The noncognitive questionnaire: an instrument to discriminate between successful and unsuccessful EOP students?
by Russell Velo Boham

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education
Montana State University
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Abstract:
Historically, in the United States higher education has been the nearly exclusive domain of White citizens. In the 1960s the California State legislature sponsored a program called Educational Opportunity Program (EOP) to increase access to the California State University for low-income and first-generation college students who are disproportionately ethnic minorities.

The use of standard cognitive criteria in admissions to predict academic success is unreliable for ethnic minorities. EOP student applicants receive special admit consideration, but may be denied due to low standard scores. The Noncognitive Questionnaire (NCQ) measures eight noncognitive variables and has been shown to be reliable in some studies for predicting academic success of ethnic minorities. The question was, could the NCQ be used to discriminate between successful and unsuccessful students, thus aiding the admissions process.

The NCQ was administered to 93 first time freshman EOF students entering Humboldt State University during the fall semesters of 1995 and 1996. Data on first semester GPA, number of credit hours completed, gender and ethnicity were included along with the NCQ in the analysis. The data were grouped by GPA, gender and ethnicity, then analyzed using discriminant analysis, stepwise multiple regression and analysis of variance. One purpose of the study was to describe the study population in a case study design. Another purpose was to determine if such information was useful to develop intervention and support programs.

The NCQ failed to discriminate between high and low GPA groups. Stepwise Multiple Regression did not demonstrate a significant relationship between GPA and the variables measured. However, students who performed better academically took fewer than 14 credit hours. White EOP students had higher GPAs than did ethnic minorities.

EOP students who performed less well academically had coursework overloads. The results did not support a noncognitive admissions model. The complex noncognitive phenomena were not adequately addressed using the NCQ. Future research should look at other ways to examine such variables. It is recommended that portfolios and personal interviews be considered for use and evaluation.
THE NONCOGNITIVE QUESTIONNAIRE: AN INSTRUMENT TO DISCRIMINATE BETWEEN SUCCESSFUL AND UNSUCCESSFUL EOP STUDENTS?

by

Russell Velo Boham

A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education

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APPROVAL

of a thesis submitted by

Russell Velo Boham

This thesis has been read by each member of the graduate committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

Dr. Gloria Gregg
Chairperson, Graduate Committee

Approved for the Major Department

Dr. Gloria Gregg
Head, Major Department

Approved for the College of Graduate Studies

Dr. Robert L. Brown
Graduate Dean

Date
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ABSTRACT

Historically, in the United States higher education has been the nearly exclusive domain of White citizens. In the 1960s the California State legislature sponsored a program called Educational Opportunity Program (EOP) to increase access to the California State University for low-income and first-generation college students who are disproportionately ethnic minorities.

The use of standard cognitive criteria in admissions to predict academic success is unreliable for ethnic minorities. EOP student applicants receive special admit consideration, but may be denied due to low standard scores. The Noncognitive Questionnaire (NCQ) measures eight noncognitive variables and has been shown to be reliable in some studies for predicting academic success of ethnic minorities. The question was, could the NCQ be used to discriminate between successful and unsuccessful students, thus aiding the admissions process.

The NCQ was administered to 93 first time freshman EOP students entering Humboldt State University during the fall semesters of 1995 and 1996. Data on first semester GPA, number of credit hours completed, gender and ethnicity were included along with the NCQ in the analysis. The data were grouped by GPA, gender and ethnicity, then analyzed using discriminant analysis, stepwise multiple regression and analysis of variance. One purpose of the study was to describe the study population in a case study design. Another purpose was to determine if such information was useful to develop intervention and support programs.

The NCQ failed to discriminate between high and low GPA groups. Stepwise Multiple Regression did not demonstrate a significant relationship between GPA and the variables measured. However, students who performed better academically took fewer than 14 credit hours. White EOP students had higher GPAs than did ethnic minorities.

EOP students who performed less well academically had coursework overloads. The results did not support a noncognitive admissions model. The complex noncognitive phenomena were not adequately addressed using the NCQ. Future research should look at other ways to examine such variables. It is recommended that portfolios and personal interviews be considered for use and evaluation.
CHAPTER 1
INTRODUCTION AND LITERATURE REVIEW

History of the Problem

College admissions have historically been a competitive process. The more prestigious colleges and universities traditionally have had many more applicants than available resources would allow them to reasonably handle. Admission standards are selected to discriminate among the applicants in terms of their potential for success (Crouse & Trusheim, 1988).

In the 1960s and early 1970s many universities and colleges adopted open door policies to provide access to historically underrepresented groups. The State of California, in 1969, adopted a policy and provided program funds for underrepresented or educationally disadvantaged groups through a program called The Educational Opportunity Program (EOP). The program has been in existence for 28 years on the campus of Humboldt State University. It has remained very close to its original mission as outlined in the enabling legislation. The focus of EOP is not exclusively on underrepresented ethnic minorities. Its primary focus is to provide admission and retention activities to all students who are first generation college students, who come from a family that meets the U.S. federal poverty guidelines and who do not meet regular
admission standards or are considered to be at risk academically (see Appendix A).

Students who meet EOP guidelines for special admit status will often be low in standard scores (such as the SAT) used by universities and colleges as predictors of academic success. The variables used by EOP screening committees include those such as level of disadvantage (i.e., socioeconomic status), age of applicant, whether or not the student is a first generation college student, et cetera. However, high school GPA and SAT scores are also used in evaluating EOP applicants' ability to succeed academically (see Appendix B). The use of these standardized cognitive variables as predictors of academic success can often, for students with low scores, result in their being rejected for admission.

Jones and Grieneeks (1970), in a study at the University of Texas, Austin, where several variables (including self-concept of ability) were used to predict GPA, found that self-concept of ability was a more reliable predictor of academic success than was the SAT score. It is apparent from a review of the literature on dropouts that there is a significant relationship between cognitive test scores and academic success for the general student population (Tinto, 1975). However, for disadvantaged students and particularly for Black students, self-perception of ability to succeed (positive self-concept) and motivation to succeed provide a better basis for prediction of academic achievement than do standardized measures of intelligence (Fry & Coe, 1980;
Morse, 1963; Rushland & Feld, 1977). In addition, Rosenthal and Jacobson (1968) contend that grades do not predict minority student future academic performance because teachers tend to have lower expectations of minority students and, as a consequence, they will have lower grades that are not reflective of their true academic capability.

Thompson (1971) conducted a study comparing disadvantaged college students with regularly admitted college students. She found that some noncognitive variables (including self-esteem) were valuable as predictors of success for disadvantaged students. According to Fitts (1972) there should be a positive relationship between success and self-concept. However, Martel and Richman (1985), in a longitudinal study, concluded that self-concept was a poor predictor of academic success. While results of studies using different populations and different measures of self-concept create confusion in the study of self-concept as it relates to successful behavior, enough evidence exists to suggest that a positive self-concept is important in achieving academic success (Martel & Richman, 1985).

Sedlacek (1989) and Tracy and Sedlacek (1985) have described eight noncognitive variables that when used in conjunction with one another are valid predictors of academic success for minority students: (1) positive self-concept, (2) understands and deals with racism, (3) realistic self-appraisal, (4) prefers long-range goals to short-term or immediate needs, (5) availability of a strong support person, (6) successful leadership experience,
(7) demonstrated community service, and (8) nontraditional knowledge acquired in a field.

Statement of the Problem

Fitts (1972) reported approximately 90 studies using the Tennessee Self-Concept Scale to predict academic success. Very few of the studies Fitts reviewed dealt with college students and fewer yet dealt with disadvantaged students. One of the problems in evaluating studies involving self-concept is the ambiguity in the definition of self-concept (Knapp, 1975).

Self-concept is also measured in as many ways as there are definitions. There are global measures of self-concept and specific measures of self-concept. Locus-of-control measures also fall into the category of self-concept. The logic of the idea that a positive self-image should lead to successful behavior somehow gets lost in attempting to measure accurately and reliably the concept of self-image. The results of studies relating self-concept to academic success are inconclusive. Daly (1972) found that neither ACT scores nor self-esteem were predictive of academic success. Nichols and Schauffer (1975) reviewed 15 studies dealing with self-concept and academics and found that among those dealing directly with predicting success only one-half reported positive findings. They also reported, in a study they conducted on college women, that the evidence for a self-concept/academic performance relationship is so inconclusive that perhaps other noncognitive variables might
be better predictors of academic success. Fekrat (1969) found self-concept to be positively and significantly related to academic success as measured by GPA. Smith (1972) also found a positive relationship between self-concept and academic success among a group of specially admitted Black students at the University of Pittsburgh. She also concluded that SAT scores for this group were not predictive of success as measured by quarterly grade point.

Coupled with the problems of variability in self-concept measures and the variability in populations tested is the fact that from 1980 forward there have been very few studies on self-concept and academic achievement, especially among disadvantaged students (Martel & Richman, 1985). Martel and Richman's own conclusions from their longitudinal study of specially admitted students at 19 independent colleges and universities across the state of New York were that no relationship exists between self-concept and two measures of academic success. The researchers also concluded that further study using different measures of self-concept (different than the Tennessee Self-Concept Scale) would be useless, especially in light of the high reliability and validity of the Tennessee Self-Concept Scale and its high correlation with other measures of self-concept.

The conclusions and recommendations of Martel and Richman (1985) are not unreasonable considering the exhaustive literature review they conducted and the extensive nature of their own study. The researchers did not, however, imply that the population they studied would represent other
populations of disadvantaged students in other locations, nor did they suggest
that other noncognitive measures may exist that could be useful in predicting
academic success.

Sedlacek and Brooks (1976), Sedlacek and Pelham (1976), Sedlacek
and Webster (1978), and Tracey and Sedlacek (1987a) have extensively
studied the problem of predicting academic success in college for minority
students. They conclude that usual cognitive measures such as SAT scores
and high school GPA are poor predictors. They also further conclude that self-
concept, when combined with seven other non-cognitive measures, will be
useful in predicting academic success of minority students.

EOP students at Humboldt State University in Arcata, California, are not
exclusively minority students. They are low income, first generation college
students who are considered to be at risk academically. These students
constitute a unique group. Applicants to Humboldt State University seeking
special admit status through EOP may be turned away due to low SAT scores
and low high school GPA if they cannot demonstrate their potential to succeed
in other ways.

The problem is that there is a unique group of students applying for
admission to Humboldt State University under special admit status and
standard cognitive measures of potential for success are being used as part of
the screening process. There are students who may be screened out and
low standard scores may contribute to the situation.
Purpose of the Study

The first purpose of this study was to investigate if the eight variables in the Noncognitive Questionnaire (NCQ) (see Appendix D for a copy) developed by Sedlacek and Brooks (1976) and later modified by Tracey and Sedlacek (1986) and the variable number of units taken could be used to discriminate between successful and unsuccessful EOP students. The eight variables of the NCQ are (1) positive-self-concept, (2) understands and deals with racism, (3) realistic self-appraisal, (4) prefers long-range goals to short-term or immediate needs, (5) availability of a strong support person, (6) successful leadership experience, (7) demonstrated community service, and (8) nontraditional knowledge acquired in a field.

A second purpose of the study was to investigate if the eight variables in the NCQ, the variable number of units taken and the variable GPA could be used to discriminate between males and females in the study population. A third purpose of the study was to investigate if the eight variables in the NCQ, the variable number of units taken, and the variable GPA could be used to discriminate among the various ethnic groups in the study population.
For the purpose of this study the research questions were:

1. Is it possible to use the eight variables in the NCQ and the variable number of units taken to discriminate between successful and unsuccessful EOP students at HSU?

2. Is it possible to use the eight variables in the NCQ and the variable number of units taken to discriminate between males and females in the study population?

3. Is it possible to use the eight variables in the NCQ and the variable number of units taken to discriminate among the ethnic groups defined in the study population?

4. Do males and females in the study population differ from one another with regard to GPA?

5. Do ethnic groups as defined in the study differ from one another with regard to GPA?

Significance of the Study

Members of ethnic minority groups lag far behind the majority population in terms of educational attainment largely due to the fact that, disproportionately, minorities are underprepared to enter college because they have been the victims of long-term educational disadvantage (Astin, 1982; Lang, 1988; Reed & Hudepohl, 1983; Willie & McCord, 1972). This is an
historical trend that has made some changes in recent years that include modest gains for minorities, but there is no major improvement in the areas of acceptance or success of minorities in institutions of higher education. Their retention and graduation rates lag far behind those of the dominant society's (Lang, 1988).

Across the United States, institutions of higher education and the federal and state legislatures have responded to this need by providing programs and opportunities aimed at underrepresented minority groups (Cross, 1972; Kulik, Kulik, & Shwalb, 1983; Roueche & Roueche, 1977; White & Bigham, 1982). These efforts, while not massive, have managed to make a difference in the lives of some individuals since the late 1960s when many such programs were initiated. Efforts to increase the admission, retention, and graduation rates of underrepresented minorities need to be evaluated and modified because, despite such efforts, the retention and graduation rates for high-risk students nationwide remain far below that of students in general despite higher education's best programmatic efforts (Jones & Watson, 1990; Princes, 1990).

If California is going to have higher education for all and develop special programs to assist special populations to gain admission, they need to find more appropriate methods to help determine which students from such populations may be successful. Specially admitted students at colleges and universities are considered high risk in terms of their ability to succeed academically. While noncognitive variables are used in selecting students for
special admit status, standard cognitive variables such as high school GPA and SAT scores will also be considered and will have a discriminating effect that will sometimes result in some special admit applicants being rejected.

Many studies have been conducted to find noncognitive variables that could be used as predictors of success. These studies have met with varying results (Carstens, 1993; Robinson & Cooper, 1984; Trippi & Stewart, 1989). Consequently, the results are inconclusive. The Noncognitive Questionnaire developed by Sedlacek and Brooks (1976) and later modified by Tracey and Sedlacek (1986), while proving to be reliable and valid for minority students, has not been demonstrated to be useful in predicting the academic success of students in the unique category of EOP special admit as defined by California State University (CSU) guidelines. As a consequence, students who may not meet regular admission requirements do not have a reliable objective method for assessing their potential for academic success. If the Noncognitive Questionnaire can prove to be useful in discriminating between successful and unsuccessful EOP admitted students, the EOP staff will be better equipped by having the potential to utilize appropriate noncognitive tests in their admission decision-making process.

Another possible result of this study is the potential development of early intervention projects or programs. If, for example, the Noncognitive Questionnaire should prove to be useful in discriminating between successful and unsuccessful EOP students, it would be likely that the EOP staff would
develop high school leadership projects or self-assessment instruments should such variables prove to be significant.

In addition, universities in other states who are examining their admissions policies may wish to consider appropriate noncognitive instruments as part of their overall admission decision-making process. If the Noncognitive Questionnaire is shown to be useful in discriminating between successful and unsuccessful EOP students at Humboldt State University, these institutions may wish to test it to see if the questionnaire can also be useful in their admissions process.

**Definition of Terms**

EOP student: A student admitted to Humboldt State University under the special admit category as defined by Humboldt State University and EOP guidelines.

Successful EOP student: A grade point average of 2.0 or better for one semester in an undergraduate curriculum of twelve or more semester units.

Unsuccessful EOP student: A grade point average of less than 2.00 for one semester in an undergraduate curriculum of twelve or more semester units.

Noncognitive variables: The eight variables described by William E. Sedlacek and used in the Noncognitive Questionnaire.


Understands and deals with racism: Realist based upon personal experience of racism. Is fighting to improve existing system. Not submissive to existing wrongs, nor hostile to society, nor a "cop-out." Able to handle racist system. Asserts school or organization role to fight racism.
Realistic self-appraisal, especially academic: Recognizes and accepts any deficiencies and works hard at self-development. Recognizes need to broaden his/her individuality.

Prefers long-range goals to short-term or immediate needs: Able to respond to deferred gratification.

Availability of a strong support person: Someone to turn to in a crisis.

Successful leadership experience in any area pertinent to his/her background: Demonstrated community service. Has involvement in his/her cultural community.

Nontraditional knowledge acquired in a field: Demonstrates knowledge of his/her culture. Unusual and/or culturally related ways of obtaining information and demonstrating knowledge. Field itself may be nontraditional.

Units: The credit hours associated with HSU classes.

Literature Review

This section provides a basis for the study by examining the literature on college admission practices. Cognitive factors and noncognitive factors are reviewed. Particular emphasis is placed on examining nontraditional college students and on nontraditional admission practices. The focus is on the literature as it relates to predicting college student academic success and in particular on noncognitive measures as they may be used as predictors.

At the turn of the 20th century several colleges and universities on the eastern seaboard met to discuss their divergent admissions policies in an effort to establish a single comprehensive essay exam which tested knowledge in various subjects. The tests would be developed and evaluated by a single
group of examiners. These colleges formed the College Entrance Examination Board which developed what they termed achievement tests. These tests measured students' levels of knowledge acquired in specific subject areas and were developed by instructors in those specific fields.

In 1926, the College Board began to administer the Scholastic Aptitude Test (SAT) which abandoned the idea of knowledge acquired in a specific field in favor of the idea of broad math and verbal skills acquired over a period of time. The SAT was also an objective test which could be scored easily by clerks (Simon, 1978). The College Board along with others in 1947 established the Educational Testing Service (ETS) so that it could assume the role of administering the SAT and developing new tests in an effort to provide colleges with a standardized method to restrict college admission (Crouse & Trusheim, 1988).

Selective admissions policies became widespread after World War II when large numbers of qualified students began making application (Irby, 1978). Academic preparedness, taking the right sequence of high school courses, obtaining above average grades and scoring high on standardized tests (as general measures of broad knowledge) are typical of what admissions personnel consider good predictors of potential college academic performance. The most common purpose in establishing admission requirements was to assure the entry of students who had the capability to complete their educational program successfully (Quann & Associates, 1979).
Cognitive Factors

Cognitive factors have been utilized in many studies and have demonstrated that they are useful in predicting academic success as it is variously defined (Astin, 1982; Carney & Geis 1981; Lavin, 1965; Merritt, 1972; Wheeler, 1971). In a study examining the prediction of college student GPA over a 4-year period at Murray State University in Murray, Kentucky, it was concluded that ACT sub-tests and composite scores were predictive of cumulative GPA (Rowan, 1978). Richards and Lutz (1968) and Bauer, Mehren, & Vinsonhaler (1968) agreed that pre-college cognitive factors are the single best predictors for academic success, even when noncognitive factors are included in the study.

Such selective admission practices that utilize standardized tests, high school grade point average, high school class standing, and appropriate course sequences have been criticized as culturally inappropriate and racially biased in part because they were normed on middle class White males (Sedlacek, 1989). Manning (1989) cites several studies that clearly demonstrate the discrepancy between minority and White students in standardized test scores, even when similar socioeconomic variables are considered. He further states that personal qualities such as demonstrated ability to overcome adversity should be used in the admissions process and that using such criteria would be a fair way to account for the inherent discrepancy in standardized test scores such as the SAT.
Hall and Coates (1973), in a study comparing regular admit students with students who were financially disadvantaged and were participants in one of several special programs, found that using the SAT to predict first year GPA or first year persistence was inadequate, leaving between 78% and 97% of the variance unaccounted for. In fact, in one conclusion, the researchers stated that "there is much valid criticism on the part of financially disadvantaged Anglos and minorities who claim that the present system for selection is inadequate" (p. 16). The use of standard admission procedures for students from underrepresented minority groups is unreliable, and other measures of potential for academic success for such students need to be evaluated.

Noncognitive Factors

In a study on tribal college admissions, Boham (1991) concluded that students who were admitted under the ability-to-benefit criteria were able to complete college programs successfully. The ability-to-benefit admission criteria utilize a subjective assessment of an applicant's ability to benefit from a college education based on unmeasured noncognitive factors. This assessment was applied to applicants who otherwise would have been denied admission based on their prior academic and cognitive factor performance.

Noncognitive factors, which include personality characteristics, have been the focus of research in conjunction with prediction of academic performance for several decades. In one early study, Hackett (1955),
recommended that personality variables be included along with cognitive variables for predicting academic success. His study examined college freshmen and predicted college quality point average (QPA) using the Hypomania Scale (Ma) from the Minnesota Multiphasic Personality Inventory (MMPI) and scores from the American Council Psychological Examination (ACE) to predict freshman QPA.

In a study predicting freshman GPA using the Edward's Personal Preference Schedule (EPPS), Michael, Haney, and Jones (1966) found a positive relationship between the Order Scale and a negative relationship between GPA and the Autonomy Scale of the EPPS. Utilizing a combination of cognitive and noncognitive variables, Szabo and Feldhusen (1970) also found that certain personality variables were positively correlated with freshman and sophomore academic success, as defined by GPA.

Abrams and Jernigan (1984), in a study comparing noncognitive factors and standard admissions criteria (which included the SAT) with a group of students who were considered to be at risk academically, found that there was no correlation between standard admissions criteria and the defined variables associated with academic success and the population they were studying. In fact, the noncognitive variables were more predictive of academic success than were the SAT and other cognitive variables.

Snowman, Leitner, Snyder, and Lockhard (1980) examined if the Descriptive Tests of Language Skills, designed to diagnose language and
reading skills, could improve on the predictive value of the ACT. The study population was drawn from academically underprepared students who were admitted to the university through one of its special admit programs. Stepwise multiple regression was employed to investigate any possible linear correlations. The ACT and the Descriptive Tests of Language Skills when correlated with fall and spring semester GPAs were found to have no practical significance, accounting for only 13% and 4% of the variance, respectively.

Astin (1982) discusses the severe underrepresentation of minorities in institutions of higher education in the United States. He accounts for the underrepresentation by examining many factors, including college and university admission policies, which Astin says are inappropriate models for use with minorities largely because standardized tests used in the admission process are biased. Duran (1986) found in a study on Hispanic college student achievement that high school GPA, standardized admission test scores, and the combination of both sets of scores were less predictive of early college grades among Hispanics than among White non-Hispanics.

Carstens (1993), in a study utilizing the Noncognitive Questionnaire to predict persistence and graduation of high risk students, found a relationship between several independent variables: (1) positive self-concept, (2) availability of a strong support person, (3) community involvement, (4) non-traditional knowledge acquired in a field, and (5) prefers long range goals and the dependent variables persistence and graduation. While five independent
variables in the Noncognitive Questionnaire were predictive of persistence and graduation of special admit students in the Carstens study, he also recommended that further study on special admit populations was essential in order for institutions of higher education to attain valid and reliable methodologies for selecting high risk candidates with potential.

In a study using the Noncognitive Questionnaire, White and Sedlacek (1986) tested its validity in predicting GPA and persistence of a sample of 58 specially admitted freshman students at the University of Maryland. The results using stepwise multiple regression were significant for predicting second, third, and fourth semester GPA with multiple correlation's reported of .81, .73, and .74, respectively.

Sedlacek and Adams-Gaston (1992) looked at incoming student athletes and used stepwise multiple regression to evaluate the predictability of fall semester grades using the Noncognitive Questionnaire. The independent variables of positive self-concept, realistic self-appraisal, having a strong support person available, and community involvement were demonstrated to be statistically significant with correlation's reported of .29, .25, .32, and .24, respectively. In addition, the authors examined SAT scores and found them not to be predictive of first semester GPA for student athletes.

Rehberg and Schaffer (1968), in a study examining the characteristics of successful student athletes, discovered that such characteristics as positive self-concept, demonstrated community service, leadership and realistic self-
appraisal are common characteristics of such academically successful student athletes. Boyer and Sedlacek (1988), in a study predicting persistence and cumulative GPA of international students, examined the records of 248 new international students enrolled at the University of Maryland in the fall of 1981. The Noncognitive Questionnaire was administered and the students were followed over a 4-year period. The SAT was not shown to be predictive of persistence or cumulative GPA, and the NCQ was moderately correlated.

Summary

The results of studies predicting academic success have met with varying results. The review of the literature indicated that there was no single definitive method that is best to assess student's potential for academic success. The variables involved are complex and the results are not conclusive. However, studies have made it reasonably clear that standard admission procedures are at least inadequate when applied to special populations of college students.

Specially admitted students at colleges and universities are considered high risk in terms of their ability to succeed. While noncognitive variables are used in selecting students for special admit status, standard cognitive variables such as high school GPA and SAT scores will also be considered and will have a discriminating effect that will sometimes be the reason that some special admit candidates will not receive admission. There are many studies
that have examined standard admission procedures and the recommendations invariably suggest that institutions of higher education abandon inappropriate standard admission procedures where ethnic minorities are concerned and that they adopt more valid and reliable methodologies (Crouse, 1985; Fuller, McNamara & Green, 1978; Tracey & Sedlacek, 1985).

Many studies have been conducted to find noncognitive variables that could be used as predictors of success for minority college students (Crouse, 1985; Crouse & Trusheim, 1991; Narin, 1980; Owen 1985; Sedlacek & Brooks, 1976; White, 1985; White & Sedlacek, 1986). The results of such studies are inconclusive. The Noncognitive Questionnaire, while proving in some studies to be reliable and valid for minority groups, has mixed results. There are virtually no consistent measures demonstrated in the literature to adequately assess academic potential, especially for at-risk students. As a consequence, students who do not meet regular admission requirements do not have a reliable objective method for assessing their potential for success. Furthermore, EOP programs and other programs similar to EOP do not have a reliable and valid instrument to assist them in evaluating program proposals or in assessing the potential of incoming EOP candidates.
CHAPTER 2

METHODS

Design of the Study

The study of EOP, special admit, first-time freshmen at Humboldt State University used a case study design. This study has the appearance of a double blind, quasi-experimental, post-hoc design. However, since the purpose was to describe a population involved in an instance of action, and not to generalize to a larger group, it is classified as a particularistic study of a bounded population and was appropriate for the case study design. The particularistic case study is an especially good design for practical problems, questions, and situations arising from everyday practice. Particularistic case studies are problem-centered and small-scale endeavors that assist groups of people to confront specific problems in a holistic way (Merriam, 1988). This study examined selected characteristics of the entire population of first-time freshmen EOP students who have completed 12 or more units of undergraduate course work during the fall semesters of 1995 and 1996 at Humboldt State University. The intent was to utilize the Noncognitive Questionnaire to describe this population and to use the analysis for possible
future placement of applicants into successful and unsuccessful groups, thus aiding in the admissions decision-making process.

Population

The population of this study consisted of 93 full-time undergraduate first-time freshman students who received special admits as recommended by EOP to Humboldt State University during the fall semesters of 1995 and 1996. This study evaluated and described several noncognitive characteristics of the population that may be related to academic success. It is instructive, when examining such characteristics, to appreciate the context in which the study population is situated.

Humboldt State University is one of 22 campuses in the California State University system (see Appendix C). It is located 270 miles north of San Francisco in the California Redwood Forest and on the Pacific Ocean. San Francisco is the closest metropolitan area; as such, Humboldt State University is considered to be rural and isolated. There are approximately 7,100 students enrolled at HSU in any given semester. There are approximately 670 permanent, part-time, and temporary faculty. With variation in number of courses being offered and number of students enrolled, there is an average of 16 students in an individual class. Traditionally, Humboldt State University is known for its sciences and natural resources programs. It has, in the past decade, strengthened its diversity in the areas of humanities, fine arts, and
business (HSU Catalogue, 1995-96). The study population was a subset of a larger population of students who meet federal income eligibility guidelines for Student Support Services (SSS) in which not all eligible students participate. There were 1,132 students enrolled at HSU during the 1995-96 academic year that met the low-income guidelines for SSS eligibility. In addition, there were 760 students that met both the low-income guidelines and were also first generation college students, 11.4% of the entire HSU undergraduate student population.

Based on national college participation and completion rates, comparing figures with federal income classifications, students who are from families with an annual income of below $22,033 are 75% less likely to complete college than are students from families with an annual income of above $67,881, 21% and 96% completion rates, respectively (U.S. Office of Education, 1995). At Humboldt State University, 98% of SSS eligible students are from the highest risk income group and are projected to have a less than 21% chance of graduating from college. Low-income students at Humboldt State University are also disproportionately underrepresented ethnic minorities. In the fall of 1995, not only were underrepresented ethnic minorities disproportionately represented in the low-income category, but they were also disproportionately represented among those students who required academic remediation. Table 1 provides this data.
Table 1. Remediation rates of students entering fall 1995.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>New Students</th>
<th>% Low-Income</th>
<th>English</th>
<th>Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American</td>
<td>28</td>
<td>64.3</td>
<td>29</td>
<td>46</td>
</tr>
<tr>
<td>Chicano/Latino</td>
<td>162</td>
<td>58.6</td>
<td>25</td>
<td>48</td>
</tr>
<tr>
<td>S.E. Asian/Pacific Islander</td>
<td>56</td>
<td>50.0</td>
<td>27</td>
<td>46</td>
</tr>
<tr>
<td>Native American</td>
<td>60</td>
<td>48.3</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>White</td>
<td>1262</td>
<td>21.9</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>All HSU</td>
<td>1870</td>
<td>24.7</td>
<td>10</td>
<td>25</td>
</tr>
</tbody>
</table>

First-generation college students often lack sophistication with regard to the bureaucratic nature of the university system. They also are at a loss when it comes to interpreting the unwritten system. As a result, they find it difficult to accomplish tasks such as registering for classes. The support and familiarity of the university system comes from family and other network systems. For first-generation college students, these support and network systems are often non-existent.

Low-income, first-generation college students often have feelings of isolation on campus and in the community. Humboldt State University is remotely located compared to the other campuses of the California State University (CSU) system. It is located in Arcata, California, which has a population of 16,400. The local community and the university are approximately 90% White. Consequently, the rural isolation is compounded by
cultural isolation among students of color. When students of color leave home to attend HSU, many embark on their first significant experience in a community, in a college and in a classroom in which there are few people who share their cultural background. They become isolated not only from their family and friends, but also from others who can share and affirm their cultural identity. The combination of cognitive and noncognitive factors that characterize the population of SSS eligible students can result in poor academic performance. This is particularly true for students who exhibit a combination of risk factors.

The description of the population from which the study group was selected is instructive with regard to understanding the context within which the study group was located. This description includes all SSS eligible students. In general, they are low-income and first-generation college bound. They need academic remediation, especially in math and English, speak a native language other than English, and are members of an ethnic minority group. They also have traveled some distance from home to attend HSU, have feelings of isolation, and are likely to have academic difficulty.

The study population was characteristic of the overall SSS eligible student population, but they constituted a unique group. The group numbered 93 and consisted of only first-time freshmen who were EOP participants. They were also exclusively specially admitted and were enrolled for 12 semester
units or more. They are not a sample but a bounded population. Consequently, no sampling technique was employed.

Methods of Collecting Data

The NCQ was administered to the study population by the EOP staff counselors during required academic advising sessions held the first six weeks of the fall semesters of 1995 and 1996. Students returned the completed questionnaire in sealed envelopes, and EOP counselors were unaware of any individual student Noncognitive Questionnaire results. The student’s social security account number was listed on a tear-away sheet stapled to the front of the envelope. The EOP counselors stored sealed results until grades were available via computer on the university’s banner database system. When semester grades became available the EOP counselors accessed grades using the student-provided social security account number on the tear-away sheet.

The semester GPA and the total number of units attempted were then recorded on the sealed envelope itself and the student identifier (the social security account number) was removed. The grade point average earned at the end of the fall semesters of 1995 and 1996 was used to determine group membership (see Appendixes E and F for participant letter and instruction form). Students receiving a 2.00 grade point average or better for at least 12 semester units attempted were placed in the successful EOP student group and students receiving a less than 2.00 grade point average were placed in
the unsuccessful EOP student group. Number of semester units completed and semester GPA were collected from the Admissions and Records Office at Humboldt State University and are subject to the confidentiality of the Freedom of Information Act. The NCQ was scored according to the scoring key developed for the NCQ. The supplementary work sheet aided in tabulating scores for analysis (see Appendixes G and H). In addition to scores on the Noncognitive Questionnaire and university academic data, data were also collected on (1) gender, (2) age, (3) ethnicity, and (4) parent’s occupation.

**Statistical Methods**

For the purposes of this study, there were three separate statistical methods employed to analyze the data: (1) discriminant analysis, (2) analysis of variance and (3) step-wise multiple regression.

**Discriminant Analysis**

Discriminant analysis is a statistical procedure that analyzes several variables together in order to determine if the combination of variables can be used to predict predefined group placement of individual cases. Stepwise discriminant analysis systematically adds variables into a regression equation determining statistical significance using Wilks's lambda and partial F. The stepwise process finds the variable with the greatest univariate discrimination among several variables. The procedure then pairs this first variable with the other variables one at a time until the combination that produces the greatest
discrimination is found. The pair of variables are then coupled with the next added variable, one step at a time, until the next variable adds a significant contribution to the equation. This continues on until all the independent variables have been tested and no further sufficient contribution is made (Klecka, 1980).

Discriminate analysis was appropriate for this study since there are two groups defined: (1) successful EOP students and (2) unsuccessful EOP students. Discriminate analysis was also appropriate for this study since it analyzes combinations of variables at one time and separately to determine possible group membership. In the stepwise process variables are entered and eliminated from the equation based on their ability to make a unique contribution to predicting group membership (Klecka, 1980). Discriminate analysis does not utilize hypothesis testing. Rather, it requires the researcher to make meaningful decisions about the data and to impose sense on it (Conti, 1993).

Analysis of Variance

Analysis of variance (ANOVA) is a statistical procedure that examines the means of two or more groups simultaneously among one or more variables or treatments. The statistic tests the variation among means in order to determine if differences can be attributed to factors other than chance. Total error variance (variations of individual cases about the grand mean) can be algebraically broken down into within-group variation, between-group variation,
and treatment variation. Variation not accounted for by within-group and between-group error estimates can be attributed to the treatment. ANOVA uses the ratio of the sum of between-group error to the sum of within-group error to calculate an F value that is used along with the number of degrees of freedom to determine significance (Weiss & Hassett, 1982). The null hypothesis of no statistically significant difference among the means of the eight variables of the NCQ, the variable GPA, and the variable number of units taken by defined groups was tested. The alpha level of .05 was set to control for the probability of rejecting a true null hypothesis, thus indicating a difference where none exists (Type I error) (Khazanie, 1975). "The probability of committing this error is denoted by the Greek letter alpha and is referred to as the level of significance of the test" (p. 284). In general the following steps were used to test the hypothesis:

1. The null hypothesis was stated.
2. The level of significance was stated. For the purpose of this study, the level was set at the .05 level of confidence. The .05 level is adequate for the control of Type I error (Weiss & Hassett, 1982).
3. The test statistic was analysis of variance.
4. The statistic was computed.
5. The null hypothesis was retained or rejected depending upon the calculated F value.
Stepwise Multiple Regression

Stepwise multiple regression is a procedure that systematically adds variables into the regression equation determining statistical significance. The stepwise process finds the best predictor among several variables and pairs the next added variable until a significant multiple correlation is found. The pair of predictor variables are then coupled with the next added variable, one step at a time, until the next variable adds a significant contribution to the prediction equation and so on until all the independent variables have been tested (Ferguson, 1981). The hypothesis of no statistically significant relationship between any of the eight variables in the NCQ, the variable number of units taken, and GPA by defined groups was tested. The stepwise regression statistic was appropriate for this study since the research project was concerned with which of the eight variables in the NCQ and the variable number of units taken provided a significant and unique contribution to predicting academic success.

In general the following steps were used to test the hypothesis:

1. The null hypothesis was stated.
2. The level of significance was set at the .05 level of confidence for a variable to be included in the regression equation. The .05 level is adequate for the control of Type I error (Weiss & Hassett, 1982).
3. The statistic was computed.
4. The null hypothesis was retained or rejected depending upon the calculated $R^2$ value.

**Instrumentation**

The Noncognitive Questionnaire was employed to assess the eight noncognitive variables previously discussed. The Noncognitive Questionnaire was developed by Sedlacek and Brooks (1976) and later modified by Tracey and Sedlacek (1984) at the University of Maryland, College Park. The purpose of developing the questionnaire was to provide an alternate method of predicting college success of students in special programs admitted to the University of Maryland (Sedlacek & Brooks, 1976). The Noncognitive Questionnaire has been used in numerous studies since its development (Boyer & Sedlacek, 1988; Carstens, 1993; Tracey & Sedlacek, 1984, 1985, 1987b; Young & Sowa, 1992). Reliability and validity of the Noncognitive Questionnaire have been tested by Tracey and Sedlacek (1984) and they report a test-retest reliability coefficients ranging from .70 to .94 and a median coefficient alpha of .83 (Sedlacek & Adams-Gaston, 1992). Tracey and Sedlacek (1984) found support for construct validity for the NCQ using factor analysis. It yielded eight factors that closely approximate the dimensions on the NCQ. The NCQ items were combined in the eight subscales with alpha coefficients: (1) Self-Assessment of Motivation (.56), (2) Perseverance (.82), (3) Leadership (.66), (4) Academic Self-Concept (.55), (5) Long-Range Academic
Goals (.58), (6) Community Service (.39), (7) Support of Academic Plans (.57), and (8) Expected Racial Difficulty (.55).

The Noncognitive Questionnaire was a Likert-format scoring device that asked those taking the questionnaire to score 18 items on a one to five scale as to whether they strongly agree, agree, are neutral, disagree, or strongly disagree. In addition to the 18 Likert-type items, the Noncognitive Questionnaire had two multiple choice items on educational aspirations and three open-ended items pertaining to current goals and past accomplishments.

In this study, in order to assure reliability of the open-ended items the method of triangulation was employed. Two different raters analyzed the three open-ended items, and the inter-rater reliability coefficient (Pierson r) was calculated at 0.94.
CHAPTER 3

RESULTS

Descriptive Statistics

There were a total of 114 EOP first-time freshman students admitted to Humboldt State University during the fall semesters of 1995 and 1996. After eliminating those students who completed less than 12 semester units, there were a total of 93 cases that were used in the analysis. The average age of the population studied was 19.1 years with a range of 17-47. There were 47 males and 46 females in the population. Students of Hispanic (non-White origin) were the most numerous at 39, White students were second with a total of 19, Black students were third with a total of 8, Asian students had the fourth largest population with a total of 12, American Indian students numbered 9, and students who declared other numbered 6. The mean, standard deviation, and range of the eight variables in the NCQ, the variable number of units taken, and the variable GPA for the study population are reported in Table 2.
Table 2. Mean, standard deviation, and range of all variables under consideration for study.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Valid N</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>93</td>
<td>19.51</td>
<td>17</td>
<td>47</td>
<td>4.31</td>
</tr>
<tr>
<td>Grade point average</td>
<td>93</td>
<td>2.80</td>
<td>1.2</td>
<td>4</td>
<td>0.63</td>
</tr>
<tr>
<td>Enrolled units</td>
<td>93</td>
<td>15.58</td>
<td>12</td>
<td>25</td>
<td>2.88</td>
</tr>
<tr>
<td>Self-concept</td>
<td>93</td>
<td>3.32</td>
<td>2</td>
<td>4</td>
<td>0.55</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>93</td>
<td>3.34</td>
<td>2</td>
<td>5</td>
<td>0.70</td>
</tr>
<tr>
<td>Self-appraisal</td>
<td>93</td>
<td>3.80</td>
<td>2</td>
<td>5</td>
<td>0.54</td>
</tr>
<tr>
<td>Long-range goals</td>
<td>93</td>
<td>2.98</td>
<td>2</td>
<td>4</td>
<td>0.63</td>
</tr>
<tr>
<td>Strong support person</td>
<td>93</td>
<td>4.35</td>
<td>2</td>
<td>5</td>
<td>0.70</td>
</tr>
<tr>
<td>Leadership experience</td>
<td>93</td>
<td>3.06</td>
<td>1</td>
<td>4</td>
<td>0.67</td>
</tr>
<tr>
<td>Community service</td>
<td>93</td>
<td>3.12</td>
<td>1</td>
<td>4</td>
<td>0.73</td>
</tr>
<tr>
<td>Knowledge acquired in field</td>
<td>93</td>
<td>2.14</td>
<td>1</td>
<td>3</td>
<td>0.67</td>
</tr>
</tbody>
</table>

The number of units taken was collected in order to determine if a student was full-time (12 units or more) or not. The number of units taken was included in the analysis because initial observation of the data suggested that a possible inverse relationship existed between semester GPA and number of units taken.

Discriminant Analysis

In this study discriminant analysis was used to determine which, if any, of the variables used in the NCQ and the variable number of units taken would contribute most to identifying and describing which students were successful and which students were unsuccessful. Due to a large difference in the number of cases between the two groups (85 successful students and 8 unsuccessful
students) the analysis was conducted using the top 15% of students and the bottom 15% of students. These groupings were calculated using GPA scores above and below one standard deviation from the mean of both groups combined. The cutoff point for the top 15% was a GPA of 3.43 and the cutoff point for the bottom 15% was a GPA of 2.17. The mean GPA for all cases was 2.80 and the standard deviation was 0.63.

The number of males and females in the study was nearly evenly split with 47 cases being male (50.5%) and 46 cases being female (49.5%). This frequency distribution suggested two groups for analysis that did not have a large disparity of cases between them. The ethnicity classification had six groupings: Blacks (8), Whites (19), Asians (12), Hispanics (39), American Indians (9), and Other (6). While the Hispanic group was nearly as large as all the other ethnic groups combined, Klecka (1980) does not suggest that this type of uneven distribution is a problem in analysis as long as the assumptions of multi-colinearity and normal distributions are not significantly violated. The pooled within-group correlation matrix of predictor variables was examined and for the groups being tested. Within-group correlations can have an effect on multivariate analysis (Norusis, 1988).

Three separate discriminant analyses were run: (1) NCQ scores on the eight variables and the variable number of units taken using the two groups, top 15% and bottom 15% of GPA, as the grouping variable, (2) NCQ scores on the eight variables and the variable number of units taken using
gender as the grouping variable, and (3) NCQ scores on the eight variables and the variable number of units taken using ethnicity as the grouping variable.

The stepwise method of discriminant analysis was used to examine the groupings described above. The stepwise method is used to determine which of the eight variables from the NCQ and the variable number of units taken are most useful in assigning to which group an individual case likely belongs. The Wilks's lambda takes into consideration both within group homogeneity and between group differences. The Wilks's lambda score will be between 0 and 1 and low Wilks's lambda values are inversely related to high F values calculated for significance (Klecka, 1980). The variables were selected or removed from the equation based on their Wilks's lambda score. The structure matrix contains the coefficients that show the similarity between each individual variable and the total discriminant function and lists the variables that have the strongest relationship with the discriminant function (Klecka, 1980, p. 31). The variables with the highest coefficients are used in naming the discriminant function and coefficients with a value of .30 and above are included.

**Discriminant Analysis with High GPA and Low GPA**

In this study, the eight variables from the NCQ and the variable number of units taken were analyzed to determine if they could be used to discriminate between students with a high GPA and a low GPA. The high GPA group
contained 14 cases and the low GPA group contained 18 cases for a combined total of 32 cases. The within-group correlation coefficients are presented in Table 3.

Table 3. Pooled within-groups correlations for high and low GPA groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Units</th>
<th>Self-C.</th>
<th>Race</th>
<th>Self-A.</th>
<th>L.R.G.</th>
<th>S.S.</th>
<th>Ldrshp</th>
<th>C.S.</th>
<th>Knw. F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>1.00</td>
<td>-0.02</td>
<td>-0.25</td>
<td>0.09</td>
<td>-0.10</td>
<td>0.05</td>
<td>0.13</td>
<td>-0.33</td>
<td>0.11</td>
</tr>
<tr>
<td>Self-C.</td>
<td>-0.02</td>
<td>1.00</td>
<td>0.37</td>
<td>0.02</td>
<td>0.41</td>
<td>0.14</td>
<td>0.38</td>
<td>0.36</td>
<td>0.33</td>
</tr>
<tr>
<td>Race</td>
<td>-0.25</td>
<td>0.37</td>
<td>1.00</td>
<td>0.07</td>
<td>0.11</td>
<td>0.20</td>
<td>0.37</td>
<td>0.37</td>
<td>0.26</td>
</tr>
<tr>
<td>Self-A.</td>
<td>0.09</td>
<td>0.02</td>
<td>0.07</td>
<td>1.00</td>
<td>0.33</td>
<td>-0.10</td>
<td>0.40</td>
<td>0.24</td>
<td>0.22</td>
</tr>
<tr>
<td>L.R.G.</td>
<td>-0.10</td>
<td>0.41</td>
<td>0.11</td>
<td>0.33</td>
<td>1.00</td>
<td>0.09</td>
<td>0.41</td>
<td>0.25</td>
<td>0.42</td>
</tr>
<tr>
<td>S.S.</td>
<td>0.05</td>
<td>0.14</td>
<td>0.20</td>
<td>-0.10</td>
<td>0.09</td>
<td>1.00</td>
<td>0.23</td>
<td>0.45</td>
<td>0.45</td>
</tr>
<tr>
<td>Ldrshp</td>
<td>0.13</td>
<td>0.38</td>
<td>0.37</td>
<td>0.40</td>
<td>0.41</td>
<td>0.23</td>
<td>1.00</td>
<td>0.53</td>
<td>0.50</td>
</tr>
<tr>
<td>C.S.</td>
<td>-0.33</td>
<td>0.36</td>
<td>0.37</td>
<td>0.24</td>
<td>0.25</td>
<td>0.45</td>
<td>0.53</td>
<td>1.00</td>
<td>0.46</td>
</tr>
<tr>
<td>Knw. F.</td>
<td>0.11</td>
<td>0.33</td>
<td>0.26</td>
<td>0.22</td>
<td>0.42</td>
<td>0.45</td>
<td>0.50</td>
<td>0.46</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Key

<table>
<thead>
<tr>
<th>Units</th>
<th>Enrolled Units</th>
<th>S.S.</th>
<th>Strong Support Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-C.</td>
<td>Self-Concept</td>
<td>Ldrshp</td>
<td>Leadership</td>
</tr>
<tr>
<td>Race</td>
<td>Race</td>
<td>C.S.</td>
<td>Community Service</td>
</tr>
<tr>
<td>Self-A.</td>
<td>Self-Appraisal</td>
<td>Knw. F.</td>
<td>Knowledge in Field</td>
</tr>
<tr>
<td>L.R.G.</td>
<td>Long-Range Goals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The variable with a Wilks's lambda low enough to be included in the analysis was number of units taken (.85). None of the other variables had a Wilks's lambda low enough to be included in the analysis. The discriminant analysis for the high GPA and low GPA groups is summarized in Table 4.
Table 4. Summary of discriminant analysis for the high and low GPA groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Wilks's Lambda</th>
<th>F value</th>
<th>p level</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>0.86</td>
<td>5.03</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Self-Concept</td>
<td>0.96</td>
<td>1.26</td>
<td>0.27</td>
<td>0.00</td>
</tr>
<tr>
<td>Race</td>
<td>0.98</td>
<td>0.69</td>
<td>0.41</td>
<td>0.07</td>
</tr>
<tr>
<td>Self-Appraisal</td>
<td>0.99</td>
<td>0.19</td>
<td>0.67</td>
<td>0.01</td>
</tr>
<tr>
<td>Long-Range Goals</td>
<td>0.97</td>
<td>0.76</td>
<td>0.39</td>
<td>0.01</td>
</tr>
<tr>
<td>Strong Support</td>
<td>0.98</td>
<td>0.67</td>
<td>0.42</td>
<td>0.00</td>
</tr>
<tr>
<td>Leadership</td>
<td>0.94</td>
<td>1.95</td>
<td>0.17</td>
<td>0.02</td>
</tr>
<tr>
<td>Community Service</td>
<td>1.00</td>
<td>0.10</td>
<td>0.75</td>
<td>0.11</td>
</tr>
<tr>
<td>Knowledge in Field</td>
<td>1.00</td>
<td>0.00</td>
<td>0.99</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Standardized discriminant coefficients were used to determine which variables were contributing most to the discrimination between students with a high GPA and students with a low GPA. The relative importance of each variable to the overall discriminant function can be determined by examining these standardized coefficients (Klecka, 1980, p. 29). In this study the variable number of units taken was the only variable included in the process of stepwise discriminant analysis. No canonical analysis was conducted in the stepwise process; hence, no standardized coefficients were obtained nor were there any coefficients obtained from the structure matrix. It is the structure coefficients that are used to name the discriminant function by expressing the degree of relationship between the individual variables under consideration and the discriminant function (p. 31). Variables with a coefficient of .30 and above are included in the process of naming the discriminant function.
A structure coefficient was not obtained for this analysis. However, since the variable number of units taken was the only variable included in the analysis, this discriminant function was named Class Load.

Another method to determine the usefulness of the calculated discriminant function is the number of cases in predefined classifications that the function accurately predicts. In order for the function to be useful it must accurately predict the correct group placement at a level 25% greater than chance. There were two groups in this analysis and the percent of cases that would be expected by chance alone to be included in the groups was 50%. Therefore, the discriminant function Class Load should have a predictive accuracy of 75% in order for it to be considered useful. The proportion of cases placed correctly in both categories, high GPA and low GPA, was 69% (8/14 for the high GPA group and 14/18 for the low GPA group). The percent increase beyond chance alone is 18%. This is below the 25% increase beyond chance required in order for the discriminant function Class Load to be considered to be useful (see Table 5 for classification matrix).

Table 5. Classification matrix for the high and low GPA groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Percent Correct</th>
<th>High GPA p = .50</th>
<th>Low GPA p = .50</th>
</tr>
</thead>
<tbody>
<tr>
<td>High GPA</td>
<td>71.43</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Low GPA</td>
<td>55.60</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>
Discriminant Analysis with Gender

In this study, eight variables from the NCQ and the variable number of units taken were analyzed to determine if they could be used to discriminate between gender groups. The number of males was 47 and the number of females was 46 for a combined total of 93 cases. The within-group correlation coefficients are presented in Table 6.

Table 6. Pooled within-groups correlations for gender.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA</td>
<td>1.00</td>
<td>-0.18</td>
<td>-0.13</td>
<td>0.04</td>
<td>-0.12</td>
<td>-0.09</td>
<td>-0.14</td>
<td>0.16</td>
<td>0.15</td>
<td>0.06</td>
</tr>
<tr>
<td>Units</td>
<td>-0.18</td>
<td>1.00</td>
<td>0.07</td>
<td>0.03</td>
<td>0.26</td>
<td>0.05</td>
<td>-0.10</td>
<td>-0.02</td>
<td>-0.28</td>
<td>0.06</td>
</tr>
<tr>
<td>Self-C.</td>
<td>-0.13</td>
<td>0.07</td>
<td>1.00</td>
<td>0.42</td>
<td>0.19</td>
<td>0.27</td>
<td>0.20</td>
<td>0.23</td>
<td>0.24</td>
<td>0.12</td>
</tr>
<tr>
<td>Race</td>
<td>0.04</td>
<td>0.03</td>
<td>0.42</td>
<td>1.00</td>
<td>0.23</td>
<td>0.22</td>
<td>0.22</td>
<td>0.28</td>
<td>0.21</td>
<td>0.18</td>
</tr>
<tr>
<td>Self-A.</td>
<td>-0.12</td>
<td>0.26</td>
<td>0.19</td>
<td>0.23</td>
<td>1.00</td>
<td>0.22</td>
<td>0.07</td>
<td>0.17</td>
<td>0.09</td>
<td>0.26</td>
</tr>
<tr>
<td>L.R.G.</td>
<td>-0.09</td>
<td>0.05</td>
<td>0.27</td>
<td>0.22</td>
<td>0.22</td>
<td>1.00</td>
<td>0.12</td>
<td>0.26</td>
<td>0.10</td>
<td>0.44</td>
</tr>
<tr>
<td>S.S.</td>
<td>-0.14</td>
<td>-0.10</td>
<td>0.20</td>
<td>0.22</td>
<td>0.07</td>
<td>0.12</td>
<td>1.00</td>
<td>0.20</td>
<td>0.30</td>
<td>0.18</td>
</tr>
<tr>
<td>Ldrshp</td>
<td>0.16</td>
<td>-0.02</td>
<td>0.23</td>
<td>0.28</td>
<td>0.17</td>
<td>0.26</td>
<td>0.20</td>
<td>1.00</td>
<td>0.49</td>
<td>0.44</td>
</tr>
<tr>
<td>C.S.</td>
<td>0.15</td>
<td>-0.28</td>
<td>0.24</td>
<td>0.21</td>
<td>0.09</td>
<td>0.10</td>
<td>0.30</td>
<td>0.49</td>
<td>1.00</td>
<td>0.30</td>
</tr>
<tr>
<td>Knw. F.</td>
<td>0.06</td>
<td>0.06</td>
<td>0.12</td>
<td>0.18</td>
<td>0.26</td>
<td>0.44</td>
<td>0.18</td>
<td>0.44</td>
<td>0.30</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Key

- GPA: Grade Point Average
- Units: Enrolled Units
- Self-C: Self-Concept
- Race: Race
- Self-A: Self-Appraisal
- L.R.G: Long-Range Goals
- S.S: Strong Support Person
- Ldrshp: Leadership
- C.S: Community Service
- Knw. F: Knowledge in Field

The variables with a Wilks's lambda low enough to be included in the analysis were realistic self-appraisal (.94) and nontraditional knowledge acquired in a field (.87). None of the other variables had a Wilks's lambda low.
enough to be included in the analysis. The discriminant analysis for the male and female gender groups is summarized in Table 7.

Table 7. Summary of discriminant analysis for the male and female gender groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Wilks's Lambda</th>
<th>F value</th>
<th>p level</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge in Field</td>
<td>0.86</td>
<td>12.85</td>
<td>0.00</td>
<td>0.07</td>
</tr>
<tr>
<td>Self-Appraisal</td>
<td>0.94</td>
<td>5.62</td>
<td>0.02</td>
<td>0.07</td>
</tr>
<tr>
<td>GPA</td>
<td>0.98</td>
<td>1.84</td>
<td>0.18</td>
<td>0.02</td>
</tr>
<tr>
<td>Units</td>
<td>0.98</td>
<td>2.38</td>
<td>0.13</td>
<td>0.07</td>
</tr>
<tr>
<td>Self-Concept</td>
<td>0.99</td>
<td>0.63</td>
<td>0.43</td>
<td>0.04</td>
</tr>
<tr>
<td>Race</td>
<td>1.00</td>
<td>0.34</td>
<td>0.56</td>
<td>0.07</td>
</tr>
<tr>
<td>Long-Range Goals</td>
<td>0.99</td>
<td>1.33</td>
<td>0.25</td>
<td>0.21</td>
</tr>
<tr>
<td>Strong Support</td>
<td>0.99</td>
<td>0.64</td>
<td>0.42</td>
<td>0.03</td>
</tr>
<tr>
<td>Leadership</td>
<td>1.00</td>
<td>0.38</td>
<td>0.54</td>
<td>0.20</td>
</tr>
<tr>
<td>Community Service</td>
<td>0.99</td>
<td>0.87</td>
<td>0.35</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Standardized discriminant coefficients were used to determine which variables were contributing most to the discrimination between male students and female students. The relative importance of each variable to the overall discriminant function can be determined by examining these standardized coefficients (Klecka, 1980, p.29). In this study, the variables realistic self-appraisal and nontraditional knowledge acquired in a field had standardized discriminant coefficients of -.65 and .95, respectively. These were the only variables included in the process of stepwise discriminant analysis. Table 8 displays standardized discriminant coefficients for the male and female gender groups.
Table 8. Standardized discriminant coefficients for the male and female gender groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge in Field</td>
<td>0.95</td>
</tr>
<tr>
<td>Self-Appraisal</td>
<td>-0.65</td>
</tr>
</tbody>
</table>

Structure coefficients are used to name the discriminant function by expressing the degree of relationship between the individual variables under consideration and the discriminant function (Klecka, 1980, p. 31). Variables with a coefficient of .30 and above are included in the process of naming the discriminant function. The variables realistic self-appraisal and nontraditional knowledge acquired in a field were the only variables included in the analysis and they had structure coefficients of -.40 and .78, respectively.

Based on the structure coefficient values for the variables realistic self-appraisal and nontraditional knowledge acquired in a field, the discriminant function was named Cultural Introspection. The name of this function demonstrates that nontraditional knowledge and having a realistic self-appraisal are related to an individual's placement in either the male gender group or the female gender group. Males scored significantly higher on the NCQ variable realistic self-appraisal than did females, 4.0 and 3.7, respectively. Females scored significantly higher on the NCQ variable nontraditional knowledge acquired in a field than did males, 2.4 and 1.9, respectively.
Another method to determine the usefulness of the calculated discriminant function is the number of cases in predefined classifications that the function accurately predicts. In order for the function to be useful it must accurately predict the correct group placement at a level 25% greater than chance. There were two groups in this analysis and the percent of cases that would be expected by chance alone to be included in the groups was 50%. Therefore, the discriminant function Cultural Introspection should have a predictive accuracy of 75% in order for it to be considered useful.

The proportion of cases placed correctly in both categories, male gender and female gender, was 68% (36/47 for the male gender group and 27/46 for the female gender group). The percent increase beyond chance alone is 18%. This is below the 25% increase beyond chance required in order for the discriminant function Class Load to be considered useful. Table 9 displays the classification matrix for the male and female gender groups.

Table 9. Classification matrix for the male and female gender groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Percent Correct</th>
<th>Male p = .50538</th>
<th>Female p = .49462</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>76.60</td>
<td>36</td>
<td>11</td>
</tr>
<tr>
<td>Female</td>
<td>58.70</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>67.74</td>
<td>55</td>
<td>38</td>
</tr>
</tbody>
</table>
Discriminant Analysis with Ethnicity

In this study, the eight variables in the NCQ and the variable number of units taken were analyzed to determine if they could be used to discriminate among the ethnic groups. The number of cases in each ethnic group was Blacks (8), Whites (19), Asian (12), Hispanic (39), American Indian (9), and Other (6).

No variable had a Wilks's lambda low enough to qualify for inclusion in the analysis; consequently, none were selected and none were eliminated. This line of inquiry was abandoned.

Analysis of Variance

In this study, the eight variables from the NCQ and the variable number of units taken were used to determine if the two groups, high GPA and low GPA, differed significantly from one another on any of the eight NCQ variables or on the variable number of units taken. In addition, the eight variables from the NCQ, the variable number of units taken and the variable GPA were analyzed to determine if significant differences occurred with regard to gender and with regard to ethnicity.

Three separate analysis of variance tests were run: (1) NCQ scores on the eight variables and the variable number of units taken using the two groups, high and low GPA, as the grouping variable, (2) NCQ
scores on the eight variables, the variable number of units taken and the variable GPA using gender as the grouping variable, and (3) NCQ scores on the eight variables, the variable number of units taken and the variable GPA using ethnicity as the grouping variable.

A one-way analysis of variance was conducted to analyze the groupings described above. The one-way analysis of variance compares the mean scores between/among groups on selected variables in order to determine if a significant difference occurs. The $F$ value is calculated using within-group error and between-group error. The variables are determined to be significant or not based on their calculated $F$ value, the degrees of freedom and the alpha level set (Steel & Torrie, 1960).

**Analysis of Variance with High GPA and Low GPA**

In this study, the eight variables from the NCQ and the variable number of units taken were analyzed to determine if they differed from one another between students in the high GPA group and students in the low GPA group. The high GPA group contained 14 cases and the low GPA group contained 18 cases for a combined total of 32 cases.

The variable that had an $F$ ratio high enough to be significant was number of units taken ($F=7.01$). High GPA and low GPA groups differed significantly from one another with mean number of units taken, 14 and 17,
respectively. See Table 10 for analysis of variance of all variables under
calculation for the high and low GPA groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SS Effect</th>
<th>df Effect</th>
<th>MS Effect</th>
<th>SS Error</th>
<th>df Error</th>
<th>MS Error</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>44.79</td>
<td>1</td>
<td>44.79</td>
<td>267.20</td>
<td>30</td>
<td>8.91</td>
<td>5.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Self-Concept</td>
<td>0.42</td>
<td>1</td>
<td>0.42</td>
<td>8.80</td>
<td>30</td>
<td>0.29</td>
<td>1.42</td>
<td>0.24</td>
</tr>
<tr>
<td>Race</td>
<td>0.72</td>
<td>1</td>
<td>0.72</td>
<td>10.16</td>
<td>30</td>
<td>0.34</td>
<td>2.12</td>
<td>0.16</td>
</tr>
<tr>
<td>Self-Appraisal</td>
<td>0.11</td>
<td>1</td>
<td>0.11</td>
<td>7.36</td>
<td>30</td>
<td>0.25</td>
<td>0.46</td>
<td>0.51</td>
</tr>
<tr>
<td>Long-Range Goals</td>
<td>0.20</td>
<td>1</td>
<td>0.20</td>
<td>11.30</td>
<td>30</td>
<td>0.38</td>
<td>0.53</td>
<td>0.47</td>
</tr>
<tr>
<td>Strong Support Person</td>
<td>0.61</td>
<td>1</td>
<td>0.61</td>
<td>17.61</td>
<td>30</td>
<td>0.59</td>
<td>1.04</td>
<td>0.32</td>
</tr>
<tr>
<td>Leadership</td>
<td>0.57</td>
<td>1</td>
<td>0.57</td>
<td>11.30</td>
<td>30</td>
<td>0.38</td>
<td>1.52</td>
<td>0.23</td>
</tr>
<tr>
<td>Community Service</td>
<td>0.13</td>
<td>1</td>
<td>0.13</td>
<td>23.87</td>
<td>30</td>
<td>0.80</td>
<td>0.16</td>
<td>0.69</td>
</tr>
<tr>
<td>Knowledge in Field</td>
<td>0.02</td>
<td>1</td>
<td>0.02</td>
<td>12.94</td>
<td>30</td>
<td>0.43</td>
<td>0.06</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Analysis of Variance with Gender

In this study, the eight variables from the NCQ, the variable number of
units taken and the variable GPA were analyzed to determine if they differed
from one another between the male gender group and the female gender
group. The number of males was 47 and the number of females was 46 for a
combined total of 93 cases.

The variable with an $F$ value high enough to be significant was
nontraditional knowledge acquired in a field ($F=9.6$). Males and females
differed from one another significantly with mean NCQ score for nontraditional
knowledge acquired in a field of 1.9 and 2.4, respectively. See Table 11 for
analysis of variance on all variables under consideration for male and female gender groups.

Table 11. Analysis of variance on all variables under consideration for male and female gender groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SS Effect</th>
<th>df Effect</th>
<th>MS Effect</th>
<th>SS Error</th>
<th>df Error</th>
<th>MS Error</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA</td>
<td>0.34</td>
<td>1</td>
<td>0.34</td>
<td>35.78</td>
<td>91</td>
<td>0.39</td>
<td>0.88</td>
<td>0.35</td>
</tr>
<tr>
<td>Units</td>
<td>11.42</td>
<td>1</td>
<td>11.42</td>
<td>735.23</td>
<td>91</td>
<td>8.28</td>
<td>1.38</td>
<td>0.24</td>
</tr>
<tr>
<td>Self-Concept</td>
<td>0.20</td>
<td>1</td>
<td>0.20</td>
<td>28.12</td>
<td>91</td>
<td>0.31</td>
<td>0.65</td>
<td>0.42</td>
</tr>
<tr>
<td>Race</td>
<td>0.14</td>
<td>1</td>
<td>0.14</td>
<td>44.85</td>
<td>91</td>
<td>0.49</td>
<td>0.29</td>
<td>0.59</td>
</tr>
<tr>
<td>Self-Appraisal</td>
<td>0.72</td>
<td>1</td>
<td>0.72</td>
<td>25.79</td>
<td>91</td>
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<td>0.00</td>
<td>35.96</td>
<td>91</td>
<td>0.40</td>
<td>0.00</td>
<td>0.98</td>
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<td>0.94</td>
<td>44.35</td>
<td>91</td>
<td>0.49</td>
<td>1.93</td>
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<td>1</td>
<td>0.18</td>
<td>41.44</td>
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<td>0.46</td>
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<tr>
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<td>1.85</td>
<td>47.85</td>
<td>91</td>
<td>0.53</td>
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<td>0.64</td>
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<td>Knowledge in Field</td>
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<td>3.94</td>
<td>37.24</td>
<td>91</td>
<td>0.41</td>
<td>9.63</td>
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Analysis of Variance with Ethnicity

The eight variables from the NCQ, the variable number of units taken, and the variable GPA were analyzed to determine if they differed from one another among ethnic groups. The number of cases in each ethnic group was (1) Blacks 8, (2) Whites 19, (3) Asian 12, (4) Hispanic 39, (5) American Indian 9, and (6) other 6. The variable with an F value large enough to be significant was GPA (F=2.86). See Table 12 for analysis of variance on all variables under consideration for ethnicity.
Table 12. Analysis of variance on all variables under consideration for ethnicity.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>df</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
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<td>GPA</td>
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<td>5</td>
<td>1.02</td>
<td>31.02</td>
<td>87</td>
<td>0.36</td>
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<td>Units</td>
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<td>5</td>
<td>6.70</td>
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<td>0.30</td>
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<td>41.24</td>
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<td>0.47</td>
<td>1.58</td>
<td>0.17</td>
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<tr>
<td>Self-Appraisal</td>
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<td>87</td>
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<tr>
<td>Long-Range Goals</td>
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<td>0.34</td>
<td>34.26</td>
<td>87</td>
<td>0.39</td>
<td>0.86</td>
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<tr>
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<td>0.49</td>
<td>1.06</td>
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</tr>
<tr>
<td>Leadership</td>
<td>1.43</td>
<td>5</td>
<td>0.29</td>
<td>40.19</td>
<td>87</td>
<td>0.46</td>
<td>0.62</td>
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<tr>
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<td>45.54</td>
<td>87</td>
<td>0.52</td>
<td>1.59</td>
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</tr>
<tr>
<td>Knowledge in Field</td>
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<td>0.40</td>
<td>39.18</td>
<td>87</td>
<td>0.45</td>
<td>0.89</td>
<td>0.49</td>
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</table>

Stepwise Multiple Regression

Stepwise multiple regression was used to determine which, if any, of the variables used in the Noncognitive Questionnaire and the variable number of units taken contributed most to identifying and describing which students were successful and which students were unsuccessful by assessing whether or not a relationship existed between any of the variables mentioned and first semester GPA. In addition, stepwise multiple regression was conducted to determine if significant a relationship exists between the variables gender and ethnicity and first semester GPA.

Stepwise multiple regression is a procedure that systematically adds variables into the regression equation determining statistical significance. The
stepwise process finds the best predictor among several variables and pairs the next added variable until a significant multiple correlation is found. The pair of predictor variables are then coupled with the next added variable, one step at a time, until the next variable adds a significant contribution to the prediction equation and so on until all the independent variables have been tested (Ferguson, 1981).

The hypothesis of no statistically significant relationship between any of the eight variables in the NCQ, the variable number of units taken and GPA was tested. In addition, the variables gender and ethnicity were also tested to determine if a statistically significant relationship existed between either of these variables and first semester GPA. The alpha level for entry into the regression equation was .05 and for removal it was 1.0. The stepwise regression statistic is appropriate for this study since the research project is concerned with which of the eight variables in the NCQ and the variable number of units provides a significant and unique contribution to predicting academic success.

**Stepwise Multiple Regression with First Semester GPA as the Dependent Variable**

The eight variables from the NCQ and the variable number of units taken were used to determine if there was a significant relationship between any of these variables and first semester GPA. The number of cases in each variable was 93.
None of the variables received a coefficient high enough to be included in a regression equation. Consequently, no variables were added and none were removed. This line of inquiry was abandoned.

**Stepwise Multiple Regression with First Semester GPA as the Dependent Variable by Gender**

The eight variables from the NCQ and the variable number of units taken were used to determine if there was a significant relationship between any of these variables and first semester GPA by gender. The number of males was 47 and the number of females was 46.

None of the variables received a coefficient high enough to be included in a regression equation. Consequently, no variables were added and none were removed. This line of inquiry was abandoned.

**Stepwise Multiple Regression with First Semester GPA as the Dependent Variable by Ethnicity**

The eight variables from the NCQ and the variable number of units taken were used to determine if there was a significant relationship between any of these variables and first semester GPA by ethnicity. The number of cases in each ethnic group was (1) Blacks 8, (2) Whites 19, (3) Asian 12, (4) Hispanic 39, (5) American Indian 9, and (6) other 6.
None of the variables received a coefficient high enough to be included in a regression equation. Consequently, no variables were added and none were removed. This line of inquiry was abandoned.
Summary of the Study

Access to higher education is one of the cornerstones in empowering individuals and in building self-sufficient communities. Such access has been limited in colleges and universities that have more applicants than they can accommodate, thus making access competitive. Competition for entry into selective colleges and universities has resulted in the development and implementation of screening processes that often include screening protocols that have been found to unfairly block access for individuals from underrepresented minority groups. Included in such screening protocols is the assessment of standard cognitive measures such as high school GPA and SAT/ACT scores. These measures are culturally biased and their use as screening mechanisms may result in qualified members of underrepresented minority groups being excluded from admission to selective colleges and universities. Attempts have been made in the last few decades to correct this inequity by developing programs or instituting policies that provide access.

The number of minorities who are entering college has increased in recent years, largely due to affirmative action efforts on the part of institutions
to provide access through special programs such as talent search and EOP. Recently the Governor of California, the University of California Regents, and the general public through the passage of Proposition 209 (The California Civil Rights Initiative) have initiated efforts to outlaw programs that may be gender or race specific. It has been predicted, if such efforts prevail, that the number of underrepresented minorities in the state's University of California and California State University systems will become virtually nonexistent.

EOP is a program that would likely be exempt from such efforts in that it is not a race or gender specific program. Rather, the focus is on first-generation college students who do not meet regular admission standards and who also meet federal poverty guidelines. It is logical that should EOP survive efforts to eliminate gender and race specific projects it will bear the brunt of attempting to provide access opportunities to underrepresented minority groups. While EOP is not a gender or race specific program, the bulk of its student population comes from such underrepresented minority groups. For this reason, it is appropriate that EOP and similar programs develop strategies, processes, and mechanisms to provide intervention and to limit their use of standard cognitive variables in their assessment of underrepresented minorities in their admissions process.

This study has yielded limited findings that may be useful to EOP and to similar programs that have the responsibility of appropriately assessing the
potential success of underrepresented ethnic minority groups for admission purposes.

**Discriminant Analysis**

Comparing the high GPA and the low GPA groups, discriminant analysis revealed a significant difference between the two groups with regard to the variable number of units taken. The high GPA group had taken a significantly fewer number of units (14) than did the low GPA group (17). The discriminant coefficient was high enough to name the discriminant function Class Load. However, the proportion of individual cases classified correctly was not high enough for this function to be useful.

Realistic self-appraisal and nontraditional knowledge acquired in a field were the two variables that were significant when using discriminant analysis to compare males and females in the study. Women had a higher score on nontraditional knowledge acquired in a field, and men had a higher score on realistic self-appraisal. This discriminant function was named Cultural Introspection. Even though there were high standardized discriminant coefficients associated, the prediction rate was too low. Consequently, this function was also not useable.

Using discriminant analysis to compare the ethnic groups revealed no significant differences with regard to any of the variables considered. No variable received a Wilks's lambda low enough to be included in the analysis.
Discriminant analysis was not useful in distinguishing among the various ethnic
groups in this study.

Analysis of Variance

Comparing the high GPA and the low GPA groups, analysis of variance
revealed a significant difference with regard to the number of units taken. The
high GPA group had taken a significantly fewer number of units (14) than did
the low GPA group (17). None of the other variables received a high enough F
value to be included in the analysis.

Analysis of variance revealed a significant difference with regard to
males and females in this study. Females scored significantly higher than
males on nontraditional knowledge acquired in a field.

Comparing the ethnic groups, analysis of variance revealed a significant
difference with regard to GPA. None of the other variables received a high
enough F value to be included in the analysis.

Stepwise Multiple Regression

None of the variables under consideration in any of the defined
categories scored high enough to be included in the stepwise multiple
regression formula. No variables were entered into the stepwise process and
none were removed.
Conclusions

The Noncognitive Questionnaire failed to produce any significant results with regard to the examination of the eight variables as directly related to academic performance. None of the variables under consideration were significantly associated with academically successful or unsuccessful student groupings, nor was there a significant linear relationship detected between the eight variables and first semester GPA.

Discriminant analysis and stepwise multiple regression were not useful in helping to predict future student success or in helping to describe the study population utilizing the variables described in the Noncognitive Questionnaire. However, analysis of variance demonstrated significant differences between high and low GPA groups with regard to number of units taken, between males and females with regard to nontraditional knowledge acquired in the field, and among ethnic groups with regard to GPA.

Analysis of variance found none of the means of the eight variables defined in the NCQ to be significantly different when comparing the high GPA group to the low GPA group. ANOVA, however, was useful in describing differences in one important variable, number of units taken. In terms of academic success, analysis of variance demonstrated a significant inverse relationship between the number of credit units taken and academic success as defined by high versus low GPA groupings. It was clear that EOP students in this study who took fewer credit hours performed significantly better
academically than did students who took more credit hours. In fact, White EOP
students took the least number of units and had the highest GPA while Black
EOP students took the most units and had the lowest GPA. The evidence
suggests that some students are loading up on course work and it is affecting
their GPA.

In addition, analysis of variance determined significant differences on
one NCQ variable that identifies differences between men and women and
assists in further describing the study population. Women scored significantly
higher than men on nontraditional knowledge acquired in a field. The definition
of nontraditional knowledge used in the NCQ is knowledge gained from non-
academic endeavors. What constitutes such non-academic endeavors is
subjective but centers largely around cultural activities. It appears that this
could be important academically as involvement in cultural activities requires
focus, concentration, dedication, and a willingness to learn from others,
especially in a collaborative environment. A high score on this variable could
logically translate to better grades, as many of the skills necessary to learn
nontraditional knowledge are also required to learn traditional academic
subject matter.

Stepwise multiple regression was employed to determine if a linear
relationship existed between any of the variables under consideration and first
semester GPA. The results of this test lead one to conclude that none of the
variables under consideration are related to academic success as measured
by first semester GPA. However, the researcher is hesitant to draw such a decisive conclusion. Such a conclusion flies in the face of the intuitive logic that noncognitive factors such as realistic self-appraisal, leadership experience, and availability of a strong support person are important to a successful academic career.

The Noncognitive Questionnaire as an instrument to assess the differences between successful and unsuccessful EOP students was inadequate. Either the instrument failed to include significant variables or it lacks the precision necessary to properly assess these variables with this study population. The only variable that was significant in its ability to discriminate between the successful and unsuccessful groups was the variable number of units taken, and this variable was not a part of the Noncognitive Questionnaire. The goal of using the NCQ to more appropriately demonstrate the potential of EOP students to be academically successful as measured by first semester GPA was not met. The study results do not allow creation of a model for assessment that clearly shows a positive relationship between certain noncognitive variables and academic success.

Recommendations

The Equal Opportunity Program

The Equal Opportunity Program, EOP, was one of several programs that was initiated by the legislature of the State of California to deal with
underrepresentation of lower socioeconomic level students, who are predominantly ethnic minorities (see Appendix A). This program has been very successful in the past, exceeding Humboldt State University's overall retention and graduation rates. In this study of 93 EOP students who had completed the Noncognitive Questionnaire and who were full-time, only eight had a first semester GPA below 2.00. The initial screening of applicants is a rigorous process that includes noncognitive, subjective criteria and judgment calls. The success of the process is evident by the results shown in this study with two years of data that demonstrate 91% of full-time EOP students completing their first semester with at least a 2.00 GPA. The Noncognitive Questionnaire will not be of any assistance to EOP in providing an assessment model that is reasonably accurate in predicting academic success and that does not rely on standard cognitive variables.

First, it is recommended that EOP investigate other possible noncognitive instruments to determine if they are useful. It is also reasonable for EOP to develop its own model, assess its reliability and validity, and norm it on the unique population they serve.

Second, it is recommended that EOP counselors seriously consider not allowing at risk students to enroll for more than 14 units during their first semester at HSU. While the nature of the courses selected was not part of the evaluation in terms of examining the number of units taken, it is also recommended that EOP counselors scrutinize and adjust course selections
such that these students will have a reasonably challenging yet successful first semester.

Third, it is recommended to EOP that they investigate the idea of providing activities to those students (particularly males) who lag behind in terms of acquired nontraditional knowledge. Projects could take innumerable forms as long as they were easy-going, collaborative, and developed skills such as concentration, focus, and follow-through. One such project could be a community garden. Selected students could be more involved at different stages of the development of the garden. Ultimately, these students would harvest the garden, process the food, and/or create meals to be delivered to elders in the community.

Fourth, it is recommended that EOP continue to provide the support services and the personnel that provide that supportive element that may be missing from these first-generation college students' academic lives. It is also recommended that EOP initiate efforts campus-wide to provide an overall institutional supportive environment for the diverse ethnic groups that make up their student population.

Lastly, it is recommended to EOP that they consider using student portfolios and personal interviews in their assessment process. The noncognitive variables that intuitively are related to academic success are not adequately being assessed using conventional and historic instruments. It is
possible that portfolios and personal interviews will access such complex phenomena.

### Further Research

First, future research should employ and evaluate instruments other than the Noncognitive Questionnaire for their reliability and validity. Such instruments should examine more precisely the variables associated with the Noncognitive Questionnaire. In addition, such instruments should also examine other noncognitive variables such as motivation, drive, and determination.

Second, future research should include persistence and graduation as outcome variables. Students who enter the university as first-generation college students are often interested in obtaining an education in order to be helpful in their communities as agents for positive social change. Persistence and graduation of these students are invaluable if they are to assist their communities to become more self-empowering. Research should examine not only individual personal characteristics but also institutional characteristics that assist or act as a hindrance to persistence and graduation.

Third, future research should examine the implications of positive persistence on the variables examined. It is likely that a longitudinal analysis will expose significant shifts in the usefulness of certain variables to programmatic needs. In addition, new variables may arise, as time passes, which become critical to evaluating persistence and graduation.
Fourth, future research should examine other cognitive variables such as English language ability (verbal and written), abstract thinking capabilities, or various aptitudes (appropriately evaluated). Early evaluation and intervention could prove very beneficial should such variables be shown to have predictive validity.

Fifth, future research should examine any such instruments across academic disciplines. They should be stratified by various possible combinations of factors including ethnicity, gender, socioeconomic status, and admission status. Various disciplines differ in approaches such as perceived academic rigor, amount of creative activity, amount of group activity, and amount of field/lab work involved. These factors could have significant influence on the outcomes of any test employed to evaluate both cognitive and noncognitive variables with regard to admission, persistence, and graduation.

Last, future research should focus on internal, external, and extra-collegiate factors by comparing results not only at predominantly White institutions, but also at minority institutions, such as the historically Black colleges and universities and the tribally controlled colleges. It could be very instructive to examine any possible differences in admissions, persistence, graduation, and career placement/development across these two types of institutions in comparison to predominantly White institutions.


Morse, J. R. (1963). *Self-concept-of-ability, significant others and high school achievement of eighth grade students: A comparative investigation of*


APPENDIX A

EOP ENABLING LEGISLATION
AMENDED IN ASSEMBLY JULY 30, 1969
AMENDED IN SENATE JULY 18, 1969
AMENDED IN SENATE MAY 29, 1969
AMENDED IN SENATE MAY 15, 1969

SENATE BILL No. 1072

Introduced by Senator Harmer

April 8, 1969

REFERRED TO COMMITTEE ON EDUCATION

An act to add Chapter 3.4 (commencing with Section 31226) to Division 22 of the Education Code, relating to the State College Educational Opportunity Program.

The people of the State of California do enact as follows:

SECTION 1. Chapter 3.4 (commencing with Section 31226) is added to Division 22 of the Education Code, to read:

CHAPTER 3.4. STATE COLLEGE EDUCATIONAL OPPORTUNITY PROGRAM

31226. There is a state student assistance program which shall be known as the State College Educational Opportunity Program. It shall be the purpose of the program to provide

LEGISLATIVE COUNSEL'S DIGEST

SB 1072, as amended, Harmer (Ed.). College Educational Opportunity Program.

Adds Ch. 3.4 (commencing with Sec. 31226), Div. 22, Ed.C.

Creates State College Educational Opportunity Program providing grants and, where appropriate, educational assistance for students who are economically disadvantaged, but who display potential for success in accredited curricula offered by California State Colleges. Requires Trustees of the California State Colleges to determine eligibility for grants, to be granted and renewed according to standards set by Trustees of California State Colleges. Authorizes Trustees of the California State Colleges to select students from those nominated by each high school in the state, the Veterans' Administration, and state agencies authorized to nominate candidates for participation in such pro-
Ed. Pol.
Agenda Item 1
November 24-25, 1969

SB 1072 — 2 —

1 grants and, where appropriate, educational assistance for under-
2 graduate study at California State Colleges to students
3 who are economically disadvantaged, but who display potential
4 for success in accredited curricula offered by the California
5 State Colleges.
6 For the purposes of this chapter, "trustees" means the
7 Trustees of the California State Colleges.
8 31226.1. State College Educational Opportunity Program
9 grants shall be awarded to graduates of high schools who are
10 residents of this state, to veterans of the armed forces who
11 are residents of this state, and to nominees of state agencies
12 authorized by the trustees to nominate candidates who are
13 residents of this state for participation in programs authorized
14 by this chapter. The trustees shall determine eligibility for
15 grants awarded pursuant to this chapter. Such grants may be
16 granted and renewed according to standards set by the trustees
17 until the student has received a baccalaureate degree or has
18 completed four academic years, whichever occurs first. In spe-
19 cial circumstances, such as illness or military service, or family
20 hardship, the trustees may renew the grant beyond the fourth
21 year of study, provided the student has not received a bacc-
22 laureate degree. When the recipient is an enrollee in a special
23 educational opportunity program approved by the trustees, for
24 the purposes of this chapter, the state college sponsoring the
25 program shall receive from the trustees reimbursement of up
26 to $60 per month per enrollee up to 12 months support.
27 31226.2. Grants shall be provided for students who display
28 potential for success in accredited curricula offered by the
29 California State Colleges, but lack the necessary funds to pay
30 for tuition, books, and room and board, provided such students
31 meet the standards of the state college which they are attend-
32 ing or the requirements for the special admissions program
33 established by the trustees.
34 31226.3. Grants awarded pursuant to this chapter shall be
35 in an amount sufficient to pay the costs of a student, during
36
his course of study, for tuition, books, and room and board
in accordance with his needs as shall be determined by the
trustees. No student shall be awarded a grant in excess of
\[ \text{seven hundred dollars ($700)} \]
per academic year.
31226.4. Each high school in this state shall nominate to
the trustees students it deems deserving of the grants made
available under this chapter. The trustees shall compile a list
of students so nominated from which it may select students
for grants in accordance with standards set by the trustees
pursuant to this chapter. The Veterans Administration and
state agencies authorized to nominate candidates for participa-
tion in programs authorized by this chapter may nominate
other candidates to the trustees whom they deem eligible
for such grants.
31226.5. Records of the academic progress of each student
attending college under a grant shall be kept by the trustees
in order that the program created by this chapter may be
evaluated.
31226.6. Each state college may submit plans for a special
educational opportunity program for approval by the trustees.
Each program qualifying shall be authorized a program di-
rector and may be authorized such special qualified counselors
and advisors and such related operating and equipment sup-
port as is appropriate.
31226.7. This chapter shall be known as the State College
Educational Opportunity Act.
Sec. 2. Any existing state funds appropriated by the Leg-
islature for expenditure for scholarships pursuant to Chapter
3 (commencing with Section 31201) of Division 22 of the Edu-
cation Code shall not be available for state college educa-
tional opportunity grants authorized by this act.
Sec. 3. All funds appropriated pursuant to Item 116.5 of
the Budget Act of 1969 shall be expended pursuant to the
provisions of Chapter 3.4 (commencing with Section 31226)
of Division 22 of the Education Code.
APPENDIX B

EOP SCREENING CRITERIA
Revised Screening Criteria

I. Economic Disadvantage (0-3 points)
   Current low income (meets current SS income guidelines)
   Historical low income (consider parents’ income and occupation)
   Family situation (difficult home situation, size of family, etc.)

II. Subjective (0-3 points) (from letters of recommendation and autobiographical statement)
   Motivation (student seems motivated to attend college)
   Experience/maturity (student’s autobiography and letters of recommendation, work experience, etc.)
   Self-perception (student has realistic appraisal of strengths and weaknesses)
   Perceptions of others

III. Academic Support Needs (0-6 points)
   ACT/SAT below 22 ACT, below 500 SAT V/M (HSU av ACT = 22, SAT = 538V/528M)
   GPA 2.0-3.0 (HSU av entering GPA = 3.19)
   Second-language or non-standard dialect
   College prep courses (missing one or more required subjects)
   Self-assessment (student feels some need for academic support)
   School attended: Poole school (60% or more non-White), inner-city, rural
   Basis of admission
   Class level - FTF

IV. Non-academic Support Needs (0-6 points)
   First generation
   Undeclared or uncertain major
   Bilingual or non-English home
   Cultural isolation
   Rural isolation
   Encouragement toward higher education (student not counseled toward college)

Student qualified for services based on: (italics for categories not frequently used)

01 = hs GPA
02 = SAT verbal
03 = SAT math
04 = ACT
05 = variety of academic factors
      including GPA, test scores, high school prep, etc.
06 = diagnostic tests
07 = college GPA
08 = GED
09 = failing grades
10 = reentry (5 yrs from last attendance)
11 = multiple
12 = other
APPENDIX C
MAP OF CALIFORNIA STATE UNIVERSITY
The California State University
APPENDIX D

NON-COGNITIVE ADMISSIONS

QUESTIONNAIRE II
Non-Cognitive Admissions Questionnaire II*

Please fill in the blank or circle the appropriate answers.

1. Your gender is
   1. Male
   2. Female

2. Your age is ____ years

3. Your father's occupation:
   ____________________________________________

4. Your mother's occupation:
   ____________________________________________

5. Your race is:
   1. Black (African-American)
   2. White (not of Hispanic origin)
   3. Asian (Pacific Islander)
   4. Hispanic (Latin American)
   5. American Indian (Alaskan Native)
   6. Other

6. How much education do you expect to get during your lifetime?
   1. College, but less than bachelor's degree
   2. B.A. or equivalent
   3. 1 or 2 years of graduate or professional study (master's degree)
   4. Doctoral degree such as M.D., Ph.D., etc.

7. Please list three goals that you have for yourself right now:
   1.
   2.
   3.

8. About 50% of university students typically leave before receiving a degree. If this should happen to you, which of the following would be the reason:
   1. Absolutely certain that I will obtain a degree
   2. To accept a good job
   3. To enter military service
   4. It would cost more than my family could afford
   5. Marriage
   6. Disinterest in study
   7. Lack of academic ability
   8. Insufficient reading or study skills
   9. Other

9. Please list three things that you are proud of having done:
   1.
   2.
   3.

Please indicate the extent to which you agree or disagree with each of the following items. Respond to the statements below with your feelings at present or with your expectations of how things will be. Write the number that corresponds to your answer to the left of each item.

<p>| | | | | | |</p>
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</tr>
<tr>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
<td></td>
</tr>
</tbody>
</table>

10. The University should use its influence to improve social conditions in the state.
   _____

11. It should not be very hard to get a B (3.0) average at HSU.
   _____

12. I get easily discouraged when I try to do something and it doesn’t work.
   _____

13. I am sometimes looked up to by others.
   _____

14. If I run into problems concerning school, I have someone who would listen to me and help me.
   _____

15. There is no use doing things for people, you only find that you get in it in the neck in the long run.
   _____

16. In groups where I am comfortable, I am often looked to as a leader.
   _____

17. I expect to have a harder time than most students at HSU.
   _____

18. Once I start something, I finish it.
   _____

19. When I believe strongly in something, I act on it. 
   _____

20. I am as skilled academically as the average applicant to HSU.
   _____

21. I expect I will encounter racism at HSU.
   _____

22. People can pretty easily change me even though I thought my mind was already made up on the subject.
   _____

23. My friends and relatives don’t feel I should go to college.
   _____

24. My family has always wanted me to go to college.
   _____

25. If course tutoring is made available on campus at no cost, I would attend regularly.
   _____

26. I want a chance to prove myself academically.
   _____

27. My high school grades don’t really reflect what I can do.
   _____

28. Please list offices held and/or groups belonged to in high school or in your community.

29. Indicate your class level Fr., Soph, Jr., or Sr. by circling the appropriate abbreviation.
APPENDIX E

PARTICIPANT LETTER
To the student participant
(If you are under 18 do not fill out this survey)

I am conducting a research project that should help us to identify one or more non-academic factors that will be helpful in identifying what sorts of things make students successful. Your assistance in filling out the attached short questionnaire will give us one more tool to help students in their academic pursuits. Your Fall term GPA will be collected in order to correlate non-academic factors identified in the survey and academic success as defined by GPA. Your participation in this project is entirely voluntary. This should take approximately 10-15 minutes. The results of this survey will be reported by statistical sets and no individuals will be identified.

Thank you,

Russell Boham, Director
Indian Natural Resource, Science, & Engineering Program (INRSEP)
APPENDIX F

PARTICIPANT INSTRUCTION FORM
Student Participant

Please slip the completed questionnaire in the envelope, seal the envelope, and write your Social Security Number on this sheet. Once your Fall term GPA has been collected and recorded on the envelope this sheet will be discarded and no one will be able to positively identify your GPA or the results of this survey with you. Thank you.

Participant S.S.#  ____________ - ____________
APPENDIX G

SCORING KEY FOR NCQ
QUESTIONNAIRE

ITEMS VARIABLE NAME (NUMBER)

6 Use to score for Self-Concept (I)
Option 1 = 1; 2 = 2; 3 = 3; 4 = 4; No response = 2

A. Options for Long Range Goals (IV)
Each goal is coded according to this scheme:

1 = a vague and/or immediate, short-term goal (e.g., "to meet people," "to get a good schedule," "to gain self confidence")

2 = a specific goal with a stated future orientation which could be accomplished during undergraduate study (e.g., "to join a sorority so I can meet more people," "to get a good schedule so I can get good grades in the fall," "to run for a student government office")

3 = a specific goal with a stated future orientation which would occur after undergraduate study (e.g., "to get a good schedule so I can get the classes I need for graduate school," "to become president of a Fortune 500 Company")

7 B. Options for Knowledge Acquired in a Field (VIII)
Each goal is coded according to this scheme:

1 = not at all academically or school related; vague or unclear (e.g., "to get married," "to do better," "to become a better person")

2 = school related, but not necessarily or primarily educationally oriented (e.g., "to join a fraternity," "to become student body president")

3 = directly related to education (e.g., "to get a 3.5 GPA," "to get to know my teachers")

Find the mean for each dimension (e.g., Long Range Goals) and round to the nearest whole number.
QUESTIONNAIRE
ITEMS VARIABLE NAME (NUMBER)

8 Use to score for Self-Concept (I) and Self-Appraisal (II)
Option 1 = 4; 2 through 9 = 2; No response = 2

9 Use to score for Self-Concept (I)
Each accomplishment is coded according to this scheme:

1 = at least 75% of applicants to your school could have
accomplished it (e.g., "graduated from high school," "held a
part-time summer job")

2 = at least 50% of applicants to your school could have
accomplished it (e.g., played on an intramural sports team,
"was a member of a school club")

3 = only top 25% of applicants to your school could have
accomplished it (e.g., "won an academic award," "was captain
of football team")

Find the mean code for this dimension and round to the nearest
whole number.

For items 11 through 28, positive (+) items are scored as is. Negative (-) items are
reversed, so that 1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1. A shortcut is to subtract all
negative item responses from 6.

QUESTIONNAIRE
ITEMS DIRECTION VARIABLE NAME (NUMBER)

10 - Use to score for Racism (III)

11 - Use to score for Realistic Self-Appraisal (II)

12 + Use to score for Long-Range Goals (IV)

13 - Use to score for Leadership (VI)

14 - Use to score for Availability of Strong Support (V)

15 + Use to score for Community Service (VII)

16 - Use to score for Leadership (VI)

17 + Use to score for Racism (III)

18 - Use to score for Long-Range Goals (IV)

19 - Use to score for Positive Self-Concept (I)
20 - Use to score for Realistic Self-Appraisal (II)
21 - Use to score for Racism (III)
22 - Use to score for Positive Self-Concept (I)
23 - Use to score for Availability of Strong Support (V)
24 - Use to score for Availability of Strong Support (V)
25 - Use to score for Racism (III)
26 - Use to score for Racism (III)
27 - Use to score for Positive Self-Concept (I)
28

Use to score for Leadership (VI), Community Service (VII), and Knowledge Acquired in a Field (VIII). Each organization is given a code for A, B, and C below. Find the mean for each dimension (e.g., Leadership) and round to the nearest whole number.

A. Leadership (VI)

1 = ambiguous group or no clear reference to activity performed (e.g., "helped in school")
2 = indicates membership but no formal or implied leadership role; it has to be clear that it's a functioning group and, unless the criteria are met for a score of "3" as described below, all groups should be coded as "2" even if you, as the rater, are not familiar with the group (e.g., "Fashionettes," "was part of a group that worked on community service projects through my church")
3 = leadership was required to fulfill role in group (e.g., officer or implied initiator, organizer, or founder) or entrance into the group was dependent upon prior leadership (e.g., "organized a tutoring group for underprivileged children in my community," "student council")

B. Community Service Relatedness (VII)

1 = no community service performed by group, or vague or unclear in relation to community service (e.g., "basketball team")
2 = some community service involved but it is not the primary purpose of the group (e.g., "Scouts")
3 = group's main purpose is community service (e.g., "Big Brothers/Big Sisters")

C. Knowledge Acquired in a Field (VIII) (same coding criteria as used for item 8B.)
APPENDIX H

SCORING WORKSHEET FOR NCQ
1. POSITIVE SELF-CONCEPT OR CONFIDENCE
   item 6* + item 8* + item 9* + (6-item 19) + item 22 + (6-item 27)
   \[ \text{Total Rounded Score} \]

2. REALISTIC SELF-APPRAISAL
   item 8* + (6-item 11) + (6-item 20)
   \[ \text{Total Rounded Score} \]

3. UNDERSTANDS AND DEALS WITH RACISM
   (6-item 10) + item 17 + (6-item 21) + (6-item 25) + (6-item 26)
   \[ \text{Total Rounded Score} \]

4. PREFERENCES LONG-RANGE GOALS TO SHORT-TERM OR IMMEDIATE NEEDS
   item 7A* + item 12 + (6-item 18)
   \[ \text{Total Rounded Score} \]

5. AVAILABILITY OF STRONG SUPPORT PERSON
   (6-item 14) + item 23 + (6-item 24)
   \[ \text{Total Rounded Score} \]

6. SUCCESSFUL LEADERSHIP EXPERIENCE
   (6-item 13) + (6-item 16) + item 28A
   \[ \text{Total Rounded Score} \]

7. DEMONSTRATED COMMUNITY SERVICE
   item 15 + item 28B
   \[ \text{Total Rounded Score} \]

8. KNOWLEDGE ACQUIRED IN A FIELD
   item 7B + item 28C
   \[ \text{Total Rounded Score} \]

*Recoded item. See scoring instructions for these items on pages 1-3 herein.

Revised 12/90