

CONSTRUCTION AND VALIDATION OF A COLLEGE
DROPOUT PREDICTOR SCALE FOR THE
MINNESOTA COUNSELING INVENTORY

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PREFACE

An abiding characteristic of higher education in the United States is that approximately one-half of all college entrants are eliminated in one way or another prior to graduation. As greater numbers of individuals have sought higher education and as pressures for increased efficiency in educational institutions have been heightened, attention has been focused sharply on the problem of college student dropout. Much has been published in scholarly journals and elsewhere regarding college attrition; but, as yet, little has been accomplished in reducing the rate of its occurrence. The investigation reported herein originated from the premise that attrition rates cannot be substantially reduced until a more effective means is devised for predicting individual cases of college student dropout. The principal objective of the study was to construct a scale of essentially non-intellective test items which would supplement conventional scholastic aptitude measures in predicting dropout.

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CHAPTER I

THE NATURE OF THE PROBLEM

Introduction

This dissertation reports an investigation of some factors related to college student dropout. The primary objective of the study was to extend presently used methods of appraising students toward the end of developing a more effective means of predicting college student dropout.

Studies of the extent of college student dropout have produced data which indicate that over one-half of all students entering four-year colleges withdraw temporarily or permanently from college prior to graduation. Though subject to various interpretations, such data quite clearly indicate that college student dropout directly affects a large portion of the college student population. Since it does directly affect large numbers of the nation's youth--most of whom are among the more academically talented one-half of the population as a whole--college student dropout becomes a matter of concern to higher education institutions and to the society of which they are a part.

A basic assumption underlying this study is that each case of college student dropout does represent at least a small loss to the individual, the institution, and the larger society involved. This assumption is held despite the fact that dropout in some cases may signify goal fulfillment as much as failure, and despite the commonly

expressed view that dropout is necessary in order that institutional standards be maintained. This study was undertaken on the further assumption that the personal and social loss associated with college dropout will be substantially reduced only when it becomes possible to more accurately predict individual cases of dropout.

Except where otherwise indicated, the terms "attrition," "school leaving," "withdrawal," "student mortality," and "dropout" have been used interchangeably in this report. This was done solely in the interest of reducing monotony for the reader. The decision to use the terms as synonyms was based upon the observation that they have been used as such rather than upon any firm conviction that they should be.

General Background and Need for the Study

The current period in the history of American education has often been labeled as one of "re-evaluation." No discipline and no educational level, from the nursery through the graduate school, has escaped critical re-examination from within and from without. Numerous individuals and groups have demanded that effort be made within each discipline and at each educational level to reconcile objectives, practices, and outcomes to some generally acceptable philosophy for contemporary American education.

During this period of reappraisal, few issues have been raised which are more difficult to reconcile with commonly expressed American values than that of large numbers of youth voluntarily and involuntarily discontinuing their formal schooling without attaining the educational goals held for them by society. Evidence of growing national concern in this area may be found in vast programs recently initiated by the Federal

government to provide student aid and special educational and training programs for further development of human resources not being handled satisfactorily by existing agencies.

The frame of reference within which the general problem of early school leaving has been discussed has been dominated at times by concern over human resources not being fully developed for personal or societal need satisfaction, and at other times by concern over "waste" and "inefficiency" in the social institutions assigned the task of providing formal educational experiences. Analysts have, with apparently ample justification, placed the responsibility for what appear to be excessively high student dropout rates both upon the schools and upon the society of which they are a part. For the most part, however, the task of effecting a resolution or reduction of the problem has been left to the professional educator. The implicit assumption appears to be that since the phenomenon of dropout is initially manifested in relation to an educational institution, agents charged with management of such institutions should be the most able to deal effectively with it.

The study reported on the following pages was concerned with school leaving at only one educational level, namely, within the undergraduate college. Since at least as long ago as the first year of this century, concern has been expressed by members of the education profession over college student dropout rates. As college enrollments have increased during this century, so have published reports of investigations into factors related to dropping out of college. In reporting his study of student withdrawal from a nation-wide sample of colleges, Iffert (48), with no claim of exhaustiveness, listed a total of 156 related references, 127 of which had appeared between 1950 and 1957. In reviewing published

and unpublished research reported between 1948 and 1958 on factors related to "success" in college, Fishman and Pasanella (29) found a total of 580 studies.

Since the period surveyed by Iffert and by Fishman and Pasanella, interest in college student mortality has been heightened even further by pressures arising from the "space race," and from increasing awareness of what has been described as a "tidal wave" of college bound youngsters flowing through the lower schools. The continuing concern over college dropout is reflected in Summerskill's (92) recently published review of research on college dropout.

For all the attention the problem has received, rates of voluntary and involuntary withdrawal from college appear to have changed little. Summerskill (92, p. 631) after examining median dropout figures for a number of studies conducted during each of the last four decades, concluded that "apparently the attrition rate has not changed appreciably in the past forty years." He reported median four-year dropout percentages of 53, 50, 49, and 51, respectively, for the 1920s, 1930s, 1940s, and 1950s.

If the conclusion is accepted that significant changes in college dropout rate have not occurred, it may be viewed with mixed feelings. In view of rapidly increasing enrollments and of the greater diversity of talent represented, it may be somewhat surprising that dropout rates have not increased during this century. Merely holding the line against increases in college student mortality may be considered a noteworthy accomplishment. However, others would argue that greater numbers of lower ability students are entering college, and that dropout rates must be expected to rise if academic standards are to be protected. To still others, the possibility of a continued college student dropout rate as

high as the most conservative estimate derived from recent studies is distressing in that grossly inefficient utilization of human and physical resources is suggested. In addition to the dollars and cents loss to individuals and to society, debilitating emotional reactions of at least a transitory nature may take an added toll in terms of diminished feelings of personal integrity and worthiness. If, through early identification of dropout-prone individuals, it is possible in some way to substantially reduce such losses without initiating counteractive forces, then permitting those losses to continue would seem incompatible with basic tenets of contemporary American educational philosophies.

On the basis of his investigation into college student dropout, Thorndike (94, pp. 8-9) supported essentially a "Darwinian" selection policy. His position was stated as follows:

Elimination by incapacity, indolence, and distaste is surely a chief cause of the first years loss. This elimination is, I believe, more useful to the college than the elimination before admission by entrance examination.

.....

The large dropping out of students from colleges is, of course, regrettable from the general philanthropic point of view, which wishes to secure for all the greatest educational opportunities. The important consideration is not how many leave school, but who they are. If the college that loses half its class at the end of the first year loses the less gifted, most idle, and most common half, it need not perhaps feel that it is in need of reform, and may even congratulate itself in comparison with a college which loses only five percent, but loses these from the most gifted, earnest, and superior men or women.

A half-century later, Iffert (48), after completing the most comprehensive study of college student withdrawal reported to date, questioned the basic premise upon which Thorndike's statement rested. In summarizing the results of his study, Iffert (48, pp. 97-98) made the following statement:

Extending the practice of faculty selection of students by sifting and sorting after the students have been admitted, registered, and entered classes can be accompanied by serious risks for both institutions and students. In publically controlled institutions where the practice of faculty selection after admission and registration is acknowledge to be more common, the retention rate of able students, as indicated by every criterion, is distressingly low.

In the year 1905, Thorndike may have had ample reason to question the validity of entrance examinations as predictors of achievement and persistence in college. At that time, both psychological theory building and test construction techniques were in their infancy. General psychological constructs were limited in number and in scope, few empirical data had been compiled describing or relating possible etiological agents in the low achievement-dropout syndrome, and available educational and psychological measuring instruments were relatively few and not well standardized.

However valid Thorndike's statement may have been in the year 1905, it would seem that with a half-century of advances in theory building, with the wealth of descriptive and correlative data which have been compiled, and with the more sophisticated testing instruments and procedures now available, some more efficient and socially acceptable approaches may be found which will significantly reduce the role of post-admissions selection in higher education. Strong public sentiment favoring extremely liberal admissions policies has served to perpetuate the practice of post-admissions selection, particularly in publicly financed and controlled institutions. At the same time, however, burgeoning enrollments and rising per unit costs have steadily increased pressure for greater efficiency.

Instruments have been constructed which assess with considerable accuracy a number of intellectual factors and skills which are closely

7

associated with academic achievement in college. However, no generally acceptable means has been found for assessing the host of essentially non-intellective personal and environmental variables which appear to be related both to academic achievement and to continuation in college.

Summerskill (92, p. 649) called for additional research on variables of both an intellective and a non-intellective nature in relation to dropout from college. In discussing procedures which might be employed in such future studies he stated that ". . . assumptions in future research should be carefully formulated in the light of what is known and not known about the attrition process." In keeping with that recommendation, the next chapter of this report is devoted primarily to a discussion of methodology and findings of research on college student dropout.

CHAPTER II

BACKGROUND FOR THE PRESENT STUDY

Introduction

This chapter consists of a review of relevant literature, discussion of a theoretical framework for the study, and statement of hypotheses. In this section attention is given to methods which have been used and to others which seemingly may be used to assess relationships between non-intellective factors and the manifestation of persistence and academic achievement by students in a college setting. Hypotheses are stated regarding relationships examined in this investigation.

Review of Literature

Formal research on college student retention and withdrawal has been widespread and essentially continuous for at least the last sixty years. However, only recently have efforts been made to bring together and systematize what is known of the etiology and of the correlates of behavioral patterns commonly referred to collectively as "dropout." Such an undertaking by Summerskill (92) was reported in 1962.

Early research on college student dropout was concerned primarily with determining the numbers and percentages of students who left their college of first enrollment prior to graduation. Thorndike's (94) study

of dropout from thirty-four colleges from 1900 to 1904 was of that type. No attention was given to determining possible causes or correlates of dropout. In reporting the results of his study, Thorndike expressed less concern over the high percentage of attrition he observed than over the possibility that the "elimination" process might not be operating effectively. Tabulations for determining dropout rate continue to the present time, but their value, except for gross evaluative purposes, appears to be limited.

A second widely used approach which has persisted to the present time despite a number of serious limitations is that of attempting to identify important causes of dropout through various self-report techniques. In studies of this type, data have been gathered at the time of termination or through follow-up. Variations include individual interviews, checklists, and questionnaires. The validity of most such data might well be questioned. The factor of social desirability of response could easily make the results of such studies invalid. Sampling errors may further reduce the value of such studies, particularly where follow-up is included in the design of the investigation. This type of difficulty is illustrated by the following statement by Iffert (48, pp. 12-13) regarding his nation-wide dropout study sponsored jointly by the U. S. Office of Education and the American Association of Collegiate Registrars and Admissions Officers:

Quantitative and qualitative differences between respondents and nonrespondents must be taken into account in the interpretation of the findings. The bias due to the differences in response rate is illustrated in Tables VI and VII. The percentage of men in the total sample who withdrew from 4-year institutions during or at the end of the first year, for example, was 27.4; for respondents 19.8, and for nonrespondents 39.6, exactly twice as high.

.....

The comparisons showed that the average of college grades for respondents in each type of institution was significantly higher than that for the nonrespondents and that the average high school tenths [deciles] and average placement tenths for respondents from teachers colleges were significantly higher than for nonrespondents.

In studies where students have been asked to give reasons for dropping out of college (either at the time of termination or through follow up) a wide variety of responses has usually been obtained. On the basis of some 8,000 responses, Iffert (48, p. 98) concluded the following:

Reasons for going to college and reasons for leaving college had a common characteristic namely, complexity. Few students identified one overriding reason for either action.

It is generally agreed that in terms of gross reasons which might be verbalized, "financial problems" and "academic difficulty" are the most common "causes" of dropout from college. The notion that this is the case, and that it has been for some time, is supported by data shown in Table I. In Table I are summarized the results of fourteen dropout studies conducted between 1913 and 1955. In each study, students were asked to indicate the reasons for their withdrawal from college.

It can be noted that with the exception of one omission, the three general factors listed in Table I (financial difficulty, academic difficulty, and change or loss of interest or general dissatisfaction) were in each study found to be among the four "causes" mentioned most often. Three other factors which have been mentioned frequently in studies of this type are marriage, military service, and health problems. A review of studies of this type completed over the last forty years indicates that the only distinct changes in the cause of dropout may be associated with military service obligations during periods of national emergency and the decreasing incidence of serious illness and death among college students.

TABLE I
 IMPORTANCE ATTACHED TO THREE COMMON WITHDRAWAL FACTORS
 APPEARING IN COLLEGE DROPOUT STUDIES

| Author of Report | Period Studied | Rank in Importance as a Cause of Withdrawal | | |
|------------------|----------------|--|---------------------|---|
| | | Financial Difficulty | Academic Difficulty | Change or Loss of Interest or General Dissatisfaction |
| Snitz (85) | 1913-23 | 1st | (not given) | 3rd |
| Smith (84) | 1919-20 | 2nd | 1st | 3rd |
| Moon (66) | 1925-26 | 1st | 4th | 3rd |
| Pope (75) | 1930 | 1st | 3rd | 2nd |
| McNeely (58) | 1931-36 | 2nd | 1st | 3rd |
| Snyder (86) | 1937-39 | 1st | 4th | 3rd |
| Mitchell (64) | 1937-39 | 2nd | 1st | 2nd |
| Cumings (17) | 1947-48 | 3rd | 2nd | 1st |
| Wiehe (101) | 1947-52 | 3rd | 1st | 2nd |
| Koelsche (50) | 1948-52 | 1st | 3rd | 4th |
| Iffert (48) | 1950-54 | 1st | 3rd | 2nd |
| Brunstetter (13) | 1951 | 2nd | 1st | 2nd |
| Mathews (56) | 1950-54 | 4th | 1st | 2nd |
| Moore (67) | 1955 | 2nd | 1st | 4th |

In another group of college dropout investigations, a clinical case study approach has been used. Wells (98) (99) (100) and Woods and Chase (102) have reported studies of this type. Below are examples of notations made by Wells (100, p. 155) in considering "Case LVII":

On an obviously modest equipment [the student] took a heavy course load, and failed badly in carrying it. No relevant clinical pathology.....

Comfortable economic status; exercise slight, individual; interest rather heavy ideational, cultural; favorable social impression "but not very forceful . . . friendly, well spoken . . . able to get along." Grades never satisfactory and progressively less so. Linearity 14.7, markedly ectomorphic.

Psychiatrically, low intelligence, without drive or academic habits to offset; "hard to see why he was ever allowed to come to Harvard in the first place."

.....
 . . . Rorschach response well developed; response number about one sigma high; special development of Movement and white space, good Orientation and Organization.

. . . He appears handicapped to an unusual degree by the rigid requirements of the conventional multiple choice test His academic failures are believed to result not from a basically inadequate intellectual equipment, but from failure to bring this intellect under effective discipline.

Woods and Chase (102) reported the results of a comprehensive assessment of 145 women students at the University of Iowa who "for reasons other than deficiency in health or money . . . were not progressing safely toward their goals." After information was gathered from a number of sources including personal interviews by mental and physical health personnel, the subjects for the study were found to be classifiable within the following three categories (102, pp. 428-429):

(a). Revealing non-development or maldevelopment of normal affective capacities Persistence of infantile modes of reaction, lack of individual purposefulness, and failure to appreciate social values.

(b). Having interests and individuality which were positively developed, but which were not harmonious with, and could not be satisfied by, the college activities that surrounded them.

(c). Showing general mental confusion and incoordination produced by emotional activity which was inappropriate to, and failed to reinforce, the reactions that would be advantageous to those individuals in their present situations.

Woods and Chase found little relationship between scholastic aptitude test scores and failure of the students they studied to make "satisfactory progress toward graduation." However, after studying separately a group of students whose aptitude scores were below the mean for the institution in which they were enrolled, the following statement was made (102, p. 428):

Students with insufficient intellectual ability to attain success through college training, as it is now being given, follow one or more of several courses, if they remain in college. Many feel humiliated, look upon themselves as failures, become emotionally disturbed, and a considerable number develop neuroses. Some fight the feeling of inferiority, unconsciously place the blame upon circumstances or upon other persons, and develop paranoid personality traits. Many discover other activities, good or bad, in which they can succeed and thereby win satisfaction and recognition, withdraw attention and effort from academic work, and devote their time to these profitable and unprofitable substitutes. A considerable number, after wasting more or less time and money, withdraw from college.

The general conclusion drawn by Woods and Chase was that "most of them [both high and low aptitude students] were failing to develop adaptive power even to the relatively easy collegiate environment."

Summerskill (92) and Feder (24) have suggested that complex patterns of dropout causation can be determined only through clinical studies of a type similar to those just described. Though of obvious value for diagnosing individual cases and for generating hypotheses to be tested under other conditions, the clinical assessment approach has limitations which have prevented its widespread use in dropout studies.

In recent years, the most popular approach to research on college dropout has been the correlation study. Summerskill has summarized the results of a number of studies of this type in which such factors as age at matriculation, sex, socio-economic level, hometown location and size, secondary school preparation, scholastic aptitude test scores, academic performance at college, motivation, illness and injury, means of financial

support, and personal adjustment were assessed in relation to dropout.

Below are summarized some conclusions drawn by Summerskill (92, pp. 631-647) on the basis of his review of the literature.

(a). Age per se does not affect attrition although older undergraduates may encounter more obstacles to graduation.

(b). Men and women withdraw at similar rates but perhaps for different reasons. Women, being more highly selected, as a rule make better grades. However, more women than men withdraw for non-academic reasons, primarily for marriage.

(c). Educational values held by parents and the certainty with which the youth identifies with his parents may be more consistently related to dropout than is socio-economic level.

(d). Attrition rate among students from a given home community may be less related to the location and size of that community than to the degree of disparity between its cultural and educational environment and that of the colleges in which its children enroll.

(e). High school grades, scholastic aptitude test scores, and early college grades are related to college attrition.

(f). Size of high school may be related to attrition rate; the relationship probably being due in part to differences in social development.

(g). The source and strength of motivation for college attendance appears to be related to attrition rate.

(h). Dropouts due to illness and injury constitute a relatively small fraction of the total Deaths are infrequent and due primarily to accidents rather than illness.

(i). Financial difficulty may be an important cause of college attrition but its importance may be overstated if students find it a more acceptable response than lack of motivation or lack of ability.

(j). Self support may have a slightly enhancing effect or no effect on continuation in college.

On self-report questionnaires employing direct question techniques, dropouts give relatively little weight to adjustment as a causative factor. However, clinical studies have suggested that adjustment may be one of the major factors, figuring importantly in over fifty percent of all cases of dropout. Data by Farnsworth, et al., (23) suggest that in many

cases where dropout is attributed to academic failure, adjustment difficulties may have played the dominant role. In correlation studies, a number of adjustment measurements and other personality variables have been related to academic achievement in college, but very few to dropout. A list of variables which have been examined in relation to academic achievement in college would include:

- Strength of need for achievement (33)(44)(51)(60)
- Strength of need for order (33)(44)(51)(60)
- Strength of need to dominate in personal relations (61)
- Strength of need to affiliate (33)(44)(51)(60)
- Strength of need to be dependent (33)(37)(44)(51)(60)
- Strength of need for change, variety (45)(61)
- Strength of need for autonomy (61)
- Strength of need for self exhibition (12)(61)
- Strength of need for association with opposite sex (51)
- Strength of need to be aggressive (51)
- Feelings of inferiority (59)
- Stereopathic or authoritarian personality patterns (91)
- Nonconformity, rebellion (23)(102)
- Social inadequacy (31)
- Immaturity (102)
- Irresponsibility (12)(37)
- Worry and anxiety (31)(59)
- Non-adaptability (97)
- Ability to persist in tasks (33)(44)(51)(61)
- Introspectiveness (33)
- Test-taking attitude (41)
- Hypochondriasis (41)
- Psychopathic tendency (41)
- Hypomania (41)

Few studies have been made of the correlates of dropout, per se. Chilman (16) found for a group of ninth and tenth grade students that dropouts and potential dropouts had significantly lower needs for "achievement," "order," "pragmatism," "understanding," and "cautious-controlled behavior." In addition, she found that male dropouts and potential dropouts expressed less need for "responsive-self-sufficient" behavior than males who were either classified as potential graduates or who did graduate from high school.

Chilman's observations are consistent with those reported by Lichter, et al. (55), who also studied dropout at the pre-college level. Lichter, et al., report that in their sample of high school dropouts, males tended to appear apathetic, while females did not.

On the basis of a study in which Minnesota Counseling Inventory factor scores of college dropouts were compared with those of non-dropouts, Brown (12) indicated that his male dropouts tended to be somewhat irresponsible and nonconforming, while the females who dropped out tended to be somewhat more withdrawn, introverted, depressed, and socially isolated than their classmates who remained in college.

Grace (37) reported data supporting a hypothesis that college students who valued both independence and responsibility would tend to be less anxious (as measured by the Taylor Manifest Anxiety Scale) and more apt to continue their education than fellow students who were dependent and irresponsible. This general relationship tended to be more true for females than for males.

In a study comparing MMPI scores of college graduates with those of their former classmates who completed one year or less at the institution of first enrollment, Drasgow and McKenzie (21) found that three-fourths of the dropouts had scores as high as 70 and that only one-fourth of the graduates had a profile peak of that magnitude. Furthermore, mean scores for the dropout group were significantly higher than mean scores of graduates on eight of the nine standard MMPI clinical scales. In each case, the mean score for graduates was closer to the published mean for "normal adults" than was the mean for dropouts.

In addition to the four research approaches which have been discussed, three others which seemingly have some merit have received little attention

in the literature on college student dropout. The first, an empirical item analysis approach, would represent an extension upon earlier correlation studies. Items from a multi-factor personality instrument which best discriminate between persons who have become dropouts and others who have not would be pooled into a single "cross-dimensional dropout scale." Thus, a new scale would be available, all the items of which had been empirically shown to discriminate between the two criteria groups.

This empirical item analysis approach has been employed by Hackett (42), Gough (35), and Altus (2) for constructing scales of non-intellective test items predictive of academic achievement in college. Hackett (42) selected seventy-two Minnesota Multiphasic Personality Inventory items which he judged to be discriminatory between eight male high achievers and eight male low achievers. In a cross-validation study involving one-hundred students he obtained a value of $\underline{r} = .61$ for the correlation existing between first semester college grades and scores obtained on his experimental scale. A correlation coefficient of only $\underline{r} = .10$ was found between ACE scores and scores on the experimental scale. A multiple correlation value of $\underline{r} = .69$ was found between experimental scale scores, ACE scores, and college grades; considerably higher than the value of $\underline{r} = .39$ obtained when ACE scores were used alone to predict grades.

Gough (35) developed a brief personality scale specifically for predicting college undergraduate grades, particularly those earned in Psychology courses. From a pool of 150 test items, thirty-six were selected for the scale. Of those, sixteen were from the Minnesota Multiphasic Personality Inventory. In cross-validation studies, scores on his experimental scale were found to be correlated with college course grades to the extent of $\underline{r} = .38$, and with high school grades to the extent of

$r = .36$. Scores on his experimental scale were further found to be correlated to the extent of $r = .26$ with measures of intelligence and $r = .38$ with measures of academic achievement other than grades.

Altus (2) selected sixty Minnesota Multiphasic Personality Inventory items which by his definition discriminated between twenty-five high achievers and twenty-five low achievers in an elementary Psychology course. From these sixty items he further selected a scale of twenty-six items for his experimental scale. Scores on his final scale were found to be correlated to the extent of $r = .39$ with honor point ratio, $r = .40$ with Psychology term grades, and $r = .21$ with intelligence test scores.

Heilbrun and Sullivan (46) have employed a similar approach in finding and cross-validating personality differences between counseling center clients who "defect" prematurely from counseling and those who remain long enough to secure substantial benefit from it. Items in the Gough Adjective Check List which received different responses from the two criterion groups were combined to form a "counseling readiness scale."

The possibility that a personality scale score might be obtained which would have high validity for predicting college dropout is strengthened by findings reported by Drasgow and McKenzie (21). Their finding that MMPI profiles tended to be higher for first-year college dropouts than for graduates suggests a fairly consistent relationship between adjustment and continuation.

A single scale of items drawn from several factor areas of a personality inventory would of itself provide little diagnostic information regarding the causes or conditions of a given case of dropout. It appears, however, that such a scale could have fairly high predictive validity, and that it could be scored and perhaps utilized by persons who

are relatively unsophisticated in testing procedures. It would seem that construction and validation of a scale of dropout-predictive items within a widely used high school and college personality inventory would represent a significant research contribution.

A second additional research approach with possible utility for dropout studies is that of assessing dropout behavior in relation to the compatibility of the student with important aspects of his college environment. This approach has been used by Stern (91), Thistlewaite (93) and Nasitir (72) to investigate relationships between individuals and environments for predicting academic achievement, but has apparently not been used to study dropout per se.

A third approach which has not been widely used in dropout investigations is controlled experimental study. Research on dropout has consisted almost entirely of ex post facto examination of variables rather than of prearranged control and manipulation. Since experimental research ideally rests upon theoretical formulation, it is understandable that such studies have been late in coming. However, it would seem that through other means of investigation a sufficient number of relationships will soon have been established to suggest possible experimental research studies in this area.

Some Constructs Related to College Student Dropout

The need for theoretical constructs to serve as bases for research studies is nowhere greater than in the field of education. Fishman (28, p. 678) expressed the need for new theoretical foundations, as follows:

First of all, I believe that we suffer from a serious lack of a theory of personality factors that relates them to a theory of college behavior, generally, and to the academic learning process more specifically.

If the behavior of a potential college dropout in a given situation is a function of the internal cognitive and affective structure which he brings to the situation and the objective elements of the situation or environment he enters (73, pp. 91-92)(79, p. 37), then research on dropout might logically follow three major channels: the personal, the environmental, and an interaction of the two. Summerskill (92, p. 648) has employed such an "internal-external" breakdown of factors in discussing further research needed on "the student" and on "the college." Fishman (28) also has used this framework as the basis of a model for aiding in the prediction of scholastic achievement in college. Though concerned with a slightly different problem, Fishman employed constructs which may be of value in dropout studies.

As a starting point, Fishman accepted high school grades as being the best single predictor of college grades. Further, he postulated that the predictive validity of this measure for a given individual is related to the degree of similarity between his high school and college environments, and between the individual's personal development as a high school student and as a college student.

The formulation presented by Fishman appears directly relevant to college dropout investigations only to the extent that college grades are related to continuation. Data assembled by Summerskill (92, p. 636) suggest that, though consistent as to direction, the relationship between college grades and staying in school may be highly variable. For example, Summerskill reported that ". . . in a series of 23 studies, the percentage of academic failures among those who dropped out ranged from 3 percent to 78 percent."

High school scholastic achievement data, then, do not appear to be of as much value for predicting college dropout as for predicting college grades. High school grades, being on a continuous scale, are more closely related to the continuous college grades measure than to the discrete college dropout measure. The high school analogue of college continuation is of even less predictive value in that all college entrants have essentially the same record of continuation in high school. The most readily apparent adaptation for dropout research which might be made of Fishman's (28) formulation is in assessing the extent to which changes in motivation for college attendance may be related to differences between high school and college environment, and between personal characteristics of given individuals while attending high school and while in college. The general issue of motivational change will be considered in some detail in a later section of this report.

Formulations presented by Stern (90), and Stern, Stein, and Bloom (91) offer still other possibilities for dropout research. Their conceptualization is based on assumptions regarding the existence of internal personality "needs" and an external or environmental "press." The latter may be described as the private world existing for each individual as only he views it. This scheme of "needs" and "presses" is largely a reformulation of a system proposed by Murray (71). Instruments have been constructed to assess some thirty personality "needs" and their counterpart "presses" (88). By means of these instruments it is said to be possible to determine the congruence of an individual student's "needs" with the "presses" of a given college environment (89)(90). Stern (90, p. 702) indicated that lack of congruence between "needs" and "presses" may lead to underachievement and/or withdrawal.

In addition to assessing personal-environmental congruence, instruments designed to measure personality "needs" and high school and college "presses" may be of value in testing the previously discussed model of Fishman (28).

Nasatir (72) has employed a "needs-press" formulation similar to that of Stern (90) in a study of the influence of compatible and conflicting "needs-presses" patterns upon rate of academic failure in four "identical" college dormitories. Individuals and groups were characterized as being either "academically oriented" or "non-academically oriented" on the basis of answers to a question regarding the main purposes of a college education. Attending college primarily "to obtain a basic general education and appreciation of ideas" was taken as an academic orientation. Other responses were considered as non-academic. In addition, an assessment was made of the extent to which each individual was truly a part of his living group by asking of each the proportion of time spent with other members of the group. Those spending at least half of their time with other members of the group were considered to be "integrated."

Some summary data from Nasatir's study are given in Table II. These data indicate that for both "integrated" and "non-integrated" individuals, failure rates were lowest for persons who were in compatible contexts, and highest for those who were not. Furthermore, it appears that failure rates were higher in each cell for "non-integrated" individuals than in corresponding cells for "integrated individuals."

Data from Nasatir's study lend considerable support to a contextual or environmental approach to dropout research, but seem to point equally to the importance of adjustment difficulty as a cause of dropout. In Nasatir's study, the rate of failure among individuals who did not become

"integrated" within their living group was over twice that for socially "integrated" individuals.

TABLE II

FAILURE RATE BY TYPE OF INDIVIDUAL ORIENTATION,
TYPE OF CONTEXT, AND DEGREE OF INTEGRATION (72)

| Type of Individual Orientation | Integrated Individuals | | Non-integrated Individuals | |
|--------------------------------------|---------------------------|-----------------------------|-------------------------------|-----------------------------|
| | Academic Context | Non- academic Context | Academic Context | Non- academic Context |
| <u>Academic</u> | | | | |
| Total Frequency | 14 | 16 | 28 | 26 |
| Failure Frequency | 0 | 3 | 3 | 8 |
| Percent Failure | 0% | 19% | 11% | 29% |
| <u>Non-academic</u> | | | | |
| Total Frequency | 38 | 29 | 82 | 77 |
| Failure Frequency | 6 | 2 | 25 | 13 |
| Percent Failure | 16% | 7% | 30% | 17% |

Another set of constructs with possible relevance to dropout research has been presented by Roth and Meyersburg (76). They conceptualize the onset of behaviors labeled as the "non-achievement syndrome" as "a circular process of disparagement, anxiety, functional disability, hopelessness, frustration, disparagement, etc. . .," which they feel may be interrupted by a specific psychotherapeutic approach.

In relating the work of Roth and Meyersburg to dropout research, a question to be examined is whether there exist consistent patterns of behavior which might be called "dropout syndromes," and whether the constructs they presented, or others, are of utility in explaining the

onset of these behavioral patterns.

Slater (82)(83) has drawn upon several general perception and motivation constructs in presenting a theoretical formulation for attrition and persistence. He begins with the assumption that "a person persists in an activity so long as the activity serves the psychological needs of the individual." Employing Lewin's (53, p. 79) notion that "psychological satiation" is a precedent of diminished or discontinued activity, Slater (82) developed postulates which might be summarized as follows:

1. Dropout follows satiation of the need served by college attendance.
2. If academic activity is of such a nature as to seem instrumental to achievement of personal goals, satiation will not occur and continuation in college can be expected.
3. Satiation is assumed when an activity takes on the psychological characteristic of repetition--that of "marking time" as opposed to "making progress."

In Slater's formulation, importance is placed upon accuracy of perception. He suggests that "tendencies toward persistence and attrition can be found within the perceptual field of each student," and that "persistence and attrition are a function of the relationship which exists between curricular objectives and student perception of the curriculum which promotes these objectives."

As stated, Slater's system relates primarily to dropout associated with curricular aspects of college attendance. It would appear to have wider application, however, particularly for examining the etiology of interdisciplinary or interinstitutional transfer and the dropping out of college by persons whose primary reasons for attendance were noncurricular.

From their study of public school dropouts in Chicago, Lichter, et al, (55, p. 102), also derived an essentially hedonic motivational

construct for school-leaving. The following statement appears to represent their view:

School-leaving, like any other human behavior, is essentially grounded in the pleasure-pain principle. When school problems have reached the point where school is predominantly ungratifying and an unhappy experience, leaving school is an escape hatch, and the wish to drop out is very strong. It assumes some of the aspects of the "magic answer" to the student's difficulties. Although most students realize the advantages of completing high school, such knowledge is of little avail against the complex internal and external forces pressing toward leaving school,

If the above statement is correct, it might be expected that students experiencing a build-up of "complex internal and external forces pressing toward leaving school" will increasingly employ defense mechanisms in an effort to operate with some comfort in the reality surrounding them.

The level of aspiration construct discussed by Lewin, et al. (54), may be applicable to studies of dropout and may also be of value in reducing the variance commonly found in the relationship between scholastic aptitude and achievement. Lewin has defined level of aspiration as "the degree of difficulty of the goal toward which a person is striving." "Degree of difficulty" is most often defined in a relative sense; that is, relative to the subject's earlier achievement in the same or a similar task. Frank (30, p. 119) has defined level of aspiration as "the level of future performance in a familiar task which an individual, knowing his level of past performance in that task, explicitly undertakes to reach."

Research with level of aspiration constructs by Aronson and Carlsmith (7), Festinger (25)(26), Frank (30), Gould (36), and Murray (71) has indicated that aspiration level is influenced by the actor's perception of both his previous performance and the norms of the groups of which he is a part. However, data from Naşatir's (72) study given in Table II of this

report, suggest that degree of "integration" within a group may influence academic achievement to a greater extent than the quality of norms held by the group involved. The general lack of agreement between Nasatir's findings and the generally accepted notion that strength of identification with a group and degree of adherence to its norms are positively related may be explainable on the basis of inaccurate labeling or measurement of the variables included in Nasatir's study.

In a level of aspiration study conducted by Aronson and Carlsmith (7), it was demonstrated that subjects not only set their self-expectations in accordance with the way they viewed their ability relative to the group, but that they made downward as well as upward adjustments of goals on subsequent trials when reports indicated that previous performance was not as they expected it to be in relation to the group as a whole.

The usefulness of level of aspiration constructs for studying either scholastic achievement or dropout is somewhat limited by what Cassel (15, pp. 1, 19) terms "irreality factors." Cassel refers to the "irreality dimension of the personality" in discussing the accuracy with which one's perceptions duplicate the inciting phenomena. Regarding his instrument for measuring level of aspiration, Cassel suggests that inability or unwillingness to accurately assess the quality of a given performance may be a major factor in goal-setting behavior.

Studies reported by Munger (69)(70) and by Ikenberry (49) suggest that level of aspiration may play a significant role in maintaining or changing the strength of a student's motivation for college attendance. Munger's work suggests that college entrants have achievement expectations or aspiration levels based upon their scholastic achievement in

high school, and that failure to achieve at the expected level may be sufficiently disturbing to induce withdrawal from college.

Aronson and Carlsmith's (7) study also suggests that individuals experience distress when their achievement either exceeds or falls short of their prediction. This finding may be appropriate for conceptualizing the behavior of some of the students who withdraw from college even though earning satisfactory grades.

Festinger's (27) "cognitive dissonance" theory appears to have usefulness as a research tool of itself and as an extension of constructs regarding level of aspiration. According to Festinger's theory of cognitive dissonance, a disquieting or motivating state is produced in the individual when there is incongruity between pairs of "cognitive elements." Festinger defined "cognitive elements" in the following manner (27, p. 9):

These elements refer to what has been called cognition, that is, the things a person knows about himself, about his behavior, and about his surroundings. These elements, then, are "knowledges," if I may coin the plural form of the word. Some of these elements represent knowledge about oneself: what one does, and the like. Other elements of knowledge concern the world in which one lives: what is where, what leads to what, what things are satisfying or painful or inconsequential or important, etc.

Regarding the nature of "cognitive dissonance" as a motivating force, Festinger (27, p. 18) presented the following postulate:

The presence of dissonance gives rise to pressures to reduce or eliminate the dissonance. The strength of the pressure to reduce the dissonance is a function of the magnitude of the dissonance. In other words, dissonance acts in the same way as a state of drive or need or tension.

Conceptualizing one specific case of dropout in terms of level of aspiration and cognitive dissonance theory, it might be stated that dissonance arising from the lack of congruence between the two cognitive elements, expectation of performance at "B-plus" level and actual

achievement at "C-plus" level, is perceived by the actor to be effectively reducible only by withdrawal from the situation.

Examples might also be drawn regarding discrepancies between a student's social aspirations and achievements. Finding oneself much less socially accepted within the college setting than anticipated might be expected to produce dissonance. Students lacking sufficient adaptiveness to accommodate to the situation could find withdrawal of one sort or another the most satisfactory response.

If the internal process most immediately preceding dropout may be viewed as a change in the student's motivational pattern, then constructs regarding motivational change would seem to be pertinent to this discussion. On the assumption that the foregoing notion is true in at least a majority of cases of dropout, theories regarding change in motivation were taken as the starting point in developing a theoretical basis for the present study. Since students' intentions regarding college attendance may be extremely varied, cognizance should be taken of possible exceptions to the general rule just stated. It might be said, for example, that the basic motivational pattern does not change at the time of dropout in the case of the individual who enters college with the intention of remaining for only one year. In the present study it was assumed that such cases are exceptional.

Whether motivational change is viewed within the "force-field" framework of Lewin (52), the "approach-avoidance" conflict framework of Miller (62), the "competing role-definitions" framework discussed by Bay (9, pp. 981-983), the "dissonance reduction" framework of Festinger (28) or the simple hedonic framework employed by Slater (82) and by Lichter (55), it appears that the initiation of dropout behavior may,

as a general rule, be taken as objective evidence that a basic change in motivation has occurred. The energies of the individual are no longer directed toward those activities essential for continuation in school. Rather, activity has become at least temporarily oriented toward an alternative to continuation.

Theoretical Background and Hypotheses for the Present Study

General Theoretical Background

Given the assumption that a change in energy direction precedes the onset of dropout, and given a number of motivation-change models, the problem became one of selecting for study pre-dropout behavioral elements which appeared to be functional inputs or outputs of one or more of the models.

Since college student dropout is an extremely diffuse phenomenon occurring in both sexes, among all socio-economic levels, at every level of scholastic aptitude and academic achievement, and at every grade level, it seems highly unlikely that any single theoretical formulation will encompass even most of its variants. However, a review of research conducted on college dropout and a survey of some available constructs have suggested that some generalizations can be made which may apply to many cases of dropout.

The behavioral elements selected for study in this investigation are in the area of personal adjustment or "adjustiveness." The central notion which will be pursued is that qualities of personal adjustment are important causes as well as concomitants of motivational change leading to dropout.

For the purposes of this study, the term "adjustment" is used in the sense suggested by Shaffer and Shoben (78, pp. 358-359). They suggest that the "adjusted" person is one whose behavioral responses are "integrative;" that is, fitting together to meet both the short-term and long-term needs of the individual. Conversely, the maladjusted individual is seen by Shaffer and Shoben as one who is either unable to make adjustive responses in conflict situations, or whose adjustive responses are not integrated in such a way that they will provide both short-term and long-term satisfaction. Shaffer and Shoben provide the following descriptions of the individual who repeatedly fails to behave in a manner which will bring need satisfaction to him;

A maladjusted person is revealed as impulsive, and lacking in foresight and self-control. He cannot persist in tasks and becomes fatigued too readily. He is unable or unwilling to endure personal discomfort in order to meet social expectations. He reacts poorly to stress, and shows decrements of performance when subjected to frustrations and conflicts.

In the main, the people whom we call "maladjusted" have lowered thresholds for anxiety. Their anxiety is evoked by lesser conflicts, and is aroused in greater degree, than that of normal people. They are over-motivated to escape or to defend themselves, and hence are unable to devote attention and energy to some socially oriented tasks that offer little trouble to normal people. Their resulting behavior is poorly integrated in that it fails in some degree to meet their long-term needs.

For the purposes of this study it was assumed that personal maladjustment enters into the etiology of college student dropout in at least two important ways. It was first assumed that the degree to which an individual, prior to entering college, accurately predicts the social, emotional, intellectual, physical, and financial rigor of college attendance in relation to his strength in those areas is closely related to the length of time he remains in enrollment. Perceptual accuracy of that type was considered to be a function of personal adjustment in this study.

Thus, the person with a history of non-integrative responses may choose to attend college even in the face of objective evidence that the chance of his completing a course of study is essentially nil. Not only might the maladjusted person fail to consider facts presented to him, but he might also be more likely to avoid situations in which he could receive objective information regarding his chances for successfully completing a college program.

Assuming that the maladjusted individual does enter college, the same perceptual blockages which permitted selection of college attendance as a goal may make possible or necessary a stream of inappropriate or non-integrative responses in the college setting. It was reasoned that when an individual who is not particularly well suited socially, emotionally, physically, intellectually, or financially for attendance in a given college setting fails repeatedly to make appropriate adjustive responses in situations within that setting, the probability of dropout will be high.

The general notion that personal adjustment as defined by Shaffer and Shoben is one of the major determinants of college student continuation and withdrawal appears to be congruent with analyses and models which have been presented.

Summerskill's (92) analysis of change in an individual's college attendance motivation seems to be able to accommodate adjustment factors as primary etiological forces. Summerskill maintained that such motivational change results primarily from either predictable circumstances or "unavoidable--often unexpected--environmental circumstances." He stated that attrition studies he had reviewed indicated that circumstances of the latter type account for only a relatively small percentage of all dropouts.

Thus, if the preponderance of college dropout may be directly related to predictable circumstances, it appears that many college entrants lack either the capacity or the willingness to form and accept accurate predictions regarding the intellectual, social, emotional, physical, and financial rigor of college attendance in relation to their own resources in those areas. Such deficiencies would appear to be closely related to "maladjustment" as defined by Shaffer and Shoben (78, pp. 358-359).

In another summary statement within the reference previously cited, Summerskill (92, p. 637) again seemed to suggest that dropout is more a function of "maladjustiveness" and inability to form accurate expectations than of low scholastic aptitude, narrowly defined. Summerskill's statement is as follows:

In general, then, the attrition problems that predominate in the colleges involve the student's failure to meet the psychological, sociological, or economic demands rather than the strictly academic demands of the college environment.

A primary reason for selecting personal adjustment as the point of departure for this study was the fact that many relationships appear to exist between adjustment and socio-economic status--an element generally conceded to have a bearing upon school leaving at all educational levels. Explanations for higher school continuation rates among children from middle and upper social status homes have usually centered upon matters of finance and of educational values. Those factors undoubtedly have a great deal to do with deciding who shall enter college. However, children from higher social status homes tend to possess a third quality which may have as much to do with their continuation once enrolled in college than having a dependable source of money and of "encouragement." The third quality is better adjustment. The fact that not all children from higher social status homes are well adjusted in the sense that we

are using the term may account for many of the "exceptional" cases in which students who apparently place a high value on education and who are not in financial need fail to continue to graduation, at least in the college of their first enrollment. Some studies relating social status, adjustment, academic success, and continuation in school will be discussed here to complete the basic notions upon which the present study rests.

There appears in the literature ample evidence that school achievement in general is related to social status (1)(14)(18)(47)(68). Though relationships in the order of $r = .20$ to $.50$ have commonly been found between social status measures and various measures of intelligence, mental ability has not generally been accepted as the principal agent operating between social status and academic achievement. Affective rather than strictly intellectual considerations have been pointed to as the basis for the positive correlation between social status level and school achievement (34)(63)(65)(87).

In commenting on the relationship between ratings on the Warner Index of Social Characteristics and reading achievement in the first grade, Milner (63) concluded that upon entering school, lower-class children, to a larger extent than middle-class children, lack the advantage of having had . . . "a warm positive family atmosphere or an adult-relationship pattern which is more and more being recognized as a motivational prerequisite for any kind of adult-controlled learning." The lower-class children in Milner's study tended to view adults as predominately hostile.

Studies by Auld (8), Gough (34), and Sims (81) corroborate the assumption of a generally positive relationship between social status

ranking and personal adjustment test scores. Sims (81), for example, found among late adolescents a significant positive relationship between "social class identification" and the Bell Adjustment Inventory factors for both home adjustment and social adjustment. His findings suggest that college entrants from higher social status homes will tend to relate in a more personally satisfying manner both to their families and to their college social environments than entrants representing lower social status positions. When interpreting results of studies such as those by Auld (8), Gough (34), and Sims (81) the possibility that a social class bias may occur in the definition and measurement of adjustment should be considered. It has been suggested that keys for adjustment inventories tend to reflect middle-class values, and that individuals holding lower-class values tend to score low even though they may adjust quite satisfactorily within their "natural" environments.

In general, correlation studies have found small but often significant positive correlations between social status level and both personal adjustment and school achievement. However, a study by Ikenberry (49) suggests that by late adolescence, many male students who do not express middle-class or higher cultural values become strongly oriented toward academic achievement. Havighurst and Neugarten (43, p. 48-49) discuss this phenomenon within a social mobility frame of reference. It is discussed elsewhere in relation to such ego defense mechanisms as compensation, substitution, and sublimation. Ikenberry (49) failed to find a significant relationship between "cultural scale" scores and dropout, but did find an inverse relationship between grades and "cultural scale" scores.

Ikenberry's experimental groups were ranked according to mean "cultural scale" score as follows:

- Lowest - Dropouts with grade point averages of greater than 2.0
- Fourth - Non-dropouts with grade point averages of greater than 2.0
- Third - Dropouts with grade point averages of less than 2.0
- Second - Dropouts who completed no courses prior to leaving
- Highest - Non-dropouts with grade point averages of less than 2.0

It might be assumed that for the sample and the setting employed in Ikenberry's study, persons lacking awareness of or commitment to social norms tended to excel academically and to drop out for reasons other than academic failure, whereas persons most familiar with cultural patterns tended neither to excel academically nor to withdraw from college either voluntarily or involuntarily for reasons other than low grades. Part of the discrepancy between findings of this study and those discussed earlier may be attributable to a lack of relationship between Ikenberry's "cultural scale" and other measures of social status.

In summarizing reports of research on child rearing practices, adjustment, and social achievement, by social class, Anastasi (5, p. 510) made the following statement:

In so far as can be determined from available data, middle-class and core culture parents tend to demand more conformity than lower-class parents and may thereby induce frustration and stifled initiative and creativity in some cases. On the other hand, certain aspects of lower-class family life tend to undermine the child's self-confidence and emotional security and to discourage intellectual development. These differences are reflected in the poorer emotional adjustment and inferior school achievement of lower class children.

It has been suggested that in addition to factors built into the internal personality structure differentially by homes representing different social classes, children from these homes are influenced differently by their "peer culture" and by the school proper (6)(47)(74). It is generally held that public schools reflect primarily a middle-class culture pattern. Course offerings, learning incentives, and extra-

curricular activities provided by the schools are generally less well suited to the lower-class child than to the middle class child. Davis (19) has suggested that failure to provide school experiences appropriate for the lower-class child may be an important factor producing low academic achievement, poor adjustment, and general distaste for school among lower-class children.

Relationships found to exist between personal adjustment, intelligence, and social status have at least the following implications for the present study:

- (a). Existing personal adjustment scales and intelligence tests both tend to be slightly biased in the same direction with respect to scores made by members of various social status groups.
- (b). Independent measures of personal adjustment and scholastic aptitude used together may assess much but not all of the influence which social class may have upon school performance.
- (c). Responses to adjustment inventory items may differ between scholastic achievement levels as well as between dropouts and non-dropouts.
- (d). For some adjustment inventory items, dropouts and low academic achievers may give more responses indicating "favorable" adjustment than non-dropouts and high academic achievers.

Postulates

On the basis of a review of published reports of dropout research, the following postulates are proposed as a foundation for the present investigation.

- (a). Facility in forming accurate predictions and perceptions regarding college attendance and in dealing with cognitive discrepancies encountered as a college student is closely related to the persistence of college attendance motives.
- (b). Personal adjustment as measured by paper and pencil inventories is closely related to facility in forming accurate future predictions and present perceptions regarding college attendance, and to facility in dealing with incongruities which are encountered as a college student.
- (c). There also exist intellectual factors at least partially measurable by scholastic aptitude tests which are related to facility in forming accurate expectations and perceptions and to facility in dealing with cognitive incongruities.
- (d). There may exist intellectual-adjustive factor interactions in the causation of both academic achievement and dropout.

The principal objective of this study was to isolate a single measurement from the internal cognitive-affective structure of college entrants which would supplement intellectual capacity or scholastic aptitude scores as predictors of continuation in college. An "adjustment" orientation was followed because of the availability of usable assessment techniques and because experimental evidence seems to support the assumption that maladaptive tendencies are related in a number of ways to continuation-dropout behaviors.

Adjustment was taken for the basic predictive measure in spite of the fact that it may represent primarily the "personal" contribution to behavior determination, largely ignoring the "situational." The rationale for this decision was derived principally from a postulate presented by

Sherif and Sherif (79, p. 82). They state that "The more unstructured the stimulus situation, the greater the relative contribution of internal factors in the frame of reference."

Even though behavior can generally be considered to be situationally determined or influenced, in complex and relatively unfamiliar situations, environmental stimuli may have little or no relationship to behavior, particularly among individuals most lacking in adjustive qualities. Thus, it would seem that much of the apparently non-goal-directed (nonintegrative) student behavior occurring in college may be considered to originate from internal stimuli rather than objective, external stimuli.

For the purpose of this study it was assumed that the internal organization of the individual plays a larger role in college dropout causation than situational factors per se. That is, it was assumed that many individuals enter college possessing internal affective structures which do not equip them to operate effectively in the college environments they enter.

Hypotheses

The hypotheses which were tested in the present study are as follows:

- (a). There exist items in the Minnesota Counseling Inventory which will elicit significantly different responses from groups of subjects designated as dropouts and non-dropouts, the groups having matched frequency distributions of scholastic aptitude scores.
- (b). When test items selected under hypothesis (a) are combined into a single dropout-predictor scale, scores on the experimental scale for a cross-validation group will be significantly related to the continuation-dropout dichotomy.

- (c). The coefficient of correlation between experimental dropout-predictor scale scores and scholastic aptitude test scores will differ significantly from zero for the cross-validation sample utilized in this study.
- (d). Minnesota Counseling Inventory mean scores (on each of eight scales) will differ significantly between groups of dropouts and non-dropouts having scholastic aptitude test scores representing lower, intermediate, and upper levels.
- (e). Minnesota Counseling Inventory mean scores (on each of eight scales) for dropouts utilized in this study will be significantly greater than corresponding mean scores for non-dropouts.
- (f). Minnesota Counseling Inventory mean scores (on each of eight scales) will differ significantly between groups designated as having lower, intermediate, and upper levels of measured scholastic aptitude.
- (g). Mean differences observed in testing hypothesis (f) will be ordered according to the following pattern: Lower scholastic aptitude groups will have the highest Minnesota Counseling Inventory scale mean scores, followed in order by groups representing the upper and intermediate ACT score levels.
- (h). A significant interaction (with respect to scores on each of eight Minnesota Counseling Inventory scales) will be found to exist between measured scholastic aptitude level and the dropout versus non-dropout dichotomy.
- (i). There will be found as much variation in Minnesota Counseling Inventory mean scores (on each of eight scales) associated

with measured scholastic aptitude level as with the dropout versus non-dropout dichotomy.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

The primary objective of the present investigation was to assemble and validate a scale of essentially non-intellective test items which would discriminate between entering college freshmen who do and who do not continue in enrollment in good standing beyond one calendar year. A scale was sought which would not be significantly related to scholastic aptitude, as measured by a standardized college admission examination.

A secondary aim of the investigation was to obtain additional validity data for previously observed relationships between personal adjustment inventory scores, scholastic aptitude levels, and continuation in college.

Instrumentation

The present study required the use of two standardized testing instruments, one to give a measure of scholastic aptitude and the other to provide a pool of items assessing non-intellective qualities of the adolescent. The instruments selected were the American College Testing Program battery (3) and the Minnesota Counseling Inventory (10). The American College Testing Program battery (hereafter referred to as the "ACT" battery) is described by its publishers as follows (4, p. 8):

The ACT battery is designed to measure as precisely as possible the ability of a student to perform those intellectual tasks which he is likely to face in his college studies. In the test, emphasis is placed on generalized skills and abilities, such as organization, criticism, judgment, and evaluation, rather than on a knowledge of the factual organization and content of classroom material,

For the purposes of this study, a single score representing scholastic aptitude was desired. Of the various scores provided by the ACT battery, the composite score was considered most appropriate. The composite score, which is based on a scale ranging from zero to 36, is described by the instrument's publishers as follows (4, p. 10):

The composite score is the mean of the four educational development scores. It is viewed as an index of total educational development and has proved to be the best single predictor of freshman success in college.

Reliability coefficients for composite scores on the two alternate forms of the ACT battery, 1-A and 1-B, have been determined to be .94 and .95, respectively. The coefficients were obtained by the Spearman-Brown odds-evens technique with scores from 1031 high school seniors tested with Form 1-A and 886 high school seniors tested with Form 1-B. For both forms, a value of 1.1 standard score units was obtained as the standard error of measurement for the composite score.

The ACT battery, which was administered as a part of a college admissions-orientation program to all subjects in this study, was considered to provide an adequate measure of scholastic aptitude for the purposes of this investigation.

The Minnesota Counseling Inventory (hereafter referred to as the "MCI") was selected as a source of non-intellective test items for use in this investigation. The MCI consists of 355 items in the form of brief statements. In completing the instrument the subject is instructed to read each statement, decide whether it is true or false as it applies

to him, and mark his response on a separate answer sheet.

Eight scale scores were obtained from the MCI for use in this study.

Below are given the names attached to the scales and descriptions of

behaviors expected to be associated with high and low scores on each

(10, pp. 10-12):

Validity Score (V): The V scale yields a validating score which represents the degree of defensiveness of the student. High scores are obtained by those attempting to choose responses that are socially acceptable. Occasionally, the individuals may actually think and behave as ideally as is implied by high V scores. It is more likely that such a score reflects a naive attempt on the part of the student to "look good" on the Inventory. A raw score as high as 6 should make one suspect the validity of the profile; raw scores of 8 or higher on the V scale invalidate the meaning of the other scales and such answer sheets need not be scored further. Approximately 2 per cent of students have a raw score of 8 or higher.

Family Relationships (FR): The score on this scale refers to the relationships between the student and his family. Students with low scores are most likely to have friendly and healthy relationships with parents, and with brothers and sisters. They probably receive much affection in the home and feel much affection toward members of their families. Such persons usually regard their parents as making reasonable demands on them and granting them a reasonable amount of independence. They spend much time at home and participate in activities with their families.

High scores suggest conflicts or maladjustments in family relationships. Such scores are most frequently obtained by students who have difficulties with their parents or brothers and sisters. These students usually feel that their parents are unreasonably strict and demand too much of them. Such students avoid spending more time at home than is absolutely necessary and often express a desire to leave home.

Social Relationships (SR): Scores on this scale refer to the nature of the students' relations with other people. Low scores are often characteristic of gregarious, socially mature individuals. Students with low scores usually appear to be happy and comfortable when with groups of students or adults. They appear to enjoy talking with others and are interested in what others say. In groups, these students are frequently the ones who introduce people to one another. Such students seem to have a genuine liking for others and are well-liked by them. In general, they have good social skills; converse easily and well, have acceptable manners, and conduct themselves appropriately in social situations.

Students with high scores are likely to be socially inept or under-socialized persons. They often seem to be unhappy and uncomfortable when with groups of students or adults; they do not enjoy talking or associating with others. Other people, in turn, derive no great satisfaction from being with them. These students may refuse to attend school functions. They may not answer questions in class when called upon even if they know the answers.

Emotional Stability (ES): Low scores characterize emotionally stable individuals. Such students seldom worry; are not likely to be self-conscious or lacking in self-confidence; tend to be calm and relaxed most of the time. Rarely asking advice, they are capable of making their own decisions. They do not show fear in new or strange situations and usually behave efficiently in emergencies.

High scores characterize students who frequently are unhappy and, in general, appear to be emotionally unstable. These students often over-react emotionally to what appear to be trivial situations. They may lose their tempers easily and frequently be moody or irritable; they often appear tense or anxious and weep under stress. In new situations they may be either fearful and timid or overly aggressive.

Conformity (C): The scores on this scale indicate the type of adjustment a student makes in situations requiring conforming or responsible behavior. Students with low scores are usually reliable and responsible, conforming to rules and behavior codes even when they may not agree with them. Instead of rebelling against such regulations, these students attempt to have them changed through orderly procedures. They ordinarily show respect to persons in authority. Although not necessarily docile nor overly submissive, they understand the need for social organization. Such students cause little disturbance in school, seldom have unexcused absences or tardiness, practically never repeat an offense, and usually complete assignments on time.

Students with high scores are likely to be irresponsible, impulsive, and rebellious. They may appear to learn little from experience, committing the same offense repeatedly even though verbally acknowledging it to be wrong. These students are individualistic and self-centered. They may frequently be sent to the principal, cause disturbances in class, have unexcused absences, and fail to complete assignments. Some of these students have juvenile court records. High scores, in conjunction with unfavorable family background, may suggest the need for counseling to avoid future delinquent behavior.

Adjustment to Reality (R): This scale refers to a student's way of dealing with reality--whether he approaches threatening situations in order to master them or withdraws from them in order to avoid them. Students with low scores seem to deal rather effectively with reality. They are able to make friends and establish satisfactory

relationships with groups. They have little difficulty communicating with others and do not fear sharing their emotional experiences. They frequently welcome competition. In general, their behavior appears to be quite predictable.

Students with high scores on the R scale have difficulty making friends and establishing relationships with groups. They are often secretive, withdrawn, shy, sensitive, and easily embarrassed. However, they usually reveal little emotion. In speaking, they may ramble and introduce irrelevant details. They may write odd themes, or work on peculiar inventions or hobbies. Although they daydream of "success," they shun competition. To others they seem odd and distant. Such students are often the ones who escape the counselor's or teacher's attention because their withdrawing behavior is inconspicuous and causes little trouble for anyone else.

Mood (M): This scale indicates a student's usual mood or emotional state. Low scores characterize students who maintain good or appropriate morale. These students are cheerful most of the time. When depressed or discouraged, they quickly recover. They frequently smile and laugh and are enthusiastic about subjects, friends, and activities. Being self-confident, they regard the future optimistically and make long-range plans. Furthermore, they are enthusiastic and optimistic about the plans of others.

High scores are usually obtained by students with poor morale. Such students seem to be depressed and "blue" most of the time. Classmates may regard them as "wet blankets." Students with high scores on the M scale lack self-confidence and frequently feel useless. Moreover, they lack hope in the future and complain of the hopelessness of trying to do things. Such students become easily discouraged and distracted and consequently may not persevere with scholastic tasks very long.

Leadership (L): The scores on the L scale are related to those personality characteristics reflected in leadership behavior. Students with low scores often have outstanding leadership skills and in general know how to work well with others. They readily assume responsibilities in groups to which they belong and show initiative in developing and carrying out ideas. Other students frequently recognize such qualities, placing these students in positions of leadership, such as school and activity offices.

Although low scores indicate leadership qualities, high scores do not indicate successful "followership." Students with high scores on the "Leadership" scale are often inept in social situations and likely to avoid participation in groups. Pending further studies, high scores should be understood as merely indicating lack of leadership qualities.

The last seven MCI scales listed above are termed the "diagnostic" scales of the inventory. They are composed of items from the "Social

Adjustment," "Family Relations," and "Emotionality" scales of the Minnesota Personality Scale and the "L," "Psychopathic Deviate," "Schizophrenic," "Depression," and "Social Introversion" scales of the Minnesota Multiphasic Personality Inventory.

Test-retest and odd-even reliability studies reported by the authors of the MCI (10)(11) suggest that for the middle to late adolescent, the scales assessing Family Relationships, Social Relationships, Emotional Stability, and Adjustment to Reality are fairly reliable. In Table III are shown reliability data for the MCI diagnostic scales. Odd-even reliability coefficients, means, and standard deviations are given as they appear in the publisher's manual (10, p. 22). Standard errors of measurement based on the foregoing data were computed by the present writer using procedures suggested by Guilford (40, p. 441). Standard errors of measurement thus derived are also shown in Table III, both in raw score units and in T-score units (mean 50, s.d. 10).

A principal reason for employing the Minnesota Counseling Inventory in this investigation was that it would permit comparison with and possibly extension of the findings of Brown (12), who used the same instrument in an effort to find personality differences between dropouts and non-dropouts. In addition to that primary consideration, the Minnesota Counseling Inventory was found to be satisfactory in terms of reliability, length, appropriateness to the age level being tested, and ease of scoring. During the 1961 fall semester, the Minnesota Counseling Inventory was administered to all subjects included in this study. The instrument was administered as a part of a one-semester college orientation program.

TABLE III
 RELIABILITY DATA FOR DIAGNOSTIC SCALES
 OF THE MINNESOTA COUNSELING INVENTORY
 (11TH and 12TH GRADE MALES, N=200)

| MCI Scale | Odd-Even Reliability Coefficient | Raw Score Units | | | T-Score Units ^a |
|--------------|--|-------------------------------------|------|------|-------------------------------------|
| | | Standard Error of Measurement | Mean | S.D. | Standard Error of Measurement |
| FR | .86 | 2.33 | 8.9 | 6.3 | 3.7 |
| SR | .94 | 2.66 | 18.9 | 11.1 | 2.4 |
| ES | .81 | 2.95 | 12.7 | 6.7 | 4.4 |
| C | .56 | 2.57 | 12.6 | 3.9 | 6.6 |
| R | .88 | 2.48 | 10.7 | 7.1 | 3.5 |
| M | .66 | 2.49 | 11.4 | 4.3 | 5.8 |
| L | .73 | 2.44 | 11.3 | 4.7 | 5.2 |

^aAssumed mean = 50, s.d. = 10

Population and Samples Selected for Study

The population from which subjects for the present study were selected consisted of 378 male first semester freshmen enrolled in the College of Arts and Sciences at Oklahoma State University in the fall of 1961. This population was chosen for three principal reasons. A fairly large population was sought in order to provide a sufficient number of subjects who would meet criteria for inclusion in experimental groupings. The population identified appeared to be satisfactory in that respect. A second reason for utilizing a population consisting of Arts and Sciences students was that doing so would permit a somewhat more direct comparison with results obtained by Brown (12), whose samples were of liberal arts

college students. An additional reason for selecting the above-defined population for the present study was that data from both the American College Testing Program battery and the Minnesota Counseling Inventory were obtainable for each population member.

It was recognized that restricting the study to a relatively narrow population would limit the applicability of the findings. However, since the objectives of the study were principally methodological rather than substantive, it was felt that the previously identified population would be adequate. In interpreting results of the study it should, of course, be borne in mind that first semester male Arts and Sciences students in a tuition-free land grant institution in Oklahoma may differ markedly from their counterparts in other types of institutions located in other regions.

The judgment to use only male subjects in the present study was made in the interest of economy, and because it has been demonstrated that the sexes respond to adjustment inventory items differently and offer somewhat different explanations for withdrawing from college. Males were selected for study rather than females because of the interests of the investigator and because it appears that within the American society greater importance is placed upon the continuation of males in college than of females. The early discontinuation of formal schooling by males appears to be viewed as a greater personal and social loss than does similar discontinuation by females.

At the time this study was concluded (spring semester, 1963), population members had had an opportunity to complete three semesters of enrollment. In selecting subjects who would be included in experimental groups as "dropouts" and as "non-dropouts," the following criteria were used.

Dropout: A member of the original population of fall 1961 first-semester freshmen who received no credit for academic work completed at Oklahoma State University during the 1962 fall semester.

Non-dropout: A member of the original population of fall 1961 first-semester freshmen who received credit for academic work completed in the Oklahoma State University College of Arts and Sciences during the 1962 fall semester, who had earned credit in at least 36 semester hours of work with a sufficiently high accumulative grade point average to meet the University standard for continued enrollment.

The information available for population members not falling into either of the above classifications was not considered adequate for judging individuals to be "dropouts" or "non-dropouts." For this reason, they were excluded from the study. A total of 103 population members were found to meet criteria set up for the "dropout" classification. A total of 178 were considered to be "non-dropouts."

For the purposes of the present study, six experimental groups were sought: dropouts representing three scholastic aptitude score levels and non-dropouts representing the same three strata of measured scholastic ability. This design was employed first as a means of reducing the relationship between scholastic aptitude (as measured by the ACT battery) and the experimental dropout predictor scale which was to be constructed. It was felt that by minimizing the ACT score difference between dropouts and non-dropouts used in the study, the relationship between scholastic ability and dropout would not be tapped in selecting items for the experimental scale. In addition, it was expected that an analysis of Minnesota Counseling Inventory scale scores for groups of dropouts and non-dropouts representing three academic ability groupings would provide

useful data on possible inter-relationships between ability level, personality, and dropout.

In setting the composite ACT score intervals for the lower, intermediate, and upper scholastic ability groups, two considerations were of paramount importance: obtaining group n's of maximum and equal size. . Since dropouts tended to have lower composite ACT scores than non-dropouts, it was found that in order to form the six desired experimental groups of even approximately equal size and having comparable ACT score means and frequency distributions, some data would have to be sacrificed. By setting the composite ACT score intervals at 0.5-18.5, 18.6-21.5, and 21.6-36.5, it was possible to obtain six experimental groups of maximum and equal size (n = 24).

Except in two groups where the population n and the sample n were equal, samples were selected randomly from their corresponding population groups. Due to the fact that sample size and population number are not in constant proportion from one segment of the population to another, it may not be said that the total sample is representative of the total population. More important for the purposes of the present study, however, is the fact that subjects within each of the six experimental groupings were drawn in such a way that they would be representative of their respective segments of the total population. Thus, from the total population, six equal-sized samples were selected representing dropouts and non-dropouts having composite ACT scores within three designated intervals.

Because of the narrowness of the intermediate ACT score interval and because population segments were not deleted between the intermediate and the extreme intervals, it may not be said that samples from the three

ACT score intervals are totally independent. Since the reported standard error of measurement for composite ACT scores is 1.1, the probability is fairly great that scores at the extremes of the intermediate interval do not differ significantly from scores in the upper and lower intervals. However, the probability that the upper and lower ACT score intervals overlap is less than .01. These considerations appear to have little implication for the principal part of the present study, the construction and validation of a dropout predictor scale, but analysis of variance results may be affected.

When sampling was completed, composite ACT score mean-differences between dropouts and non-dropouts at each level were tested statistically. In no case was significant difference found (t test, two-tailed; probability greater than .05 in each case). Variances among composite ACT scores in the six groups were compared by means of F tests (40, p. 224) and found not to differ significantly in any case (two-tailed tests, probability greater than .05 in each case).

Each of the experimental groups assembled in the manner described in the previous section was further divided by an odd-even sampling procedure into two groups of equal size (n = 12). One group from each pair thus created was utilized in selecting items for the experimental dropout predictor scale; the other group from each pair was held back for cross-validation purposes. Employing this design, data for a total of 72 subjects (36 dropouts, 36 non-dropouts) were used in validating items for the experimental scale. Data for an equal number of subjects were utilized in cross-validating the scale. For the final phase of the investigation, namely, the analysis of Minnesota Counseling Inventory scale scores, data for the six original experimental groups were

reconstituted. Separate validation samples were not needed for that portion of the study.

Item Validation: Selecting Items for the Experimental Dropout Predictor Scale

In order to assess the validity of Minnesota Counseling Inventory items for predicting dropout, a count was made to determine the number of positive responses made to each item by 36 individuals classified as dropouts and 36 who were classified as non-dropouts. To assess the discriminatory power of each item, chi square tests were made as suggested by Guilford (38). Tests were made in a 2 X 2 table with the Yates correction for continuity applied where expected cell frequencies fell below ten (40, p. 234). Chi square approximations were evaluated in terms of both a one-tailed and two-tailed test. Items which discriminated in a predicted direction were included in the experimental scale if the associated chi square approximation indicated significance at the .10 point (one-tailed test). Items which discriminated in a direction opposite that predicted were included in the experimental scale only if the chi square approximation indicated significance at the .10 level (two-tailed test).

Cross Validation of the Experimental Dropout Predictor Scale

An overlay key for the experimental dropout predictor scale was constructed in such a way that when it was placed on a Minnesota Counseling Inventory answer sheet, the response blanks scored more frequently by non-dropouts than by dropouts were left exposed. The scoring key was constructed to give non-dropouts experimental scale scores which were high relative to those of dropouts.

Using the overlay key, experimental scale scores were obtained from the Minnesota Counseling Inventory answer sheets of cross-validation sample subjects.

Two methods were utilized to assess the validity of the experimental scale; a point-biserial coefficient of correlation (40, pp. 301-305) tested for significance by a direct t test (40, p. 302), and a Kolmogorov-Smirnov two-sample test (80, pp. 127-136). In addition to providing, respectively, a parametric and a non-parametric estimate of the significance of the relationship between scale and criterion, the correlation measure was obtained to facilitate understanding on the part of readers and the Kolmogorov-Smirnov test to establish the "cut-off score" at which the experimental scale discriminated maximally between dropouts and non-dropouts in the validation sample.

Analysis of Variance for Minnesota Counseling Inventory Scale Scores

For each of the 144 subjects included in this study, eight scale scores were obtained from the Minnesota Counseling Inventory. In order to meet the normality and interval measurement assumptions of the analysis of variance procedure (40, pp. 281-282), raw MCI scale scores were converted to T -scores with an assumed mean of 50 and standard deviation of 10. The procedure suggested by Guilford (40, pp. 494-500) was followed in making the conversion.

An analysis of variance was computed for each MCI scale in order to provide tests for hypotheses d, e, f, g, h, and i, listed on pages 39 and 40 of this report. A two-way classification was utilized with dropouts and non-dropouts constituting one dimension and lower, intermediate, and upper composite ACT score levels making up the second (40,

pp. 267-284). Using this design, it was possible to test whether mean scores differed significantly between dropouts and non-dropouts or among the three composite ACT score levels, and for significant effects of interaction between the two classifications. F ratio tests were made as suggested by Guilford (40, p, 274).

CHAPTER IV

RESULTS

Introduction

Findings of the present investigation are reported below under three headings which represent the three major subdivisions of the study: item validation procedures, cross-validation of the experimental dropout predictor scale, and analysis of Minnesota Counseling Inventory scale scores. Conclusions and recommendations based on the findings of this study will be presented in Chapter V.

Item Analysis: Validation of Minnesota Counseling Inventory Items for the Experimental Dropout Predictor Scale

Minnesota Counseling Inventory items were considered to have significant discriminatory power between dropout and non-dropout samples if their associated chi square approximations were found to meet either of two conditions. The conditions were:

- (a). The item must discriminate between dropouts and non-dropouts in a predicted direction, and have an associated chi square approximation equal to or exceeding the tabled value for a one-tailed (directed) test at the .10 probability point.
- (b). An obtained chi square estimate must equal or exceed the tabled value for a two-tailed (non-directed) test at the .10 probability level.

A total of 34 items which met at least one of the above conditions were found in the Minnesota Counseling Inventory. The 34 items are identified by number in Table IV, and are grouped according to the MCI scale or scales in which they are included. It may be noted that items 8, 220, and 269 each appear in two MCI scales. The last eight items listed in Table IV were found to be among the 44 MCI items not scored with any of the existing scales. Also shown in Table IV are the numbers of positive responses given to each item by dropouts and non-dropouts used in the item validation procedure. Chi square values associated with the difference in responses made to each item are shown at the extreme right in Table IV.

In Table IV, the subscript "a" is used to designate those items which discriminated between dropouts and non-dropouts in the direction opposite to that predicted. The 34 MCI items making up the experimental dropout predictor scale are listed in Table X on page 89. Listed with each item in Table X is the response made more frequently by non-dropouts than by dropouts.

In appraising the validity of the items selected for the experimental scale, it should be noted that the first one-third of the Minnesota Counseling Inventory (119 items) yielded only four items which were considered to discriminate between dropouts and non-dropouts. In the second one-third of the MCI (items 120-237), 14 items were found to have associated chi square values large enough for them to be considered discriminatory. Sixteen such items were found among the last 118 items in the inventory. The probability of such an uneven distribution of items occurring by chance alone was examined by means of a one-sample chi square test with two degrees of freedom (80, pp. 42-47). A value as large as that obtained in the test (chi square approximation = 15.789)

TABLE IV

RESPONSE FREQUENCIES, CHI SQUARE APPROXIMATIONS, AND PROBABILITIES
ASSOCIATED WITH MCI ITEMS INCLUDED IN THE EXPERIMENTAL
DROPOUT PREDICTOR SCALE

| MCI Scale | Item Number | Number of Positive Responses | | Chi ² | Probability (One-tailed) |
|-------------------|------------------|---------------------------------|---------------|------------------|-----------------------------|
| | | Non- dropouts | Drop- outs | | |
| FR | 252 ^a | 12 | 4 | 3.500 | .05 |
| FR | 348 ^a | 19 | 11 | 3.657 | .05 |
| SR | 147 ^a | 21 | 28 | 3.130 | .05 |
| SR | 320 | 20 | 30 | 6.545 | .01 |
| SR | 335 | 12 | 18 | 2.057 | .10 |
| SR | 344 | 0 | 6 | 4.545 | .05 |
| SR | 350 | 6 | 13 | 2.574 | .10 |
| ES | 40 | 14 | 23 | 4.503 | .05 |
| ES | 149 ^a | 18 | 11 | 2.829 | .05 |
| C | 8 | 12 | 18 | 2.057 | .10 |
| C | 157 ^a | 17 | 24 | 2.776 | .05 |
| C | 246 | 20 | 14 | 2.006 | .10 |
| C | 269 ^a | 19 | 11 | 3.657 | .05 |
| C | 281 | 13 | 7 | 2.492 | .10 |
| R | 133 | 0 | 4 | 2.348 | .10 |
| R | 146 | 3 | 9 | 2.500 | .10 |
| R | 220 | 7 | 14 | 3.294 | .05 |
| R | 248 | 34 | 29 | 2.032 | .10 |
| R | 271 | 7 | 20 | 10.041 | .001 |
| M | 8 | 12 | 18 | 2.057 | .10 |
| M | 143 ^a | 17 | 24 | 2.776 | .05 |
| M | 172 | 11 | 5 | 2.009 | .10 |
| M | 220 | 7 | 14 | 3.294 | .05 |
| M | 228 | 17 | 10 | 2.904 | .05 |
| M | 269 ^a | 19 | 11 | 3.657 | .05 |
| L | 109 | 3 | 11 | 4.345 | .05 |
| L | 198 ^a | 11 | 18 | 2.829 | .05 |
| L | 234 ^a | 7 | 14 | 3.294 | .05 |
| L | 286 ^a | 19 | 26 | 2.904 | .05 |
| None ^b | 31 | 18 | 12 | 2.057 | .10 |
| None | 151 | 12 | 18 | 2.057 | .10 |
| None | 187 | 19 | 26 | 2.904 | .05 |
| None | 203 | 2 | 8 | 2.903 | .05 |
| None | 244 | 35 | 29 | 3.520 | .05 |
| None | 305 | 34 | 28 | 2.903 | .05 |
| None | 306 | 14 | 22 | 3.556 | .05 |
| None | 337 | 29 | 23 | 2.492 | .10 |

^a Item discriminated in direction opposite that predicted.

^b Items not scored with any standard MCI scale.

would occur by chance alone less than one time in one-thousand. Because of this unanticipated finding, additional tests were made in an effort to determine whether early responses on the MCI tended to be more or less valid than later responses, and whether dropouts and non-dropouts responded with equal validity throughout the scale.

The possibility that dropouts and non-dropouts responded with greater or less validity in different parts of the MCI was examined by a procedure employing the sign test as outlined by Siegel (80, pp. 68-75). The first one-half and the last one-half of the MCI Validity scale were scored separately for all dropouts and all non-dropouts used in the item selection procedure. Each subject's data were examined for changes in response frequency between the first one-half and the second one-half of the Validity scale. The numbers of dropouts and of non-dropouts who increased, decreased, and failed to change their response frequency are given in Table V. A greater number of responses in one-half of the scale than in the other was taken as an indication of change. The same number of responses in each one-half of the scale was considered to represent no change.

The sign test described by Siegel (80, pp. 68-75) was applied separately to the data for dropouts, non-dropouts, and the two groups combined, to determine whether significant shifts in Validity scale response had occurred. The probability values resulting from application of the sign test are shown in Table V. The probabilities of observed distributions occurring by chance alone were .12 for dropouts, .19 for non-dropouts, and .06 for the two groups combined. In interpreting this set of findings, it should be noted that higher absolute Validity scale scores signify lower response validity. On the basis of

the results obtained with the sign test, it appears that both dropouts and non-dropouts may have responded with somewhat lower validity as they progressed through the MCI Validity scale. However, the change could be considered statistically significant at the .10 point only if the groups were combined.

TABLE V

Number of Respondents Who Increased, Decreased, or Failed to Change Frequency of Response From the First One-Half to the Second One-Half of the MCI Validity Scale

| Group | Number of Subjects Who; | | | Probability of Chance Occurrence ^a |
|--------------|---|--|--|---|
| | Did Not Change Frequency of V-scale Responses | Increased Frequency of V-scale Responses | Decreased Frequency of V-scale Responses | |
| Dropouts | 11 | 16 | 9 | .12 |
| Non-dropouts | 2 | 20 | 14 | .19 |
| Total | 13 | 36 | 23 | .06 |

^aOne-tailed sign test (80, pp. 68-75)

As a second possible explanation for the uneven distribution of discriminatory items found within the MCI, it was considered that the first one-third of the inventory may have been heavily loaded with items of a type which occurred infrequently in the latter two-thirds. In view of findings discussed thus far, it might be assumed that MCI scales with a disproportionately large number of items located in the first one-third of the inventory would contribute relatively fewer items to the experimental scale than those with items more evenly distributed throughout the inventory. Conversely, scales with fewer items located in the first one-

third of the inventory might be expected to contribute relatively more items to the experimental dropout predictor scale.

A count was made to determine the number of items located in the first one-third of the MCI which were included in the scoring of each of the MCI scales. The values obtained are given in Table VI, accompanied by the corresponding numbers of items constituting each MCI scale and the number of items contributed to the experimental scale by each MCI scale.

TABLE VI

Number of Items from Each MCI Scale Occurring in the Total Inventory, the First One-Third of the Inventory, and in the Experimental Dropout Predictor Scale

| MCI Scale | Total No. of Items in the MCI Scale | No. of Items Located in First One-third of MCI | No. of Items Occurring in Experimental Scale |
|-------------------|-------------------------------------|--|--|
| V | 14 | 9 | 0 |
| FR | 36 | 6 | 2 |
| SR | 61 | 20 | 5 |
| ES | 43 | 22 | 2 |
| C | 35 | 8 | 5 |
| R | 55 | 18 | 5 |
| M | 46 | 20 | 6 |
| L | 35 | 12 | 4 |
| None ^a | 44 | 8 | 8 |

^aItems not scored with any standard MCI scale

To facilitate comparison, the numbers shown in the second and third columns of Table VI were converted to the percentages they represented of the total number of items in corresponding MCI scales. The resulting values are given in Table VII. In order to determine whether a significant relationship existed between the proportion of items located in the first one-third of the inventory and the proportion found to be discriminatory, a Spearman rank-correlation coefficient (40, pp. 285-288) was computed for the two columns of data in Table VII. The resulting value ($\rho = -.50$) was tested for significance with the procedure recommended by Guilford (40, p. 288). It was determined that a probability of .08 was associated with rejection of the null hypothesis of zero or positive correlation (one-tailed test).

TABLE VII

Proportions of Items from Each MCI Scale Occurring
in the First One-Third of the Inventory and
in the Experimental Dropout Predictor Scale

| MCI Scale | Percent of Scale Located in First One-third of MCI | Percent of Scale Occurring in Experimental Scale |
|-----------|--|--|
| V | 64.3 | 0.0 |
| FR | 16.7 | 5.6 |
| SR | 32.8 | 8.3 |
| ES | 51.2 | 4.7 |
| C | 22.9 | 14.3 |
| R | 32.7 | 9.1 |
| M | 43.5 | 13.0 |
| L | 34.3 | 11.4 |
| None | 18.2 | 18.2 |

Cross-Validation of the Experimental Dropout Predictor Scale

Using an overlay scoring key, Minnesota Counseling Inventory answer sheets for the previously selected cross-validation sample were scored for the experimental dropout predictor scale. Experimental scale scores and composite ACT scores are given in Table XI on page 92 for each subject utilized in the cross-validation procedure.

A point-biserial coefficient of correlation (40, pp. 301-305) was computed for the relationship between scores obtained on the experimental scale and the dropout versus non-dropout criterion. The point-biserial correlation coefficient obtained was .274. A direct, one-tailed t test was carried out as suggested by Guilford (40, pp. 219, 302) for the research hypothesis that a significantly greater than zero positive correlation would exist between experimental scale scores and continuation in college. The test resulted in a t value of 2.38, equal to that required for significance at the .01 point with 70 degrees of freedom. On the basis of the t test results, the null hypothesis of zero or negative correlation was rejected with a probability of .01. The alternate hypothesis of a significant positive correlation between experimental scale scores and the criterion of dropout was considered to be confirmed.

In order to provide a test for the hypothesis that dropouts in the cross-validation sample would have lower experimental scale scores than their counterpart non-dropouts, a Kolmogorov-Smirnov two-sample test was made as suggested by Siegel (80, pp. 127-136). The chi square approximation obtained by the Kolmogorov-Smirnov procedure was 5.645. This value was found to exceed the tabled chi square value of 4.605 associated with a probability of .05, but not to exceed the value of 7.828 associated with a probability of .01 (one-tailed test, two d.f.). As a result of the

Kolmogorov-Smirnov test, the null hypothesis of no positive relationship between experimental scale scores and continuation in college was rejected with a probability of less than .05 but greater than .01. The alternate or research hypothesis was considered to be confirmed.

In performing the Kolmogorov-Smirnov two-sample test, it was observed that the experimental scale score at which the instrument discriminated maximally between dropouts and non-dropouts was 18. It was found that 47.6 percent of the dropouts in the cross-validation sample had experimental scale scores of 18 or less, while only 19.8 percent of the non-dropouts had scores as low as 18. The Kolmogorov-Smirnov two-sample test was made of the significance of a difference as great as that between the values of 47.6 percent and 19.8 percent.

The hypothesis that scores on the experimental scale would not be significantly correlated with composite ACT scores was tested for subjects included in the cross-validation sample. A Spearman rank-difference coefficient of correlation (40, pp. 285-288) of .148 was obtained for the relationship in question. The hypothesis of zero correlation was tested by means of a procedure recommended by Guilford (40, p. 288) for determining the significance of a "rho" coefficient. It was determined that a probability of .21 would be associated with rejection of the hypothesis of zero correlation. On the basis of this test, the null hypothesis of zero correlation was not rejected.

Analysis of Minnesota Counseling Inventory Scale Scores

A separate analysis of variance was carried out as suggested by Guilford (40, pp. 267-275) with scores from each of the eight Minnesota Counseling Inventory Scales. Data for the 144 subjects included in this

study were cast into a 2 X 3 classification for the analysis of variance procedures. Dropout and non-dropout groups constituted "rows" while three composite ACT score groups served as "columns." Hypotheses d through i (listed on pages 39 and 40 of this report) were tested by the analysis of variance and succeeding t tests. In Table VIII are summarized the results of the analysis of variance carried out for each of the eight MCI scales. Given in Table VIII, from left to right, are the sources of variance examined in the analyses; the degrees of freedom associated with each source; and, for each MCI scale, variance estimates (mean sums of squares) obtained for each variance source examined.

In no case did an F value obtained by dividing a "within" variance estimate into another value lying in the same column in Table VIII equal or exceed the F value required for significance at the .10 point.

In interpreting analysis of variance results obtained in this study, the following recommendation by Guilford (40, p. 263) served as a guide:

If F is insignificant, of course, we should not apply t tests. Acceptance of the null hypothesis on the basis of an F test automatically accepts the null hypothesis for all pairs of means in the list, including the pairs with the largest differences.

Since no F value was found which could be considered significant with a probability of .10 or less, null hypotheses could not be rejected for any of the eight MCI scales. In Table IX, page 66, are shown the MCI scale mean scores for each criteria group employed in the study.

TABLE VIII

MEAN SUMS OF SQUARES AND F RATIOS FROM ANALYSIS OF VARIANCE

| Source and Degrees of Freedom | Mean Sums of Squares and <u>F</u> Ratios ^a (by Minnesota Counseling Inventory Scale) | | | | | | | |
|---|---|--------|---------|---------|---------|---------|---------|--------|
| | V | FR | SR | ES | C | R | M | L |
| Between, Total (5 d.f.) | | | | | | | | |
| Mean Sum of Squares | 65.52 | 40.63 | 75.61 | 80.05 | 81.52 | 104.18 | 115.62 | 39.71 |
| Within (138 d.f.) | | | | | | | | |
| Mean Sum of Squares | 93.50 | 100.70 | 101.35 | 100.77 | 99.37 | 100.88 | 100.32 | 102.68 |
| Between Dropouts and Non-dropouts (1 d.f.) | | | | | | | | |
| Mean Sum of Squares | 100.25 | 90.25 | 78.03 | 10.56 | 117.36 | 5.44 | 25.84 | .17 |
| <u>F</u> Ratio | (1.179) | (.896) | (.770) | (.105) | (1.181) | (.054) | (.258) | (.002) |
| Between ACT Score Levels (2 d.f.) | | | | | | | | |
| Mean Sum of Squares | 8.33 | 36.18 | 133.34 | 10.64 | 69.27 | 212.70 | 218.94 | 68.76 |
| <u>F</u> Ratio | (.891) | (.359) | (1.316) | (.106) | (.697) | (2.108) | (2.182) | (.670) |
| Interaction (2 d.f.) | | | | | | | | |
| Mean Sum of Squares | 100.34 | 20.27 | 16.68 | 184.19 | 75.84 | 45.03 | 57.20 | 30.42 |
| <u>F</u> Ratio | (1.073) | (.201) | (.165) | (1.828) | (.763) | (.446) | (.570) | (.296) |

^aF ratios located below corresponding "greater" mean sums of squares; none significant at probability level of .10 or lower.

TABLE IX

MCI SCALE MEAN SCORES FOR DROPOUTS AND FOR NON-DROPOUTS
AT THREE COMPOSITE ACT SCORE LEVELS^a

| MCI Scale | Experimental Group | | | | | |
|-------------------------|--------------------------|------------------|---------------------------------|------------------|--------------------------|------------------|
| | Lower ACT Score Level | | Intermediate ACT Score Level | | Upper ACT Score Level | |
| | Dropouts | Non- dropouts | Dropouts | Non- dropouts | Dropouts | Non- dropouts |
| | (\bar{X}) | (\bar{X}) | (\bar{X}) | (\bar{X}) | (\bar{X}) | (\bar{X}) |
| Validity | 49.8 | 49.5 | 53.0 | 48.0 | 50.0 | 50.1 |
| Family Relationships | 51.9 | 50.1 | 49.5 | 49.3 | 51.0 | 48.2 |
| Social Relationships | 49.7 | 52.2 | 48.0 | 48.2 | 50.2 | 51.9 |
| Emotional Stability | 50.7 | 49.5 | 48.5 | 52.2 | 51.5 | 47.4 |
| Conformity | 51.1 | 50.8 | 50.6 | 50.2 | 51.0 | 46.3 |
| Reality | 52.2 | 52.5 | 49.0 | 50.1 | 49.5 | 46.9 |
| Mood | 50.7 | 51.6 | 47.6 | 47.4 | 52.9 | 49.6 |
| Leadership | 50.6 | 50.7 | 49.5 | 47.7 | 50.0 | 51.4 |

^aValues are reported in T Score units; assumed mean 50, s.d. 10.

One additional set of tests was made utilizing data from the analysis of variance of MCI scale scores. F ratio tests were made according to the procedure outlined by Guilford (40, p. 224) for the hypothesis that greater variance was associated with composite ACT score group means than with dropout criterion group means (see hypothesis 1, page 39 of this report). For three of the eight MCI scales; Reality, Mood, and Leadership; the F ratios obtained in this series of tests were large enough and in the right direction to indicate one-tailed probabilities of .25 or less associated with rejection of the null for hypothesis 1. The F ratio obtained for the Leadership scale was found to have an associated probability of less than .10 but greater than .05. On the Validity, Family Relationships, and Conformity scales, larger variance estimates were obtained for dropout criterion groups than for composite ACT score groups. The results of this series of F ratio tests were not considered sufficiently conclusive to warrant rejection of the null hypothesis for any of the scales. Various MCI scales may tend to be more closely related to one than to the other of the criteria classifications, but it was not felt that the data obtained in this study clearly support such a conclusion.

Summary of Results

In the course of this investigation, statistical tests were made for nine hypotheses which were stated at the outset of the study, and for an additional six which were included to facilitate interpretation of other findings. The data upon which statistical tests were made were from a total of 144 male students who were enrolled as first semester freshmen in the Oklahoma State University College of Arts and Sciences in the Fall of 1961.

In this section, results of the present study are summarized with the hypotheses that were tested. Also given are the types of statistical tests utilized in testing the various hypotheses. Results are presented in the order obtained and do not necessarily follow the order in which the hypotheses were previously stated. Conclusions and recommendations based on these findings are presented in the final chapter of this report.

I. Hypothesis

There exist items in the Minnesota Counseling Inventory which will elicit significantly different responses from groups of subjects designated as dropouts and non-dropouts, the groups having matched frequency distributions of scholastic aptitude scores.

Statistical Tests

Chi square, two-tailed and directed one-tailed tests (38)(40, p. 234)

Results

Twenty-four MCI items were found to discriminate between the criterion groups at the .10 level. Fourteen of the same items and ten additional items were found to discriminate between criterion groups at the .10 point (directed test).

Disposition of Hypotheses

Null: Rejected

Alternate: Confirmed

II. Hypothesis

The unevenness of the distribution of discriminatory items observed in the first, second, and final one-thirds of the MCI would not occur by chance alone.

Statistical Test

One-sample chi square, two-tailed, 2 d.f. (80, pp. 42-47)

Results

Chi square approximation = 15.789; a probability of less than .001 was found to be associated with rejection of the null.

Disposition of hypotheses

Null: Rejected

Alternate: Confirmed

III. Hypothesis

Responses of dropout subjects to items in the MCI Validity scale will indicate significantly lower validity for the second one-half of the scale than for the first one-half.

Statistical Test

Sign test, one-tailed (80, pp. 68-75)

Results

A probability of .12 was found to be associated with rejection of the null.

Disposition of Hypotheses

Null: Not rejected

Alternate: Not confirmed

IV. Hypothesis

Responses of non-dropout subjects to items in the MCI Validity scale will indicate significantly lower validity for the second one-half of the scale than for the first one-half.

Statistical Test

Sign test, one-tailed (80, pp. 68-75)

Results

A probability of .19 was found to be associated with rejection of the null.

Disposition of Hypotheses

Null: Not rejected

Alternate: Not confirmed

V. Hypothesis

Responses to the MCI Validity scale by dropouts and non-dropouts combined indicate significantly lower validity for the second one-half of the scale than for the first one-half.

Statistical Test

Sign test, one-tailed (80, pp. 68-75)

Results

A probability of .06 was found to be associated with rejection of the null.

Disposition of Hypotheses

Null: Rejected

Alternate: Confirmed

VI. Hypothesis

The proportion of items in an MCI scale found to discriminate between dropouts and non-dropouts is significantly related to the proportion of the scale that is located in the first one-third of the MCI.

Statistical Test

Spearman rank-difference coefficient of correlation, followed by a one-tailed test of significance of the rho coefficient (40, pp. 285-288)

Results

Spearman rho = .50; a probability of .08 was found to be associated with rejection of the null.

Disposition of Hypotheses

Null: Rejected

Alternate: Confirmed

VII. Hypothesis

When MCI items selected under hypothesis "I" are combined into a single dropout predictor scale, a significant positive relationship will be found between experimental scale scores and continuation in college for subjects in the cross-validation sample.

Statistical Tests

Point-biserial coefficient of correlation (40, pp. 301-305); followed by a direct one-tailed t test of significance of the coefficient with 70 d.f. (40, p. 302).

Results

Point-biserial $r = .274$; $t = 2.38$; a probability of .01 was found to be associated with rejection of the null.

Disposition of Hypotheses

Null: Rejected

Alternate: Confirmed

VIII. Hypothesis

Scores on the experimental dropout predictor scale will be significantly higher (stochastically) for non-dropouts than for dropouts within the cross-validation samples used in this study.

Statistical Test

One-tailed Kolmogorov-Smirnov two-sample test; 2 d.f. (80, pp. 127-136)

Results

Chi square approximation = 5.645; a probability of less than .05 but greater than .01 was found to be associated with rejection of the null.

Disposition of Hypotheses

Null: Rejected

Alternate: Confirmed

IX. Hypothesis

The coefficient of correlation between experimental dropout predictor scale scores and scholastic aptitude test scores will not differ significantly from zero for the cross-validation sample utilized in this study.

Statistical Tests

Spearman rank-difference coefficient of correlation, followed by a two-tailed test of significance of the rho coefficient (40, pp. 285-288)

Results

Spearman rho = .148; a probability of .21 was found to be associated with rejection of the null.

Disposition of Hypotheses

Null: Not rejected

Alternate: Not confirmed

X. Hypothesis

Minnesota Counseling Inventory mean scores (on each of eight scales) will be significantly higher for dropouts than for non-dropouts utilized in this study.

Statistical Tests

Analysis of variance, F ratio (40, p. 274)

Results

No F value was obtained of sufficient size to indicate that the probability associated with rejection of the null would be as low as .10.

Disposition of hypotheses

Null: Not rejected in any case

Alternate: Not confirmed in any case

XI. Hypothesis

Minnesota Counseling Inventory mean scores (on each of eight scales) will differ significantly between groups designated as having lower, intermediate, and upper levels of measured scholastic aptitude.

Statistical Tests

Analysis of variance, F ratio (40, p. 274)

Results

In no case was an F ratio found having an associated probability as low as .10.

Disposition of hypotheses

Null: Not rejected for any scale

Alternate: Not confirmed for any scale

Hypothesis

In testing hypothesis XI lower scholastic aptitude groups will have the highest MCI mean scores, followed in order by groups representing the upper and the intermediate scholastic aptitude levels.

Statistical Tests

Meaningful t tests could not be made following non-significant F ratios reported under hypothesis XI, above (40, p. 263).

Results

None

Disposition of hypotheses

Null: Not rejected for any scale

Alternate: Not confirmed for any scale

XIII. Hypothesis

A significant interaction (with respect to scores on each of eight MCI scales) will be found to exist between measured scholastic aptitude level and the dropout versus non-dropout dichotomy.

Statistical Test

Analysis of variance, F ratio (40, p. 274)

Results

For one scale (Emotional Stability), an F ratio was found having an associated probability of less than .25. In no case was an F ratio found having an associated probability as low as .10.

Disposition of Hypotheses

Null: Not rejected for any scale

Alternate: Not confirmed for any scale

XIV. Hypothesis

In the analysis of variance of MCI scale scores, mean sums of squares associated with mean-differences among ACT score groups will be significantly less than those associated with mean differences between dropout and non-dropout groups.

Statistical Tests

Analysis of variance, F ratio (40, p. 224)

Results

A one-tailed probability of .10 or lower was found for only one scale (Leadership).

Disposition of Hypotheses

Null: Not rejected for any scale

Alternate: Not confirmed for any scale

CHAPTER V

SUMMARY, LIMITATIONS, AND CONCLUSIONS

The principal objective of the study reported herein was to determine whether a valid college dropout predictor scale could be constructed from items included in the Minnesota Counseling Inventory. The subjects utilized in the study were male students who were enrolled as first semester freshmen in the Oklahoma State University College of Arts and Sciences in the fall semester of 1961. For the purposes of this investigation, subjects were considered to be dropouts if they received no credit for academic work completed at Oklahoma State University during the fall semester of 1962. Subjects classified as non-dropouts must have (a) received credit for academic work completed in the Oklahoma State University College of Arts and Sciences during the 1962 fall semester, (b) earned credit in at least 36 semester hours of work, and (c) maintained a sufficiently high accumulative grade point average (1.50) to meet the University scholastic requirement for continuing in enrollment.

Groups of dropouts and of non-dropouts were selected having matched frequency distributions of composite ACT scores. A group of dropouts and a group of non-dropouts were selected to represent each of three levels of scholastic aptitude. The levels were designated as "lower," "intermediate," and "upper." The composite ACT score intervals representing the three scholastic aptitude levels were 0.5 - 18.5, 18.6 - 21.5, and 21.6 - 36.5.

Data for one-half of the subjects in each of the six experimental groupings were utilized in validating Minnesota Counseling Inventory items for inclusion in an experimental dropout predictor scale. Data for the remaining subjects were held back for cross-validation purposes.

In an item validity analysis, chi square tests were made for each MCI item to determine whether responses of dropout subjects and non-dropout subjects were significantly different. For a total of 34 MCI items, chi square values were obtained which were of sufficient size to indicate that the item had discriminated between the criterion groups. To be considered discriminatory, items were required to yield chi square approximations having probabilities of .10 or less in either a two-tailed test or a directed one-tailed test.

Minnesota Counseling Inventory responses of subjects in the cross-validation samples were scored for the 34 items included in the experimental dropout predictor scale. A point-biserial coefficient of correlation of .274 was obtained for the relationship between scores on the experimental scale and the dropout versus non-dropout dichotomy. The obtained coefficient was found to be significantly greater (in a positive direction) than zero, with a probability of .01. A non-parametric Kolmogorov-Smirnov two-sample test indicated that experimental scale scores for non-dropouts were significantly higher than those for dropouts, with a probability of less than .05, but greater than .01. A Spearman rank-difference correlation coefficient of .147 was found for the relationship between experimental scale scores and composite ACT scores for members of the cross-validation sample. The coefficient did not differ significantly from zero, with a probability as low as .10 (two-tailed, 70 d.f.).

A secondary objective of the study reported on these pages was to test the general hypothesis that for each of the three designated scholastic aptitude levels, MCI responses of dropout subjects would indicate significantly less favorable personal and social adjustment than responses made by non-dropout subjects. Tests were also made for the hypothesis that subjects in the lowest scholastic aptitude classification would have the highest (least favorable) adjustment scores, followed in order by subjects in the upper and the intermediate scholastic aptitude score intervals. The results of statistical tests made for these and other related hypotheses were suggestive, but not generally conclusive. Specific findings are reported in detail in Chapter IV of this report.

Limitations

In interpreting the findings of this investigation, the reader should be cognizant of certain associated limitations. A brief discussion will be presented here of factors which may have substantially influenced the results reported herein.

According to a series of statistical tests reported earlier, subjects utilized for this study apparently made more valid responses during the first one-fifth of the Minnesota Counseling Inventory than after they had completed one-fifth of that instrument. This finding assumes considerable importance when viewed in connection with the finding that a disproportionately low number of items located near the beginning of the MCI were found to discriminate between dropouts and non-dropouts. Of the first 119 items in the MCI, only four were found to be discriminatory, according to the chi square procedures used in this study. The findings of this study suggest that at the outset, responses made to MCI items by dropouts and

by non-dropouts tended to be alike and relatively valid (as measured by the MCI Validity scale). However, it appears that as subjects included in the two groups progressed through the inventory, their responses tended to become dissimilar and less valid. The implication of these findings seems to be that differing modes of reacting to a testing situation may have influenced the designation of items as "discriminatory" as much as the personal and social adjustment factors which the MCI purportedly measures.

A second limitation associated with the present study was the relatively small number of MCI items found to discriminate between the dropout and non-dropout criterion groups. Items were included in the experimental dropout predictor scale if corresponding chi square approximations were found to have associated probabilities of .10 or less in either a two-tailed or a directed one-tailed test. The combined rejection region associated with the two tests represented fifteen percent of the area under the normal curve. Thus, by chance alone, fifteen percent of the 355 items in the MCI might have been declared discriminatory in one or the other of the tests employed. The percentages of items found to be discriminatory within the first, the second, and the final one-thirds of the Minnesota Counseling Inventory were 3.4, 11.9, and 13.6, respectively. In view of these observations, it must be concluded that items included in the experimental scale may have been selected largely on the basis of chance.

A third limitation of this study is in connection with the population on which it was based. The population was made up of males in only one freshman class in a liberal arts college at a state university in the southwestern portion of the United States. Furthermore, dropout and non-dropout subjects were selected to provide samples of equal size representing

the lower, the middle, and the upper one-thirds of the available distributions of composite ACT scores. Because of the nature of the sampling procedure selected, it may be said that each experimental sample is representative of the portion of the population from which it was drawn. However, because of the decision to maximize and equalize sample size across the criteria groupings, it cannot be said that the total sample drawn is representative of the total population. For example, in two of the six groupings the probability of a given population member becoming a sample member was 1.00; while in other cases it was as low as .29. The inequality was due to the fact that few individuals with high composite ACT scores were identified as dropouts, while few individuals with low composite ACT scores were found among the identified non-dropouts.

Conclusions and Recommendations

In view of the limitations discussed in the preceding section, a conservative interpretation would appear to be in order for the findings of this study.

Statistical tests made in cross-validating the experimental dropout predictor scale constructed in this study indicated that dropouts made significantly lower scores on the scale than did non-dropouts. The associated probability was less than .05, but greater than .01. That finding was substantiated by the finding of a coefficient of correlation between experimental scale scores and the dropout criterion which was significantly greater than zero (in a predicted direction), with a probability equal to .01.

It was observed that even though the obtained coefficient of correlation was significantly greater than zero, experimental scale scores

accounted for less than ten percent ($r_{pbi}^2 = .075$) of the variance between the criterion groups. On the basis of this observation, it was concluded that the practical value of the experimental scale for predictive purposes is quite limited. In testing the scale with a cross-validation sample it was found that 47.6 percent of the dropout subjects and 19.8 percent of the non-dropout subjects scored below the cut-off point at which the discriminatory power of the instrument was greatest.

The customary analysis of variance procedures carried out in this study for Minnesota Counseling Inventory scale scores produced no F values of sufficient size to be considered statistically significant with probability as low as the .10 point. The findings did suggest that MCI scale scores vary at least as much in association with composite ACT score level as with the dropout versus non-dropout dichotomy. Interpreted rigorously, however, the analysis of variance results of this study did not support the conclusion that significant relationships exist between MCI scale scores and the criteria against which they were examined.

With respect to future research on the prediction of individual cases of college dropout, results of this investigation suggest that, for populations of the type studied, factors other than personal and social adjustment as measured by the MCI should be considered.

The design of the present investigation did not include a direct test of the relative importance of "personal" as opposed to "situational" variables in the etiology of college dropout. However, the absence of findings supporting a strong relationship between personality factors and dropout suggests that other relationships should be considered. Future investigations of college dropout might profitably examine the interaction of both personal and environmental variables along lines suggested by Stern (91), Thistlewaite (93), and Nasatir (72).

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APPENDIX

TABLE X

MINNESOTA COUNSELING INVENTORY ITEMS INCLUDED
IN THE EXPERIMENTAL DROPOUT PREDICTOR
SCALE, WITH SCORING KEY

| MIC Item Number | Item | Key for Non-dropouts |
|--------------------|---|-------------------------|
| 8. | I find it hard to keep my mind on a task or job. | False |
| 31. | I resent having anyone take me in so cleverly that I have to admit he put one over on me. | True |
| 40. | I have been depressed because of low marks in school. | False |
| 109. | I feel like giving up quickly when things go wrong. | False |
| 133. | At times I have fits of laughter and crying that I cannot control. | False |
| 143. | Sometimes without any reason or even when things are going wrong I feel excitedly happy, "on top of the world." | False |
| 146. | I have had blank spells in which my activities were interrupted and I did not know what was going on around me. | False |
| 147. | I like to take the first step in making friends. | False |
| 149. | Criticism disturbs me greatly. | True |
| 151. | I find it hard to set aside a task that I have undertaken, even for a short time. | False |
| 157. | I have very few quarrels with members of my family. | False |
| 172. | Criticism or scolding hurts me terribly. | True |
| 187. | Most people will use somewhat unfair means to gain profit or advantage rather than to lose it. | False |

TABLE X (Continued)

| MCI Item Number | Item | Key for Non-dropouts |
|--------------------|---|-------------------------|
| 198. | I have had periods when I felt so full of pep that sleep did not seem necessary for days at a time. | False |
| 203. | At times I have enjoyed being hurt by someone I loved. | False |
| 220. | I don't seem to care what happens to me. | False |
| 228. | I sometimes tease animals. | True |
| 234. | It makes me feel like a failure when I hear of the success of someone I know well. | False |
| 244. | I am almost never bothered by pains over the heart or in my chest. | True |
| 246. | My relatives are nearly all in sympathy with me. | True |
| 248. | My hands have not become clumsy or awkward. | True |
| 252. | I have disagreed with my parents about my choice of a life work. | True |
| 269. | I wish I could be as happy as others seem to be. | True |
| 271. | Once a week or oftener I become very excited. | False |
| 281. | When in a group of people I have trouble thinking of the right things to talk about. | True |
| 286. | I enjoy gambling for small stakes. | False |
| 305. | I seldom or never have dizzy spells. | True |
| 306. | I think most people would lie to get ahead. | False |
| 320. | I enjoy entertaining people. | False |
| 335. | I feel embarrassed when entering a public assembly after everyone else has been seated. | False |
| 337. | Some people are so bossy that I feel like doing the opposite of what they request, even though I know they are right. | True |

TABLE X (Continued)

| MCI Item Number | Item | Key for Non-dropouts |
|--------------------|--|-------------------------|
| 344. | I am annoyed by social activities. | False |
| 348. | I have disagreed with my parents about the way in which work around the house should be done. | True |
| 350. | I hesitate to enter a room by myself when a group of people are sitting around the room talking together. | False |

TABLE XI
 EXPERIMENTAL DROPOUT PREDICTOR SCALE SCORES
 AND COMPOSITE ACT SCORES FOR
 CROSS-VALIDATION SAMPLES

| Criteria Group | Code Number of Subject | Composite ACT Score | Experimental Scale Score |
|---------------------------------------|------------------------|---------------------|--------------------------|
| Dropout, Upper ACT Score Level | 113 | 22 | 15 |
| | 114 | 25 | 20 |
| | 115 | 24 | 24 |
| | 116 | 23 | 21 |
| | 117 | 25 | 17 |
| | 118 | 28 | 20 |
| | 119 | 25 | 21 |
| | 120 | 22 | 13 |
| | 121 | 22 | 14 |
| | 122 | 27 | 20 |
| | 123 | 24 | 17 |
| | 124 | 25 | 18 |
| Dropout, Intermediate ACT Score Level | 213 | 20 | 20 |
| | 214 | 20 | 21 |
| | 215 | 20 | 20 |
| | 216 | 19 | 16 |
| | 217 | 19 | 18 |
| | 218 | 19 | 17 |
| | 219 | 21 | 20 |
| | 220 | 21 | 18 |
| | 221 | 19 | 17 |
| | 222 | 20 | 21 |
| | 223 | 19 | 25 |
| | 224 | 20 | 15 |
| Dropout, Lower ACT Score Level | 313 | 16 | 16 |
| | 314 | 18 | 22 |
| | 315 | 15 | 16 |
| | 316 | 15 | 14 |
| | 317 | 15 | 21 |
| | 318 | 13 | 19 |
| | 319 | 12 | 17 |
| | 320 | 14 | 22 |
| | 321 | 18 | 20 |
| | 322 | 15 | 18 |
| | 323 | 15 | 24 |
| | 324 | 10 | 21 |

TABLE XI (Continued)

| Criteria Group | Code Number of Subject | Composite ACT Score | Experimental Scale Score | |
|------------------------------------|---|---------------------|--------------------------|----|
| Non-dropout, Upper ACT Score Level | 413 | 24 | 22 | |
| | 414 | 28 | 24 | |
| | 415 | 23 | 21 | |
| | 416 | 26 | 17 | |
| | 417 | 24 | 20 | |
| | 418 | 23 | 20 | |
| | 419 | 26 | 23 | |
| | 420 | 27 | 22 | |
| | 421 | 26 | 20 | |
| | 422 | 23 | 23 | |
| | 423 | 23 | 21 | |
| | 424 | 25 | 25 | |
| | Non-dropout, Intermediate ACT Score Level | 513 | 20 | 17 |
| | | 514 | 19 | 21 |
| 515 | | 21 | 23 | |
| 516 | | 21 | 15 | |
| 517 | | 21 | 19 | |
| 518 | | 19 | 21 | |
| 519 | | 20 | 19 | |
| 520 | | 19 | 19 | |
| 521 | | 19 | 22 | |
| 522 | | 21 | 22 | |
| 523 | | 19 | 22 | |
| 524 | | 20 | 20 | |
| Non-dropout, Lower ACT Score Level | | 613 | 13 | 18 |
| | | 614 | 14 | 18 |
| | 615 | 18 | 21 | |
| | 616 | 7 | 22 | |
| | 617 | 17 | 19 | |
| | 618 | 16 | 25 | |
| | 619 | 16 | 16 | |
| | 620 | 16 | 15 | |
| | 621 | 18 | 20 | |
| | 622 | 18 | 21 | |
| | 623 | 18 | 21 | |
| | 624 | 18 | 19 | |

VITA

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