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ABSTRACT

One hundred twenty college freshmen in the lowest 20% of their classes participated in a study of the relationships between scores on the Nelson-Denny Reading Test and the Cooperative English Test and varying levels of standing on ACT English and Social Studies and SAT Verbal Tests, by race and gender, controlling for high school grade-point average, class size, rank in class, and complexity of the Omnibus Personality Inventory. Results indicated that, of the two ACT subtests, ACT English was the better predictor. ACT Social Studies alone was not significantly related to either of the criterion variables. For the Nelson-Denny, performance was positively related to ACT English and SAT Verbal scores. High school grade-point average varied significantly with Nelson-Denny scores. For the Cooperative English Test, a three-way interaction was present; in order to predict Cooperative English scores, information would be required on level of ACT or SAT score, sex, and race of the student. Class size, rank in class, autonomy, and complexity did not vary significantly with either the Nelson-Denny or the Cooperative English Test. (Author/AA)

# A STUDY OF THE RELATIONSHIP OF SELECTED VARIABLES TO ACHIEVEMENT IN A BASIC COMMUNICATION SKILLS COURSE

THESIS

A thesis submitted in partial fulfillment of the requirements for the degree of Specialist in Education at the University of Kentucky

By

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ABSTRACT OF THESIS

A STUDY OF THE RELATIONSHIP OF SELECTED VARIABLES TO

ACHIEVEMENT IN A BASIC COMMUNICATION SKILLS COURSE

This study explored the relationship of varying levels of standing on ACT English and Social Studies and SAT Verbal scores by race and gender, controlling for HSGPA, class size, rank in class, and autonomy and complexity of the OPI for 120 college freshmen selected from the lowest twenty percent of their freshman classes. Analysis of variance and analysis of covariance were used to determine relationships between the independent variables and the criterion variables, the Nelson-Denny Reading Test and the Cooperative English Test. Three groups were derived (low, middle, high), using ACT English and SAT Verbal scores in order to test differences of means by level of score. Results revealed that of the two ACT subtests, ACT English is the better predictor. ACT Social Studies alone is not significantly related at the .05 level to either of the criterion variables. For the Nelson-Denny performance is positively related to the level of ACT English or SAT Verbal score, $p < .01$. HSGPA varies significantly with Nelson-Benny, $p < .05$. For the Cooperative English, a three-way interaction is present for scores on ACT English or SAT Verbal, race, and gender, $p < .02$. In order to predict Cooperative English, information would be required on level of ACT or SAT score, sex, and race of a student. Class size, HSR, autonomy, and complexity did not vary significantly with either Nelson-Denny or Cooperative English.

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Date

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# CHAPTER I

## THE PROBLEM

The primary purpose of this study was exploratory, looking into the relationship of selected variables as each relates to the criterion variables, the Nelson-Denny and the "Mechanics and Effectiveness" portion of the Cooperative English Test. In this study, the following specific questions were asked:

1. Is there a statistically significant positive relationship between ACT English and ACT Social Studies scores and scores on the Nelson-Denny Reading Test and the Cooperative English Test?

2. Is there a statistically significant positive relationship between SAT Verbal scores and scores on the Nelson-Denny and the Cooperative English?

3. Is there a statistically significant positive relationship between high school grade point averages and scores on the Nelson-Denny and the Cooperative English?

4. Is there a statistically significant positive relationship between rank in high school graduating classes and scores on the Nelson-Denny and the Cooperative English?

5. Is the size of high school graduating class related to scores on the Nelson-Denny and the Cooperative English?

6. Is there a statistically significant positive relationship between measures of autonomy (Au) and complexity (Co) of the Omnibus

Personality Inventory and scores on both the Nelson-Denny and the Cooperative English?

A secondary purpose of this study explored whether the sex or race of the students is related to performance on both the Nelson-Denny and the Cooperative English. The two subordinate questions were:

1. Do males or females score higher on the Nelson-Denny and the Cooperative English?

2. Is there a significant difference between the scores of blacks and whites on the Nelson-Denny and the Cooperative English?

## Background of the Study

Long before it became popular for colleges and universities to seek minority or disadvantaged students, Berea College was engaged in educating both minorities and economically disadvantaged. Throughout its existence, the College has drawn the majority of its students from low-income families of the Southern Appalachian Mountain region, and since the repeal of the Day Law in 1951 which permitted blacks and whites to be educated in the same school, the College has actively recruited blacks, as well as low-income whites. That students continue to be selected from a low socio-economic level is revealed by data from the Seventh Annual Survey of College Freshmen released by the American Council on Education. Seventy-three percent of Berea's 1972-73 class came from homes with annual incomes of under $8,000. Consistently, the majority of Berea students have been first generation college students and children of blue collar workers. From the point of view of socio-economic level, the student population fits the description of "New Students" identified by Patricia Cross in Beyond the Open Door (1971).

Not only has the majority of the student population been economically disadvantaged, but the College has also traditionally classified twenty percent of the entering freshman class as educationally disadvantaged. That is, over the years the College has maintained a rather extensive pre-admission testing program, and from a battery of tests, those students scoring in the lowest twenty percent of the class have been required to take non-credit basic courses in reading, English, and mathematics.

In the fall of 1969, although not acknowledging to an open admissions program, the College lowered admission standards significantly and admitted students ill-prepared for academic achievement. By the fall of 1970, instructors of freshman composition became aware that many students who had taken developmental reading and basic composition the previous year still lacked reading and writing skills requisite for quality academic performance. Proceeding from the belief that severe deficiencies in basic skills cannot be remediated in four months, faculty proposed a new course in communication skills, combining the former reading and writing courses. The course became part of the curriculum in September, 1971, by faculty action.

Designated general studies, the new course was designed to provide instruction for a minimum of one semester but was planned so that most students would be enrolled at least two semesters. In an attempt to ensure a measure of competence, criteria were set to determine when a student no longer had to enroll in the basic course. The criteria set required that a student achieve a score of 12.0 or above on the Nelson-Denny Reading Test and a raw score of 37 (22%ile) or above on the "Mechanics and Effectiveness Section" of the Cooperative English Test.

At the end of each term, testing would determine the right to waive further developmental work. Furthermore, if at the end of the second term the student had been enrolled in the course he had not achieved the criteria, he must enroll for a third semester in a communication skills section R (repeat). This new general studies requirement was a change in curriculum which affected both students and faculty.

At the end of the first year of the new communications skills program, many students did not achieve the standards set for passing the course and were required to enroll in the R section during their sophomore year. Additional personnel had to be hired, and students' programs had to be changed after spring pre-registration had been completed.

The question arose among the faculty teaching in the basic program--Is it possible to identify student characteristic related to achievement on both the Nelson-Denny and the Cooperative English? If so, predictors of achievement might be found which would be of value to faculty, administrators, and admission counsellors in helping to identify those students who might need special help in the communication skills course.

## Review of Related Literature

Predicting academic success has long presented an intriguing and challenging problem because there have always been discrepancies between predictions and achievement for both individuals and groups. Previous research studies have been numerous and diverse, using a variety of techniques and batteries of measures. Many of the studies are global in nature; that is, they utilize global measures of ability to predict overall success at some level of academic pursuit, whether it be elementary, high school, college, or graduate study.

Cognitive, affective, and non-intellective factors have all been investigated relevant to their predictive validity. Not only standardized tests but also local predictors have been employed in the hope of improving the prediction equation. In this study, the variables selected for inclusion have been included in various combinations in numerous studies.

Achievement and Aptitude Tests. Because of their high correlation with academic success, the two most well-known and most widely used predictors of academic achievement for college and university students are the scores of the American College Test and the Scholastic Aptitude Test.

Both the composite score and subtest scores of the American College Test are used for predictive purposes, either alone or in combination with high school grades. This combination of variables has often been used to place students in appropriate levels in English composition (Buros, 1965, p.4). Green (1969), in analyzing academic proficiency of freshmen in a school of business, found that the ACT Composite Score was significant in predicting quality point average. In an investigation involving records of 51 colleges and universities, Munday (1968) studied the correlation of the ACT with several standardized tests which are widely used for screening and predictive purposes and found that ACT English scores correlate .73 with the Cooperative English Test, while the ACT Social Studies Test, essentially a reading test, correlates .70 with the Nelson-Denny Reading Test. Vraa (1971) found that ACT Social Studies and Natural Science Reading scores were significant variables in predicting success for Canadian males enrolled in a United States college but that the ACT English score was the best predictor.

Another nationally administered standardized test which is widely used for predictive purposes is the Scholastic Aptitude Test. Although the test is not an achievement one, according to Buros (1972), the SAT has acceptable validity for predicting freshman grade point average of .30 - .55. At Indiana University research showed that the validity coefficient for SAT Verbal Scores was .54, while at the same school, the validity coefficient for the ACT was .61 (Buros, 1972). Bloom and Peters (1961) report that Crawford and Burnham in Forecasting College Achievement showed that SAT verbal scores correlated with average English and history grades +.49 (Bloom and Peters, p.28).

Wilson (1970) investigated the relative utility of CEEB Average and SAT scores in predicting college performance at CRC - Member Colleges for women and concluded that the CEEB Achievement Average was more useful as a predictor than were SAT Scores alone. He found that the accuracy of predictions based on SAT alone can be improved by adding class rank, and furthermore, adding CEEB Achievement Average Scores significantly improves predictions.

That both the SAT and ACT are to a great degree measures of reading and verbal abilities is an accepted fact. As might be expected, Daniel (1967) found that verbal scores between high academic aptitude students and low academic aptitude students differed significantly. Whether there was a significant positive relationship between scores on the SAT Verbal and ACT subscores and achievement in reading and English for this group of students as there is for other groups was of prime interest in this study.

High School Grade Point Average. Although standardized tests have proved valid predictors of academic success, the fact that for many groups high school grade point average (HSGPA) correlates with academic success in college has been established. Many believe that, among other considerations, the high school grade point average is indicative of behavior patterns which are likely to be continued in college. Studies offer conflicting evidence as to whether grades alone should be used as the only criterion of performance. However, grades "are unquestionably an index of competence in school work" (Lavin, 1965, p.16).

In a study by Richards, Holland, and Lutz (1967) involving 7,208 students at twenty-two colleges, the best single predictor of academic accomplishment was the high school grade point average; however, a better predictor than grades alone was found to be some weighted combination of ACT Scores and high school grades. Marshall (1969) found not only that the cognitive variable which had the highest correlation with college grade point average was HSGPA, but also that the predicted GPA was a more efficient predictor than were non-cognitive variables in their study. Goldman and Sexton (1975) investigated the relationship of the number of high school classes a student had taken in a given subject area to success in college and found that college success was virtually unrelated to the number of classes taken in each area but was related only to HSGPA.

In comparing aptitude and achievement test scores and HSGPA, Endler and Steinberg (1963) found HSGPA to be superior in predicting first year college grades. Lunneborg and Lunneborg (1969) studied the success of students in six Washington State community colleges and found that predictors having the highest degree of correlation with academic success

were HSGPA, with the average of high school English grades tending to be the highest. Wilson (1970) of the College Research Center found that the high school grade point yields a higher simple correlation with college freshmen GPA than does secondary school rank.

Both Worthington and Grant (1965) and Campbell (1966) found that college performance corresponds significantly to high school grades. Campbell found that students with a "B" average in high school achieved significantly higher quartile rank in class consistent with GPA, while those students with a "D" average had only a 50 - 50 chance of success in college. However, A. V. Wilson (1969), in studying freshmen at Tuskegee, found that HSGPA was not related to freshman academic success.

Whether high school grades, either alone or in combination with other variables, are indicative of academic achievement for basic students at Berea College was one of the questions investigated.

Rank in Class. Another aspect of the high school experience which is of interest to researchers is that of rank in class. Selective institutions often automatically begin the selection process by choosing students from the top ten or twenty percent of the high school graduating class. However, with the inflation of grades generally in the educational system and the inception of open enrollment, interest has been stimulated in the relationship of a student's rank in a group, rather than the grades alone, as an indicator of performance.

Although there is not a mass of information on the subject of rank in class, a few studies have included rank as a variable. Karp (1967) in a study involving 1,250 students from 208 high schools found that the most important predictor for freshman GPA was high school rank (HSR). Brown (1964) found that HSR and aptitude measures were better predictors

of college GPA than were study habits and attitudes. In a discussion of the SAT Score as an aggregate predictor of academic success, Doermann (1968) concedes that "performance in secondary school measured by rank-in-class seems to be more valid" (p.22). Wilson (1970) in his study of grades for freshman women, found that the accuracy of prediction of the SAT can be improved by adding class rank. In addition, his study showed that "weights from multiple correlational analyses show that weights for Rank and Achievement Average are greater than weights for SAT V or SAT M."

A study by Dalton (1974) does not bear out the previous findings, for he found that although HSR is more valid as a predictor of academic success for minority students (primarily black) than SAT Scores, HSR appears to be less valid for minorities than for the general populace. Pabst (1966) concludes that although HSR, English and Social Studies are the best predictors of academic achievement, it is quite possible for a person who ranks low to succeed in college.

This study sought to determine whether those students who ranked highest among their high school peers continued their pattern of high rank and also scored highest on both the Nelson Denny and the Cooperative English when they were freshmen in college.

Size of Class. The relationship of the size of high school from which students are graduated to academic success is not clear. For example, there exists the possibility that students from very small high schools may not have had the advantages of adequate libraries, skilled teachers, and a comprehensive curriculum. Bright students who have in their past learning experiences lacked a favorable learning climate may achieve academically at an accelerated rate when given a more favorable

learning environment. On the other hand, the possibility exists that students from remote areas may find the adjustment to a larger community difficult, thus limiting their academic achievement when they are college freshmen. Students from large high schools may have had adequate opportunity to develop their potential at the public school level. Berea students, just as students in other colleges, are selected from high schools with graduating classes ranging from fewer than twenty-five graduates to more than five hundred-fifty, and thus there is diversity in the student population.

There are few studies involving the size of high school class. Pabst (1965) in a study involving 1,900 Indiana University students, found that the size of high school from which students graduate was not related to success in college. On the other hand, Campbell (1966) found class size significant at the .05 level and that students from classes of 200 - 399 had the greatest percentage of achievement. Gallant (1966) found few notable differences when comparing ACT and SAT percentile ranks of students with size of graduating classes, but it is interesting to note that in relation to the group he studied the larger the high school class, the lower the mean HSGPA. Although not specifically noting class size, Worthington (1965) found that college performance is significantly influenced by the high school attended. Indeed, it would seem that high school environment might be important in developing learning skills requisite for academic success in college.

Personality. Stein (1963, p.61) has said that "behavior in college . . . is a function of the transactional relationships between the student and his environment." One instrument which assesses the manner in which one reacts to others, ideas, and environment is the Omnibus Personality

Inventory. For purposes of this study, two scales from OPI, Autonomy (Au) and Complexity (Co) were selected for inclusion. Au, a "measure of personal autonomy, independence of thought and judgment, and non-authoritarian thinking" has been found to be correlated consistently above .45 with measures of verbal ability (Heist and Yonge, 1968). Lavin (1965, p.79), in summarizing findings of research on measures of independence, reports that "independence appears to be positively related to academic performance." Complexity (Co) indicates that one is tolerant of uncertainties and likes to take chances without knowing whether or not something will actually happen. Whether students possess these characteristics, autonomy and complexity, may greatly influence their academic progress.

The efficacy of using a variety of non-intellective factors in predicting academic achievement has been widely studied by means of several different instruments. Hakel (1966), in studying 102 males, failed to find any definite relationship with regard to personality correlates. However, although personality variables were not identified, Daniel (1967) found that students with low academic aptitude were more homogeneous with respect to personality variables than were high academic aptitude students.

In a study involving 178 male and female students, A. V. Wilson (1969) found the SCAT Quantative to be the best predictor, but that when the results of the California Test of Personality were added to the prediction equation, R increased from .455 to .756, significant above the .01 level of confidence. Liberty, Pierson, and Burton (1964) found that "poor readers were likely to be pessimistic, anxious, low in achievement evaluation, intolerant of ambiguity, and high on

succorance and abasement needs." Although both Elton (1969) and Morgan (1971) found that OPI Scores failed to predict educational outcomes, Morgan, in studying persistors in college, found that although the ACT Composite score was the most powerful discriminator, authoritarianism and nonconformity entered the discriminating process for males and both authoritarianism and social comfort discriminated among females.

An investigation of the relationship between personality traits and improvement in college reading was conducted by Carney (1966) with a group similar to the population of the present study. He studied 147 Western Reserve freshmen who scored below the 30th percentile on the reading portion of the Cooperative English and who were required to enroll in a reading improvement course. His basic hypothesis that inflexible personality contributed to poor reading was not substantiated.

Even though the personality traits of autonomy and complexity are known to be related to verbal ability and to academic success, previous investigations present conflicting evidence concerning the relationship between personality on actual achievement for different groups. Therefore, inquiry into the relationship of two personality traits to achievement in reading and English for the group of the present study seemed worthwhile.

Gender. Another aspect of the present investigation centered on the question of difference of achievement between the sexes. Lavin (1965, p.44) reports in his review of research on academic prediction that ability and school performance are more highly correlated for females than for males, and that for females absolute performance tends to be higher. Therefore, in studies of academic prediction, if students are not separated by gender, the magnitude of correlations will not accurately

reflect the true level for sexes separately. According to Cross (1971, pp.137-38), studies from as far back as 1929 show that high school grades for women have been superior to those of men, but that in selective institutions, the achievement level is more even because of admission policies. In open door institutions, the difference in the level of achievement is more pronounced because women with poor high school grades are less likely to go to college than are males. Males whose high school grades are low are likely to enter open door institutions.

The population of the present study in many ways more accurately fits the description of "new students" than traditional ones, and research on new students reveals changing patterns. A recent study of open enrollment students at CUNY by Gross, Faggen and McCarthy (1974) found that although females on the average consistently showed higher GPA's, the predictor score means and standard deviations were basically the same for male and female. Clark and Ammons (1970) found that cognitive factors were significant predictors of academic success for all except Negro males. In studying the relationship of reading comprehension scores to achievement of junior college students, Feuers (1970) failed to find a significant difference between males and females. In studying personality differences, Heist and Yonge (1968) found that statistically significant differences between the sexes did not exist in complexity, a measure of flexibility and tolerance for uncertainties and ambiguities. However, Long, (1964) found that in predicting academic success, personality factors were more important for men than for women, and perhaps the difference could be related to the immaturity of men.

Studies such as those reported by Michael, Jones, and Coe (1962),

Speigel (1971), and Campbell (1966) bore out Lavin's generalization that achievement for females would be significantly higher than for males. It was hypothesized for the present study that the generalizations of Lavin and Cross would be borne out. Because of admission patterns, as a group women have higher entrance scores than men, and for that reason, higher achievement by women was expected.

Race. The final question asked in the study was: Is there a significant difference between the scores of blacks and whites on the Nelson-Denny and the Cooperative English?

Since the inception of open enrollment in colleges and universities, there has been a hue and cry that standardized tests are unfair to minorities, especially blacks. Much research has been conducted in an effort to determine the validity of the charge, and yet conclusive findings to support the contention have not established the charge.

Tatum and Tatum (1974) in studying academic predictors for black students found that as predictors SAT V and SAT M did not differentiate between the sexes at the .05 level of significance. Dalton (1974) also found that SAT scores were not effective predictors for minority students, primarily blacks. After reviewing SAT scores for blacks at integrated colleges, Clark and Plotkin (1963) concluded that the scores either failed to predict or underestimated performance.

Not all studies, however, have reached the same conclusion. Beasley (1974) determined that even though biographical or nonintellective data correlated with criterion variables in his study of predictors of academic success, five subscores of the ACT correlated significantly with success. His findings support the contention that the ACT predicts as well for blacks as it does for other populations. Cross in Beyond the Open Door

(pp. 124-125) summarizes studies which have investigated ethnic bias in standardized tests as follows:

> . . . the great weight of the evidence is that the tests predict college grades equally well for whites and members of minority ethnic groups (Cleary, 1968; Kendrick, 1967-68; Flaugher, 1970; Kendrick and Thomas, 1970). (What grades predict is a different question.) Even where differential predictions exist, the inaccuracies tend to favor minority youth and not to discriminate against them (Cleary, 1968; Temp, 1971). If anything, the results of research indicate that for blacks test scores are better predictors of college grades than are high school grades (McKelpin, 1965); Munday, 1965; Thomas and Stanley, 1969; Kendrick and Thomas, 1970).

Summary. Inasmuch as the results of research studies still provide conflicting evidence concerning variables, both cognitive and non-intellective, which best predict academic success, there exists a need for continued research. Because the relationships found in one school or with one group do not necessarily carry over or apply to another school, local studies are needed.

# CHAPTER II

# METHOD

## Statement of the Problem

The present study was exploratory, looking into the relationship of varying initial levels of standing on selected variables and achievement in a basic communication skills course. Specifically, the question was asked: Is there a statistically significant relationship between the criterion variables, (the Nelson-Denny Reading Test and the Cooperative English Test) and ACT English and Social Studies scores or SAT Verbal score, high school grade point average (HSGPA), rank in high school graduating class (HSR), size of high school graduating class (ClSz), and the measures of autonomy (Au) and complexity (Co) of the Omnibus Personality Inventory?

Additionally, the question was asked: Is the gender or race of a student related to performance on the Nelson-Denny and the Cooperative English?

## Hypotheses

The following substantive statements were tested:

1. There is a statistically significant positive relationship between ACT English and Social Studies scores or SAT Verbal scores, controlling for HSGPA, size of graduating class, rank in class, and measures of autonomy and complexity of the OPI and scores on the Nelson-Denny and the Cooperative English.

2. There is a statistically significant difference between the means of the males and females on the criterion variables.

3. There is a statistically significant difference between the means of the blacks and whites on the criterion variables.

Null Hypotheses

1. There is no statistically significant positive relationship between ACT English and Social Studies scores or SAT Verbal scores, controlling for HSGPA, size of class, rank in class, and measures of autonomy and complexity of the OPI and scores on both the Nelson-Denny and the Cooperative English.

2. There is no statistically significant difference between the means of the males and the females on both the Nelson-Denny and the Cooperative English.

3. There is no statistically significant difference between the means of blacks and whites on both the Nelson-Denny and the Cooperative English.

Population

The sample for this study included Berea College students enrolled in Communication Skills, G. S. 015, 016, during the years 1971-72 and 1972-73. Therefore, the population is considered to be all Appalachian students with characteristics similar to those of this sample.

In September, 1971, as a result of entrance tests, 87 students were originally assigned to G. S. 015. Of that number, SAT scores were available for 24 and ACT scores for 44. Six students entered with College Qualification Test (CQT) scores, and eight others either withdrew from school or did not complete the course, leaving a total of 68

students for whom data were available.

In September, 1972, 62 students were originally assigned to the course. Of that number 28 had ACT scores, 28 had SAT scores, and six had CQT scores. Four students withdrew before the end of the year, leaving a total of 52 to be included in the study. Data for the two years were grouped, making a total of 120 cases to be included in the study.

The sample itself created the limiting factor of a restriction of range in the study. Because all subjects enrolled in the course were selected from the lower twenty percent of the entering freshman classes, the range of scores on the SAT Verbal and ACT English and Social Studies was lower than the range for all entering freshmen.

Data Collection

Data on the variables were secured from the records of Berea College Testing Service, the Admissions Office, and the reading teacher.

Data Analyses

After the data were collected, the first procedure involved coding the data for each individual, in order that the data could be transferred to computer cards. Nelson-Denny scores were recorded by grade level, and the Cooperative English scores, by raw score. The size of high school graduating class was coded in increments of 25, with the code numbers beginning with 1 for the smallest category and increasing as the range for size of class increased. Rank in class was coded from 5 to 1, with 5 representing the top twenty percent of the class. The code used to differentiate the gender of the student was 1 for male and

2 for female; for race, the code was 1 for blacks and 2 for whites.

Because Berea College accepts either SAT or ACT scores for admission purposes, no common standardized test was available for all students. Although a table of concordance for ACT and SAT scores has been computed by Chase and Burritt (1966), the relationship of their table involves total scores and SAT and the composite score for ACT, and there are no concordant scores for subtests used in this study. Further, Maxey and Lenning (1974) have pointed out that it is not possible to use a concordance table for the two tests (SAT and ACT) because the two batteries differ philosophically and technically. However, Maxey and Lenning point out that the ACT and SAT are equally effective as predictors.

The first step involved obtaining frequency tables for ACT English and Social Studies and SAT Verbal scores. Then each set of scores was divided into low, middle, and high groups. The three groups were derived as follows: the low group included those whose scores on ACT English were 2 to 10 and less than 285 on SAT Verbal; the middle group included those whose scores ranged from 11 to 15 on ACT English and from 286 to 349 on SAT Verbal; scores for the high group ranged from 16 to 21 on ACT English and from 350 to 388 on SAT Verbal.

Each of the questions on pages 1 and 2 was studied by analyses of variance and covariance, using the Statistical Package for the Social Sciences.

The first analysis of variance procedure was carried out for the Nelson-Denny by ACT English and SAT Verbal, race, and gender to determine main effects and whether there were 2-way or 3-way interactions. Next, a multiple classification analysis by the category of ACT English and

SAT Verbal scores (low, middle, and high), race, and gender was performed to determine whether statistically significant differences between the means of the three categories existed. The next step involved an analysis of variance by ACT English and SAT Verbal group scores, race, and gender, controlling for HSGPA, and class size.

The same procedure was followed for the Cooperative English, using ACT English and SAT Verbal. Similar analyses of variance and analyses of covariance were carried out for both the Nelson-Denny and the Cooperative English, using the ACT Social Studies scores and SAT Verbal scores.

A third set of analyses used the average of ACT English and Social Studies scores and SAT Verbal scores, controlling for race, gender, HSGPA, class size, and rank.

Because data on autonomy and complexity were missing for 38 cases, analyses of variance and analyses of covariance were computed separately for both autonomy and complexity by ACT and SAT scores, race, and gender, controlling for HSGPA and class size.

Level of Significance

The .05 level of significance was used in this study since, according to Kerlinger (1964), "it is considered a reasonably good gamble" (p.154).

# CHAPTER III

## RESULTS

The primary purpose of the present study was to explore the relationship of selected variables as each relates to the criterion variables, the Nelson-Denny and the Cooperative English. The variables included portions of nationally administered tests, ACT English and Social Studies scores or SAT Verbal scores; aspects of the high school experience, HSGPA, size of high school graduating class, and high school rank; and two personality variables, autonomy and complexity of the OPI. A second purpose of the study was to determine whether the gender or race of the student is related to performance on both the Nelson-Denny and the Cooperative English.

In order to answer the questions, the following substantive hypotheses were formulated:

1. There is a statistically significant positive relationship between ACT English and Social Studies scores or SAT Verbal scores, HSGPA, size of high school graduating class, rank in class and measures of Au and Co of the OPI and scores on both the Nelson-Denny and the Cooperative English.

2. There is a statistically significant difference between the means of males and females on the criterion variables.

3. There is a statistically significant difference between the means of blacks and whites on the criterion variables.

The hypotheses were tested by analyses of variance and analyses of covariance.

Table 1 presents means and standard deviations for each of the

Table 1

Observed Means and Standard Deviations

for Variables Included in the Study

| Variable | Mean | Standard Deviation | Cases |
|---|---|---|---|
| Nelson-Denny | 11.56 | 1.23 | 120 |
| Cooperative English | 34.36 | 7.27 | 120 |
| ACT English | 12.91 | 4.19 | 68 |
| ACT Social Studies | 11.18 | 4.74 | 68 |
| SAT | 306.81 | 42.11 | 52 |
| HSGPA | 2.62 | 5.77 | 120 |
| Class Size | 6.87 | 4.13 | 120 |
| HS Rank | 3.88 | 1.01 | 120 |
| Autonomy | 40.91 | 7.03 | 92 |
| Complexity | 47.37 | 7.19 | 92 |
| Gender | 1.48 | .50 | 120 |
| Race | 1.51 | .50 | 120 |

variables included in the study. Correlation coefficients showing the relationship between the variables are given in Table 2.

The correlation matrix reveals that SAT scores correlate more highly with the Nelson-Denny scores (.44) than do ACT English (.26) and ACT Social Studies (.21) scores. The correlation between the Cooperative English and SAT is .32 and .27 for ACT English. Between ACT Social Studies and Cooperative English a negative correlation (-.01) exists.

The first analyses tested the relationship of scores on ACT English and SAT Verbal by race and gender, controlling for HSGPA and class size. Results of the analyses are given in Table 3. Main effects were significant, $F$ (4,115) = 4.5, $p < .002$, indicating that the two most important variables related to achievement on the Nelson-Denny are the level of scores on ACT English and SAT Verbal and the race of the student. HSGPA also varies significantly with the Nelson-Denny ($p < .05$). There were no statistically significant interactions. The hypothesis that there is a statistically significant relationship between ACT English scores, SAT Verbal scores, and HSGPA and scores on the Nelson-Denny is supported.

Table 4 summarizes the results of the analyses of variance for the Cooperative English by ACT English and SAT Verbal scores, race, and gender, controlling for HSGPA and class size. Main effects of ACT English or SAT scores, race and gender are significant, ($p < .001$). HSGPA also varies significantly with Cooperative English, ($p < .001$). There is a three-way interaction ($p < .02$) of ACT English or SAT Verbal score, race, and gender.

Figures 1 and 2 give information for the subsamples, broken down by level (low, middle, high) of ACT English and SAT scores by race and gender, and scores on the Cooperative English. Figure 1 shows that

Table 2

Correlation Matrix for Nelson-Denny and Cooperative English

ACT English and Social Studies, SAT, and Other Variables

| Variables | Nel.-Den. | Coop. Eng. | ACT Eng. | ACT S. S. | SAT | HSGPA |
|---|---|---|---|---|---|---|
| Nel.-Den. | 1.00 | 0.38 | 0.27* | 0.22* | 0.45* | 0.17* |
| Coop. Eng. | 0.38 | 1.00 | 0.27* | -0.01 | 0.33* | 0.30* |
| ACT Eng. | 0.27 | 0.27* | 1.00 | -0.11 | 99.00 | -0.02 |
| ACT S. S. | 0.22 | -0.01 | -0.11 | 1.00 | 99.00 | 0.26 |
| SAT | 0.45* | 0.33* | 99.00 | 99.00 | 1.00 | 0.35* |
| HSGPA | 0.17 | 0.30* | -0.12 | 0.26 | 0.35* | 1.00 |
| Class Sz. | 0.02 | -0.07 | -0.11 | -0.08 | -0.11 | 0.04 |
| HSR | 0.07 | 0.17 | -0.03 | 0.20 | 0.37 | 0.67* |
| Autonomy | 0.09 | 0.06 | 0.15 | -0.10 | 0.09 | -0.15 |
| Complexity | -0.09 | 0.15 | -0.02 | 0.12 | -0.12 | -0.04 |
| Gender | -0.17 | 0.12 | 0.18 | -0.32 | -0.20 | -0.06 |
| Race | 0.30 | 0.22* | 0.19* | 0.25* | 0.25* | -0.02 |

Table 2 (Cont'd)

| Variables | Class Sz. | HSR | Autonomy | Complexity | Gender | Race |
|---|---|---|---|---|---|---|
| Nel.-Den. | 0.02 | 0.04 | 0.09 | -0.09 | -0.17 | 0.30* |
| Coop. Eng. | -0.07 | 0.17 | 0.06 | -0.15 | 0.12 | 0.22* |
| ACT Eng. | -0.11 | -0.03 | 0.15 | -0.02 | 0.18 | 0.19* |
| ACT S. S. | -0.08 | 0.20 | -0.10 | 0.12 | -0.32 | 0.25* |
| SAT | -0.11 | 0.37 | 0.09 | -0.02 | -0.20 | 0.25* |
| HSGPA | 0.04 | 0.67* | -0.15 | -0.04 | -0.06 | -0.02 |
| Class Sz. | 1.00 | 0.17 | 0.09 | -0.02 | 0.16 | -0.36 |
| HSR | 0.17 | 1.00 | -0.12 | -0.13 | 0.05 | -0.11 |
| Autonomy | 0.09 | -0.12 | 1.00 | 0.30 | 0.18 | -0.25 |
| Complexity | -0.02 | -0.13 | 0.29 | 1.00 | -0.17 | -0.22 |
| Gender | 0.16 | 0.05 | 0.18 | -0.17 | 1.00 | -0.25 |
| Race | -0.36 | -0.11 | -0.25 | -0.22 | -0.25 | 1.00 |

* p .05

Table 3

Summary Data for ANOVA for Nelson-Denny by ACT English and SAT Verbal Scores, Race, and Gender with HSGPA and Class Size

| Source | df | SS | MS | F | p |
|---|---|---|---|---|---|
| Covariates* | 2 | 500.64 | 250.32 | 2.03 | 0.15 |
| HSGPA | 1 | 493.30 | 493.30 | 4.01 | 0.05 |
| Class Sz. | 1 | 3.38 | 3.38 | 0.027 | 0.99 |
| Main Effects | 4 | 3656.81 | 914.20 | 7.43 | 0.001 |
| Stanscor | 2 | 1550.07 | 775.04 | 6.30 | 0.003 |
| Race | 1 | 1058.52 | 1058.52 | 8.60 | 0.004 |
| Gender | 1 | 275.18 | 275.18 | 2.24 | 0.13 |
| 2-Way Interactions | 5 | 706.55 | 141.31 | 1.15 | 0.34 |
| Stanscor Race | 2 | 649.61 | 324.81 | 2.64 | 0.07 |
| Stanscor Gender | 2 | 92.84 | 46.42 | 0.38 | 0.99 |
| Race Gender | 1 | 11.58 | 11.58 | 0.094 | 0.99 |
| 3-Way Interactions | 2 | 214.13 | 107.07 | 0.87 | 0.99 |
| Stanscor Race Gender | 2 | 214.13 | 107.07 | 0.87 | 0.99 |
| Explained | 13 | 5078.12 | 390.63 | 3.17 | 0.001 |
| Total | 119 | 18127.40 | 152.33 | | |

| *Covariate | Beta |
|---|---|
| HSGPA | 0.353 |
| Class Sz. | 0.04 |

Table 4

Summary Data for ANOVA for Cooperative English by ACT English and SAT Verbal Scores, Race, and Gender with HSGPA and Class Size

| Source | df | SS | MS | F | p |
|---|---|---|---|---|---|
| Covariates* | 2 | 595.46 | 297.73 | 7.16 | 0.001 |
| HSGPA | 1 | 563.04 | 563.04 | 13.54 | 0.001 |
| Class Sz. | 1 | 43.79 | 43.79 | 1.05 | 0.31 |
| Main Effects | 4 | 815.24 | 203.81 | 4.90 | 0.001 |
| Stanscor | 2 | 264.27 | 133.64 | 3.21 | 0.04 |
| Race | 1 | 272.74 | 272.74 | 6.56 | 0.01 |
| Gender | 1 | 221.02 | 221.02 | 5.32 | 0.02 |
| 2-Way Interactions | 5 | 113.40 | 22.67 | 0.55 | 0.99 |
| Stanscor Race | 2 | 107.36 | 53.68 | 1.29 | 0.28 |
| Stanscor Gender | 2 | 5.10 | 2.55 | 0.06 | 0.99 |
| Race Gender | 1 | 1.60 | 1.60 | 0.04 | 0.99 |
| 3-Way Interactions | 2 | 364.68 | 182.34 | 4.39 | 0.02 |
| Stanscor Race Gender | 2 | 364.68 | 182.34 | 4.39 | 0.02 |
| Explained | 13 | 1888.73 | 145.29 | 3.50 | 0.001 |
| Total | 119 | 6295.51 | 52.90 | | |

| *Covariate | Beta |
|---|---|
| HSGPA | 0.377 |
| Class Sz. | -0.147 |

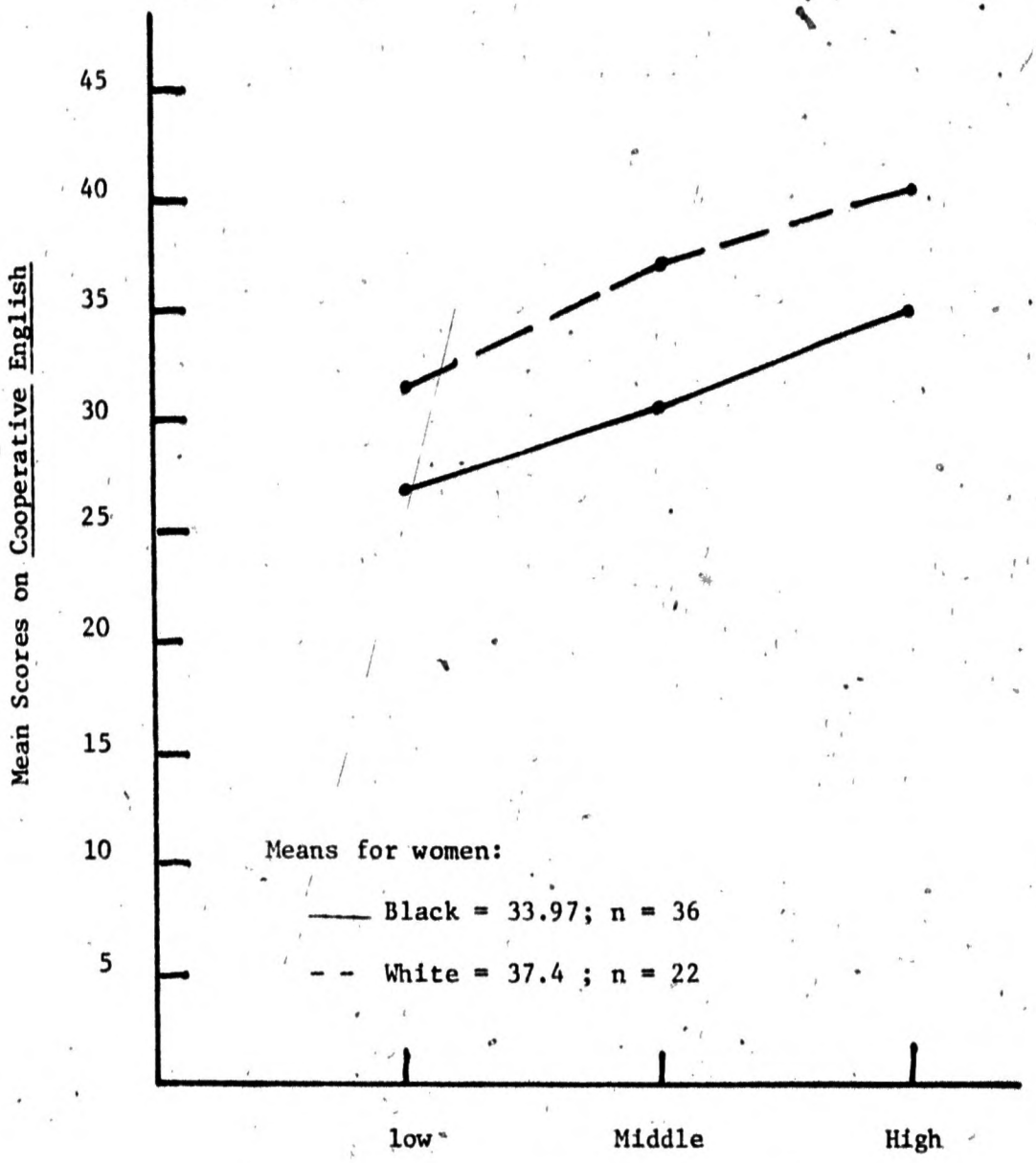


Figure 1. Mean scores on Cooperative English by by subsamples of women.

Low group = ACT English, 2-10
SAT Verbal, less than 285
Middle group = ACT English, 11-15
SAT Verbal, 286-349
High group ACT English, 16-21
SAT Verbal, 350-388

performance of white women was higher than that of black women, and it appears that achievement on the Cooperative English for all women was related to the level of ACT English or SAT scores. The higher the mean ACT English or SAT score is, the higher, the Cooperative English mean score.

Reference to the plot of interaction means for males, shown in Figure 2, indicates marked differences. Black males having highest scores on the Cooperative English were those in the middle group, while there was little difference in achievement between those in the high and low groups. Highest scores for white males were made by those in the low group; however, there is little difference in the mean scores for the three groups. These data, then, do not support the hypotheses of significant differences in mean performance by gender and race on the Cooperative English since the interaction was significant.

The analyses of variance for both the Nelson-Denny and the Cooperative English by ACT Social Studies and SAT Verbal scores, race, and gender, with covariates HSGPA and class size, showed race to be the only significant main effect, $p < .003$. There were no significant interactions. Therefore, the hypothesis of a statistically significant positive relationship between ACT Social Studies or SAT Verbal scores and scores on both the Nelson-Denny and Cooperative English was not supported.

Further analyses were performed using an average of ACT English and Social Studies scores in combination with SAT Verbal for the independent variable. Results of the analysis of variance for Nelson-Denny by ACT English and Social Studies average and SAT Verbal, race and gender, controlling for HSGPA, class size, and HSR are given in Table 5. Main effects of ACT average scores and race were significant, ($p < .001$),

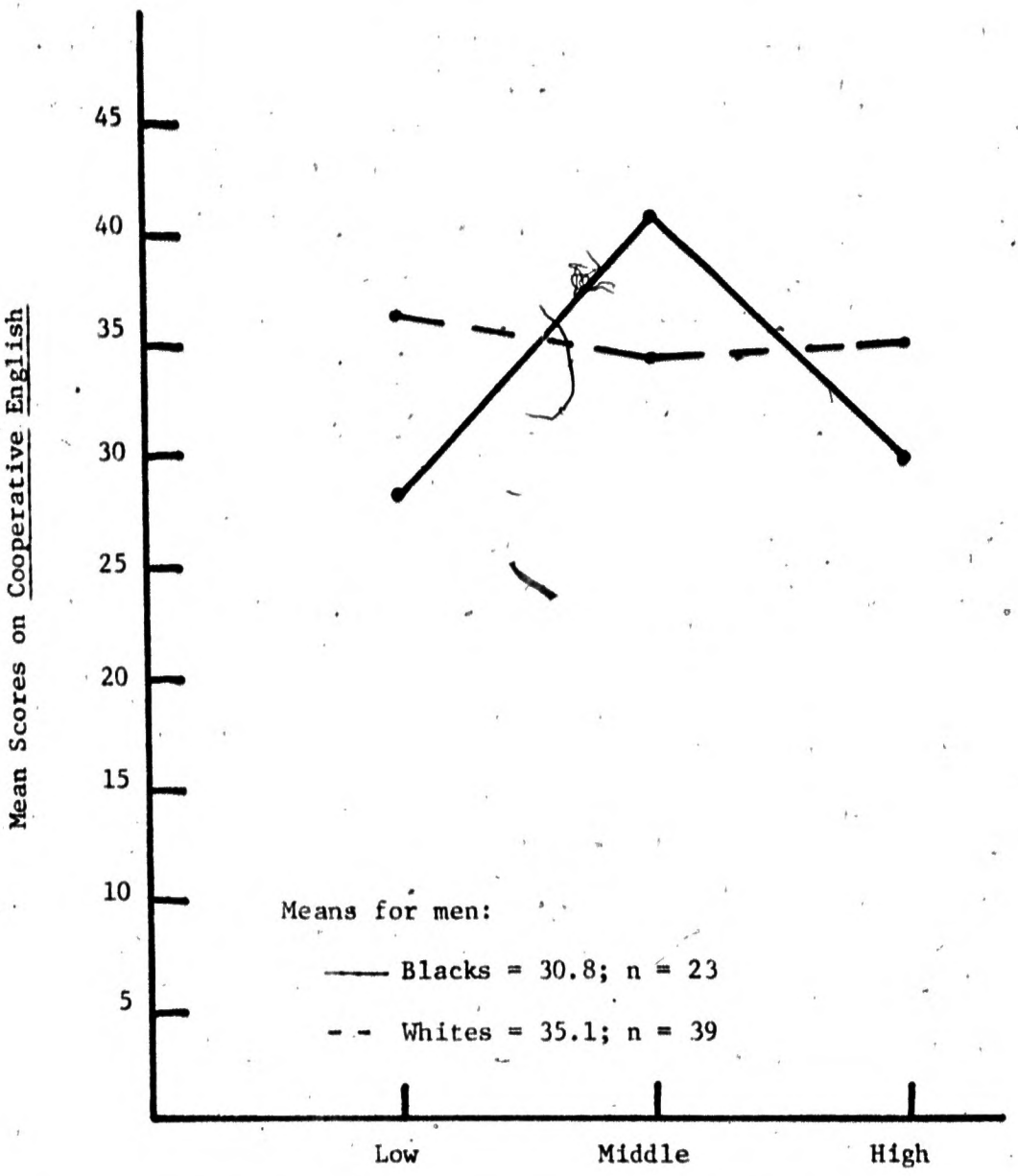


Figure 2. Mean scores on Cooperative English for subsamples of men.

Low group = ACT English, 2-10
SAT Verbal, less than 285

Middle group = ACT English, 11-15
SAT Verbal, 286-349

High group = ACT English, 16-21
SAT Verbal, 350-388

Table 5

Summary Data for ANOVA for Nelson-Denny by ACT Eng. and SS Average SAT Verbal Scores, Race and Gender with HSGPA, Class Size, HSR

| Source | df | SS | MS | F | p |
|---|---|---|---|---|---|
| Covariates* | 3 | 657.04 | 219.01 | 1.64 | 0.18 |
| HSGPA | 1 | 617.58 | 617.58 | 4.64 | 0.03 |
| Class Size | 1 | 17.43 | 17.43 | 0.13 | 0.99 |
| H. S. Rank | 1 | 156.40 | 156.40 | 1.17 | 0.28 |
| Main Effects | 4 | 2870.15 | 717.54 | 5.39 | 0.001 |
| Stanscor | 2 | 851.25 | 425.62 | 3.20 | 0.04 |
| Race | 1 | 1497.10 | 1497.10 | 11.24 | 0.001 |
| Gender | 1 | 298.61 | 297.61 | 2.23 | 0.13 |
| 2-Way Interactions | 5 | 478.90 | 95.78 | 0.72 | 0.99 |
| Stanscor Race | 2 | 355.68 | 177.84 | 1.34 | 0.27 |
| Stanscor Gender | 2 | 111.89 | 55.95 | 0.42 | 0.99 |
| Race Gender | 1 | 3.25 | 3.25 | 0.02 | 0.99 |
| 3-Way Interactions | 2 | 132.79 | 66.40 | 0.50 | 0.99 |
| Stanscor Race Gender | 2 | 132.79 | 66.40 | 0.50 | 0.99 |
| Explained | 14 | 4138.88 | 295.63 | | 0.01 |
| Total | 119 | 18127.40 | 152.33 | | |

| *Covariate | Beta |
|---|---|
| HSGPA | 0.534 |
| Class Size | 0.095 |
| HS Rank | -1.549 |

with no significant interactions. HSGPA also varies significantly, $F$ (1,119) = 4.64, $p < .03$.

Summary data for the analysis of variance for Cooperative English by ACT English and Social Studies average scores, SAT Verbal score, race and gender with HSGPA, class size and rank as covariates are presented in Table 6. Main effects, $F$ (4,119) = 5.05, $p < .001$, are ACT average scores and SAT Verbal scores, race, and gender. The covariate HSGPA is significant, $F$ (1,119) = 8.70, $p < .004$, supporting the hypothesis that there is a statistically significant relationship between ACT English and Social Studies or SAT Verbal and HSGPA. A three-way interaction between standardized scores, race, and gender are significant at the .04 level. Both HSR and class size assumed negative Beta weights. Analyses fail to support the hypothesis that there is a statistically significant positive relationship between HSR and class size and Cooperative English.

Since data on autonomy and complexity were available for only 92 cases, separate analyses of variance and analyses of covariance were performed to determine whether autonomy and complexity are significantly related to achievement. Analysis of variance for autonomy by level of standing on ACT English or SAT Verbal, race, and gender with HSGPA and class size as covariates revealed that race was the only significant effect, $F$ (1.91) = 5.26, $p < .02$, with no interactions. Multiple classification analysis revealed higher means for blacks. Analysis of variance for complexity by ACT English and SAT Verbal, race, and gender, controlling for class size revealed race to be a significant main effect, $F$ (1,91) = 5.76, $p < .02$, with no statistically significant interactions. Multiple classification analysis showed blacks to have higher mean scores on complexity, also.

Table 6

Summary Data for ANOVA for Cooperative English by ACT Eng. and SS Avg. and SAT Verbal Scores, Race and Gender with HSGPA, Class Size, HSR

| Source | df | SS | MS | F | p |
|---|---|---|---|---|---|
| Covariates* | 3 | 598.64 | 199.55 | 4.93 | 0.003 |
| HSGPA | 1 | 352.27 | 352.27 | 8.70 | 0.004 |
| Class Size | 1 | 37.94 | 37.94 | 0.93 | 0.99 |
| H. S. Rank | 1 | 3.18 | 3.18 | 0.08 | 0.99 |
| Main Effects | 4 | 818.51 | 204.63 | 5.05 | 0.001 |
| Stanscor | 2 | 270.49 | 135.24 | 3.34 | 0.04 |
| Race | 1 | 365.71 | 365.71 | 9.03 | 0.003 |
| Gender | 1 | 178.12 | 178.12 | 4.40 | 0.04 |
| 2-Way Interactions | 5 | 353.01 | 70.60 | 1.74 | 0.13 |
| Stanscor Race | 2 | 101.27 | 50.64 | 1.25 | 0.29 |
| Stanscor Gender | 2 | 277.24 | 138.62 | 3.42 | 0.04 |
| Race Gender | 1 | 30.56 | 30.56 | 0.75 | 0.99 |
| 3-Way Interactions | 2 | 271.33 | 135.67 | 3.35 | 0.04 |
| Stanscor Race Gender | 2 | 271.33 | 135.67 | 3.35 | 0.04 |
| Explained | 14 | 2041.49 | 145.82 | | 0.001 |
| Total | 119 | 6295.51 | 52.90 | | |

| *Covariate | Beta |
|---|---|
| HSGPA | 0.40 |
| Class Size | -0.139 |
| H S Rank | -0.221 |

In summary, results of analyses reveal that whether a student entered with SAT or ACT grouping criteria did not make a difference in achievement. However, results of analyses of variance for the Nelson-Denny and Cooperative English differed. For the Nelson-Denny, performance is related to the level of SAT Verbal or ACT English and Social Studies scores. The higher the initial score is, the higher the performance on the Nelson-Denny. Race, also, is a factor significantly related to performance on the Nelson-Denny, with whites scoring higher than blacks.

Results of the ANOVA revealed that a three-way interaction of ACT English or SAT Verbal scores, race, and gender is present for the Cooperative English and that HSGPA varies significantly, $p < .05$. For women, there appears to be a positive correlation between the ACT English and SAT scores and the Cooperative English. However, for men the interaction is marked. For the group included in this study, black males in the middle group had the highest scores on the Cooperative English, and there was little difference in performance between the low and high groups. Performance of white males in all three groups did not vary significantly. Therefore, in order to predict performance on the Cooperative English, information identifying the race, gender, and level of ACT English or SAT Verbal score of a student would be required.

There is no statistically significant positive relationship between measures of autonomy and complexity, rank and class size and the criterion variables.

# CHAPTER IV

## DISCUSSION

The primary purpose of the present investigation was to explore the relationship of varying levels of standing on ACT English and Social Studies scores and SAT Verbal scores and other selected variables to achievement in a basic communication skills course. Two tests whose scores determine whether a student passes or fails the communication skills course, the Nelson-Denny Reading Test and the Cooperative English Test, were used as the criterion variables. Variables included in the study were ACT English and Social Studies scores, SAT Verbal scores, HSGPA, class size, rank, and the measures of autonomy and complexity from the OPI. Included in the study also was the question: Is the gender or race of a student related to performance on both the Nelson-Denny and the Cooperative English? Analyses of variance and analyses of covariance, controlling for race and gender, were used to study the questions asked.

Before discussing the results of the analyses, it is important to observe that results of this study were undoubtedly affected by restriction of range; that is, all members of the group studied were selected from the lower twenty percent of their entering freshman classes. Kaufman (1972) has pointed out that for groups having a restricted range of test scores, correlations are lower between the predictor and the criterion than they would be in a normal population. Therefore, low

correlations found between the independent variables and the criterion variables were not unexpected. Even so, several observations can be made as a result of this study.

The first research question explored the relationship between ACT English and Social Studies scores and scores on the Nelson-Denny and the Cooperative English. In the analysis of variance for the Nelson-Denny which included ACT Social Studies or SAT Verbal scores, the the result was not significant at the .05 level. However, the ANOVA for Nelson-Denny including ACT English and SAT Verbal scores, revealed a relationship significant at the .003 level. When ACT English and Social Studies scores were averaged and average score was included with SAT Verbal, there was a positive relationship with Nelson-Denny, significant at the .05 level. The findings, then are similar to those of Sassenrath (1966), Pabst (1966), and Vraa (1971), who found that the ACT Social Studies and Natural Science scores were significant in predicting achievement, but that the ACT English score was the best predictor. The fact that the ACT English score has a stronger relationship to the Nelson-Denny score than does the Social Studies score seems paradoxical in the light of a statement by Munday (1968), which maintains that of the standard ACT predictors, "The English test covers English usage, as opposed to vocabulary or reading .... The Social Studies and Natural Science tests are reading tests ..."

In the ANOVA for the Cooperative English including ACT Social Studies and SAT Verbal, only race and HSGPA were significant at the .05 level. In the ANOVA which included ACT English and SAT Verbal scores, an interaction of these scores, race, and gender showed that for both blacks and whites, the ACT English score alone cannot be used to explain

the variance in Cooperative English scores. The finding, then, implies that although students may be placed in certain English classes on the basis of ACT English or SAT Verbal scores, there may be implications that instructors should consider alternative instructional strategies for students in the different groups.

For the group of students included in this study, the correlation between the Cooperative English and ACT English is low--.27, a finding which is surprising, in view of the fact that Munday (1968), in a study involving 51 colleges and universities, found that ACT English correlated with Cooperative English .73. The difference may be accounted for in part, at least, by the restriction of range. The first research question, then, can be answered that there is a significant positive relationship between ACT English scores and scores on the Nelson-Denny. On the Cooperative English, however, there is an interaction of test scores, race, and gender. In this analysis, ACT Social Studies is not significantly related at the .05 level.

The second research question related to students' SAT Verbal scores and performance on the Nelson-Denny and Cooperative English. The ANOVA for both the Nelson-Denny and the Cooperative English, including SAT Verbal scores, with HSGPA as a covariate, indicate that the variance of both criterion variables is best explained by SAT in combination with HSGPA. HSGPA has a Beta weight of 0.353 for the Nelson-Denny and 0.377 for Cooperative English. Although Wilson (1970) found that the accuracy of predictions using SAT could be improved by adding class rank and CEEB Average Scores, when rank was included as a covariate in these analyses, rank was not statistically significant.

Although studies such as those by Richards, Holland, and Lutz (1969)

and Marshall (1969) have identified HSGPA as the most efficient predictor, their findings also established that other variables increased the predictive effectiveness of the equation, and findings in this study indicate that neither SAT alone nor HSGPA is most effective in explaining achievement, but that the two taken together are more effective. That academic competency in high school as measured by HSGPA provides an index by which to judge future academic performance is applicable to the students in the present study, for high school grade point averages varied significantly with the Cooperative English.

A comparison of the correlations of ACT English and Social Studies scores with the Nelson-Denny and Cooperative English and the correlations of SAT Verbal and Nelson-Denny and the Cooperative English reveals that the correlations are higher between SAT and the criterion variables than are the correlations between English and Social Studies and the criterion variables. According to Buros (1972) research at Indiana University showed the validity coefficient for the ACT to be higher than that for SAT. The reason for the difference in the strength of the correlations between the ACT and SAT and the criterion variables in this study is not known. Further investigation may be warranted.

Another specific question in the study concerned the relationship of high school rank to achievement on the Nelson-Denny and Cooperative English. Although Karp (1967) and Doermann (1968) concluded that HSR alone was the best predictor for freshman GPA and both Brown (1964) and Pabst (1966) found rank to be important in predicting achievement, findings of the present study are not consonant with the studies cited. When rank was included as a covariate for both the Nelson-Denny and the Cooperative English, a negative relationship was found. Thus

findings do not support those previously cited, nor do they support a study by Wilson (1970) in which not only was HSR included in a prediction equation, but the weights for rank were greater than the weights for SAT scores. Dalton found that HSR appears to be less valid for minorities than the general populace. Since the population of the present study are minorities (blacks and Appalachian whites), the findings of no significant positive relationship between HSR and achievement on the criterion variables appear to agree with the findings of Dalton.

A fifth question investigated whether size of high school graduating class was significantly related to achievement in the communication skills class. In the analysis of variance for the Co-operative English class size assumed a negative Beta weight. In the analysis of variance for the Nelson-Denny, the Beta weight for class size was .095, not significant. Findings are consistent with those of Pabst (1965) who found that the size of high school from which a student graduated was not related to success in college and disagree with findings of Campbell (1966) who found class size significant at the .05 level.

The relationship of the two personality measures, autonomy and complexity, to achievement on the criterion variables was studied. Neither Au nor Co was found to be significantly related to the criterion variables. Findings are not consistent with those of Elton (1969) and Morgan (1971), who found that personality factors entered into the discriminating process for persistors in college. However, mean scores for blacks were higher than scores of whites on both autonomy and complexity. The finding might be attributed to the fact that most black students enrolled in Berea College come from urban areas, and consequently environment may be a contributing factor in explaining the difference.

By the same token, many of the white Appalachian students come from an authoritarian and fundamentalist background which has limited their opportunities for independence.

In another study, Daniel (1969) found that students with low academic aptitude were more homogeneous with respect to personality variables than were high academic aptitude students. It appears that students included in the present study are homogeneous in respect to the two personality factors included in the selected variables. Mean scores on both Au and Co are low, and it cannot be said that this group is characterized by the traits of autonomy and complexity, traits related to academic success. Further investigation of personality characteristics of students in the lowest twenty percent of the freshman class may be warranted, in order that decisions may be made relative to appropriate instructional strategies that may aid students in developing independence.

The last two questions of the study were formulated to determine whether gender or race is related to performance on the Nelson-Denny and the Cooperative English.

In the analysis of variance for the Nelson-Denny, although gender was not significant at the .05 level, there was a trend toward higher mean scores for men. The three-way interaction of ACT English or SAT Verbal scores by race and gender for the Cooperative English shows that for women, there appears to be a positive correlation between ACT or SAT score and performance on the Cooperative English, but that the same relationship does not exist for men.

Cross (1971, p.138) has pointed out that the level of performance of males and females is more even in selective institutions. The level

of achievement on the Nelson-Denny was more even in this case because of the restricted range from which students were chosen, being equivalent to selectivity. Other recent studies such as those by Gross, Faggen and McCarthy (1974) and Feuers (1970) have failed to find significant differences between males and females on predictor variables.

The final question of the study examined difference of achievement between blacks and whites. On the Nelson-Denny, the difference in performance was significant at the .001 level, with the means of whites being higher than those of blacks. The difference in performance was not unexpected since blacks generally enter with lower verbal and achievement scores than do whites. However, the three-way interaction of test scores, race, and gender for the Cooperative English, revealed by the analysis of variance, indicates that Act English scores or SAT Verbal scores alone do not predict accurately for either black or white males.

In conclusion, the answer to the question which prompted this study of whether predictors of achievement could be identified for students in the basic communication skills course is affirmative. First of all, the level of achievement on the Nelson-Denny is related to the level of ACT English and Social Studies scores and SAT Verbal scores and HSGPA. Students with higher scores on the nationally adm. 'stered standardized tests and higher grade point averages achieve higher scores on the Nelson-Denny. Although the average of ACT English and Social Studies scores is predictive, ACT English is the best predictor. Additionally, the race of a student is important in the prediction. Mean scores for whites are higher than mean scores for blacks.

In predicting Cooperative English scores, ACT English and Social

Studies average, ACT English, SAT scores, and HSGPA are important. However, a three-way interaction must be considered for Cooperative English. The level of scores on the ACT tests and SAT Verbal, race, and gender are all important. White women score higher than black women, and the higher the ACT English or SAT score is, the higher the Cooperative English score. For males, black men in the middle group have highest Cooperative English scores, while there is little difference in mean scores of the low and high groups. White men in both the low and high groups score higher than those in the middle group.

Other variables included in the study, HSR, class size, and the personality measures of autonomy and complexity were not found to be significantly related to the criterion variables.

Recommendations for Further Research

A longitudinal study including attrition, field of major, and achievement of persistors in college should be conducted for students required to enroll in basic communication skills to shed light upon the wisdom of enrolling "high risk" students in a liberal arts curriculum.

A study including an experimental and a control group should be conducted to determine the validity of the assumption that the basic communication skills course is necessary for and effective in aiding students in the lowest twenty percent of the freshman class.

A replication of the study should be conducted to determine whether future groups enrolled in the basic course have similar characteristics. Of particular interest is whether the three-way interaction of ACT English or SAT Verbal scores, race, and gender on the Cooperative English is peculiar to the students of the group in this study.

A three-way interaction found in a replication would confirm a need for a different approach in teaching methods and structure of the course.

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