

THE DEVELOPMENT OF AN EDUCATION VALUES SCALE
FOR THE PREDICTION OF COLLEGE DROP-OUTS
USING ROTTER'S SOCIAL LEARNING THEORY
AS A THEORETICAL CONSTRUCT

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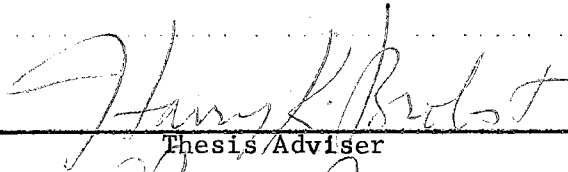
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CHAPTER I

INTRODUCTION

Need for the Study

The national importance of drop-out studies is attested to by the appearance of numerous popular magazine articles, allocation of federal grants, and various investigations by several congressional committees. The importance of this problem to the college administration is affirmed by P. H. Davis (1962), as he warns trustees that each early leaver represents a financial loss of over \$1,000 to the institution. The need for seeking a more satisfactory resolution of the drop-out problem on the Oklahoma State University campus is supported in the findings of a descriptive study of the entire 1962 freshmen enrollment, which indicated 38% of this group were lost. (Gaskey, 1964). Sex and college in which they were enrolled made no significant difference. The importance of drop-out rate becomes more meaningful when viewed in absolute numbers and see that 980 out of 2,542 freshmen did not return for their sophomore year. According to Davis, this implies a financial loss of \$980,000 to the institution. We might rationalize ignoring the problem by chalking off these 980 students as academically unfit, but the findings will not permit this. The study shows that only 65% of these people were below academic retention standards, and that 5% of them left with above a 3.0 average. The national picture is even more alarming as we see a 60.5% drop-out rate reported in a nationwide four year study by

R. E. Iffert (1958).

Statement of the Problem

Obviously arm chair philosophizing and descriptive studies of the drop-out after he has been lost can do little, if anything, to prevent the loss. Stricter screening on the basis of standardized test scores or high school grade point averages is not a completely adequate solution, because the drop-out rate for private institutions, many of which practice such techniques, is 52% on the national average. Further studies of the 1962 freshmen class on the Oklahoma State University campus show the highest correlation between grade point average and either composite ACT scores or high school grade point to be about .56. Studies made at other universities indicate that any such cutting scores would eliminate significant numbers of potentially successful students (Halladay and Andres, 1958; Koelsche, 1956; Little, 1959; Slater, 1957).

If the drop-out rate is to be reduced, efficient means of identifying the potential drop-out immediately upon his enrollment need to be developed. If this can be done, then it may be possible to develop a more effective counseling program for these individuals that should help them avoid termination or interruption of their academic careers.

Predictive studies using general intelligence tests and achievement batteries have yielded minimal correlations even with first semester G.P.A. The drop-out students seem to be at least once removed from this problem. Attempts at identifying the potential drop-out have also been made with such instruments as the Minnesota Counseling Inventory (Egermeier, 1963; Brown, 1960) and the MMPI (Grace, 1957). These approaches have not produced significant results.

The problem, then, is to develop an instrument that can be coupled with the incoming freshmen entrance exams, high school records, and other pertinent information that will enhance prediction sufficiently to justify singling out individuals for special counseling.

The Approach Made in this Study

The low correlation of drop-outs with academic achievement tests and past performance scores strongly implies drop-out behavior may be associated with some kind of affective component. Intuitively, one would say he lacks certain types of motivation, and this has been supported by Sarnoff and Raphael (1955) when they found "shallowness of motivation" to be one of the major characteristics of the drop-outs. Shallowness is not clearly defined in this article. Harrison (1956) in a study of students suspended for emotional problems found the psychotics and neurotics more able to return and successfully complete a degree program than those with character disorders. This supports a hypothesis that most of the personality instruments used for drop-out prediction may have failed because they are clinically oriented. That is, they were developed to measure psychotic and neurotic behavior, which does not appear to have a direct relationship to attrition or persistence in college performance.

Much of the literature on motivation points to such things as value attitudes, expectancies, incentives, reinforcement values, minimal goal levels, etc., as important factors contributing to motivational level. Social Psychology is accumulating evidence for the importance of social and family groups in molding the value attitudes of an individual. Several drop-out studies have hinted at the significance of this

dimension. On this campus a smaller percentage of the drop-outs were from professional and semi-professional families (Caskey, 1964). This would seem to be more a reflection of values that are different between these socio-economic classes than of financial need since in this study the same percentage of students with some type of loan was found in the drop-out group as in the group remaining for their sophomore year.

Koelsche (1956) found the probability of drop-out increased with curricular objectives in this order: (1) College for vocational preparation, (2) College for intellectual achievement, (3) College as a desirable place to go but with indifference to chosen curriculum, (4) College as a place to go based on the choice being made by someone else. Vorreyer (1963) seemed to have more predictive success with the Bell Adjustment Inventory than do most other studies using elaborate analysis of clinical type instruments. The Bell deals with average adolescent adjustment problems and thus points to the family and social value attitudes as important influences on the drop-out. One facet of the approach made in this study is an attempt to get at the educational values of the drop-out, as opposed to those of the returnees.

A second facet of this study deals with the concept of conflict in these values. The items selected for the Educational Values Scale are presented in paired comparison format. Safran (1951) has developed a system to extract an inconsistency score from this type of test. Caskey (1960) has demonstrated that such an inconsistency score correlates with such things as the readiness of a faculty for an effective counseling program, intelligence, etc. It is hypothesized that such an inconsistency score will reflect the amount of conflict involved in the educational values of the student, and will yield a further predictive

measure of the likelihood of becoming a drop-out.

Rotter's theory states that the Behavior Potential is a function of the Expectancy of the individual and the Reinforcement Value of that person.

The Expectancy in Rotter's system refers to the subjective probability that an individual has of obtaining positive reinforcement by using behaviors that are functionally related to a specific class of reinforcements. This Expectancy is a combination of generalized and specific expectancies. The generalized expectancies are those that have been built up over a period of time in the learning process. The specific expectancies are those that are related more directly to the immediate environmental situation.

The Reinforcement Values are those positive reinforcements which the individual has learned can be obtained by certain functionally related behaviors.

Rotter further states that these Expectancies and Reinforcement Values must be appropriate to the culture in which the individual is situated and in order to be used in a testable formulation should be empirically validated.

The Behavior Potential with which this study is concerned is persistence in college. The Expectancies, which are the subjective probabilities the individual has for achieving a given behavior, are derived from the composite ACT score. This can be justified on the basis that this score is representative of past performance of the student and therefore leads the student to a generalized expectancy of future performance (ACT, 1964-65). In addition, this score should contribute to a specific expectancy because of the use of the ACT Test in the freshman

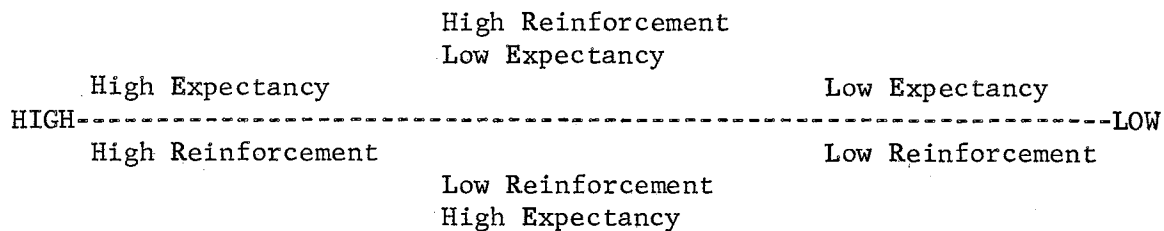
orientation clinic. The entering freshmen are given a test interpretation which explains the ACT score in terms of what they may expect of themselves in academic achievement in the university setting.

The Reinforcement Values have been derived from an empirical scale of reasons for going to college found by Iffert (1958). He has compiled a list of 25 reasons students give for going to college from a large stratified national sample. These have been ranked and scaled according to desirability of the students. Four items from the top nine of this list and four from the lower seven have been selected. These items were of equal ranking by both men and women. These eight items are the ones used in the aforementioned paired comparison test.

According to Rotter's formulation, a high persistence in college should be manifest in the person showing both High Expectancy and High Reinforcement Value. The least persistence would be shown by the person with Low Expectancy and Low Reinforcement Value.

His theory would also predict departure or persistence behavior between the above extremes on the basis of High Expectancy and Low Reinforcement Value, or Low Expectancy and High Reinforcement Value. The first of these categories might describe the high ability student who drops out of college. The latter might be an explanatory construct for the low ability student who successfully completes a college career. If we place these classifications on a continuum of High Persistence to Low Persistence, the following schema would result:

Persistence



Another hypothesis of Rotter's formulation would predict that conflict among Reinforcement Values will produce departure behavior. It is hypothesized in this study that the internal inconsistency score of the Education Values Scale will reflect this conflict of values, and therefore enhance the predictive value of the formulation by some systematic variation to the Reinforcement Value score.

Since Rotter does not specify the nature of this functional relationship, this study is an attempt to establish this mathematical relationship. It may be likely that different relationships will hold true for different behavioral situations; consequently, any equations and weighted coefficients derived from this study cannot be indiscriminantly generalized to other situations.

Scope of the Study

The Educational Values Scale was administered to incoming freshmen during the orientation clinics in the summer of 1964. These students were followed through to the beginning of their sophomore year, which is the fall semester of 1965. The data is analyzed on the basis of a drop-out and returnee dichotomy. A multivariate discriminant analysis is used for each of the following groups: (1) Those who leave at mid-semester, or who complete one semester, (2) Those who complete two

semesters, (3) Those who return for the sophomore year. Each of the above categories is examined for sex differences. Suspension, probation and satisfactory grade-point groups are also examined.

Those students classified as drop-outs were sent a questionnaire through the mail in an effort to determine their behavior pattern or potential subsequent to their leaving Oklahoma State University.

The entire sample was randomly divided in half. The statistical analysis made on one of these groups and any significant discriminations are cross validated on the second half.

The hypotheses tested are:

1. The mean values in all the groups will be the same for the 10 variables used in the discriminant function.
2. There will be no difference among the means of the Reinforcement Values (Educational Values) for the groups.
3. There will be no difference among the means of the Expectancy Values (ACT Composite) for the groups.
4. The discriminant functions developed will not predict departure behavior better than chance.
5. The discriminant functions will not predict departure behavior better than random selection in proportion to pre-established base rates.
6. The discriminant functions will not predict departure behavior better than Reinforcement Values alone.
7. The discriminant functions will not predict departure behavior better than Expectancy Values alone.

Limitations of the Study

It is impossible to clearly define the difference between a drop-out and a pseudo-drop-out. Most of the studies reported in the literature have been based on records of the college of initial enrollment only. Studies which have attempted extensive follow-up of students leaving the college of initial enrollment have concluded most reasons stated for leaving were given as socially acceptable and could not necessarily be considered as valid. No insight was gained concerning valid causes for the interrupted educational process of those students who did eventually complete a degree program at another school but over a prolonged period of time. It is also recognized that high school grade point average, marriage, and socio-economic class may also be variables closely related to the drop-out pattern.

Since the students on this campus come from varying sizes of high schools with a variety of curricula, it is felt the high school grade point average would not be as valid a comparison among students as the standard ACT composite score would be.

In the case of marriage, which some studies feel is the only valid reason given by drop-outs in follow-up interviews and questionnaires, one can question the cause of the early marriage. Is it the result of immature impulsivity, a psychological escape from parental authority, or was the marriage entered into with deliberate and mature judgment? In the descriptive study of the 1962-63 freshman class, only 3% of the total drop-out group were married. The same percentage of married students was found in the group that remained for their sophomore year (Caskey, 1964). With such a small and equal ratio for both groups, it is unlikely that marriage would prove to be a significant variable.

One might suspect financial inability to be a causative factor in the higher percentage of drop-outs among children of non-professional parents, but this drop-out rate can also be explained on the basis of the value systems of the professional classes. We know that many students from families with extremely low incomes are able to finance their education through part-time work and the many liberal loan funds available to them. We cannot probe into the private income statements of families who do not apply for loans to make an accurate determination of their financial ability. It is known that about 85% of the student population at Oklahoma State University is drawn from families in the upper lower to the upper middle classes with heavy emphasis on the middle ranges (ACT, 1963). If student loans are a reasonable index of financial need, there appears to be no difference in that need between the drop-out group and the returnee group (Caskey, 1964). It is felt the socio-economic variable would make little contribution to the nature of this study that would not be picked up in the Educational Values Scale being used.

Because of these many factors which seem to be incapable of accurate investigation, the variables discussed above are included in this study. The purpose of the predictor scale to be developed is to identify the potential early leaver regardless of causality. It will not presume to label good or bad, avoidable or unavoidable, the reason for leaving. It is only hoped that these people can be identified early enough for personal interviews in which the legitimacy of their reason can be examined objectively and constructive counseling given which would include future plans other than college, if this alternative seems more appropriate.

Summary

The review of the literature and the interaction of Rotter's theory with Safran's inconsistency technique supports three major factors central to the plan of this study.

1. Personality factors relating to values and attitudes contribute significantly to the total behavior pattern of the college drop-out.

2. Prediction of behavior in life situations can be made more meaningful and more efficient if the instruments to be used are developed within the constructs of a behavior theory.

3. Many psychological tests are built on the concept of unidimensional sets of stimuli whereas life situations most often require judgments and decisions at multidimensional levels. Perhaps the very thing for which measurement ought to be attempted is the consistency with which an individual can cope with the multidimensional life situations that confront him.

This investigator feels these factors merit the time and effort involved in the somewhat unique approach made by this study into relatively unexplored areas of theory and the use of certain statistical techniques.

CHAPTER II

REVIEW OF THE LITERATURE RELATED TO COLLEGE DROP-OUT STUDIES

The literature can be conveniently classified into three main categories: (1) Philosophical and Theoretical, (2) Descriptive, and (3) Predictive. The scope of each of these areas is pointed out, and an analysis of results is made in order to summarize their significance and implications.

Philosophical and Theoretical Approaches

In this area are found articles written primarily from the viewpoint of somewhat narrow confines and some with suggested plans of attack that appear to be worthy of consideration.

The inadequacy of such suggestions as merely raising the entrance requirements (Shuman, 1956) or requiring two years of a foreign language in high school (Skelton, 1959) will become clear as one reviews the results of some of the later descriptive studies. On the other hand, some have pointed out techniques that seem to hit more nearly at the crux of the problem. Davis (1962) warns trustees that each early leaver represents a financial loss of over \$1,000 to the institution. He suggests a list of variables that college administrators should consider as being related to retention. These variables include the philosophy of the faculty and administration, the physical facilities of the campus, the

counseling services, and the follow-up study of drop-outs.

Coplein (1962), although primarily interested in secondary education, presents some suggestions for more adequate study of the problem. He points out the need for some kind of national clearing house to follow the student from one school to another, or to a job. He feels that summer losses differ from retardation effects such as probation students, voluntary drop-outs, and academic and disciplinary suspensions, and should be studied separately. These summer drop-outs are more likely to continue their education in a different school.

Chambers (1961) proposes the two-year community college as a proving ground with the universities being reserved for the more serious research minded and those wishing professional training. A number of authors recommend the general college or basic division concept in the four-year institution as a step toward retaining students.

A classification by which to analyze the causes of drop-outs is presented by Angers (1961). His three major classifications are: (1) Vocational Disorganization, (2) Uncontrollable Reasons, and (3) Discouragement. Those in the first group came to college primarily as a result of external pressures such as parents, classmates, or status seeking and consequently lack internal motivation. Those in the second group leave because of financial troubles, family problems, and illness. The "discouraged" are those who did not seem to adjust to the competition and/or the standard of excellence expected of them in college.

Baker and McClintock (1962) have demonstrated the feasibility of developing better measurement techniques for studying the problem by borrowing an early-failure exponential curve from industry and predicting the number of early college failures successfully.

One can no longer afford to dismiss the drop-out as merely lacking intelligence, but must recognize his problem as one of great complexity. It should be recognized that adequate solutions to the drop-out problem require tedious and long-term research, as well as the development of new and more efficient research techniques.

Descriptive Studies

The data presented in these studies attempts to describe the drop-out in terms of what he brings to college, how he lives while on the campus, and his reasons for leaving college as he perceived the situation at the time of his departure. The study reported by Iffert (1958) has become a national yardstick for any subsequent research attempts. Under the auspices of the U. S. Office of Education, a carefully stratified sample was selected on the basis of geographic region, size of the institution, type of institution according to control and organization, and sex of the students. The study was begun with a sample of approximately 13,700 and carefully followed up over a four-year period. Comparisons were made with a great variety of environmental variables, such as socio-economic status, source and amount of financial aid, parents' background, and place of residence while in college. Comparisons were also made with standing in high school class and high school cumulative grade-point average. Questionnaires concerning their reason for attending college and for leaving college were analyzed and scores for each of the reasons computed and reported.

Iffert (1958) reports a drop-out rate of 60.5 per cent over the four-year period as the national average. This rate varies greatly according to the type of institution. Public institutions show an

average rate of 67 per cent, while private institutions show only 52 per cent. There is a range from 58 per cent for the men from technological institutions to 71.2 per cent for the men from teachers colleges. These figures have been computed with respect to institution of first registration.

Jex and Merrill (1962) predict that by 1975 the drop-out is likely to be primarily the incompetent student. Their basis for such a conclusion is a 10-year study in which they were able to follow-up many so-called drop-outs. They found that many of them were interrupted in their progress toward a degree, but eventually achieved completion of a degree program. They believe that at least 60 per cent of the drop-out group will ultimately graduate.

The data from all sources indicate the most crucial drop-out period to be the freshman year, the chances for survival increasing to 65 per cent or better by the junior year.

Although there is a negative correlation between dropping out and both high school rank and standardized test scores, many investigators find such rankings inadequate in describing the total drop-out population.

Iffert (1958) states that only 75 per cent of those from the upper half of their high school class who enter college will graduate.

Halladay and Andrew (1958) indicate that 8 per cent to 15 per cent of the drop-outs from Arkansas colleges were above average on achievement and ability scores, and from 5 per cent to 8 per cent were described as very capable. They further state that 36 per cent were progressing satisfactorily at the time they dropped out. Koelsche (1956) documents figures to show that in a random sample of 180 drop-outs who responded

to questionnaires over a four-year period, 25 per cent were in the upper one-fifth of their high school class and 50 per cent in the middle one-fifth. The median for the entire group on the American Council on Education, ACE, test was in the middle one-fifth.

Little (1959), in a study at the University of Wisconsin, states that if admissions were restricted to the top 30 per cent on high school mental test scores, 21 per cent of the University graduates would have been denied admission. The same percentage would have been denied admission had the 30th percentile on a mental test given to entering freshmen been used for an admission requirement. He also states that if standing in the upper 40 per cent of the high school class had been an admission requirement, 503 of a class of 1949 students would have been denied admission, 87 of whom graduated in a normal four-year period. In this study, 52 per cent of the students lost were in the top 30 per cent of mental ability.

Slater (1957) shows persistence unrelated to ACE scores in the drop-out group. But at Oklahoma State University (Caskey, 1964) a significant difference at the .01 level was found between freshman drop-out and returnee ACT scores. Generally drop-outs were found to have lower high school and college grade-point averages, as well as lower reading ability.

Little (1959) found the father's profession and size of high school to be insignificantly related to dropping out. However, Hitchcock (1955) indicates a larger percentage of those who did not arrive on campus after pre-enrolling at the University of Nebraska were from skilled-labor parents rather than from professional and managerial. This relationship has also been corroborated by a recent study at Oklahoma State

University, which shows that a smaller percentage of drop-outs' parents were in the professional group (Caskey, 1964).

Slocum (1956), by means of questionnaires to both drop-out and persistors, found that their perceived intentions and the problems they felt to be serious were essentially the same. By interview techniques, Gekoski and Schwartz (1961) found twice as many drop-outs as those remaining felt their course work to be poor preparation for life and rated faculty members much lower. One-half as many drop-outs as returnees knew the name of their advisor, or sought counseling help prior to dropping out, and two-thirds as many drop-outs held favorable attitudes toward extracurricular activities as did returnees.

Koelsche (1956), by questionnaire sent to drop-outs over a four-year period, found them to have a definite tendency to avoid repeating a course when failed. Slater (1957) claims the decision to drop out is a function of the student's curricular objectives and his perception of the curriculum in terms of fulfilling these objectives. The probability of dropping out increased with changes in objectives for going to college in the following order: (1) College for vocational preparation; (2) College for intellectual achievement; (3) College as a desirable place to go, but indifference to chosen curriculum; and (4) College as a place to go based on a decision made by someone other than student.

Sarnoff and Raphael (1955) studied drop-outs by multiple interviews and found three major characteristics emerging: (1) shallowness of motivation; (2) lack of adequate work habits in relation to college demands; and (3) immaturity in operational attitude and outlook. Munger (1956) followed three groups through eight semesters of college residence. The groups were classified on the basis of upper, lower, and

middle third of their high school class. He found persistence unrelated to scores on an ability test, but did find that students who did not receive grades near their expectation were more apt to drop out.

Harrison (1956) studied 179 students who left or were suspended because of emotional problems and returned for another try. He found those clinically diagnosed as having character disorders less likely to succeed than those diagnosed as psychotic or neurotic. E. S. Jones (1955) characterizes the probation student as less flexible and capable of less variety than the superior student, but claims his chances of survival are tripled by adequate counseling.

Fullmer (1956) in a longitudinal study demonstrates the chances for survival are greater for those who change majors two or more times.

Grace (1957) used the Minnesota Multiphasic Personality Inventory to find the drop-out less responsible, more dependent, and more anxious. Brown (1960) found the total profile of the drop-out elevated on the Minnesota Counseling Inventory with the men tending to be irresponsible and nonconforming and the women more depressed social isolates. It is interesting to note that none of the subjects in this study left school for scholastic reasons. Johnson (1954) found a trend toward significant difference between drop-out and persistor on the social adjustment scale of the California Test of Personality.

Heilburn (1962) used the ACL Needs Scale which he developed from the Gough Adjective Check List, and found the drop-out to have a lower need for achievement, along with a higher need for change. J. B. Jones (1962) studied drop-outs using the Minnesota Multiphasic Personality Inventory, Guilford's Inventory of Factors STDCR, Guilford-Martin Personnel Inventory, Kuder Preference Record (Vocational form G), Group Membership

Record, American Council on Education Personality Report, and the "Who Are You" technique. He concluded that the drop-out: (1) tends to be less self-analytic or meditative; (2) tends to be more careless, less self-critical, and has ability to comprehend the items or material presented to him; (3) tends to have interests more characteristic of the opposite sex (for women only) and; (4) is unlikely to be chosen by a classmate as a suitable partner for work on school projects.

The drop-out might be characterized as more rigid and fearful of change, less willing to accept the responsibility of adult independence, lacking in internalized goals and values, and somewhat of a social misfit. He also tends to be the type of person who feels easily, and perhaps hopelessly, defeated when faced with the prospect of possible failure or disappointment. In addition, he tends to rationalize his failings in an unrealistic manner.

The validity of a reason for dropping out of college might be questionable because of the means by which it must be attained. It is likely that the student being interviewed prior to leaving school is more anxious to terminate the relationship than be concerned with much honest self-evaluation. The same might be true of the student approached by follow-up questionnaires through the mail. The possibility of the use of socially acceptable reasons rather than true feelings is attested to by Slocum (1956). Holmes (1959) concludes that marriage is probably the only clear-cut reason obtained from such studies. Yoshino (1958) states financial reasons were viewed only as an influential rather than a determining reason by most students.

Although none of the studies show perfect agreement in ranking the importance of reasons found for withdrawal, the more outstanding reasons

reported in these studies seem to be lack of finances, academic difficulty, dissatisfaction with curriculum and college, marriage, military service, and illness (personal or within immediate family).

Predictive Studies

Earlier efforts at prediction, using correlations of test scores and high school grades with college grade-point averages, are seriously limited for at least two reasons: (1) Such correlations are seldom found to rise above .50 to .60 level, and (2) These early studies do not account for the significant number of students who drop out of school with satisfactory ability and grade-point averages. Such ability predictors might be useful for counseling purposes in specialized areas such as engineering. A noteworthy attempt in this area was reported by Malloy, Wysocki, Boleslaw and Graham (1955). A biserial correlation of .465 based strictly on the attrition-survival dichotomy was achieved by using a discriminant analysis with the Minnesota Form Board and ACE-"Q" score. Two-way tables were constructed from the data to show chances of survival for the student at various score levels. It is unlikely that even this reported success using ability-testing could be generalized to an entire college population.

The Minnesota Counseling Inventory scales have been used as a drop-out predictor (Egermeier, 1963; Brown, 1960), but with relatively little success. Brown found the M. R. and Le scales significant predictors but states the results are far from clear cut. Egermeier extracted an experimental scale from this same instrument by item analysis of the responses of drop-outs compared to returnees. His validation group yielded a point biserial correlation of only .274. He concluded that

the practical value of the experimental scale for predictive purposes is quite limited. He found the correlation as high between the experimental scale scores and the composite ACT scores as with the drop-out returnee dichotomy. This might suggest that the subject's ability to perceive the "correct" response on the items could have as much influence on the score as his personality characteristics.

Grace (1957) approached significance with the Minnesota Multiphasic Personality Inventory by using a quadrant analysis of the Dependent-Independent scales, and their interaction with the Responsible-Irresponsible scales. He found that the number of drop-outs increased as anxiety increased, in the following order: (1) Independent-Responsible, (2) Independent or Responsible, (3) Independent-Irresponsible, Dependent-Responsible, (4) Dependent or Irresponsible, and (5) Dependent-Irresponsible. No effort at validation of a predictor scale has yet been reported for this approach.

Another promising prediction seems to stem from the use of a battery of tests and more complex analysis of the results. Vorreyer (1963) derived a discriminate analysis equation from the Ohio State University Psychological Test, cumulative grade-point average, and the Home-Health-Social-Emotional scores of the Bell Adjustment Inventory. From this, he claims 80 per cent accurate prediction for women, 83 per cent for men.

By setting an index score on his six ACL Needs Scales, and combining with relative ability, Heilburn (1962) has defined four distinct groups as follows: (1) Negative Index-Low Ability, (2) Positive Index-Low Ability, (3) Negative Index-High Ability, (4) Positive Index-High Ability. He then related these categories to drop-out status. The suggestion is made that the first two groups could profit from counseling

in goal selection, and the latter two groups could profit from counseling for relating their personal adjustment to college life.

Ikenberry (1961) factor analyzed the drop-outs' results on the Michigan State University Reading Test, the CEQT, Test of Critical Thinking, Inventory of Beliefs, Differential Values Inventory, Rokeach's Dogmatism Scale, and a social status index. From this emerged an Intellectual function that was most dominant; a Socio-Cultural-Sex function that more often influenced the men; and a Social Background function free of ability and sex correlates. This was reported as an effort at a more precise description of the drop-out, but it would seem to merit further development with a view of prediction.

Summary

Ability and achievement ratings seem to be useful primarily for spotting only those students on the low end of the scale who will clearly drop out due to academic failure alone. If properly used, these ratings should also contribute to the overall predictive accuracy of test batteries.

One might hypothesize that the cause of weakness in existing personality inventories as predictors is their clinical orientation. The greater success of prediction found in inventories such as the Bell Adjustment (Vorreyer, 1963) seems to support this criticism of suggested weakness since the items deal with more socially normal problems of youth rather than more deviant personality traits. The experimental items extracted by Egermeier (1963) seem to be in harmony with this logic as well. The findings of Harrison (1956) concerning the greater success of the psycho-neurotic personality might imply that the typical

potential drop-out would not likely show a significantly different pattern on such tests.

A continued exploration of the value systems and attitudes toward education and its concomitants would seem to be a fruitful field of endeavor. The studies of Ikenberry (1961) and Holmes (1958) certainly open many avenues of thought in this direction. The hope for one or two neatly packaged single predictors is quite unlikely, and the need for greater precision and more research on the multidimensional level has become obvious.

Since the drop-out seems to be quite similar to the returnee in many ways such as background, intentions, and abilities; there may be some underlying structures of personality and patterns of thought for which adequate tests have yet to be developed. We may find these less abnormal than was once supposed, and perhaps not too deviant in the sense of neurotic patterns.

The conflicting results on some of the descriptive studies indicate variation among colleges, as well as the likelihood of change from year to year within one campus. These diverse results should point up the need for the student personnel staffs to maintain their records on every student as up-to-date and as detailed as possible. Evaluation should be kept current and research should be carried out on a longitudinal basis.

CHAPTER III

RATIONALE AND METHODOLOGY

Rotter's Social Learning Theory

One of the primary goals of testing is accurate prediction and is especially true for the counselor and the educator. If one can know with reasonable certainty what behavior to expect from the counselee, then he can begin to make logical plans to reinforce or extinguish that behavior.

In spite of this primary goal, the field of testing has apparently made little progress in this direction. Some worthwhile predictive efficiency has been obtained in the realm of intelligence and specific abilities but in most cases of behaviors stemming from emotional or personality patterns of individuals, prediction has been little better than chance. Jane Loevinger (1959, p. 305) in discussing the theory and techniques of assessment states: "To date the only tests which meet standards for individual prediction are those of general ability."

Rotter (1960, p. 112) proposes three aspects to the discrepancies mentioned above:

1. There is no logical relation between the constructs of the theory, or behavior to be predicted, and the constructs which the test was developed to measure.
2. The test procedure does not take into account the effect of social stimuli on behavior.
3. There is an absence of logic in the assumed relationship between what the subject does, or test behavior, and what

is inferred from such behavior.

He concludes his paper by saying:

Implicit in this entire paper is the belief that a satisfactory theory of goal directed behavior is a primary prerequisite for developing adequate tests. Knowledge of statistics and test construction procedures can be valuable, but they cannot supplant an adequate theory of behavior which is applied to the test taking behavior itself (Rotter, 1960, p. 122).

Butler (1954, p. 77) confirms this view with the following:

. . . the writer knows of no personality inventory for which the content, the form of items, and the psychometric methods applied have been dictated by a formal psychological model.

Rotter's Social Learning Theory seems to be most adaptable to such a scheme because it provides a psychological model around which a test can be built. It is flexible enough that specific behaviors and test items can be subsumed in it. It is sufficiently comprehensive to account for the variables thought to be important in this study. He states the essence of his theory succinctly in a paper presented to the Nebraska Symposium on Motivation in 1955.

This Social Learning Theory may be described as a molar behavior theory employing an empirical law of effect. It uses both an expectancy construct and a reinforcement construct but does not utilize any concept of drive reduction. The basic formula for behavior employs three constructs. The first of these is Behavior Potential, which is the potentiality of any behavior occurring in any given situation or situations as calculated in relation to any single reinforcement or set of reinforcements. Expectancy, the second, is defined as the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations. Expectancy is independent of the value or importance of the reinforcement. Reinforcement Value, the third basic construct, is defined as the degree of preference for any reinforcement to occur if the possibilities of occurrence of this and other reinforcements are equal. These constructs are related as shown in the formula below.

$$B.P. \quad x, s_1 R_a = f(E_x R_a s_1 \ \& \ R.V. \ a_1, s_1)$$

This formula may be read as follows: The potential for behavior \underline{x} to occur in situation \underline{l} in relation to reinforcement \underline{a} is a function of the expectancy of the occurrence of reinforcement \underline{a} following behavior \underline{x} in situation \underline{l} , and the value of reinforcement \underline{a} in situation \underline{l} .

It can be noted in this formula that the psychological situation or s plays a role in the determination of all the measures. However, the specific way in which the measures are involved is through the influence of the situation on expectancies of the individual. What the situation provides is cues which are related through previous experience to expectancies for behavior-reinforcement sequences. Perhaps stated more simply, what the situation provides is cues which tell the individual what behaviors he may expect will be followed by what reinforcements.

With respect to departure behavior, Rotter (1954, p. 228) suggests a classification in terms of some imbalance between the subject's Expectancy and Reinforcement Value, and/or in terms of conflicts of needs.

Liverant (1958) demonstrated the utility of such an approach to test construction by developing a Goal Preference Inventory within Rotter's construct. The results gave support to the validity of his inventory in measuring some three or four needs specific to a college population. He cautions that the variables involved in Rotter's formulation must be empirically determined and be considered typical of the specific culture being studied. He further suggests that lowering the level of generality of the needs should enhance the predictive efficiency of an instrument developed under Rotter's constructs.

In another study using Rotter's theory, Worell (1956) has shown that subjects will have more realistic expectancies when the experimental task presents a more practical kind of achievement situation rather than the usual gambling situation implied with many studies on level of aspiration.

Worell (1959) has improved predictive efficiency of academic achievement tests by use of level of aspiration measures related to

students' expectations of the discrepancy in their level of aspiration and actual performance to their attrition of drop-out rate. The concept of level of aspiration used in this study is highly similar to Rotter's expectancy value.

Feather (1961) lends support to this approach in a carefully controlled study of persistence. He suggests the usefulness of expectancy value as a concept in motivation and stresses the importance of change in expectation as it relates to the motivation to achieve success. He concludes his report of this study by saying:

The factual evidence clearly provides a demonstration that persistence can be conceptualized as an interaction of personality dispositions and situational influence (Feather, 1961, p. 561).

The Concept of Inconsistency

The method of paired comparisons for determining individual preferences is particularly useful when data do not have substantial evidence of objective or quantitative ranking. Such preferences as values and attitudes are of this nature and arbitrary ranking of them would be inappropriate.

It is likely that an individual making such value preference choices may consider A greater than B, B greater than C, and C greater than A. Such a sequence of preferences is obviously a mathematical inconsistency.

In a complete paired comparison format each item to be ranked is compared against each of the other items. A measure of the inconsistency of the individual can be obtained by determining the number of inconsistent choice patterns described above. Such a pattern is called a circular triad and can be expressed geometrically as a triangle. The vertices represent value items and the arrows represent direction of

preference. The inconsistency defined above, $A > B > C > A$, would be illustrated by the following diagram:

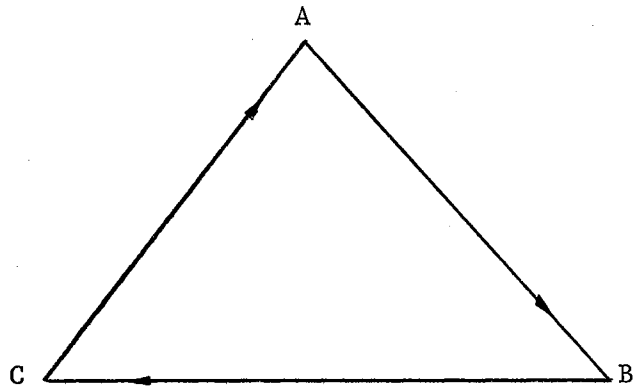


Figure 1. The Circular Triad
of Inconsistency.

The Educational Values Scale used in this study is a complete paired comparison instrument and can be illustrated geometrically as follows:

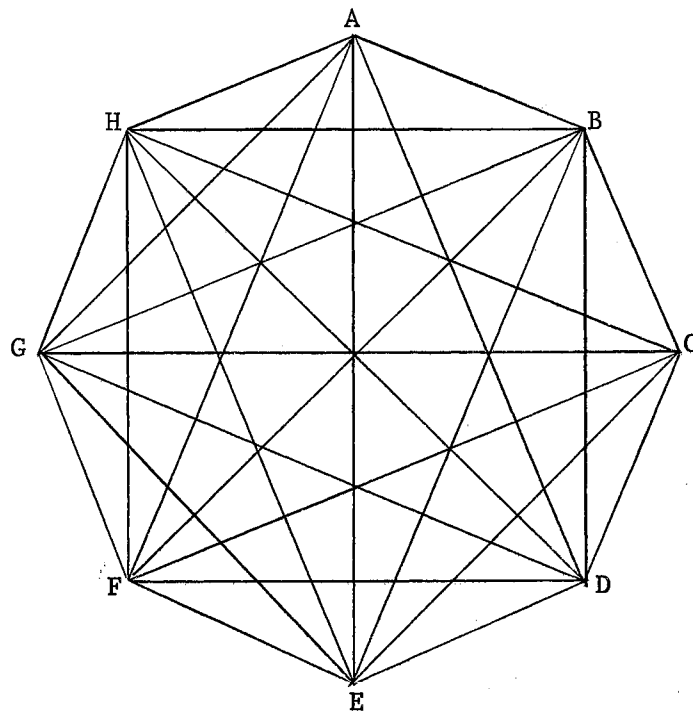


Figure 2. All Possible Choice Patterns
for a Complete Paired Com-
parison Test Containing
Eight Items.

The eight value items are represented by the eight vertices of the octagon. All the possible preferences by pairs are defined by the straight lines proceeding from each vertex. The internal inconsistency of an individual can then be determined by counting the number of closed triangles formed by his response pattern in the octagon. This would be the number of circular triads (Kendall, 1939).

Safran (1951) has developed a set of tables listing all the possible choice patterns which could be made to a complete paired comparison instrument using eight items. From this table one can derive an inconsistency score equivalent to the number of circular triads formed by any individual's choice pattern. A test format for the proper arrangement of the eight items in pairs and a set of templates for scoring were also developed for a complete paired comparison of eight items.

The circular triad test for inconsistency has been used most extensively in test reliability studies or other areas of test development. The primary emphasis has thus been placed on the test rather than the subject. One common usage of this test has been to determine if the test items are of a unidimensional nature on the assumption that high inconsistency reflects item properties of a multidimensional nature.

Caskey (1960) and Safran (1951) have applied the inconsistency score to the individual on the assumption that the score is a reflection of inconsistent behavior patterns rather than a faulty test. They have found those who were trained and psychologically ready for specific sets of behaviors respond to test items related to that behavior in a significantly more consistent pattern than those who were psychologically naive. Using this technique enables one to evaluate the degree of an individual's internal consistency on the basis of that person's own

choices and without the necessity of external criteria.

The Sample

The entire freshmen class enrolling for the fall semester of 1964 was selected as the population to be examined. The Educational Values Scale was administered to them during the two-day orientation clinics which they are required to attend during the summer prior to beginning class work in the fall. In the 39 clinics held during the summer of 1964, 3,153 students participated. There were 3,108 officially enrolled as entering freshmen for the fall semester of 1964. The sample for this study consists of all the officially enrolled freshmen for whom all data to be used were available and totaled to a sample size of 1,889.

Each student in the sample was then assigned a four-digit code number by alphabetical order, and IBM cards were punched and verified visually with the following information:

1. The student identification code number.
2. The month and year when the E. V. S. was administered.
3. The college in which the student was enrolled.
4. The sex of the student.
5. The drop-out category of the student.
6. The ACT composite standard score the student received.
7. The cumulative GPA of the student at the completion of his last semester of official enrollment or at the end of his freshman year if he returned in the fall of 1965.
8. The numerical choice pattern for the E. V. S.
9. The inconsistency score for the E. V. S.
10. The information concerning his activities after leaving

Oklahoma State University when a response to a questionnaire sent to the 684 drop-outs was obtained.

The cards were first sorted by college and sex in order to assure proper stratification of the sample. Sorts for each college were then made on the basis of the last semester for which they were enrolled as well as a group which did not even complete the first semester. This sequence of sorts resulted in four drop-out categories for each of the six colleges by sex for a total of 48 separate groups as shown in the table below.

TABLE I
RANDOMIZED STRATIFICATION OF SAMPLE

Drop-out Category	<u>College of Initial Enrollment</u>					
	1	2	3	4	5	6
<u>0</u>	M/F	M/F	M/F	M/F	M/F	M/F
<u>1</u>	M/F	M/F	M/F	M/F	M/F	M/F
<u>2</u>	M/F	M/F	M/F	M/F	M/F	M/F
<u>3</u>	M/F	M/F	M/F	M/F	M/F	M/F

Each of these groups was then sorted on the third digit of the four digit identification number. The odd numbered cards were selected for the statistical analysis and the even numbered cards were set aside to be used as the cross validation sample.

The ACT Test

The ACT composite score used in this study is derived from the battery of tests administered through the American College Testing Program,

Inc. of Iowa City, Iowa. This battery of tests is required of each entering freshman in all of the state colleges and universities. Most of the entering freshmen have taken the ACT battery during their senior year of high school but those who have not are required to do so during the orientation and advisement clinic they attend prior to enrollment.

This battery consists of four tests--one each in the areas of English, mathematics, social studies and natural science. The tests average 45 minutes in length and are designed to measure the student's ability to perform the kinds of intellectual tasks college students typically perform. The tests place primary emphasis upon what the student can do with what he has learned, rather than upon what he has learned in the sense of detailed and specific subject matter. In other words, test items are concerned with intellectual skills and abilities--not with specific and detailed content. This part of the battery yields four test scores and a composite, or average score (ACT, 1964-65).

The composite score was selected to be used as the expectancy value for this study because (1) it is most widely used by counselors in talking with students about their expectancy for success in college; (2) the booklet, Using ACT on Your Campus (ACT, 1964-65), confirms that the composite score is the best single ACT measure of scholastic performance; (3) this composite score has come to be generally accepted among the students as their common yardstick of expected success or failure in college.

The Educational Values Scale¹

The most comprehensive research in the area of college drop-outs was done on a nationwide scale by Iffert (1958). With a total sample of 13,700 he has provided a wealth of information concerning the family and educational background of college students, their value systems, and

¹See Appendix B for the sample of the scale as it was administered to the students.

their ability level. In carefully planned questionnaires lists of reasons for attending college, attitudes towards the faculty, reasons for leaving college, etc., were collected. Each of the items in these lists was rated by the subjects on a 0-4 scale and mean scale values assigned to the items for groups of men and women classified as to the type college in which they were enrolled.

On comparison of the descriptive study made on this campus with the Iffert Study and similar studies from other colleges, the general characteristics of the Oklahoma State University student body seemed to compare favorably with those of the typical state college or university. The ACT score norms are essentially the same for the total freshman class as for the national norms. The drop-out and retention rate in proportion to sex and various colleges on the campus are about the same as the national average. The high school and socio-economic background of the student on this campus are average.

Because of these similar findings, it was felt justifiable to assume the list of 25 reasons for entering college submitted by Iffert would also be typical of this student body. Therefore, it was decided to use this list as a basis for the development of a scale of values or attitudes about higher education.

Iffert's 25 items¹ were ranked in order of scale value assigned to them in his report for the state university group. The rankings were also made for both men and women. From these rankings the list was screened to reduce it to the eight items required by Safran's paired comparison format. These eight items were selected to contain only those ranked the same by men and women. The table on the next page

¹See Appendix B for the original items.

indicates the resultant list:

TABLE II
THE RANK ORDER OF IMPORTANCE ATTACHED TO IFFERT'S REASONS
FOR ATTENDING COLLEGE BY MEN AND WOMEN

Iffert Item No.	Rank Men	Rank Women
1.	1	1
7.	2	3
14.	3	2
17.	4	5
4.	6	6
12.	8	9
11.	14	13
10.	18	18
2.	20	21
5.	21	22
25.	24	24
23.	25	25

Because of extreme similarity of some of the items and to maintain better balance of the types of items, adjacent items on the Iffert scale were combined in three cases to produce one item for the experimental scale. Selection was also made from the extreme ends of the Iffert scale in an effort to have items which would be more discriminating. Table III on page 35 indicates which of the Iffert items were used to make up the experimental scale.

TABLE III

ITEMS FROM IFFERT'S STUDY USED FOR THE
EDUCATIONAL VALUES SCALE

Experimental Scale Item No.	Iffert Item No.
1.	1. & 7.
2.	14. & 17.
3.	4.
4.	12.
5.	10.
6.	2. & 5.
7.	25.
8.	23.

The first four items of the experimental scale have been derived from the top nine of the Iffert scale and the last four of the experimental scale from the lower seven of the Iffert scale.

Each of the selected items were then reworded for more consistency of form and made more suitable for the paired comparison format. These are stated below in the form in which they are presented and ranked in the order of their relative importance as judged by the above procedure.

1. --to be prepared for the kind of occupation I want.
2. --to satisfy my curiosity about certain fields of knowledge.
3. --to fulfil what was expected of me.
4. --to gain social development.
5. --to follow my parents wishes.
6. --to have the qualities of those I most respect.
7. --to follow family tradition.
8. --to avoid boredom at home.

The eight items were paired in the following order of presentation:

1-2, 3-4, 5-6, 1-5, 7-2, 6-1, 2-6, 3-2, 2-8, 3-8, 5-3, 4-2, 6-7, 4-6, 5-7, 8-5, 1-4, 8-7, 1-3, 7-1, 7-4, 3-7, 6-8, 8-4, 2-5, 5-4, 6-3, 8-1. This order, developed by Safran (1951) and used successfully by Caskey (1960), minimizes bias due to response set of the subjects. It enables one to use a scoring key along with a prepared set of tables¹ to derive a quick measure of internal consistency by the circular triad method. A total score can be derived indicative of which reason the subject values most highly.

Statistical Analysis

The sample is divided into three drop-out categories. These three categories are: (1) those who did not complete the first semester, and those who completed the first semester but did not enroll for the second; (2) those who completed the second semester but did not enroll for the first semester of their sophomore year; (3) those who were enrolled in the first semester of their sophomore year. A discriminant analysis was made on the three groups resulting from the above categorization. The variables included in the analysis are, the ACT Composite score, the E. V. S. choice pattern (eight items), and the E. V. S. inconsistency score.

Significant differences being found among these groups, another analysis was run on the same sample using GPA above or below 2.0 and drop-out or return as the four basic discriminant groups. This was done separately for male and female samples. The two categories of GPA to be used are: (1) Suspension or Probation level, 0.00--1.99, and (2) Satisfactory progress level, 2.00--4.00. These analyses consist of

¹See Appendix B.

the same 10 variables used in the first analysis.

The functions found to yield the most significant predictive values are then cross validated on the second half of the total sample withheld for this purpose.

Clarification of Terms

Drop-out: refers to any student who leaves Oklahoma State University prior to the beginning of his sophomore year.

Returnee: refers to any student who is officially enrolled at the beginning of his sophomore year.

ACT Test: refers to the American College Test which is a battery of tests used by the American College Testing program in its educational assessment program and is required of each entering freshman student at Oklahoma State University.

Educational Values Scale: refers to the paired comparison test administered to the freshmen orientation clinics and composed of eight items developed by Dr. O. L. Caskey and this author from the study of values done by R. E. Iffert.

Expectancy: refers to the ACT Test composite score and is used in the context of Rotter's Social Learning Theory.

Reinforcement Value: refers to any one of the eight items of the Educational Values Scale and used in the context of Rotter's Social Learning Theory.

Behavior Potential: refers to the degree of persistence demonstrated by a student in his enrollment at Oklahoma State University and will be used in the context of Rotter's Social Learning Theory.

Inconsistency Score: refers to a numerical value placed on the

response pattern to the Educational Values Scale and derived by the Principle of Circular Triads for a complete paired comparison instrument.

Departure Behavior: refers to the expectation that when he enrolls in college he will persist to completion of a specified program. Departure behavior will thus be a lack of such persistence. It will not necessarily connote behavior which is socially unacceptable or psychologically imbalanced. The person may be well adjusted in selecting life patterns other than college.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The multivariate discriminant analysis was used because of its appropriateness for the discrete groupings used in this study. These groups classify on a drop-out or returnee dichotomy rather than a continuous variable. It also allows for flexibility in determining the functional relationship of the variables hypothesized to be operant in discriminating these groups.

The computer program used was adapted from the discriminant analysis for several groups developed by the Health Sciences Computing Center, University of California at Los Angeles (Dixon, 1965). Because of the storage limitations of the computer in handling the large sample size of this study with 10 variables, the number of groups for any one analysis was restricted to a maximum of four and the N for any one group to a maximum of 500.

To make the desired comparisons, nine separate analyses were made using the sample described in Chapter III. In addition, a correlation matrix of the 10 variables was computed and F tests were made to determine the contribution made by each of the 10 variables used in the study.

As several of the above mentioned analyses are used in testing one or more of the hypotheses a description of each analysis is presented first and a separate section is devoted to the testing of the hypotheses

with reference to the appropriate analyses by number. The results of the nine analyses are tabled in Appendix A. A significance level of $p \leq .05$ was selected as the criterion for rejection of each of the hypotheses as stated in the null. The interpretation of the results of these various analyses and their relationship to the theoretical construct of this study is presented in Chapter V.

Description of Analyses

Analysis I. The entire sample of both male and female subjects was used and the following classifications were made:

Group 1. Those who were enrolled for all or part of the first semester but not enrolled for the second.

Group 2. Those who continued to be enrolled for the second semester but not for the third.

Group 3. Those who were still enrolled at the beginning of the third semester.

Analysis IA. The same subjects and groups as in Analysis I were used but only the eight EVS variables and the Inconsistency Score were used for deriving the discriminant function.

Analysis IB. The same subjects and groups as in Analysis I were used but only the ACT Composite Score was used as a variable to be examined. Nine dummy variables were assigned from a set of random numbers with the same range (1 - 7) as the EVS Values. This was done to compensate for any bias that might be introduced in favor of Analysis IA due to the use of more variables in the discriminant function.

Analysis II. Only the male subjects of the original sample were used

and the following classifications were made:

Group 1. Those with grade point average below 2.0 who were not enrolled at the beginning of the third semester.

Group 2. Those with grade point average of 2.0 or above who were not enrolled at the beginning of the third semester.

Group 3. Those with grade point average below 2.0 who were enrolled at the beginning of the third semester and had been enrolled for the previous two semesters.

Group 4. Those with grade point average of 2.0 or above who were enrolled at the beginning of the third semester and had been enrolled for the previous two semesters.

Analysis IIA. The same subjects and groups as in Analysis II were used but only the eight EVS variables and the Inconsistency Score were used for deriving the discriminant function.

Analysis IIB. The same subjects and groups as in Analysis II were used but only the ACT Composite Score was used as a variable to be examined. Nine dummy variables were assigned from a set of random numbers with the same range (1 - 7) as the EVS Values. This was done to compensate for any bias that might be introduced in favor of Analysis IIA due to the use of more variables in the discriminant function.

Analysis III. Only the female subjects of the original sample were used and the same classifications were made as in Analysis II.

Analysis IIIA. The same subjects and groups as in Analysis III were used but only the eight EVS variables and the

Inconsistency Score were used for deriving the discriminant function.

Analysis IIIB. The same subjects and groups as in Analysis III were used but only the ACT Composite Score was used as a variable to be examined. Nine dummy variables were assigned from a set of random numbers with the same range (1 - 7) as the EVS Values. This was done to compensate for any bias that might be introduced in favor of Analysis IIIA due to the use of more variables in the discriminant function.

Testing of the Hypothesis

Hypothesis 1. The mean values in all the groups are the same for the 10 variables used in the discriminant function.

A generalized Mahalanobis D^2 was calculated by the discriminant analysis program used. This is used as chi square to test the hypothesis that there will be no difference among means of the groups for the 10 variables in the discriminant function (Dixon, 1965).

TABLE IV

Analysis I	Chi Square	69.23229	d.f.	20	p < .0005
Analysis II	Chi Square	131.93247	d.f.	30	p < .0005
Analysis III	Chi Square	93.17138	d.f.	30	p < .0005

The hypothesis is rejected in all three analyses.

An analysis of variance was made on the groups in Analysis I for all 10 variables. One hundred subjects were randomly selected from each of

the three groups. This permits testing the difference among the means by the F ratio (Cooley, 1962). The results of the AOV for the three groups and 10 variables in Analysis I are reported in Table V below.

Hypothesis 2. There is no difference among the means of the Reinforcement Values (Educational Values) for the group. The hypothesis is accepted in the case of the eight EVS variables and the Inconsistency Score.

Hypothesis 3. There is no difference among the means of the Expectancy Values (ACT Composite) for the groups.

The Hypothesis is rejected in the case of the ACT Composite Score.

TABLE V
UNIVARIATE F TESTS FOR THE GROUPS AND
10 VARIABLES USED IN ANALYSIS I

Variable	F Ratio	p for F (2,198)
ACT Composite	3.413	.025 < p < .05
EVS 1	1.229	.25 < p < .50
2	1.246	.25 < p < .50
3	.071	.90 < p < .95
4	.574	.50 < p < .75
5	.189	.75 < p < .90
6	.137	.75 < p < .90
7	1.369	.25 < p < .50
8	1.964	.10 < p < .25
Inconsistency	1.135	.25 < p < .50

Because this study is designed to develop an efficient predictor of potential drop-outs, hypotheses four through seven are based on the predictive accuracy of the nine analyses. The percentage of the total drop-out group which was predicted correctly by the nine discriminant functions developed are reported in the table below. Each of the hypotheses is tested with these percentages using the chi square approximation for a binomial population with one degree of freedom (Ostle, 1963, p. 117).

TABLE VI
 PERCENTAGE OF TOTAL DROP-OUTS PREDICTED CORRECTLY
 BY THE DISCRIMINANT FUNCTIONS AS SHOWN IN
 THE CLASSIFICATION MATRICES OF
 THE NINE ANALYSES REPORTED

	Variables Used in Various Analyses		
	ACT Composite 8 EVS Variables Inconsistency	8 EVS Variables Inconsistency	ACT Composite 9 Random Variables
Total Sample Male and Female	Analysis I 68%	Analysis IA 68%	Analysis IB 70%
Males only from Total Sample	Analysis II 61%	Analysis IIA 42%	Analysis IIB 59%
Females only from Total Sample	Analysis III 57%	Analysis IIIA 56%	Analysis IIIB 65%

Hypothesis 4. The discriminant functions developed do not predict departure behavior better than chance.

TABLE VII

Analysis I	Chi Square	12.96	d.f. 1	$p < .0005$
Analysis II	Chi Square	4.85	d.f. 1	$.025 < p < .05$
Analysis III	Chi Square	1.96	d.f. 1	$.10 < p < .20$

The hypothesis is rejected in Analysis I and II and is approaching the rejection region in Analyses III.

Hypothesis 5. The discriminant functions do not predict departure behavior better than random selection in proportion to pre-established base rates of 40%.

TABLE VIII

Analysis I	Chi Square	32.67	d.f. 1	$p < .0005$
Analysis II	Chi Square	18.37	d.f. 1	$p < .0005$
Analysis III	Chi Square	12.04	d.f. 1	$.0005 < p < .001$

The hypothesis is rejected in all three analyses.

Hypothesis 6. The discriminant functions do not predict departure behavior better than Reinforcement Values alone.

TABLE IX

Analysis I	vs IA	Chi Square	00.0000	d.f. 1	$p = 1$
Analysis II	vs IIA	Chi Square	13.3400	d.f. 1	$p < .0005$
Analysis III	vs IIIA	Chi Square	00.0406	d.f. 1	$.80 < p < .90$

The hypothesis is rejected only in Analysis II.

Hypothesis 7. The discriminant functions do not predict departure behavior better than Expectancy Values alone.

TABLE X

Analysis I	vs IB	Chi Square	0.168	d.f. 1	.60 < p < .70
Analysis II	vs IIB	Chi Square	0.165	d.f. 1	.60 < p < .70
Analysis III	vs IIIB	Chi Square	3.520	d.f. 1	.05 < p < .10*

The hypothesis is accepted in all three analyses.

*It is approaching the rejection region only in Analysis III and in favor of the ACT Composite score alone.

Cross Validation

As all three cases of Analysis I indicate the most stability and greatest predictive efficiency, the discriminant functions derived in Analysis I were selected to be used on the cross validation sample. Each subjects' scores were run using these functions. The resultant predictions and verification of them are shown in the classification matrix of Table XI on page 47.

TABLE XI
 CLASSIFICATION MATRIX FOR THE CROSS-VALIDATION
 GROUP USING THE DISCRIMINANT FUNCTIONS
 DERIVED IN ANALYSIS I

	Function 1	Function 2	Function 3	Total
Group 1	47	20	36	103
Group 2	82	68	82	232
Group 3	180	163	363	706

The discriminant functions derived from Analysis I predict 65% of the drop-outs in the cross validation sample correctly. There is no significant difference between this and the 68% predictive efficiency of the functions when used on the original sample.

The discriminant function derived from Analysis IA were also tested on the cross validation group to establish the predictive reliability of the Educational Values Scale. The classification matrix for this is shown in Table XII below.

TABLE XII
 CLASSIFICATION MATRIX FOR THE CROSS-VALIDATION
 GROUP USING THE DISCRIMINANT FUNCTIONS
 DERIVED IN ANALYSIS IA

	Function 1	Function 2	Function 3	Total
Group 1	30	29	44	103
Group 2	82	71	79	232
Group 3	188	212	306	706

The discriminant functions derived from Analysis IA predicted 63% of the drop-outs in the cross validation sample correctly. There is no significant difference between this and the 68% predictive efficiency of the functions when used on the original sample.

Other Pertinent Statistics

Rotter's theoretical construct requires that the Reinforcement Values be determined independently of the Expectancy Values. Inter-correlations of the 10 variables used in this study were made to confirm this assumption about the independence of the Education Values Scale items and the Inconsistency Score from the ACT Composite score as well as from each other. The correlation matrix for this is shown in Table XIII on page 49.

Paul Meehl (1956) has demonstrated the use of Bayes Rule for inverse probabilities for testing the clinical efficiency of predictive instruments. Let P represent the incidence of a certain characteristic in a specified population, i.e., the drop-out rate. Let p_1 be the incidence of positive findings among cases who actually have the characteristic. Let p_2 be the incidence of positive test findings among cases who actually lack the characteristic. Let Q be the quantity $1 - p$. When does the use of a test improve overall decision making? According to Meehl, if $p < Q$, the condition is met when the following inequality is satisfied:

$$Q < \frac{p_1}{p_1 + p_2}$$

The predictive efficiencies of the discriminant functions used in Analyses I, IA, and IB satisfy this inequality. The values from Analysis I appropriate to the above inequality statement are as follows:

TABLE XIII

CORRELATION MATRIX FOR THE 10 VARIABLES
(DERIVED FROM THE TOTAL SAMPLE)

	1	2	3	4	5	6	7	8	9	10
1	1.000	-0.068	0.095	-0.075	0.056	-0.033	0.036	-0.108	-0.058	-0.025
2	-0.068	1.000	-0.004	-0.117	-0.060	-0.014	-0.200	-0.090	-0.203	-0.215
3	0.095	-0.003	1.000	-0.269	-0.179	-0.200	-0.145	-0.067	-0.084	-0.040
4	-0.075	-0.117	-0.269	1.000	-0.369	0.056	-0.144	0.012	-0.079	-0.044
5	0.056	-0.060	-0.179	-0.369	1.000	-0.284	-0.121	-0.199	-0.034	0.029
6	-0.033	-0.013	-0.200	0.056	-0.284	1.000	-0.198	-0.022	-0.168	0.044
7	0.036	-0.200	-0.145	-0.144	-0.121	-0.198	1.000	-0.117	-0.133	-0.090
8	-0.108	-0.090	-0.067	0.012	-0.199	-0.022	-0.117	1.000	-0.259	0.075
9	-0.058	-0.203	-0.083	-0.079	-0.034	-0.168	-0.133	-0.259	1.000	0.124
10	-0.025	-0.215	-0.040	-0.044	0.029	0.044	-0.090	0.075	0.124	1.000

$p = 41\%$ $Q = 59\%$ $p_1 = 68\%$ $p_2 = 44\%$

In a comparison of Analysis I, IA, and IB the question arises as to why the combination of ACT and EVS scores does not predict better than either set of scores alone. To examine this phenomena of the discriminant functions, the predictions made by the EVS functions alone were compared with those made by the ACT functions alone for each subject. The groups used in Analysis IA and IB were used for this comparison. The functions derived from the EVS Scale predicted correctly 67 of the 102 predicted incorrectly by the ACT functions. The functions derived from the ACT composite predicted correctly 76 of the 111 predicted incorrectly by the EVS. By using both sets of functions separately and taking the cases predicted to be drop-outs by each, only 35 of the 349 total drop-outs are predicted incorrectly. Such a sequential use of these functions results in 90% predictive efficiency.

The drop-outs picked up by the EVS function alone and by the ACT function alone appear to be manifesting different response patterns to the tests than the larger majority of the total group which were predicted correctly by the combined ACT-EVS discriminant function. In order to determine more specifically the nature of these phenomena, it was decided to examine these response patterns separately. In order to make a more complete comparison of these subjects, each subject was matched with one from the returnee group who had an identical ACT composite score. The means on each of the scales used for these four groups were also compared with the means on these scales for the total sample (both drop-outs and returnees). The means for each of these groups are given in Table XIV on page 51.

As a result of this comparison the existence of the High and Low

Expectancy groups hypothesized within the construct of Rotter's theory became quite clear. To seek further support for the theoretical construct, tests were made on the difference of the means between the drop-outs and returnees for the High Expectancy group and for the Low Expectancy group. The results of this analysis are given in Table XV on page 52 and Table XVI on page 53.

TABLE XIV
COMPARISON OF MEAN VALUES OF HIGH AND LOW
EXPECTANCY GROUPS TO THE TOTAL GROUP

N = 45

	Low Expectancy Group		Total Group	High Expectancy Group	
	<u>Drop</u>	<u>Return</u>	<u>Means</u>	<u>Drop</u>	<u>Return</u>
ACT Composite	18.630	18.630	20.610	21.070	21.070
EVS 1	5.957	6.370	6.183	6.157	6.216
2	4.783	4.761	4.817	4.725	4.863
3	3.913	3.696	3.777	3.510	3.863
4	4.152	3.696	3.777	3.627	3.784
5	2.391	2.783	2.572	2.627	2.569
6	5.000	4.522	4.758	4.902	4.863
7	0.935	1.130	0.950	1.059	0.765
8	0.870	1.065	1.100	1.235	1.059
Inconsistency	5.152	7.152	6.182	6.157	4.902

TABLE XV

DIFFERENCE BETWEEN THE MEAN VALUES OF DROP-OUTS AND
RETURNEES IN THE HIGH EXPECTANCY GROUP

	Drop-outs	Returnees	Difference	t	Significance level
ACT Composite	21.07000	21.07000	.00000		
EVS 1	6.15787	6.21568	+ .05881	.297	.25 < p
2	4.72549	4.86274	+ .19606	.793	.20 < p < .25
3	3.50980	3.86274	+ .35294	1.341	.05 < p < .10
4	3.62745	3.78431	+ .15686	.531	.25 < p
5	2.62745	2.56862	- .05883	.267	.25 < p
6	4.90196	4.86274	- .03122	.150	.25 < p
7	1.05882	0.76470	- .29412	1.531	.05 < p < .10
8	1.23529	1.05882	- .17647	.757	.20 < p < .25
Inconsistency	6.15687	4.90196	-1.25491	.861	.15 < p < .20

TABLE XVI

DIFFERENCE BETWEEN THE MEAN VALUES OF DROP-OUTS AND
RETURNEES IN THE LOW EXPECTANCY GROUP

	Drop-outs	Returnees	Difference	t	Significance Level
ACT Composite	18.63000	18.63000	.00000		
EVS 1	5.95652	6.26956	+ .41304	1.985	.025 < p < .05*
2	4.78260	6.76086	- .02174	.083	.25 < p
3	3.91304	3.69565	- .21739	.787	.20 < p < .25
4	4.15217	3.69565	- .45652	1.472	.05 < p < .10
5	2.39130	2.78260	+ .39130	1.686	.025 < p < .05*
6	5.00000	4.52173	- .47827	1.745	.025 < p < .05*
7	0.93478	1.13043	+ .19565	.973	.15 < p < .20
8	0.86956	1.06521	+ .19565	.798	.20 < p < .25
Inconsistency	5.15217	7.15217	+2.00000	1.307	.05 < p < .10

*The probability of obtaining 3 out of 10 t statistics of the .05 level is .001 (Sakoda, 1954).

Results of the Follow-up Questionnaire¹

Of the 684 classified as drop-outs, mailing addresses were obtained for 652. Letters explaining the nature of the study, urging their cooperation, and containing the questionnaire with stamped return envelopes were mailed to these people. The post office returned 361 of these letters for lack of a forwarding address. Of the remaining 291 from whom responses could be expected, 252 questionnaires were returned. The letters were mailed in early November, 1966, and the last returns were received in February, 1967, prior to the termination of this study on March 31, 1967. Generalization to the total drop-out population from this small return is tenuous at best, but the results are shown to indicate possible trends that might be expected. None of the statistical analyses are dependent on this information.

<u>What they did after leaving</u>	<u>Number</u>	<u>Per Cent of 252</u>
Enrolled in another college or university the semester following departure from O.S.U.	79	31%
Enrolled in another college or university the year following departure from O.S.U.	18	7%
Were enrolled in another college or university at the time they received the questionnaire.	8	3%
Enrolled in junior college the semester following departure.	18	7%
Enrolled in junior college the year following departure.	12	5%
Enrolled in special training of some kind the semester following departure.	12	5%

¹See Appendix B.

	<u>Number</u>	<u>Per Cent of 252</u>
Enrolled in special training the year following departure.	8	3%
Enrolled in special training at the time they received the questionnaire.	2	0.8%
Completed special training of some kind.	4	1.6%
Entered full-time employment.	87	35%
Entered military service.	66	26%
Married	76	30%
Men	30	12%
Women	46	18%

What their feelings were about leaving

Felt they made the right decision.	77	30%
Felt they were not ready for college.	99	39%
Felt they were not getting the kind of preparation they needed.	20	8%
Felt they were not getting personal and social satisfaction at college.	30	12%
Felt they could have benefitted from counseling assistance before deciding to leave.	20	8%
Felt they might have stayed in college with counseling assistance.	49	19%

CHAPTER V

INTERPRETATION OF RESULTS

Summary of the Study

The purpose of this study was to develop a test for the prediction of college drop-outs within the framework of a theoretical construct which would tie the test and the behavior to be examined together both logically and empirically. Rotter's Social Learning Theory (1955) was selected for this framework and is discussed in Chapter III. This theory is summarized in the formulation which states, "The behavior potential of an individual is a function of his expectancy of receiving specific reinforcements and the value which he attaches to those reinforcements." The ACT Composite score was used as the Expectancy Value in this formulation. A set of eight Reinforcement Values was selected from a nationwide college study by Iffert (1958) and built into a complete paired comparison instrument. The paired comparison format was used to make possible the further extraction of an Internal Inconsistency Score on each subject. As was discussed in Chapter III it was hypothesized that this score would reflect an internal conflict of values in the subject which might in some way effect his Behavior Potential.

The sample consisted of the entire entering freshman class for whom complete data could be obtained which in the final analysis amounted to 1,889 students from a total population of 3,108. This sample was divided into two randomly stratified groups. The stratification was on the basis

of the college in which they were enrolled and sex. Because of the limitations of the computer program only 849 subjects were used for the original analysis and the remaining 1,040 were withheld for the cross-validation group.

The multivariate discriminant analysis was chosen as the principle statistic to be used. Of the various groupings tried in the analyses, the dichotomy of drop-out versus returnee without respect to sex or grade point average yielded the highest predictive accuracy. The discriminant functions developed from this analysis predicted 68% of the drop-outs correctly in the initial sample and 65% correctly in the cross-validation sample. It was further discovered that 90% predictive accuracy could be obtained by developing two separate sets of discriminant functions and applying them to the sample independently. One of these functions used the ACT Composite or Expectancy Value only and the other used the Educational Values Scale or Reinforcement Values plus the Inconsistency Score. A closer study of these two groups gave more adequate support to the theoretical construct of this study.

Predictive Validity

The most important question for a study of this nature is, "Will it predict?" The discriminant functions derived in all three of the main analyses, which used all ten of the variables, support an affirmative answer to this question. These functions were shown to be discriminating among the groups selected at a significance level of .005. Testing these functions on the basis of predictive power alone continues to support the predictive validity in all analyses except the females grouped by grade point average. The functions were shown to predict better

than chance beyond the .05 significance level. The more parsimonious grouping by the simple drop-out and returnee dichotomy without respect to sex or GPA was significant beyond the .005 level in its predictive accuracy of 68%. The stability of this predictive power was upheld in the cross validation group for which the predictive accuracy was 65%. This small 3% shrinkage can be accounted for in the population difference in the two groups resulting from chance in the randomization of the sample. It was found that the initial group contained a drop-out density of 41% and the cross-validation group contained only 31%.

The Educational Values Scale is brought into question at this point since it was a newly developed instrument with no advance reliability studies. The universal stability and meaningfulness of the values selected was empirically supported by the Iffert study. Empirical validation of this assumption is shown in the fact that the sample used in this study ranked the values in the same order as the Iffert sample with the exception of one item. This was item six, which was selected more nearly from the middle ranges in which ranking is expected to be less consistent. One of the basic principles of accurate prediction is that the test being used must have reliability. The analyses demonstrated that the Educational Values Scale used alone predicted correctly for the initial group at better than the .005 level of significance and suffered only a 5% shrinkage in predictive accuracy on the cross-validation group. Using this axiom in reverse, "if the test in question does an adequate job of prediction, it must be reliable." The evidence justifies confidence in the reliability of the developed instrument.

The lack of evidence for significant differences among the means of the EVS items which was found in the ratios for testing Hypothesis 3

does not detract from the predictive power of these items when used in the discriminant functions. Cooley and Lohnes (1962, pp. 116-133) state that this kind of phenomena is due to the nature of the discriminant function and is one of its advantages for predictive purposes. These phenomena seem to be similar to the ordinary multiple correlation in which several tests which correlate at low levels with a given criterion can be combined to yield a more significant multiple correlation.

Construct Validity

Construct validity deals with the inter-relationship of the test and the theory. Is the test designed within the framework of the behavior theory and will it support predictions made by the theory with positive findings?

The first stipulation of the Social Learning Theory is that the Expectancy Values and Reinforcement Values must be independent of each other. The correlation matrix on page 49 evidences correlations below .37 among all the 10 variables used in this study and in most cases the correlations are approaching zero. The importance of this assumption of independence is highlighted by the findings in Analyses II and III which were done on the basis of grouping by sex and by grade point average at the time of departure. The sex difference is not significant, but there does appear to be a general deterioration of the predictive power of these functions in comparison to those of Analysis I made with only the drop-out and returnee grouping. The college grade point average is another very meaningful form of reinforcement value to a student but is also closely correlated to his ACT scores. The classification by GPA reinforcement values is confounding with the EVS scores and the

Expectancy Values in these two Analyses and a general deterioration of predictive power as well as an erratic pattern of the predictive power among the various groups is manifested.

A second stipulation of the theory is that the Reinforcement Values must be empirically derived and must be closely associated with the values of the particular population to be tested. The items from Iffert's study fulfill this assumption.

The 10 variables used in Analyses I, IA, and IB were selected on the basis of the above assumptions. The discriminant functions derived using both Reinforcement Values and Expectancy Values do in fact support the prediction made concerning the Behavior Potential of the subjects in the sample within the framework of the theoretical construct. The fact that both the Expectancy Values and the Reinforcement Values are able to maintain their predictive accuracy in the cross-validation group gives further support to the theory as it substantiates that both sets of values are making a meaningful and independent contribution to the Behavior Potential.

Hypotheses 6 and 7 were designed to further test the construct validity. Considering the fact that both the Expectancy Values and Reinforcement Values are functioning with fairly high efficiency, these hypotheses are a rather strenuous test to place on the discriminant function using the combination of all 10 variables. The inability of the combined function to predict better than either Reinforcement Values or Expectancy Values alone most likely stems from two reasons. The discriminant function is basically a type of linear regression and the Reinforcement Values appear to be operating in a curvilinear fashion. This could cause a "wash-out" effect when more extreme fluctuations of

Reinforcement Values occur in combination with more average level Expectancy Values. Secondly, the large majority of the sample are clustered quite close to both the mean Expectancy Values and mean Reinforcement Values. The two sets of values appear to be measuring different and independent facets of the same personality in a parallel fashion. The relatively small number of subjects that were found to be predicted correctly by the EVS and ACT functions separately were lost in the combined function.

Closer examination of these two small groups demonstrates more clear-cut support for the theoretical construct. There is a definite clustering of these two groups around High and Low Expectancy Values which are significantly different from the mean for the total group. The mean Reinforcement Values for these two groups were compared to those for the total group. The results of this comparison can be seen most clearly by plotting the deviation of the mean Reinforcement Values of the High and Low Expectancy groups from the mean Reinforcement Values of the total group. The graph of these deviations is presented on Figure 3 on page 62.

Some enlightening general observations can be made from this view of the test response patterns. The individual Reinforcement Values appear to be diametrically opposed in most cases for the High and Low Expectancy groups. This would further account for the "wash-out" effect found in combining Reinforcement Values with Expectancy Values in one discriminant function. This bipolar selection of values supports the stipulation of the theory that the Reinforcement Values must be specific to the population. It would appear that the original assumption of specificity for the total campus population is not as satisfactory as

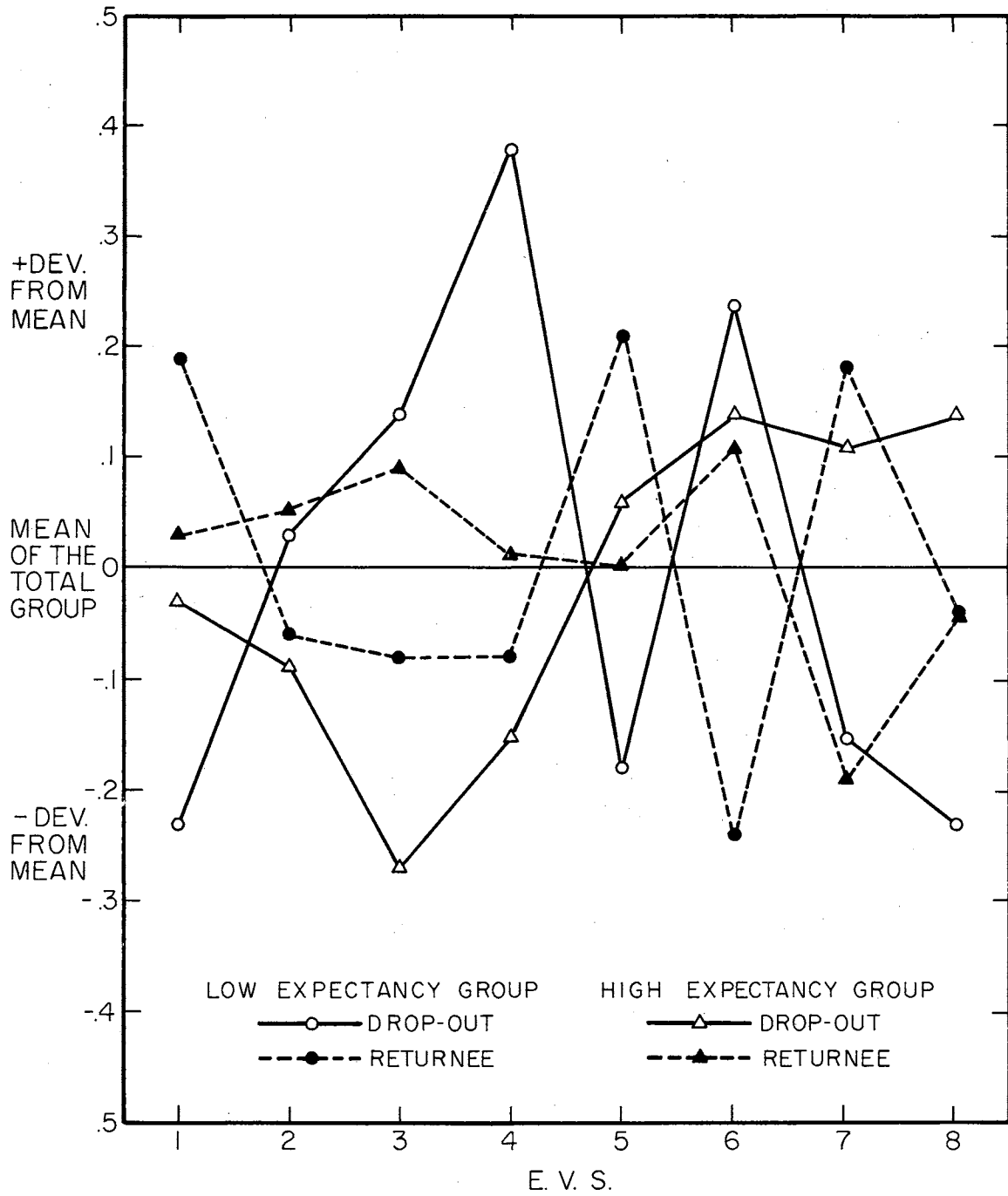


FIGURE 3 MEAN VALUE PATTERNS FOR DROP-OUTS AND RETURNEES OF HIGH AND LOW EXPECTANCY GROUPS

narrowing the specification of values to either High or Low Expectancy groups.

In examining the overall patterns of these groups it is quite noticeable that the Low Expectancy group manifests a much more exaggerated pattern of deviations than does the High Expectancy group. Such increased emphasis on Reinforcement Values would be expected from Rotter's theory. Persons with lower Expectancy would be expected to rely more heavily on their Reinforcement Values for adequate motivation. One other characteristic of the general patterns is worthy of note. The Low Expectancy drop-out pattern follows very closely the same trends as the pattern of the High Expectancy returnee but in a much more exaggerated form. It appears that the Low Expectancy person is endeavoring to emulate a pattern of values that are not his own internalization and which would be most difficult of fulfillment for him.

In comparing the patterns of the drop-outs and the returnees within this Low Expectancy group, the deviations from the mean of the total group for each of the eight values are directly opposed to each other. These contrasts are discussed individually for each of the eight values used in the Educational Values Scale.

Value One. To be prepared for the kind of occupation I want.

It can be seen from the graph that the returnee group rates this value above the mean while the drop-out group rates it equally as far below the mean. For this group with Low Expectancy in the area of academic achievement, the added strength of occupational goals shown in this value selection of the returnees as opposed to the drop-outs makes intuitive sense.

Value Two: To satisfy my curiosity about certain fields of

knowledge.

The returnees rate this value below the drop-outs. It is a value less likely to find adequate reinforcement in this Low Expectancy group. This value being less important to the returnee would make it less likely that low academic achievement would become such a discouraging factor as it would to the drop-outs who rate this value more highly.

Value Three: To fulfill what was expected of me.

There is even more difference in the two groups here than on Value Two. Again this value more likely represents an academically oriented goal. Most parents and adults expect high grades of young people in college. This expectancy is less likely to be fulfilled in the low ACT score group. The returnee group again seems to be manifesting a recognition of reinforcement values more realistically in keeping with their expectancy.

Value Four: To gain social development.

This value is extremely important to the drop-out group, while the returnees rate it much lower. Part of the lower academic performance of the Low Expectancy drop-out group may well be accounted for in the high values placed on the social aspects of college life.

Value Five: To follow my parents' wishes.

The returnees rate this value as far above the mean as the drop-outs rate it below the mean. The parental wishes of the returnee group were apparently for their child to have a college education, and the students in this group are desirous of fulfilling this expectation. As for the drop-out group, it should not necessarily be assumed that the parents wished their child in college and that the low rating of this value is an indication of rebellion on the part of the student. It could as

easily be assumed that college was not the parents' wishes and consequently the student was not particularly concerned about this reason for coming to college.

Value Six: To have the qualities of those I most respect.

Considering the test situation and the fact that the values scale was presented with an academic orientation, it is not unreasonable to assume that the testees would be thinking in terms of academic prowess in a person who merits respect. For the Low Expectancy person to develop such a quality in himself to any great degree is less probable than even the average achiever. To gain much reinforcement in this particular value certainly is not likely for this group. The drop-outs again rate this considerably higher than the returnees.

Value Seven: To follow family tradition.

The same discrepancy between drop-outs and returnees is found on this value as on number five. The family relationship and desires seem to be playing an important role in the persistence versus drop-out behavior pattern of this Low Expectancy group.

Value Eight: To avoid boredom at home.

The drop-out group considers this value less important than the returnee group. The drop-outs may be showing more concern with making a socially accepted response to the test item or they may also be saying they were not bored at home and would prefer to be at home. A preference to remain at home certainly gives support to the low ratings placed on values one, five, and seven. This value pattern could well be describing a person who is much more dependent on others for their reinforcement. If this is true, the low value for parental influence shown in items five and seven could be a reflection of unconscious resentment to

their dependence on the parents. If the Low Expectancy drop-out is viewed this way, then he might be saying reinforcement for values four and six, which he rates higher, is not to be found in the college setting but in his old environment.

Although academic failure is obviously a contributing factor to the drop-outs in this Low Expectancy group, it does not seem to be the only factor. The drop-outs group examined here left with a GPA of 1.33 while the returnees in this Low Expectancy group maintained only a 1.75. There were 36 of the drop-outs in this group with a GPA below 2.0 while there were 43 of the returnees with a GPA below 2.0. A large majority of both groups were either on probation or suspension, which required them to petition for readmission. The returnees undertook this extra responsibility and the drop-outs did not. The reinforcement values patterns demonstrate differences in the two groups that aid in explaining their differential behavior patterns which also seems to support the construct validity of this study.

The reinforcement value patterns of the High Expectancy groups demonstrate a more parsimonious differential between the drop-outs and returnees as well as more direct support of the theoretical construct. Value items one through four were selected as High Reinforcement Values from Iffert's study (1958). It can be seen on the graph that the returnees in this High Expectancy group did in fact value all four of these items more highly than did the drop-outs of the same group. Value items five through eight were selected as Low Reinforcement Values. The returnees in turn rate each of these items at a lower level than do the drop-outs. This pattern is precisely in keeping with the prediction made under the theoretical construct; the person with High Expectancy

and Low Reinforcement values is more likely to manifest departure or drop-out behavior. The difference in values between drop-outs and returnees on the High Expectancy group is reflected more strongly in their grade point average than was seen in the Low Expectancy groups. The High Expectancy drop-out group had a GPA of 1.97 and 30 of this group had an individual GPA below 2.0 which does not seem to be noticeably different than the performance record of the Low Expectancy group who did not drop-out. The High Expectancy returnee group maintained a GPA of 2.28, and only eight individuals in this group show a GPA below 2.0.

The Inconsistency scores again seem to show the reversal pattern for High and Low Expectancy groups. The High Expectancy group Inconsistency scores tend in the direction of the prediction made under the theoretical construct. In this case the drop-outs indicate a more inconsistent choice pattern than do the returnees. The theoretical construct of this study stated that a greater conflict of values would be a factor related to departure behavior and would be reflected in the greater Inconsistency score.

A difference in the Inconsistency score of drop-outs and returnees for the Low Expectancy group is shown but in reverse magnitude to the prediction of the theoretical construct. The lower Inconsistency score of the drop-out in this group may be a continuation of what seems to be a superficial but forced effort to emulate the value system of the High Expectancy returnees and for which fulfillment is unlikely. This lower Inconsistency score could also indicate a more consistent set of values for this person, but values which are not related to college as much as they are to home. A student such as described in the latter alternative above would truly not be manifesting a values conflict and therefore

should not have as high an Inconsistency score, but would be expected to manifest departure behavior by leaving school to seek his value fulfillment elsewhere.

The concept of emotional flexibility may be a possible explanation for the higher Inconsistency score of the Low Expectancy returnee. The possibility of the increased difficulty of the Low Expectancy person's chances of finding much fulfillment in some of the academically oriented values has been pointed out. It is possible that these people have learned to live with these facts of life and have thus learned to be flexible in their value system, making shifts as the need arises without undue rigidity or emotional conflict. If this is the case, such a flexibility could well be reflected in their response pattern to the EVS and be registered in higher Inconsistency Scores.

Pragmatic Validity

Statistical significance and predictive efficiency may be impressive; but the most important question for a study of this nature is, "Is the theory and test developed useful in a practical situation?" The findings of this study do support the applied possibilities that it was designed to fulfill.

In Chapter Four the use of Baye's Inverse Probability Theorem as suggested by Meehl (1956) was shown to demonstrate the applied utility of the test as developed. In some instances the large percentage of false positive predictions would be detrimental to those individuals so classified. This test would be used only to identify people for constructive counseling and advisement and would not be used to refuse them admittance to the university. Therefore, even with the larger than

desirable group of false positives, such use of the EVS would provide a worthwhile reduction in size of freshmen groups selected for special counseling as a preventive to drop-out behavior.

A final practical consideration for screening purposes is the time involvement, scoring complexity, and cost of administration of such instruments. The students are required to have their ACT scores available to the registrar prior to enrollment in the orientation clinics. The administration of the Educational Values Scale developed in this study would require a maximum of 30 minutes extra time in one of the testing sessions of these clinics. IBM Mark Sensor cards could be used for their responses to the EVS and it could subsequently be scored quickly and economically. If the student's ACT score was also punched in the card, immediate classification as a potential drop-out could be made by the computer as the Educational Values Scale was scored.

Recommendations

The results of this study suggest further research in two basic areas. The first would be refinement of the instruments and constructs used in this study. Secondly, the techniques developed in this study would be used as a screening device to select groups of entering freshmen for experimental and preventive counseling.

There are three areas of research needed for refinement of the theoretical construct and tests used in this study. The deterioration of predictive power in the combined discriminant function suggests the need for the development of statistical analyses which would account for the value fluctuations in a more sensitive way. Some type of factor or cluster analysis might be more appropriate. It is also apparent that

some type of exponential function would give better discrimination than the straight linear functions developed in the present study.

A second phase of this refinement to be undertaken should be a more detailed study of the value systems of college students. Since the EVS items seem to be in the nature of more long-term goals, reliable value items could be isolated that relate more immediately and directly to the daily reinforcements received by the student during his campus experience. These might contribute more weight to the functional relationship hypothesized in the behavior construct of this study.

The third phase should be the search for Expectancy scores that would serve more accurately in the developed functions. The confounding which seemed to occur when the groups were categorized by GPA suggests that rank in high school or high school grades might be used as the Expectancy score rather than the ACT composite score.

The second major area of research should be in preventive counseling techniques. The predictive power of this instrument seems to be sufficient to merit its use as a screening device. Groups of entering freshmen could be selected as potential drop-outs by means of the techniques developed in this study. Various counseling techniques, both group and individual, could be used with these in a longitudinal study to determine their effectiveness in reducing the drop-out rate. These groups could also be used for more intensive studies of values, sociological background, biographical information, personality structure, vocational interest patterns, and intellectual skills of the students.

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APPENDICES

APPENDIX A

STATISTICAL TABLES

- Analysis I. The entire sample of both male and female subjects was used and the following classifications were made:
- Group 1. Those who were enrolled for all or part of the first semester but not enrolled for the second.
 - Group 2. Those who continued to be enrolled for the second semester but not for the third.
 - Group 3. Those who were still enrolled at the beginning of the third semester.

TABLE XVII
COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

Variable	Group 1	Group 2	Group 3
ACT Composite	00.70419	00.73178	00.82362
EVS 1	18.21076	18.22640	18.12627
2	18.30055	18.16066	18.21456
3	17.59291	17.54487	17.61634
4	18.18901	18.21867	18.21334
5	18.37466	18.27077	18.23515
6	18.07730	18.03849	18.09711
7	17.73837	17.64361	17.80223
8	16.71492	16.60735	16.53350
Inconsistency	00.42105	00.40622	00.40428
Constant	-260.33404	-259.44379	-261.45296
Chi square	69.23229	d.f. 20	p < .0005

TABLE XVIII
CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Total
Group 1	50	27	31	108
Group 2	90	71	80	241
Group 3	110	107	283	500

Analysis IA. The same subjects and groups as in Analysis I were used but only the eight EVS variables and the Inconsistency Score were used for deriving the discriminant function.

TABLE XIX
COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

Variable	Group 1	Group 2	Group 3
EVS 1	45.05707	44.99617	44.98705
2	46.56419	46.36368	46.57294
3	43.94728	43.82782	44.00105
4	45.99497	45.95811	46.08550
5	46.00544	45.83249	45.91940
6	45.56449	45.45837	45.64176
7	43.43653	43.25838	43.47278
8	41.15407	40.97624	40.98299
Inconsistency	1.02332	1.00685	1.00711
Constant	-635.81041	-632.44391	-635.83043
Chi square	20.13294	d.f. 18	.30 < p < .40

TABLE XX
CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Total
Group 1	36	35	37	108
Group 2	74	93	74	241
Group 3	129	138	232	499

Analysis IB. The same subjects and groups as in Analysis I were used but only the ACT Composite Score was used as a variable to be examined. Nine dummy variables were assigned from a set of random numbers with the same range (1 - 7) as the EVS Values. This was done to compensate for any bias that might be introduced in favor of Analysis IA due to the use of more variables in the discriminant function.

TABLE XXI
COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

Variable	Group 1	Group 2	Group 3
ACT Composite	0.72664	0.75805	0.85475
Random 1	0.67458	0.65306	0.62358
2	0.62037	0.67234	0.60298
3	0.60766	0.66262	0.66412
4	0.65024	0.70138	0.70887
5	0.55767	0.58857	0.57585
6	0.65550	0.71130	0.67025
7	0.59111	0.55093	0.53867
8	0.62880	0.58486	0.57056
9	0.63394	0.72831	0.69602
Constant	-16.38763	-17.77695	-19.05189
Chi square	70.75196	d.f. 20	p < .0005

TABLE XXII
CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Total
Group 1	56	28	24	108
Group 2	80	83	78	241
Group 3	117	115	267	499

Analysis II. Only the male subjects of the original sample were used and the following classifications were made:

- Group 1. Those with grade point average below 2.0 who were not enrolled at the beginning of the third semester.
- Group 2. Those with grade point average of 2.0 or above who were not enrolled at the beginning of the third semester.
- Group 3. Those with grade point average below 2.0 who were enrolled at the beginning of the third semester and had been enrolled for the previous two semesters.
- Group 4. Those with grade point average of 2.0 or above who were enrolled at the beginning of the third semester and had been enrolled for the previous two semesters.

TABLE XXIII

COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

	Group 1	Group 2	Group 3	Group 4
ACT Composite	3.04133	3.24463	3.10358	3.24580
EVS 1	54.84514	54.66710	55.23332	55.08458
2	53.64518	53.50448	53.93995	53.96693
3	52.63699	52.50112	53.03699	52.96064
4	54.81027	54.85565	55.11161	55.12501
5	56.86078	56.82609	57.15412	47.01517
6	54.07552	53.88350	54.38201	54.43291
7	56.44027	56.33023	57.09401	56.88955
8	51.68982	51.55017	52.01567	51.90349
Inconsistency	1.06550	1.04150	1.09081	1.05302
Constant	-790.92996	-791.75756	-802.03866	-803.30959
Chi square	131.93247	d.f. 30	p < .0005	

TABLE XXIV

CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Function 4	Total
Group 1	87	28	38	29	182
Group 2	8	13	5	11	37
Group 3	26	10	26	14	76
Group 4	32	60	33	97	222

Analysis IIA. The same subjects and groups as in Analysis II were used but only the eight EVS variables and the Inconsistency Score were used for deriving the discriminant function.

TABLE XXV
COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

Variable	Group 1	Group 2	Group 3	Group 4
EVS 1	49.38526	48.84224	49.66167	49.25763
2	49.53727	49.12197	49.74795	49.58285
3	47.73746	47.27408	48.03717	47.73172
4	50.19545	49.93235	50.40233	50.19994
5	52.43262	52.10193	52.63532	52.28932
6	49.13305	48.61064	49.33837	49.15817
7	48.86957	48.25345	49.36834	48.80987
8	46.26370	45.76134	46.47849	46.10258
Inconsistency	0.97727	0.94737	1.00077	0.95886
Constant	-693.42053	-680.77626	-700.49652	-692.24857
Chi square	33.31451	d.f. 27	.10 < p < .20	

TABLE XXVI
CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Function 4	Total
Group 1	22	50	56	54	182
Group 2	3	17	5	12	37
Group 3	12	16	31	17	76
Group 4	18	67	49	88	222

Analysis IIB. The same subjects and groups as in Analysis II were used but only the ACT Composite Score was used as a variable to be examined. Nine dummy variables were assigned from a set of random numbers with the same range (1-7) as the EVS Values. This was done to compensate for any bias that might be introduced in favor of Analysis IIA due to the use of more variables in the discriminant function.

TABLE XXVII

COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

Variable	Group 1	Group 2	Group 3	Group 4
ACT Composite	0.84789	1.06583	0.87993	1.03627
Random 1	0.71387	0.70273	0.76522	0.73679
2	0.59498	0.42552	0.63408	0.50533
3	0.80717	0.83424	0.80143	0.80200
4	0.69547	0.66976	0.69355	0.69941
5	0.96366	0.98823	0.90323	0.94711
6	0.59889	0.59842	0.52547	0.58114
7	0.70649	0.67346	0.73108	0.71155
8	0.67715	0.73271	0.61325	0.65479
9	0.65793	0.66718	0.72168	0.70268
Constant	-19.41473	-23.66236	-19.95429	-23.09029
Chi square	119.03387	d.f. 30	p < .0005	

TABLE XXVIII

CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Function 4	Total
Group 1	86	21	46	29	182
Group 2	9	14	4	10	37
Group 3	20	13	31	12	76
Group 4	35	86	40	61	222

Analysis III. Only the female subjects of the original sample were used and the same classifications were made as in Analysis II.

TABLE XXIX

COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

	Group 1	Group 2	Group 3	Group 4
ACT Composite	0.91402	1.14747	0.97648	1.17556
EVS 1	41.76542	42.09678	41.83103	41.82609
2	42.69393	42.73353	42.73564	42.77504
3	40.47777	40.74096	40.72983	40.68949
4	41.37303	41.68638	41.78885	41.55786
5	39.11595	39.35201	39.44383	39.27035
6	41.76423	42.00685	42.10038	41.90842
7	37.97138	37.92066	38.02919	38.05088
8	35.49802	35.46247	35.59130	35.28236
Inconsistency	1.14269	1.17709	1.16414	1.14829
Constant	-582.91479	-593.59945	-589.90958	-591.10076
Chi square	93.17138	d.f. 30	p < .0005	

TABLE XXX

CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Function 4	Total
Group 1	38	9	16	13	76
Group 2	9	18	11	16	54
Group 3	16	5	8	6	35
Group 4	24	39	29	74	166

Analysis IIIA. The same subjects and groups as in Analysis III were used but only the eight EVS variables and the Inconsistency Score were used for deriving the discriminant function.

TABLE XXXI
COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

Variable	Group 1	Group 2	Group 3	Group 4
EVS 1	41.38622	41.62073	41.42592	41.33838
2	43.21880	43.39245	43.29637	43.45009
3	40.42252	40.67161	40.67081	40.61844
4	41.56461	41.92688	41.99351	41.80425
5	38.98929	39.19300	39.30852	39.10745
6	42.03906	42.35187	42.39399	42.26189
7	38.14418	38.13760	38.21380	38.27312
8	35.60207	35.59309	35.70245	35.41617
Inconsistency	1.13745	1.17052	1.15855	1.14156
Constant	-576.11127	-582.87673	-582.14445	-579.84660
Chi square	24.79205	d.f. 27	.50 < p < .60	

TABLE XXXII
CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Function 4	Total
Group 1	34	12	11	19	76
Group 2	11	17	12	14	54
Group 3	9	7	6	13	35
Group 4	39	27	39	61	166

Analysis IIIB. The same subjects and groups as in Analysis III were used but only the ACT Composite Score was used as a variable to be examined. Nine dummy variables were assigned from a set of random numbers with the same range (1 - 7) as the EVS Values. This was done to compensate for any bias that might be introduced in favor of Analysis IIIA due to the use of more variables in the discriminant function.

TABLE XXXIII
COEFFICIENTS FOR THE DISCRIMINANT FUNCTIONS

Variable	Group 1	Group 2	Group 3	Group 4
ACT Composite	1.00325	1.23158	1.06557	1.26855
Random 1	0.61308	0.64565	0.64263	0.64512
2	0.65787	0.66526	0.68439	0.75410
3	0.87865	0.88883	0.75008	0.76100
4	0.66200	0.81268	0.87965	0.76480
5	0.72409	0.77614	0.58571	0.68967
6	0.56868	0.49775	0.68935	0.59369
7	0.49618	0.45369	0.57989	0.50977
8	0.68684	0.74632	0.81952	0.68305
9	0.90319	1.01529	0.84810	0.88789
Constant	-19.02030	-24.40841	-21.18542	-24.38954
Chi square	103.74683	d.f. 30	p < .0005	

TABLE XXXIV
CLASSIFICATION MATRIX

	Function 1	Function 2	Function 3	Function 4	Total
Group 1	37	15	15	9	76
Group 2	12	20	5	17	54
Group 3	8	6	17	4	35
Group 4	24	40	32	70	166

APPENDIX B

DATA COLLECTION INSTRUMENTS

IFFERT'S ORIGINAL ITEMS

1. I felt a college degree was necessary for the kind of work I wanted to do.
2. Business, church, or other community leaders encouraged me to go to college.
3. I hoped to make many new friends in college.
4. It had always been expected that I would go to college.
5. The persons I respected most in my community had gone to college.
6. I had serious intellectual curiosities which only college could satisfy.
7. I wanted to prepare myself for a better paying job than I would otherwise be able to get.
8. I wanted to learn how to get along with other people.
9. I hoped to acquire some qualifications for leadership in civic affairs.
10. My parents insisted on my going to college.
11. Most of my friends were going to college.
12. I thought college life would help me to develop socially.
13. I wanted the close fellowship of living in a dormitory, sorority house, or fraternity house.
14. I had a compelling interest in one particular field in which I wanted to specialize, namely:
15. I wanted to explore several lines of work to see what I would be most interested in.
16. I felt I could live an easier life if I had a college education.
17. I wanted to find out more about certain fields of knowledge.
18. I felt college acquaintances and contacts would prove advantageous in finding a position after graduation.
19. I thought a college education would enable me to be more influential in community affairs.
20. I thought that college would be a good place to meet the type of person I'd like to marry.
21. I hoped that college training would enable me to be a better husband or wife.
22. I enjoyed studying and wanted to continue academic work.
23. There was not much for me to do around home.
24. My teachers thought I was good college material.
25. In my family young people had always gone to college.

EDUCATIONAL VALUES SCALE

DIRECTIONS: On the pages following you will find a number of pairs of statements. Each statement is a consideration which some persons have felt to be important in causing them to come to college. Read each pair of statements, and decide which of the two you think is the more important to YOU. Indicate your choice in the manner illustrated in the example below. Do not write on these pages. Write only on the answer sheet.

Mark the items in the order in which they occur; **DO NOT** skip around.

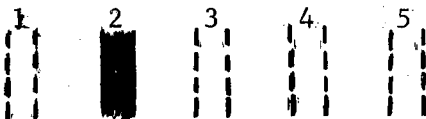
Be sure to make a choice for each pair, even though in some cases you feel that you are guessing or do not really prefer either item. There is no time limit, but you will find it easier to mark your first impression rather than to dwell on each choice too long.

There are no right or wrong answers, as each choice is simply a matter of personal preference. This is in no way a test of intelligence or educational level.

EXAMPLE: Consider the following choice as an example to be marked.

1. Working among people who have interests and taste similar to your own.
2. The work itself promises to be interesting.

Suppose that you think it is more important to you to have work which is interesting than to work among people whose interests and tastes are similar to your own. Your preference is for the second statement of the pair. In this case, you would fill in the space between the second pair of lines on the answer sheet, as shown below:



Since you have only two choices, pay no attention to the third, fourth, and fifth pairs of lines on the answer sheet.

**REMEMBER--MAKE ONE CHOICE IN EVERY PAIR--
MAKE YOUR MARKS DARK--IF YOU CHANGE A
CHOICE, ERASE COMPLETELY**

MAKE ONE CHOICE IN EVERY PAIR WHICH BEST SUITS YOUR PURPOSE IN COMING TO COLLEGE.

DO NOT WRITE IN THIS BOOKLET--
MARK YOUR ANSWERS ON THE ANSWER SHEET

1.

1. To be prepared for the kind of occupation I want.
2. To satisfy my curiosity about certain fields of knowledge.

2.

1. To fulfill what was expected of me.
2. To gain social development.

3.

1. To follow my parents wishes.
2. To have the qualities of those I most respect.

4.

1. To be prepared for the kind of occupation I want.
2. To follow my parents wishes.

5.

1. To follow family tradition.
2. To satisfy my curiosity about certain fields of knowledge.

6.

1. To have the qualities of those I most respect.
2. To be prepared for the kind of occupation I want.

7.

1. To satisfy my curiosity about certain fields of knowledge.
2. To have the qualities of those I most respect.

8.

1. To fulfill what was expected of me.
2. To satisfy my curiosity about certain fields of knowledge.

9.

1. To satisfy my curiosity about certain fields of knowledge.
2. To avoid boredom at home.

10.

1. To fulfill what was expected of me.
2. To avoid boredom at home.

11.

1. To follow my parents wishes.
2. To fulfill what was expected of me.

12.

1. To gain social development.
2. To satisfy my curiosity about certain fields of knowledge.

13.

1. To have the qualities of those I most respect.
2. To follow family tradition.

14.

1. To gain social development.
2. To have the qualities of those I most respect.

15.

1. To follow my parents wishes.
2. To follow family tradition.

16.

1. To avoid boredom at home.
2. To follow my parents wishes.

17.

1. To be prepared for the kind of occupation I want.
2. To gain social development.

18.

1. To avoid boredom at home.
2. To follow family tradition.

19.

1. To be prepared for the kind of occupation I want.
2. To fulfill what was expected of me.

20.

1. To follow family tradition.
2. To be prepared for the kind of occupation I want.

21.

1. To follow family tradition.
2. To gain social development.

22.

1. To fulfill what was expected of me.
2. To follow family tradition.

23.

1. To have the qualities of those I most respect
2. To avoid boredom at home.

24.

1. To avoid boredom at home.
2. To gain social development.

25.

1. To satisfy my curiosity about certain fields of knowledge.
2. To follow my parents wishes.

26.

1. To follow my parents wishes.
2. To gain social development.

27.

1. To have the qualities of those I most respect.
2. To fulfill what was expected of me.

28.

1. To avoid boredom at home.
2. To be prepared for the kind of occupation I want.

YOU MAY NEED TO CHECK SEVERAL ITEMS TO FULLY DESCRIBE YOUR ACTIVITIES TO DATE, FOR EXAMPLE: YOU HAY HAVE MARRIED, BECOME EMPLOYED, GONE TO TECHNOLOGY SCHOOL A YEAR AFTER LEAVING O.S.U., AND HAVE NOW COMPLETED THAT PROGRAM.

Enrolled in another college or university.

The following semester (after leaving O.S.U.).

The following year.

Am presently enrolled.

Enrolled in junior college.

The following semester.

The following year.

Am presently enrolled.

Completed the program.

Enrolled in special training such as vocational, business, technology, etc.

The following semester.

The following year.

Am presently enrolled.

Completed the program.

Went into full time employment

Went into the armed services.

Married.

After leaving my feelings were:

I might have stayed in school if I had received some kind of counseling assistance.

I could have used some counseling assistance in planning what to do when I did leave school.

I now feel that I made the right decision by leaving.

O.S.U. was not giving me the preparation I needed.

I was not receiving any personal or social satisfaction from my experience at O.S.U.

O.S.U. had what I needed, I just wasn't ready for the experience.

INCONSISTENCY TABLE FOR EASE OF SCORING¹

- A. Arrange number of choices in decreasing frequency. Check to make sure there are 28 choices. Disregard choice itself.
- B. Compare to table. Use pattern closest to frequency if exact one is not listed.

FREQUENCY ORDER	SCORE	FREQUENCY ORDER	SCORE
7 6 5 4 3 2 1 0 -	0	6 6 4 4 4 2 2 0 -	6
7 6 5 4 2 2 1 1 -	2	6 6 4 4 4 2 1 1 -	7
7 6 5 4 2 2 2 0 -	1	6 6 4 4 3 3 2 0 -	7
7 6 5 4 3 1 1 1 -	1	6 6 4 4 3 3 1 1 -	8
7 6 5 3 3 2 2 0 -	2	6 6 4 4 3 2 2 1 -	8
7 6 5 3 3 2 1 1 -	3	6 6 4 3 3 3 2 1 -	8
7 6 5 3 3 3 1 0 -	1	6 5 5 5 4 2 1 0 -	4
7 6 4 4 4 2 1 0 -	1	6 5 5 5 4 1 1 1 -	5
7 6 4 4 4 1 1 1 -	2	6 5 5 5 3 3 1 0 -	5
7 6 4 4 3 3 1 0 -	2	6 5 5 5 3 2 1 1 -	7
7 6 4 4 3 2 2 0 -	3	6 5 5 5 2 2 2 1 -	7
7 6 4 4 3 2 1 1 -	4	6 5 5 4 3 2 2 1 -	10
7 6 4 3 3 2 2 1 -	6	6 5 5 4 4 3 1 0 -	6
7 6 4 3 3 3 2 0 -	4	6 5 5 3 3 3 3 0 -	9
7 6 4 3 3 3 1 1 -	5	6 5 5 4 3 3 1 1 -	9
7 6 3 3 3 3 3 0 -	5	6 5 5 4 3 3 2 0 -	8
7 6 3 3 3 3 2 1 -	7	6 5 4 4 4 4 1 0 -	7
7 6 3 3 3 2 2 2 -	8	6 5 4 4 4 3 2 0 -	9
7 5 5 5 3 2 1 0 -	1	6 5 4 4 4 3 1 1 -	10
7 5 5 4 4 2 1 0 -	4	6 5 4 4 4 2 2 1 -	10
7 5 5 4 4 1 1 1 -	5	6 5 4 4 3 3 2 1 -	9
7 5 5 4 3 3 1 0 -	3	6 5 4 3 3 3 2 2 -	8
7 5 5 4 3 2 1 1 -	4	6 4 4 4 4 4 2 0 -	10
7 5 5 4 3 2 2 0 -	4	6 4 4 4 4 3 3 0 -	11
7 5 4 4 4 3 1 0 -	5	6 4 4 4 4 4 1 1 -	11
7 5 4 4 4 2 1 1 -	5	5 5 5 5 5 2 1 0 -	5
7 5 4 4 3 3 1 1 -	3	5 5 5 5 5 1 1 1 -	6
7 5 4 4 3 3 2 0 -	5	5 5 5 5 4 2 2 0 -	8
7 5 4 4 3 2 2 1 -	5	5 5 5 5 4 3 1 0 -	7
7 5 3 3 3 3 3 1 -	9	5 5 5 5 4 2 1 1 -	9
7 4 4 4 3 3 3 0 -	10	5 5 5 5 3 3 2 0 -	11
6 6 6 2 2 2 2 2 -	6	5 5 5 5 3 2 2 1 -	11
6 6 6 3 3 2 2 0 -	3	5 5 5 5 2 2 2 2 -	12
6 6 6 4 2 2 1 1 -	3	5 5 5 4 3 3 2 1 -	13
6 6 6 3 2 2 2 1 -	5	5 5 5 4 4 2 2 1 -	12
6 6 6 3 3 3 1 0 -	2	5 5 5 4 4 3 1 1 -	11
6 6 6 4 2 2 2 0 -	2	5 5 5 4 4 3 2 0 -	10
6 6 6 4 3 2 1 0 -	1	5 5 5 4 4 4 1 0 -	5
6 6 5 5 3 1 1 1 -	3	5 5 5 3 3 3 2 2 -	14
6 6 5 5 2 2 1 1 -	4	5 5 4 4 4 3 2 1 -	14
6 6 5 5 2 2 2 0 -	3	5 5 4 4 4 4 1 1 -	12
6 6 5 5 3 2 1 0 -	2	5 4 4 4 4 4 2 1 -	15
6 6 5 4 3 3 1 0 -	4	5 4 4 4 4 3 3 1 -	16
6 6 5 4 3 2 1 1 -	6	5 4 4 4 4 4 3 0 -	13
6 6 5 4 3 2 2 0 -	5	5 4 4 4 4 3 2 2 -	17
6 6 5 4 4 2 1 0 -	3	5 4 4 4 3 3 3 2 -	16
6 6 5 4 4 1 1 1 -	4	4 4 4 4 4 4 4 0 -	14
6 6 5 4 4 2 1 0 -	3	4 4 4 4 4 4 3 1 -	17
6 6 5 3 3 2 2 1 -	7	4 4 4 4 4 3 3 2 -	19
6 6 4 4 4 3 1 0 -	5	4 4 4 4 4 4 2 2 -	18
		4 4 4 4 3 3 3 3 -	20

¹Adapted by O. L. Caskey from an original copyrighted table developed by Carl Safran, with permission of the author.

VITA

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Doctor of Philosophy

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Biographical:

Personal Data: Born in Muskogee, Oklahoma, April 21, 1926, the son of Hugh M. and Lillian P. Marsh.

Education: Attended elementary and secondary school in Muskogee, Oklahoma, graduated from Central High School, Muskogee, Oklahoma; attended first year of college at Kemper Military School, Booneville, Missouri, 1943-1944; attended United States Naval Academy, Annapolis, Maryland, 1944-47; received the Bachelor of Science degree with a major in Education from Kansas State College, Pittsburg, Kansas, January, 1952; received the Master of Arts degree with a major in the Christian ministry from Ozark Bible College, Joplin, Missouri, June, 1952; received the Master of Arts degree with a major in pastoral psychology, June, 1962; participant in the NDEA Guidance and Counseling Institute for the academic year 1961-62 at Oklahoma State University; participant in NDEA Institute for College Counselors, Stanford University, Palo Alto, California, summer, 1966; completed requirements for the Doctor of Philosophy degree in May, 1967.

Professional Experience: Served as assistant manager for the theaters and concessions in Muskogee, Oklahoma, for the year 1947-48; served as part time minister for the various churches in Missouri from 1949 to 1952; served as secondary public school teacher of mathematics in Diamond, Missouri, 1952-53, and Carthage, Missouri, 1953-54; served as resident minister of First Christian Church, Sallisaw, Oklahoma, 1954-58; served as secondary public school teacher of mathematics in Oklahoma City, Oklahoma, 1958-61, and 1962-63; also served as chairman of the Department of Mathematics in the John Marshall Junior-Senior High School in Oklahoma City, Oklahoma, 1959-61;

served as non-resident minister for the Christian Church at Luther, Oklahoma, 1958-62; served as Counselor in the University Counseling Service, January, 1964 to date; received a grant from the U. S. Department of Health, Education, and Welfare in support of this dissertation, October 1, 1966, to March 31, 1967.

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