by the females' high school academic data and scholastic aptitute tests validating higher than did the same data for males. These findings supported the research efforts of Baggaley

(1974), Denty (1972), Fincher (1974), Gross, Faggen and McCarthy (1974) and Mathis (1973).

The variable of greatest validity for suburban college males and females for the fall quarter g.p.a. was high school g.p.a. followed in order, for each sex, by high school English grades, STEA scores, and high school math grades.

At the rural institution, the only variable which correlated significantly with the fall quarter g.p.a.'s of females was the STEA (.29). The best predictor for males was the total high school g.p.a. (.29) and the high school math grade (.28).

At the suburban and metropolitan institutions, the fall quarter g.p.a. of either sex could be predicted better by the high school academic data than by a single test of scholastic aptitude. This supports references listed previously in this chapter which indicated the high school academic data to be more valid predictors of college grade point averages than a scholastic aptitude test. Furthermore, the fall quarter g.p.a.'s of females were not more predictable than males at all colleges.

Prediction by Race

For white students (Table 6) the best predictor of fall quarter g.p.a. was the total high school g.p.a. (.48), followed by the high school math grade (.39), high school English grade (.33), and the STEA score (.30). For non-white students only one of the four independent variables, high school math, correlated significantly (.37) with the

fall quarter grade point average. Perhaps this indicates that the fall quarter g.p.a.'s of non-whites cannot be predicted by the same variables as white students. This finding was supported by the multiple regression equations computed by race which were not significant at the .05 level. When the identical multiple regression analyses in Tables 10 and 11 were computed for non-white students, the probability value ranged from $p < .09$ to $p < .44$ and the R^2s ranged from .07 to .15. Research of Cramer and Stevic (1972) and Cleary (1975) appeared to be substantiated, which suggested separate systems of prediction for student race may be necessary.

Prediction by Curricular Division

The STEA was a more efficient predictor of fall quarter g.p.a. for all occupational-technical students than for all college parallel students (Tables 7, 8, and 9). At the same time, high school grades were better predictors than the STEA of the criterion variable for all college parallel students. These results were sustained by the findings of Munday (1969).

For the two curricular divisions at the metropolitan and suburban colleges, the total high school g.p.a. and high school math or English grades were better predictors of fall quarter g.p.a. than the STEA. This suggests that the predictors of fall quarter g.p.a. for occupational-technical or college parallel students are similar. However, at these two institutions, the scholastic aptitude score of students in the occupational-technical curriculums was a better

predictor of initial college grade point average than it was for college parallel students. This finding was in agreement with Munday's (1969) research.

However, there appeared to be a difference in the predictors for students at the rural community college than the metropolitan and suburban institutions for the two curricular divisions. While the STEA and high school math were the best predictors for occupational-technical students' fall quarter g.p.a.'s, the total high school g.p.a. and high school English were the most valid predictors of the criterion variable for college parallel students.

In summary, the STEA correlated higher with fall quarter g.p.a., and a greater number of significant validity coefficients were generated at the suburban institution than at either of the other two community colleges. At the rural campus the opposite was true--lowest and fewer significant correlation coefficients between the STEA and fall quarter g.p.a. The metropolitan college was second to the suburban college in those comparisons. A speculative explanation for this may be that the suburban institution employs the Comparative Guidance and Placement Test (CGP) for the placement of students. The CGP was not used by the metropolitan or suburban institutions. Other factors that may have influenced the ranking of the three institutions would be students' motivation, teachers' grades, previous education, and students' health. Once again it is important to note that the low to moderate correlation coefficients did not account for a large portion of the variance between the independent variables and the criterion variable.

Conclusions

Considering the results of this study the following conclusions were made:

1. The score from the Short Test of Educational Ability correlated significantly, but at a low level, with the students' fall quarter grade point averages at the three institutions; therefore, it appears not to be a valid predictor of fall quarter g.p.a. for the community colleges used in this study.

2. The score from the Short Test of Educational Ability correlated significantly, but at a low level, with the fall quarter grade point averages of males and females and therefore, it appears not to be an effective predictor of fall quarter g.p.a. for either sex for the community college samples utilized in this study.

3. The score from the Short Test of Educational Ability correlated significantly, but at a low level, with the fall quarter grade point averages of white students, but not non-white students. Therefore, the Short Test of Educational Ability perhaps is not an efficient predictor of fall quarter grade point average, regardless of race, for the community college sample studied.

4. The score from the Short Test of Educational Ability significantly correlated at low to moderate levels of magnitude with the fall quarter g.p.a.'s of students enrolled in the occupational-technical divisions, but did not significantly correlate with the fall quarter g.p.a. of those in the college parallel or non-curricular

groups. Therefore, it appears not to be an efficient predictor of g.p.a. for either curriculum at the three community colleges selected for this research.

5. The Short Test of Educational Ability when combined with secondary school academic data becomes more efficient at predicting the fall quarter grade point averages at each of the three community colleges than the STEA used alone.

6. The total high school grade point average exceeded the Short Test of Educational Ability in fourteen of the nineteen correlational tests as the single best predictor of fall quarter grade point average. Therefore, the total high school grade point average was the single best predictor for the community college samples studied.

7. The Short Test of Educational Ability's lack of predictive validity should be a major concern when used by community college personnel to make decisions regarding curriculum placement of students or projecting initial grade point averages.

Recommendations for Utilization of the Study and for Future Research

The following recommendations for effective use of the study and future research are made. It is recommended that:

1. A research project be conducted with a group of community colleges, stratified by race, to study those academic and non-academic variables which best predict the grade point averages of non-white students.

2. An investigation be conducted with a group of community colleges, stratified by curriculums, to study those academic and non-academic variables which best predict the grade point averages of students by curriculum.

3. The Virginia Community College System should continue to encourage its member institutions to search for a valid aptitude instrument to be used in the counseling process.

4. This study should be replicated with another group of community colleges.

Summary

This chapter summarized the study's purpose and design. In addition, the results of the study are discussed. Finally, the conclusions and recommendations for use of the study were addressed.

REFERENCES

Adams, L. L., Highley, H. B., & Campbell, L. H. Statistical comparison of entrance prediction equations using ACT or SAT scores, or both. College and University, 1976, 51(2), 174-182.

Anderson, R. A study of the predictability of high school grades and the Differential Aptitude Tests for success in vocational programs in health careers. LaCrosse, Wisconsin: University of Wisconsin, 1971. (ERIC Document Reproduction Service No. ED 068 697)

Baggaley, A. R. Academic prediction at an ivy league college, moderated by demographic variables. Measurement and Evaluation in Guidance, 1974, 6(4), 232-235.

Baird, L. L. Prediction of accomplishment in college: A study of achievement. Journal of Counseling Psychology, 1968, 16, 246-253.

Barr, J. B., Goodnight, J. H., Sall, J. P., & Helwig, J. T. (Eds.), A users guide to SAS-76. Raleigh: SAS Institute, Inc., 1976.

Barrilleaux, S. P. Freshmen study habits and attitudes. Rockville, Maryland: Montgomery College, 1972. (ERIC Document Reproduction Service No. ED 063 916)

Burton, G. E. Prediction of college grades from selected background factors. College Student Journal, 1976, 10(1), 10-14.

Campanile, S. C. Prediction of academic success and description of students in a comprehensive community college. (Doctoral dissertation, The State University of New Jersey, 1970). Dissertation Abstracts International, 1971, 31, 3331A-3332A. (University Microfilms No. 71-475)

Carroll, J. B. Redundant testing. Report of the Commission on Tests: II. Briefs. New York: College Entrance Examination Board, 1970.

Carter, E. H. A comparison of CGP Mathematics Tests and last high school mathematics grades as predictors of success or failure in community college transfer mathematics courses. Unpublished manuscript, New River Community College, Office of Institutional Research, 1974.

Clark, R. M. A trial administration of the Comparative Guidance and Placement Program. Reedley, California: Reedley College, 1973. (ERIC Document Reproduction Service No. ED 086 292)

Clem, J. C. A study of the predictive efficiency of the Regents Scholarship Examination at State University of New York, Agricultural and Technical College, Alfred. (Doctoral dissertation, New Mexico State University, 1968). Dissertation Abstracts, 1968, 29, 1033A. (University Microfilms No. 68-13,552)

College Entrance Examination Board. Comparative Guidance and Placement Program: An experimental program for junior colleges. Progress report. New York, New York: College Entrance Examination Board, 1968. (ERIC Document Reproduction Service No. ED 026 053)

College Entrance Examination Board. Report of the Commission on Tests: I. Righting the balance. New York: Author, 1970.

Collins, C. C. Junior college student personnel programs: What they are and what they should be. Washington: American Association of Junior Colleges, 1967.

Collins, C. C. Some student characteristics and their implications for student personnel work. Berkley, California: University of California, 1969. (ERIC Document Reproduction Service No. ED 032 071)

Cramer, S. H., & Stevic, R. R. A review of the 1971-72 literature: Research on the transition from high school to college. College Board Review, 85, Fall 1972, 32-38.

Cronbach, L. J. Essentials of psychological testing (3rd ed.). New York: Harper & Row, 1970.

Cronbach, L. J. Test validation. In Robert L. Thorndike (Ed.), Educational Measurement (2nd ed.). Washington, D.C.: American Council on Education, 1971.

Cross, K. P. Beyond the open door. San Francisco: Jossey-Bass, 1971.

Denty, R. E. An investigation of concurrent and predictive validity of selected scales of the Comparative Guidance and Placement Program. (Doctoral dissertation, Florida State University, 1972). Dissertation Abstracts International, 1972, 33, 2707A. (University Microfilms No. 72-32,757)

DeVecchio, R. C. Scholastic aptitudes, academic motivation, personality and biographical characteristics of non-returning and returning community college freshmen. (Doctoral dissertation, University of Virginia, 1971). Dissertation Abstracts International, 1972, 32, 4371A-4372A. (University Microfilms No. 72-7163)

Dobbin, J. E. & Turnbull, W. W. The need for new appraisal techniques in junior colleges. In T. R. McConnell (Ed.), Junior college student personnel programs--Appraisal and development. A report to the Carnegie Commission. Washington, D.C.: American Association of Junior Colleges, 1965. (ERIC Document Reproduction Service No. ED 013 065)

Downie, N. M., & Heath, R. W. Basic statistical methods. (4th ed.). New York: Harper & Row, 1974.

Fincher, C. Is the SAT worth its salt? An evaluation of the use of the Scholastic Aptitude Test in the University System of Georgia over a thirteen year period. Review of Educational Research, 1974, 44(3), 293-305.

Flora, L. D. Predicting academic success at Lynchburg College from multiple correlational analysis of four selected predictor variables. (Doctoral dissertation, University of Virginia, 1967). Dissertation Abstracts, 1967, 27, 2276A. (University Microfilms No. 66-15,220).

Floyd, W. A. A longitudinal study of the Scholastic Aptitude Test as a predictor of college success. The School Counselor, 1967, 14(3), 138-141.

Gell, R. L., & Bleil, B. F. Grades--scores--predictions: A study of the efficiency of high school grades and American College Test scores in predicting academic achievement at Montgomery College. Rockville, Maryland: Montgomery College, 1971. (ERIC Document Reproduction Service No. ED 052 782)

Gold, B. K. The Fall, 1969 guidance examination: A report on some proposed new tests. Los Angeles, California: Los Angeles City College, 1970. (ERIC Document Reproduction Service No. ED 038 967)

Gross, A. L., Faggen, J., & McCarthy, K. The differential predictability of the college performance of males and females. Educational and Psychological Measurement, 1974, 34, 363-365.

Hill, J. R. Use of measurement in selection and placement. In R. L. Thorndike (Ed.), Educational Measurement (2nd ed.). Washington: American Council on Education, 1971.

Hinko, P. M. A national survey of counseling services. Junior College Journal, 1971, 42(3), 20-24.

Hoyt, D. P. Predicting grades in two year terminal programs: An experiment in predicting the college ability of 'non-academically oriented' students. Junior College Journal, 1966, 36(5), 20-23.

Hoyt, D. P., & Munday, L. A. Academic description and prediction in junior colleges. The two year college and its students: An empirical report. Iowa City: The American College Testing Program, 1969. (Monograph No. 2)

Janzen, H. L. The use of reading tests for entrance and placement testing in a community college. Calgary, Alberta, Canada: Mount Royal College, 1970. (ERIC Document Reproduction Service No. ED 041 951)

Johns, D. J. Correlates of academic success in a predominately black open-door, public, urban community college. (Doctoral dissertation, University of Virginia, 1970). Dissertation Abstracts International, 1971, 31, 4464A-4465A. (University Microfilms No. 70-26,584)

Jones, H. J. An evaluation of the Washington Pre-College Differential Guidance Test as an effective guidance instrument at the junior college level. (Doctoral dissertation, Washington State University, 1966). Dissertation Abstracts, 1967, 27, 2830A-2831A. (University Microfilms No. 67-1564)

Jones, W. P. Predicting academic performance with the Short Test of Educational Ability considering social class and sex differences. (Doctoral dissertation, New Mexico State University, 1968). Dissertation Abstracts, 1969, 29, 3832A. (University Microfilms No. 69-7932)

Jones, W. P. Sex differences in academic prediction. Measurement and Education in Guidance, 1970, 3(2), 88-91.

Jones, W. P. Short Test of Educational Ability: A rejoiner from the publisher. Journal of Educational Measurement, 1971, 8(1), 51-52.

Jones, W. P., & DeBlassie, R. R. Social class contrasts in short term predictability of grade seven achievement. Journal of Educational Research, 1971, 65(1), 11-14.

Kilpatrick, G. A consideration of placement testing. El Camino, California: El Camino College, 1968. (ERIC Document Reproduction Service No. ED 022 454)

Lanier, D., & Lightsey, R. Verbal SAT scores and high school averages as predictors. Intellect, 1972, 101, 127-128.

Lavin, D. E. The prediction of academic performance. New York: Russell Sage Foundation, 1965.

Lunneborg, C. E., & Lunneborg, P. W. Predicting success in community college vocational courses. Journal of Counseling Psychology, 1969, 16(4), 353-357.

Lunneborg, C. E., Lunneborg, P. W., & Greenmun, R. Prediction of multiple aspects of the community college experience. Measurement and Evaluation in Guidance, 1970, 2(4), 234-242.

Maier, R. O. Evaluation of English course placement for the 1967-68 school year. Maui, Hawaii: Maui Community College, 1968. (ERIC Document Reproduction Service No. ED 022 473)

Mathis, H. R. The validity of the American College Test in prediction of academic achievement in community colleges of Appalachian Kentucky. (Doctoral dissertation, North Carolina State University, 1972). Dissertation Abstracts International, 1973, 33, 3391A-3392A. (University Microfilms No. 73-1198)

McConnell, T. R. Junior college student personnel programs--Appraisal and development. A report to the Carnegie Commission. Washington, D.C.: American Association of Junior Colleges, 1965. (ERIC Document Reproduction Service No. ED 013 065)

Monroe, C. R. Profile of the community college. San Francisco: Jossey-Bass, 1972.

Morgenfeld, G. R. The prediction of junior college achievement from adjusted secondary school grade averages. (Doctoral dissertation, University of Arizona, 1967). Dissertation Abstracts, 1968, 28, 2987A-2988A. (University Microfilms No. 68-791)

Morrison, J. L., & Ferrante, R. Compensatory education in two year colleges. Report No. 21. University Park, Pennsylvania: Pennsylvania State University, 1973. (ERIC Document Reproduction Service No. ED 078 818)

Munday, L. A. A comparison of junior college students in transfer and terminal curricula. Journal of College Student Personnel, 1968, 9(5), 325-329.

Munday, L. A. A comparison of junior college students in transfer and terminal curricula. The two year college and its students: An empirical report. Iowa City: The American College Testing Program, 1969. (Monograph No. 2)

O'Banion, T., & Thurston, A. (Eds.), Student development programs in the community junior college. Englewood Cliffs, New Jersey: Prentice-Hall, 1972.

Opitz, A. M., & Reed, M. D. Virginia Community College System ad hoc committee on testing: Summary report. Richmond, Virginia: Virginia Community College System, 1970. (ERIC Document Reproduction Service No. ED 047 016)

Pfeifer, C. M., Jr., & Sedlacek, W. E. The validity of academic predictors for black and white students at a predominately white university. Journal of Educational Measurement, 8(4), 1971, 253-261.

Preas, N. B. A study of the relationship between selected variables and academic achievement in a community college. Raleigh, North Carolina: North Carolina State University, 1969. (ERIC Document Reproduction Service No. ED 039 423)

Raines, M. R. The student personnel situation. Junior College Journal, 1966, 36(5), 6-8.

Raines, M. R. Student personnel development in junior colleges. In L. E. Fitzgerald, W. F. Johnson & W. Norris (Eds.), College student personnel: Readings and bibliographies. Boston: Houghton-Mifflin, 1970.

Reed, M. D. Studies of student performance on the Comparative Guidance and Placement Program. Lynchburg, Virginia: Central Virginia Community College, 1972. (ERIC Document Reproduction Service No. ED 063 930)

Richards, J. M., Holland, J. L., & Lutz, S. W. The prediction of student accomplishment in college. Journal of Educational Psychology, 1967, 58(6), 343-355.

Root, E. L. A regression analysis of selected variables predicting academic success of full- and part-time students at Alleghany Community College, 1963-1970. (Doctoral dissertation, University of Maryland, 1970). Dissertation Abstracts International, 1971, 31, 5730A-5731A. (University Microfilms No. 71-13,190)

Science Research Associates, Inc. STEA conversion tables and technical brief. Chicago: Author, 1970.

Science Research Associates, Inc. SRA assessment survey using test results: A teacher's guide. Chicago: Author, 1972.

Science Research Associates, Inc. Interpretive Manual--STEA--Levels 3-5. Chicago: Author, no date.

Sedlacek, W. E. Issues in predicting black student success in higher education. The Journal of Negro Education, 1974, 43(4), 512-516.

Seibel, D. W. Measurement and evaluation. Junior College Journal, 1967, 38(3), 13-16. (a)

Seibel, D. W. Testing for guidance and counseling in junior colleges. Personnel and Guidance Journal, 1967, 45(10), 979-986. (b)

Stanley, J. C., & Porter, A. C. Correlation of scholastic aptitude test score with college grades for Negroes versus whites. Journal of Educational Measurement, 1967, 4(4), 199-218.

Stanley, J. C. Predicting college success of the educationally disadvantaged. Science, 1971, 171, 640-647.

Teal, J. D. A comparative study of four placement test batteries at an urban-rural community college. (Doctoral dissertation, Illinois State University, 1972). Dissertation Abstracts International, 1972, 33, 2184A. (University Microfilms No. 72-29,593)

Thomas, C. L., & Stanley, J. C. Effectiveness of high school grades for predicting college grades of black students: A review and discussion. Journal of Educational Measurement, 1969, 6(4), 203-215.

Thomas, C. L. The relative effectiveness of high school grades and standardized test scores for predicting college grades of black students. (Doctoral dissertation, The John Hopkins University, 1971). Dissertation Abstracts International, 1971, 32, 2495A-2496A. (University Microfilms No. 71-29,189)

Thorndike, R. L. Educational measurement for the seventies. In Thorndike, R. L. (Ed.), Educational Measurement (2nd ed.). Washington, D.C.: American Council on Education, 1971.

Trout, R. W., Sr. CGP--After one year. American Vocational Journal, 1971, 46(7), 25-27.

Tuscher, M. F. A proposed model for predicting success in a first course of college calculus in the community junior college. (Doctoral dissertation, University of Southern California, 1972). Dissertation Abstracts International, 1972, 33, 1468A-1469A. (University Microfilms No. 72-27,701)

U. S. Bureau of Census. 1970 General, social and economic characteristics. Final report PC(1)-C48 Virginia. (Stock No. 0301-2352). Washington, D.C.: U. S. Government Printing Office, 1972.

1975 Virginia Community College Policy Manual. Virginia Community College System, Office of the Chancellor. Richmond, Virginia: 1975.

Wattenbarger, J. L. Articulation with high schools and four-year colleges and universities. In T. O'Banion & A. Thurston (Eds.), Student development programs in the community junior college. Englewood Cliffs, New Jersey: Prentice-Hall, 1972.

Willingham, W. W. The source book for higher education. New York: College Entrance Examination Board, 1973.

Willingham, W. W. College placement and exemption. New York: College Entrance Examination Board, 1974.

Wilson, P., & Blum, W. The nature, predictive value, and use of the American College Test at Ohlone College. Fremont, California: Ohlone College, 1968. (ERIC Document Reproduction Service No. ED 028 766)

Zimmerman, W. S., & Michael, W. B. A comparison of the criterion-related validities of three college entrance examinations with different content emphases. Educational and Psychological Measurement, 1967, 27, 407-412.

The vita has been removed from the scanned document

THE PREDICTIVE VALIDITY OF THE SHORT TEST OF EDUCATIONAL ABILITY FOR THREE VIRGINIA COMMUNITY COLLEGES

by

Roland McKinley Biesecker

(ABSTRACT)

Community college counselors are continually confronted with the difficult task of assisting students to choose from one of the various curricula. Scholastic aptitude test data have been frequently used by counselors to provide students with information to assist them in their college planning. However, before the decision to assess the scholastic aptitude of students and to use the results for counseling purposes, the scholastic test's predictive validity should be determined.

The Short Test of Educational Ability (STEA) is a scholastic aptitude test score available to all Virginia Community Colleges. The STEA score is currently transmitted to the college via the student's high school transcript. Because the 1975 Virginia Community College System Policy Manual requires a validity study of potential curricular placement tools, it was the purpose of this study to determine the STEA's validity for predicting a student's 1976 fall quarter grade point average.

This investigation was conducted during the academic year 1976-1977 at three community colleges within the Virginia Community College System. The samples used in this study were drawn from 1976 Virginia high school graduates enrolled for the first time for the fall quarter, 1976, at a metropolitan, a suburban, and a rural institution. One hundred subjects were randomly selected at each institution. From the colleges' permanent files the following data were collected for each student: (1) total high school grade point average, (2) last high school grade in English, (3) last high school grade in math, (4) STEA score, (5) sex, (6) race, (7) curriculum, and (8) 1976 fall quarter grade point average. Using this data, Pearson product moment correlations and multiple regression coefficients were generated by the "Correlational Procedure" and "General Linear Model Procedure" of the Statistical Analysis System - 1976

The results of the study as they related to the hypotheses were as follows. At the three institutions significant ($p < .05$), but low, correlations were found between the students' fall quarter g.p.a.'s and their STEA scores. Low to moderate three and four variable multiple correlations were significant ($p < .05$) between the fall quarter g.p.a. and combinations of the following independent variables: the total high school grade point average, the grades in high school English and math, and the STEA. For all three colleges the results were not significant for the prediction of the fall quarter g.p.a. using the STEA when subgrouped by students' sex, race or curriculum.

From the results of this study the following conclusions were made. For the three community colleges studied the STEA was an inefficient predictor of fall quarter grade point average: (1) at either college, (2) for either sex, (3) for either race, (4) for either curriculum. Furthermore the STEA improved in prediction when secondary school data was added. In addition, the STEA's limited predictive validity should be paramount when used by community college personnel to make decisions regarding curriculum placement of students or projecting initial grade point averages.