

THE EFFICIENCY OF CERTAIN CRITERIA  
IN PREDICTING SCHOOL DROPOUT

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DONALD D. FINK

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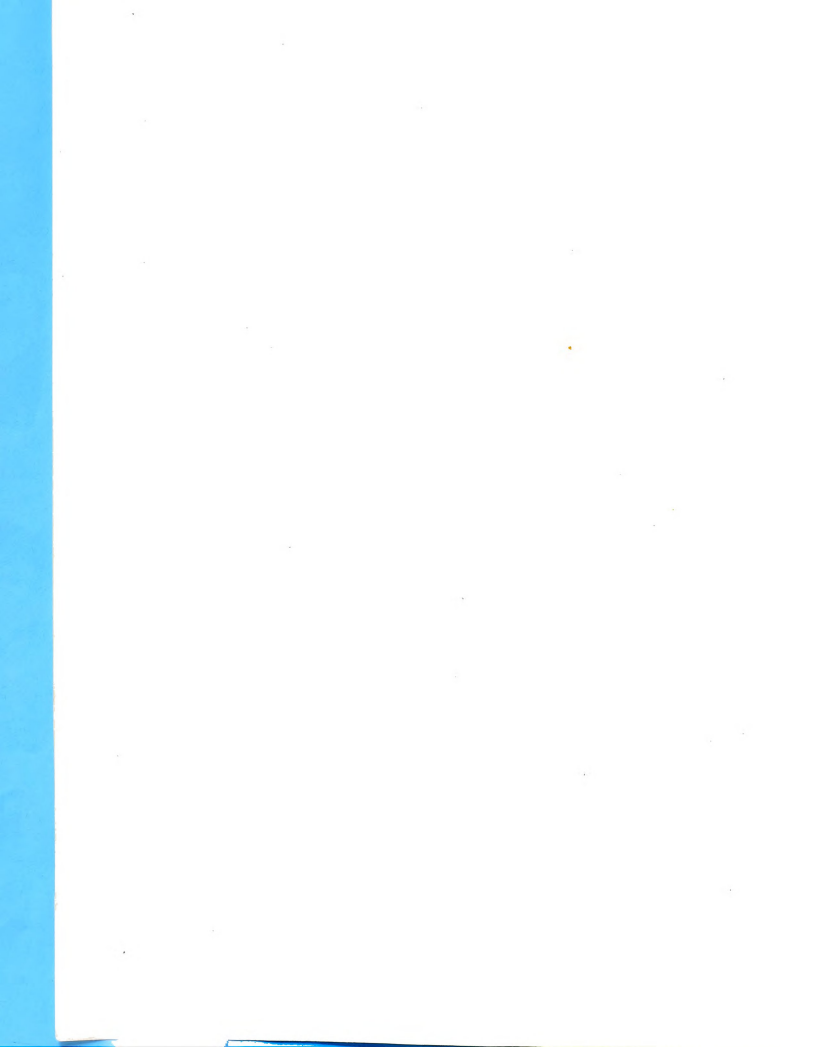
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## ABSTRACT

### THE EFFICIENCY OF CERTAIN CRITERIA IN PREDICTING SCHOOL DROPOUTS

by Donald D. Fink

Evidence of America's increasing emphasis upon education may be found in the fact that 60% of its youth are now achieving high school graduation as compared with only 10% in 1900. However, the nearly one million who annually fail to graduate with their peers still create a major social problem, especially in light of the fact that population trends are towards large metropolitan centers where unemployment is high among young people without high school diplomas. The problem is intensified by the rapid change in the occupational picture in the United States in the direction of professional, technical and skilled work and away from agricultural and unskilled jobs. These facts give rise to the necessity of learning as much as possible about the causes for dropping out of school.

The current study has as its purpose an attempt to identify criteria which will predict school dropout with consistency. The variables selected were derived from two major





Donald D. Fink

types of research - the myriad of studies which have identified certain educational and social characteristics of dropouts, and many investigations of the role of motivation and/or aspiration in educational plans, or how they, themselves, are affected by social class membership. In general, the variables were considered to be of two basic types, (1) Self-evaluative - level of occupational aspiration (measured by Haller's Occupational Aspiration Scale), the subjects' educational plans, the subjects' estimate of each parents' aspirations for their education and occupation, and the subjects' estimate of the amount of education achieved by each parent; and (2) Objective - race, age, IQ, DAT-VR, AR and NR, grade point average, and father's occupation (socio-economic status as coded by both the North-Hatt and Duncan SEI Scales).

The study opened in January, 1960 with 521 eighth and ninth grade pupils from the eight secondary schools in Grand Rapids, Michigan. When the study closed in February, 1962, 355 of the subjects had reached sixteen years of age, the age when a student in Michigan may voluntarily leave school. Of this number, 311 had been continuously enrolled and 44 were considered dropouts by definition generally having left school voluntarily for reasons other than transfer, or having been excluded.

The relationship between the variables and the criterion, school status, was investigated by three statistical





Donald D. Fink

procedures, i.e., simple correlations (nine different matrices are presented in Appendix C), multiple regression analysis, and multiple discriminant function analysis as proposed by Tiedeman and others.

In general, it may be said that though many of the simple correlations between the variables and the criterion achieved significance at the .01 level, they were consistently low, probably confirming the belief that dropout characteristics appear in clusters rather than causing early school leaving individually. Among the simple correlations, the variables most highly significant were OAS Total, parents' educational aspirations for their children, grade point average, IQ, being over-age and educational plans of the pupils. Among the females, race also achieved significance.

For the multiple regression study the following data were employed: age, IQ, DAT-VR, AR and NR, GPA, educational plans, OAS Total, each parent's educational level, each parent's educational aspiration, socio-economic status, and the criterion. All Beta weights achieved significance at either the .0005 or .01 level except GPA among the females.

The discriminant analysis strongly emphasized the role of parental educational aspiration (as expressed by the subjects) along with being over-age as dropout predictors. Of some strength, also, were GPA, IQ, and the subjects' own educational plans. The level of occupational aspiration failed



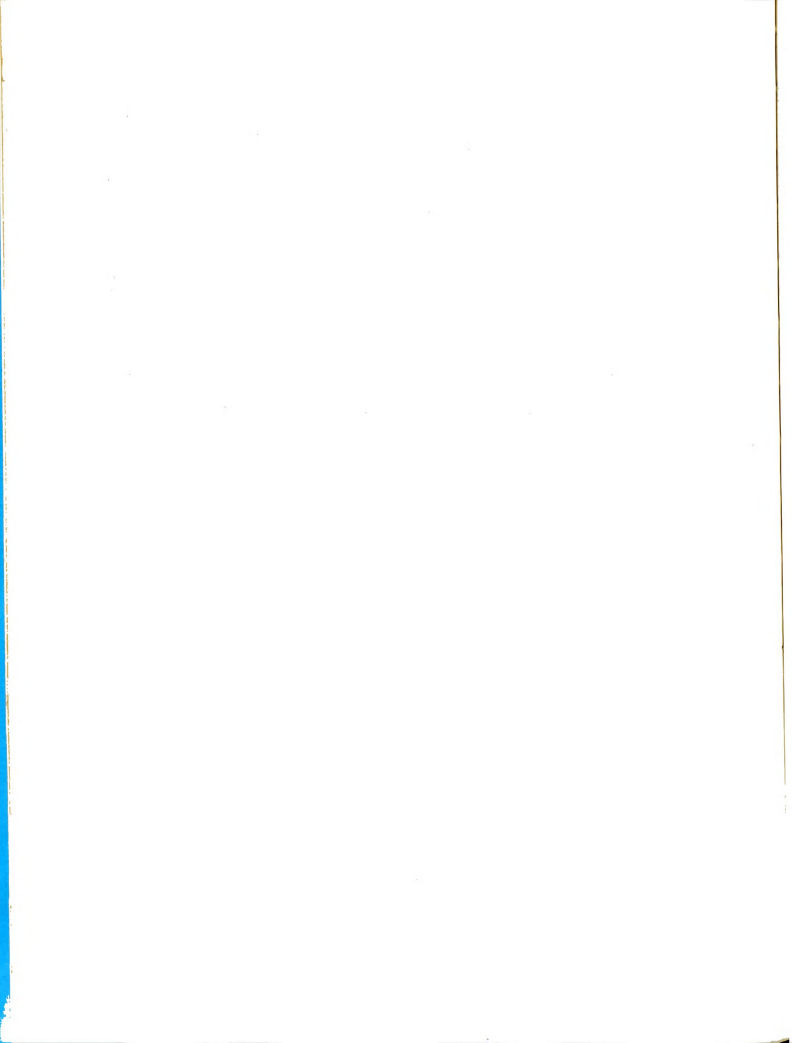
Donald D. Fink

to show power in the discriminants.

The results of the study tend to give support to current literature regarding the GPA, IQ and over-ageness of school dropouts and seem to add new dimensions by showing the significance of occupational aspiration and parental educational aspirations in school holding power. However, the claimed importance of a pupil's socio-economic status in determining school persistence seems to be denied by the current study.

Several recommendations are made for future dropout studies employing other self-evaluative instruments.





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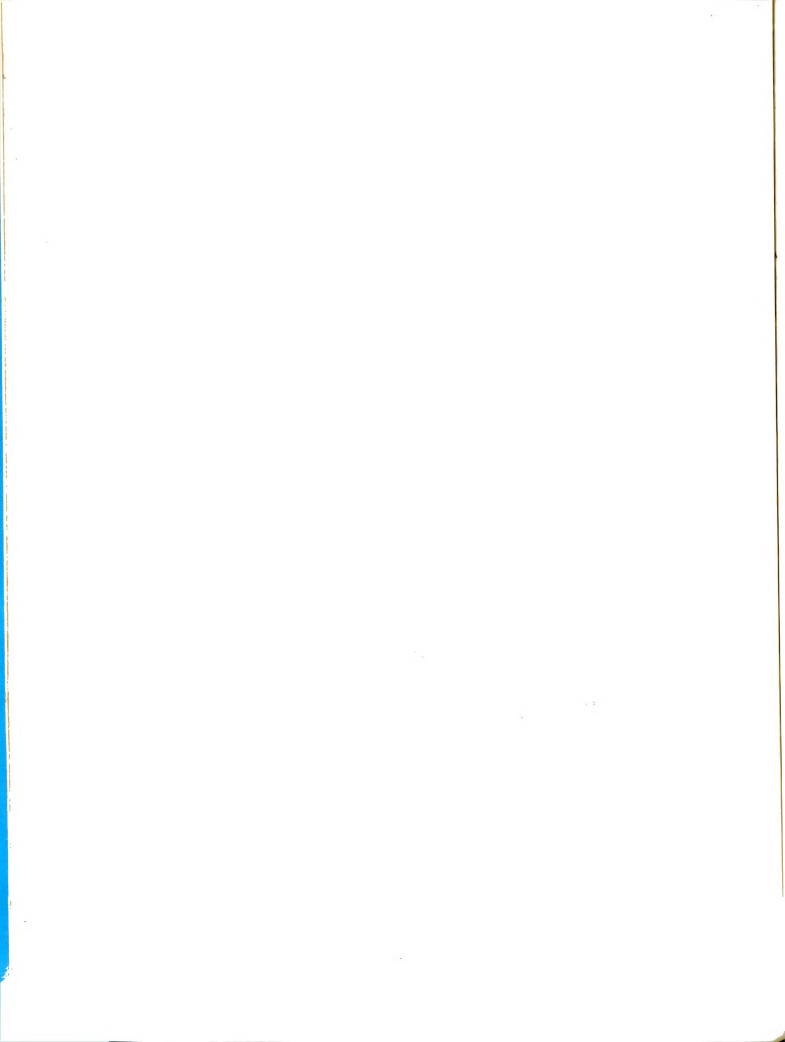
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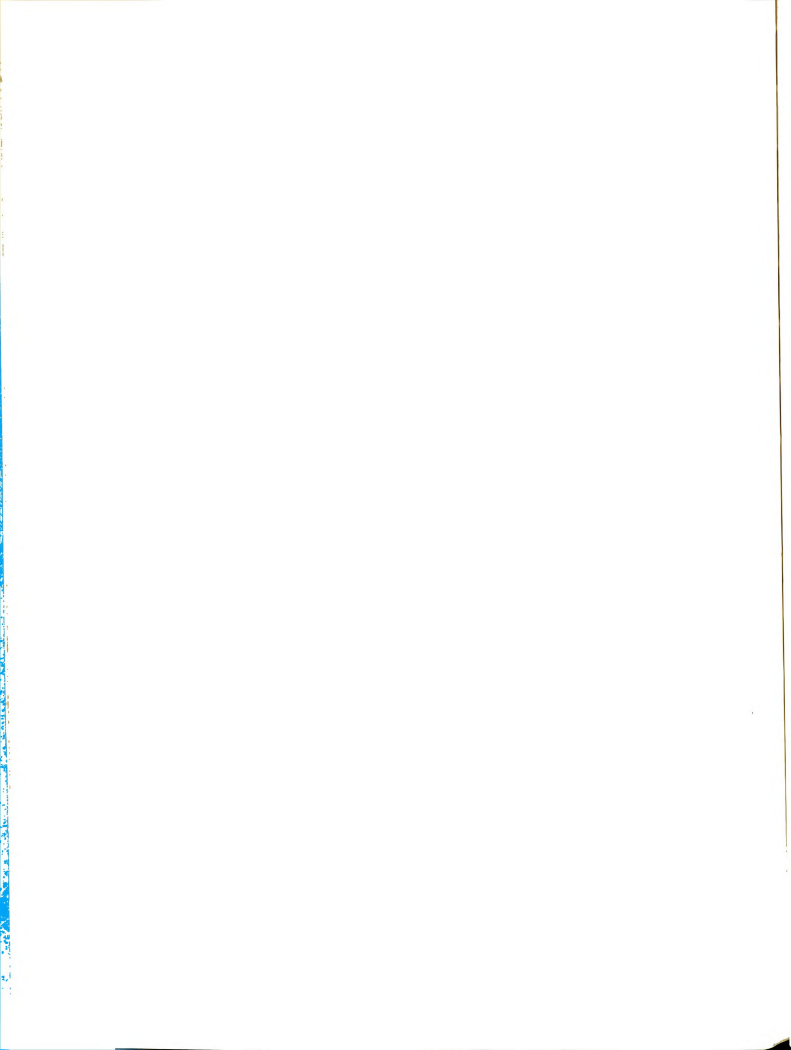


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Only a person who has experienced the planning and operation of a research project and the subsequent writing of a thesis can fully sense the overwhelming feeling of gratitude which is felt at the completion. So many persons offer so much, often at critical times, that one learns to accept the role of a helpless being with the hope that he may someday be called upon in the same fashion by those who follow. For it is probably true that the only lasting monuments which we leave behind us are those whom we were able to help in some manner and on whose lives we have left a favorable impact.

In this spirit, my deepest appreciation to Dr. Walter F. Johnson - friend, great professional image, advisor, and director of this thesis - for many, many patient hours and conferences, and for his skill at doing and saying the right things at the proper moment. Likewise, the same spirit of feeling and gratitude to Dr. Archie O. Haller, co-director and genuine student of human behavior, who is responsible for much of the design and plan of the project and who provided much of the stimulus in keeping the study "on course". These two men were, at all times, indispensable.

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and counselor, and many problems have been aired with the aid of her willing ear. Dr. Roe, a professor of school administration for some of the courses taken early in the sequence of study, is responsible for many facets of my philosophy of school administration, which job it has been my privilege to perform for seven years.

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There are many others at Michigan State University very deserving of mention, but to begin would risk omitting some



worthy names, and the hazards are too great.

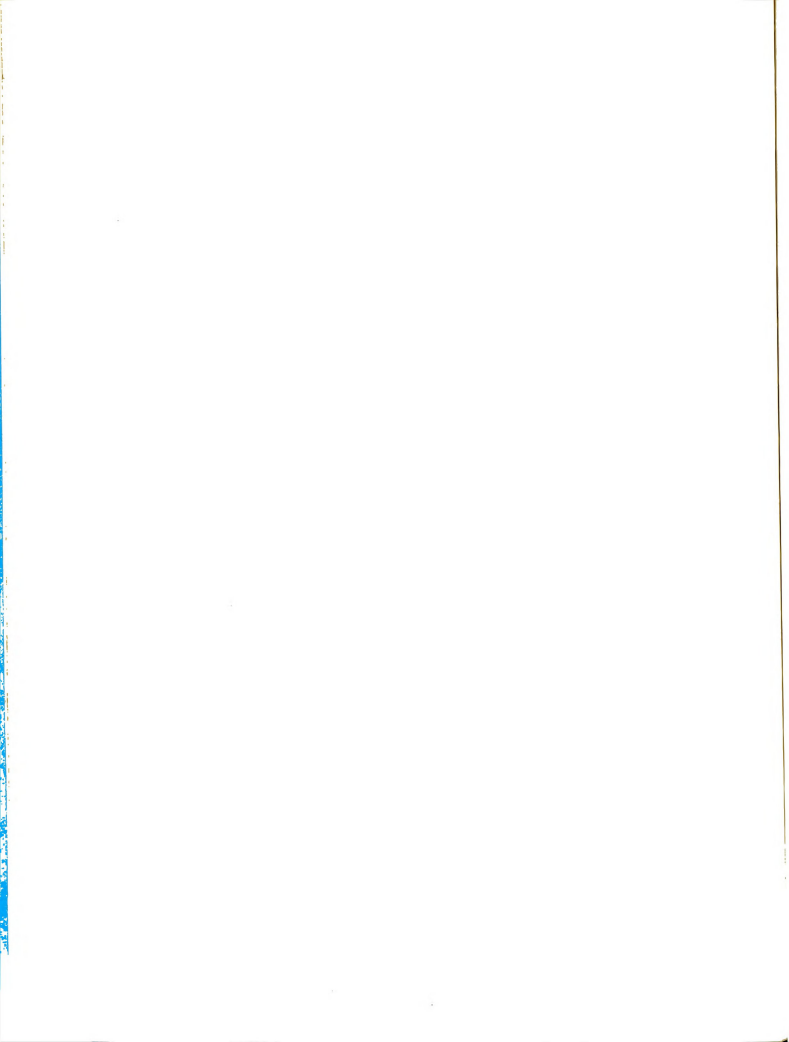
Much encouragement, understanding and inspiration have come from Superintendent of Schools Benjamin J. Buikema and Deputy Superintendent Jay L. Pylman, at whose urging the doctoral program was seen to its completion.

To my faithful secretary, former pupil at Ottawa Hills High School, and friend of our family, Miss Judy Slot, my humble gratitude for her unselfish assistance and sacrifice of personal time in the preparation of the masters from which this document was printed.

Dr. William Sur, Professor of Music Education at Michigan State University and personal friend, remarked many years ago that the doctor's degree is a family affair. Three persons can now attest to that - my lovely and loving Anne, who has been a tower of strength and patient encouragement; my wonderful son, Donald, who has freely given of his time to help with the data and has taken a genuine personal interest in "Dad's thesis"; and my happy, ambitious and precious Mary Anne, who has sacrificed many summer vacations and ball games so Dad might "finish". Truly, the diploma should contain their names.

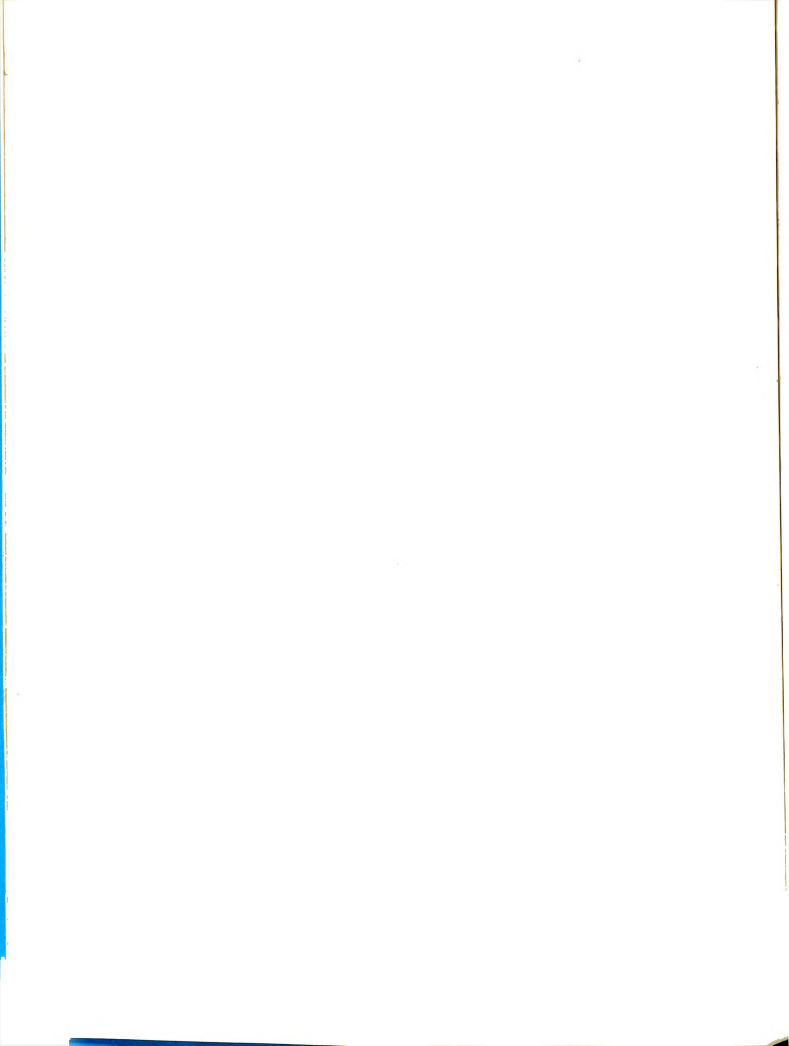
And, finally, to our Almighty Creator a prayer of gratitude for the restless spirit which would be satisfied only by the completion of this study. Truly, it is hoped that this person may be adequate to carry out whatever plans He





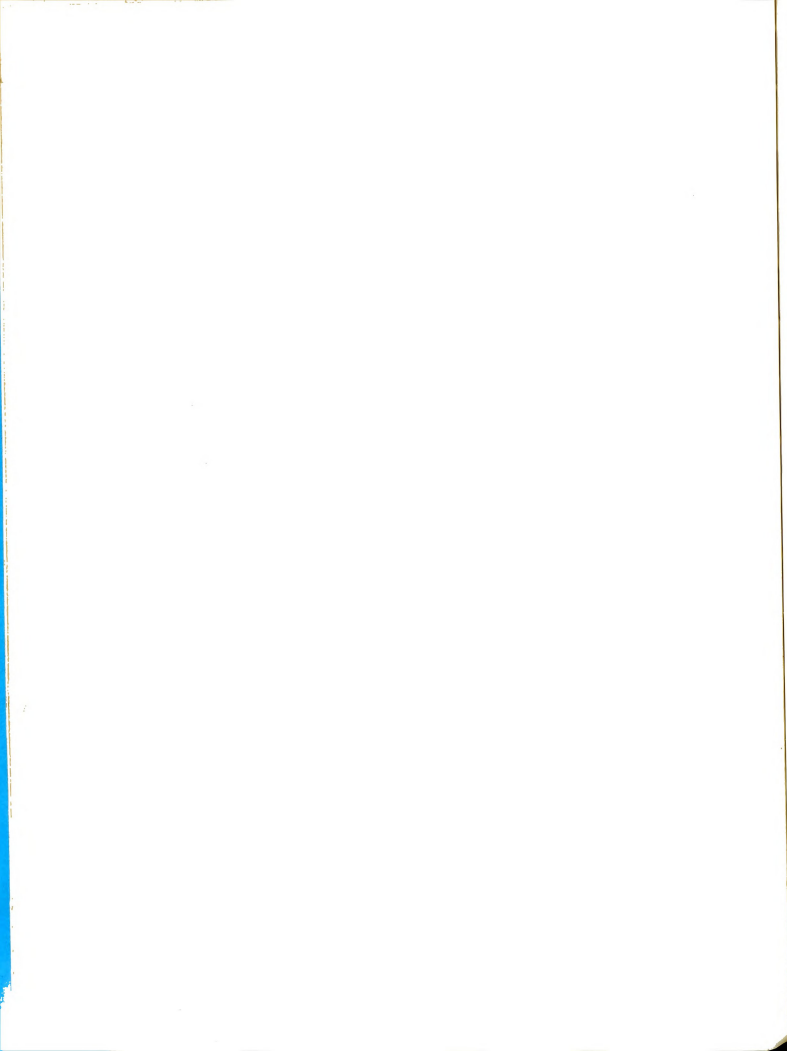
may have for the new skills and training.

Truly, these are the expressions of a grateful man.

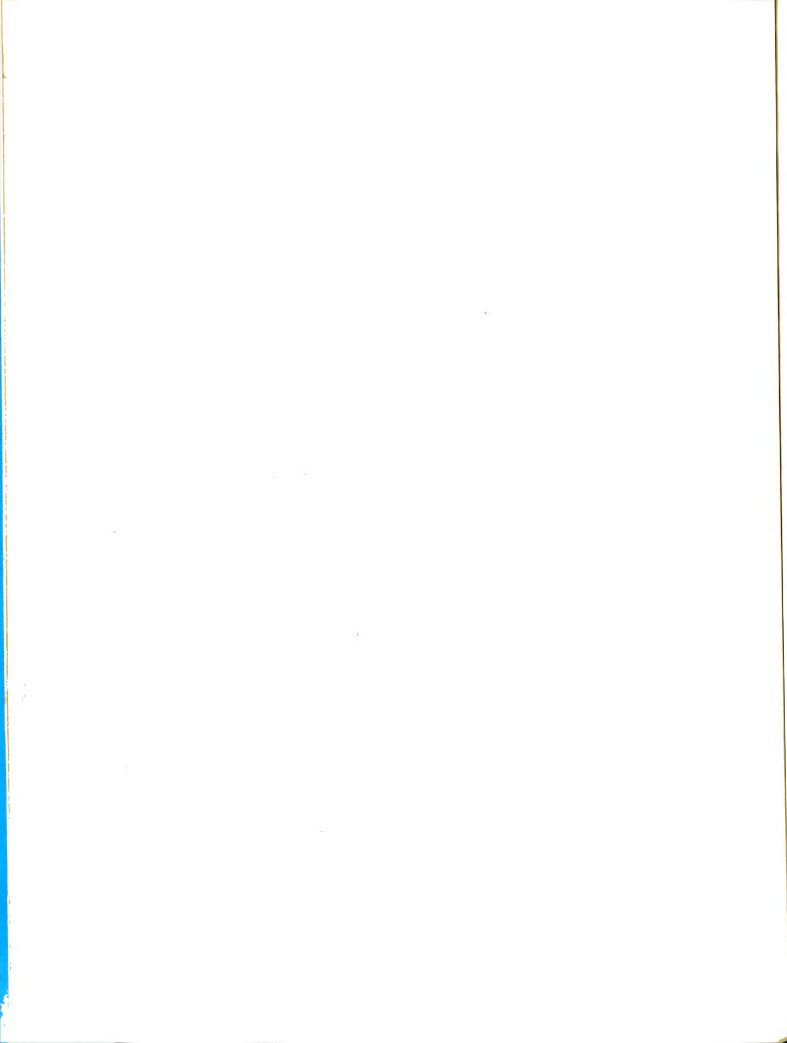


# TABLE OF CONTENTS

CHAPTER	PAGE
I. THE PROBLEM, HYPOTHESES AND PLAN OF THE STUDY	1
Statement of the problem and the hypotheses.	2
Hypotheses . . . . .	4
Need and importance of the study . . . . .	5
Limitations and scope of the study . . . . .	6
Definition of terms . . . . .	10
Plan of the study . . . . .	12
II. REVIEW OF THE LITERATURE AND RATIONALE FOR THE STUDY . . . . .	16
Studies measuring or describing the dropout.	18
Studies of motivation and aspiration . . . . .	26
Summary . . . . .	35
III. SITE, SAMPLE AND INSTRUMENTATION . . . . .	37
The site . . . . .	37
The instrumentation . . . . .	41
Identification . . . . .	41
Race . . . . .	42
Sex . . . . .	43
Age . . . . .	43
School . . . . .	45
Grade . . . . .	46
IQ . . . . .	46



CHAPTER	vii
	PAGE
Differential Aptitude Tests . . . . .	48
Grade Point Average . . . . .	50
Educational plans . . . . .	51
Occupational Aspiration Scale . . . . .	52
Father's occupation . . . . .	55
Parents' education . . . . .	59
Parental aspirations . . . . .	60
The sample . . . . .	61
Effect of age on the variables . . . . .	69
The sample - a concluding statement . . . . .	73
Summary . . . . .	73
IV. ANALYSIS OF THE DATA . . . . .	75
Closing the study . . . . .	75
Refining the sample . . . . .	78
Comparison of the original and final samples . . . . .	80
Operational hypotheses . . . . .	83
Consequences of accepting or rejecting the hypotheses . . . . .	86
Statistical procedures . . . . .	88
Multiple discriminant analysis . . . . .	92
Testing the hypotheses . . . . .	105
Summary . . . . .	108
V. SUMMARY AND CONCLUSIONS . . . . .	110

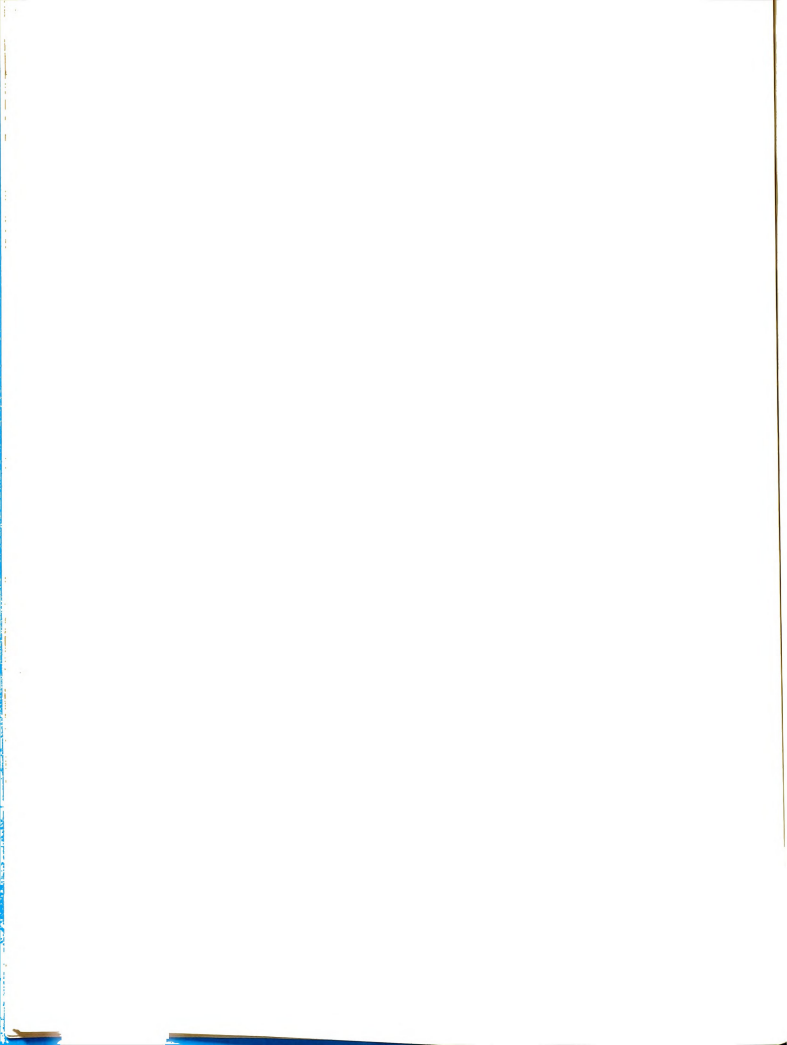


CHAPTER	viii
	PAGE
Summary of the study . . . . .	110
Conclusions . . . . .	116
Implications for future studies . . . . .	116
Summary . . . . .	119
BIBLIOGRAPHY . . . . .	121



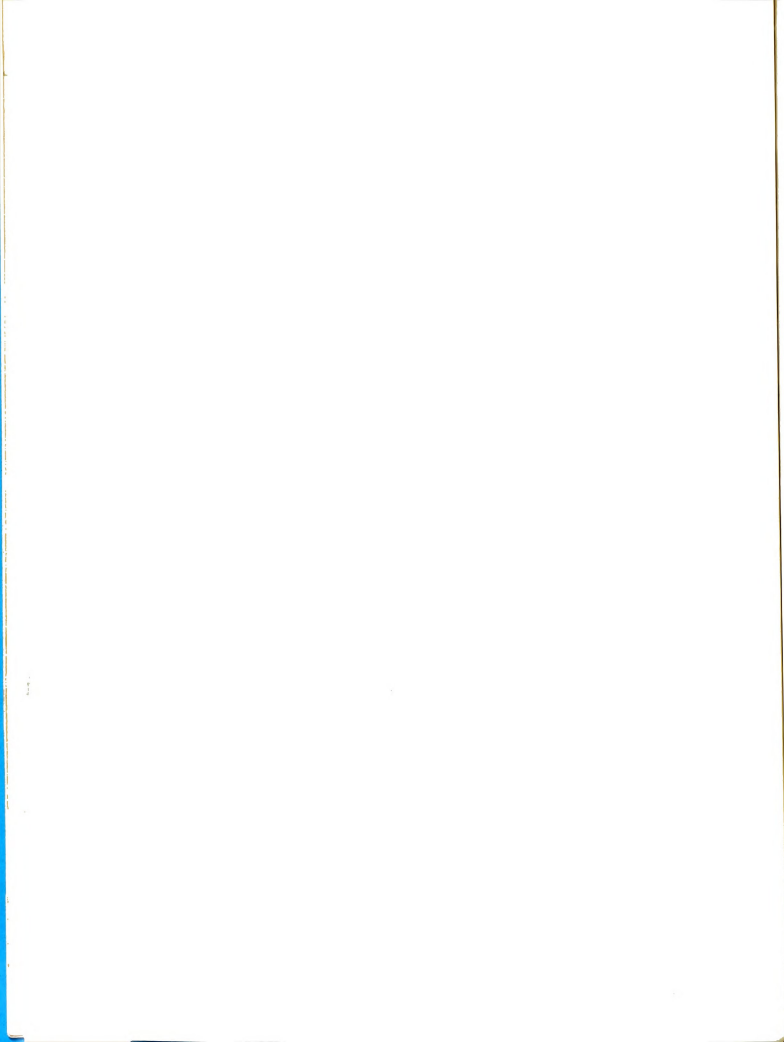
# LIST OF TABLES

TABLE	PAGE
I. Educational Characteristics of Sample Group by Race and Sex . . . . .	64
II. Mean Occupational Aspiration Scores of Sample Group by Sex and Race . . . . .	66
III. Mean Score Characteristics of Parents by Sex and Race of Subjects . . . . .	68
IV. Mean Score Characteristics by Sex . . . . .	70
V. Mean Score Characteristics by Membership Within Age Quartiles . . . . .	72
VI. Comparison of Mean Score Characteristics of Original and Final Samples . . . . .	81
VII. Multiple Correlations and Beta Weights by Sex . . . . .	93
VIII. Standardized Regression Weights (b) Converted From Beta Weights ( $b^*$ ) . . . . .	94
IX. Eigen Vectors for the First and Second Discriminant Functions . . . . .	100



# LIST OF APPENDICES

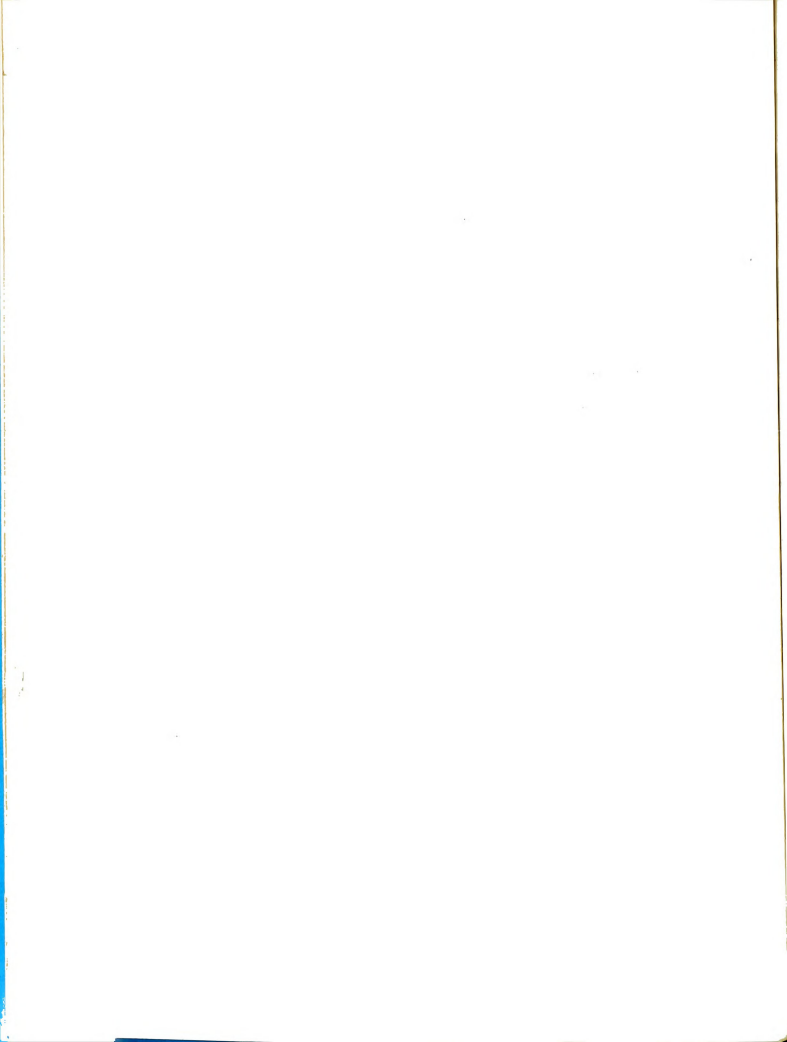
APPENDIX	PAGE
A. NON-STANDARDIZED INSTRUMENTS . . . . .	142
Occupational Aspiration Scale . . . . .	143
About me and my oarents . . . . .	149
My educational plans . . . . .	151
B. SCORING KEYS . . . . .	152
Occupational Aspiration Scale . . . . .	153
About me and my parents . . . . .	154
My educational plans . . . . .	156
Conversion Tables - DAT percentiles to	
T-scores . . . . .	157
Age conversion tables . . . . .	160
C. Matrices . . . . .	162
Correlation Matrices	
Total Group . . . . .	163
Males . . . . .	164
Females . . . . .	165
All Dropouts . . . . .	166
All Stayins . . . . .	167
Male Dropouts . . . . .	168
Male Stayins . . . . .	169
Female Dropouts . . . . .	170
Female Stayins . . . . .	171



## APPENDIX

## PAGE

Table of mean scores for the various representations of the sample . . . . .	172
Deleted Matrix for use with multiple correlations - Males . . . . .	173
Deleted Matrix for use with multiple correlations - Females . . . . .	174
Among-Groups Matrix for use with multiple discriminant function . . . . .	175
Within-Groups Matrix for use with multiple discriminant function . . . . .	176
Table of standard deviations for selected variables by sex and total group . . . . .	177



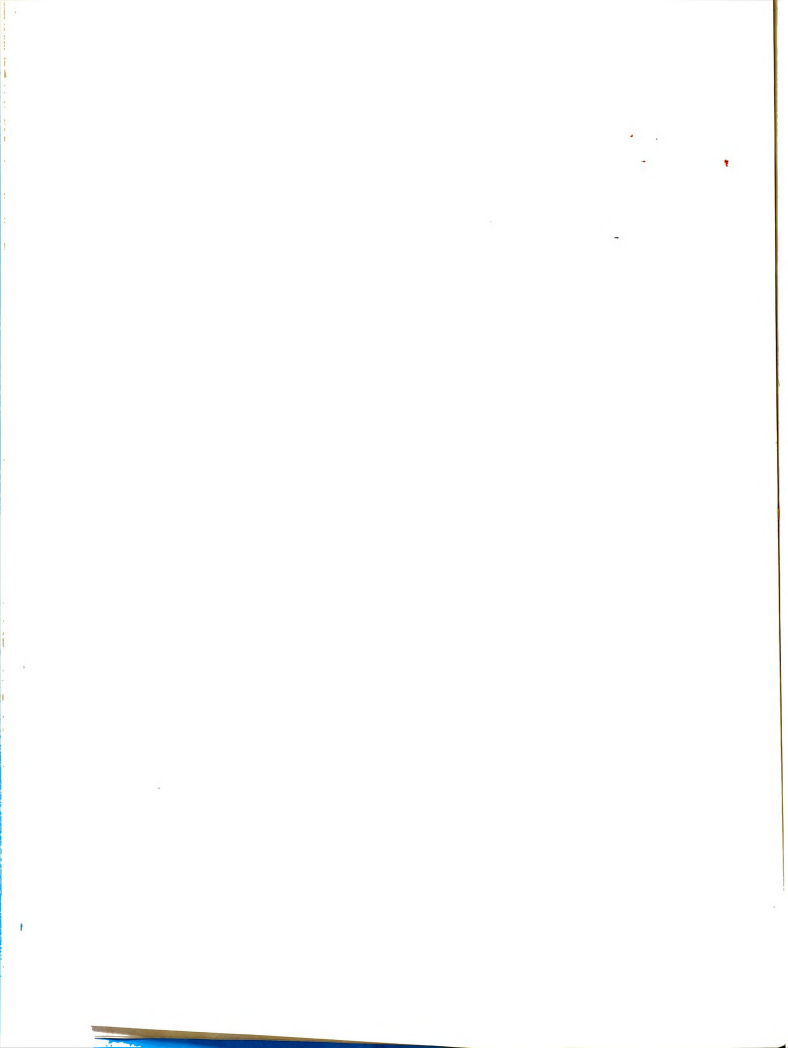
## CHAPTER I

### THE PROBLEM, HYPOTHESES AND PLAN OF THE STUDY

One of the outstanding characteristics of modern American Society is its ever-increasing emphasis upon the value of education. This is effectively underscored by the fact that at the turn of the present century only about 10% of the young people were earning a high school diploma as contrasted with almost 60% in 1959. Furthermore, many observers expect holding power to rise an additional 10% by 1970.

However, these percentages tend to be misleading unless the rapid growth of the youth population since 1900 is also taken into account. For example, though 60% of the youth who started kindergarten in 1946 did graduate in 1959, the remainder who did not complete high school that same year numbered about 900,000. And though it is anticipated that 70% will remain to earn diplomas in another decade, the number of dropouts will also have grown to nearly 1,300,000 annually by as early as 1965.

The sheer weight of these numbers is significant in itself, but the student of American social organization will identify at least two other current trends which enhance the complexity and seriousness of the dropout problem - urbanization of the population and the growing technical nature of the world of work. In 1900 over 60% of the population of the



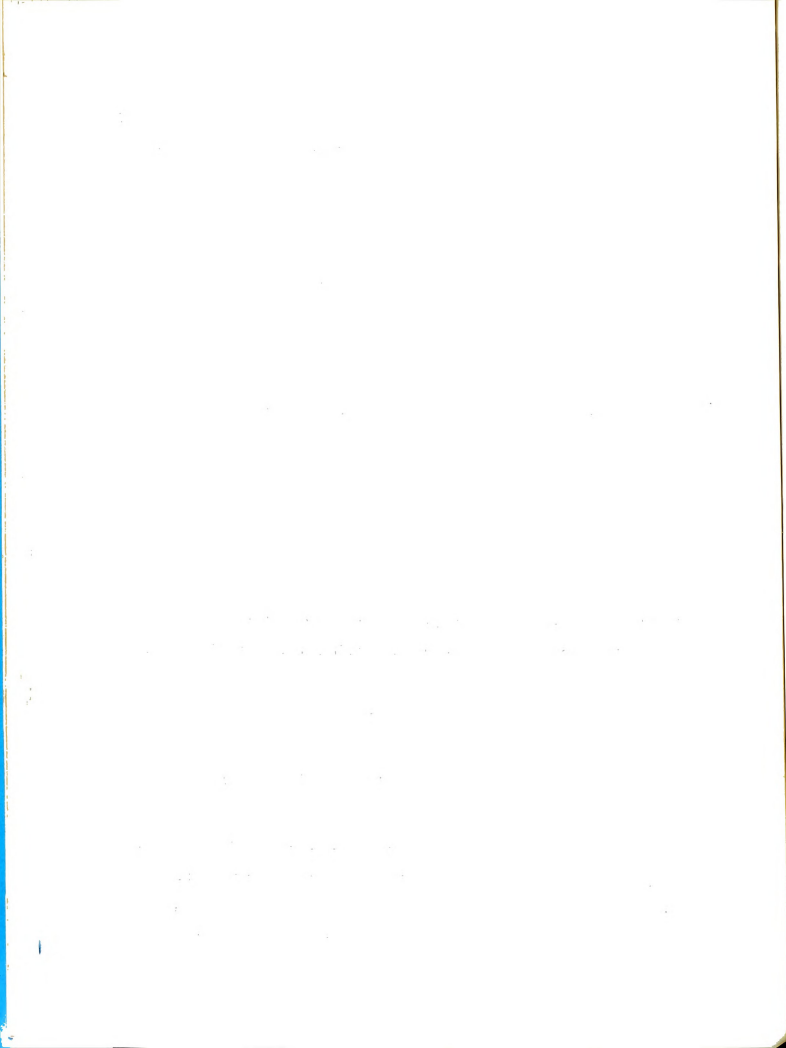


United States lived in rural areas, whereas it is expected that only slightly over 10% will be found in these regions in the 1960 census of population, meaningful to this study because the family farm as a source of work for the non-graduate is becoming virtually extinct in the shift towards urbanization. The second trend is illustrated well by the United States Department of Labor (137) when it projects no increase in the percentage of unskilled employment and a 23% decrease in farm work during the 1960's, and almost all other phases of employment in the United States are predicated upon high school graduation as the minimal educational preparation.

#### STATEMENT OF THE PROBLEM AND THE HYPOTHESES

The above seems to lead to the rather obvious conclusion that whereas a boy or girl might have chosen to enter the world of work prior to completing high school in 1900 without serious consequence to either himself or the supply of labor, the same decision sixty years later may cause a person who fails to graduate from high school by choice to be inadequately prepared to assume his work role and financially disadvantaged during his lifetime of work.

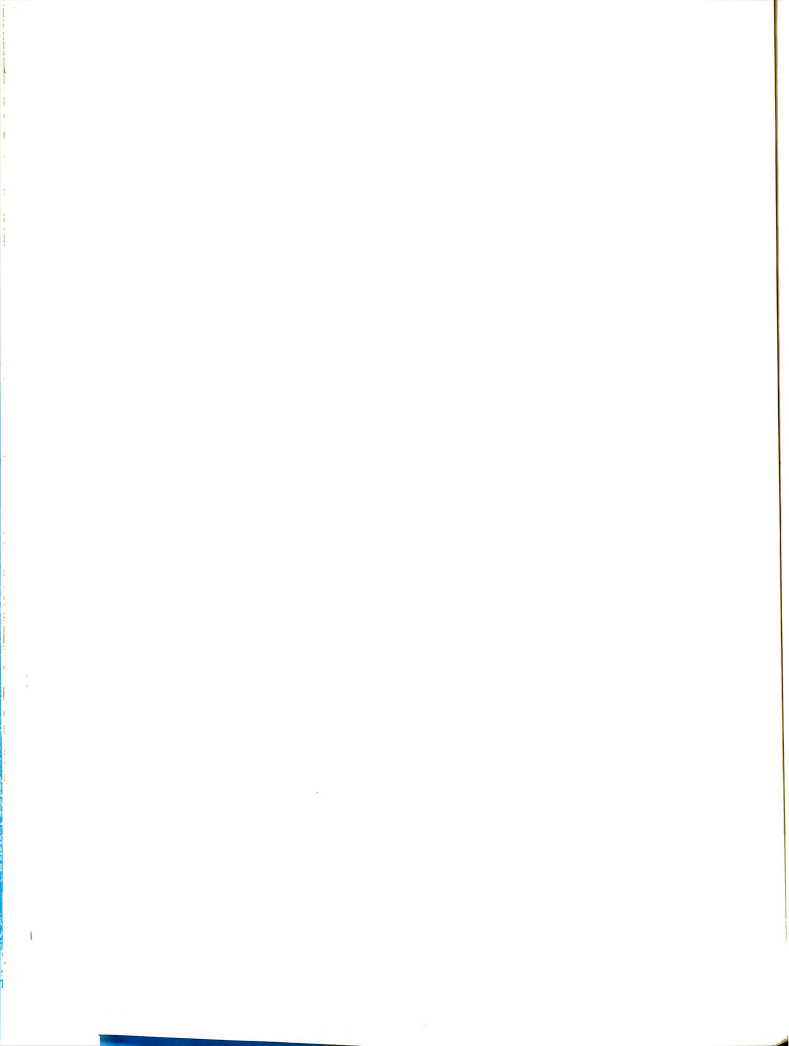
From this philosophical consideration grows the practical problem to which this study addresses itself, that of learning as much as possible about the school dropout and using this knowledge to reduce the problem. As American



society feels a growing concern about those who leave high school early, educators and students of human behavior will give increasing attention to the possibility of early identification and prevention by means of applying remedial measures.

To date, much has been accomplished in the area of describing the dropout. Large and small school systems, alike, have conducted studies of those who have failed to graduate from local schools and have identified traits or characteristics typical of a large number of these young people. The resultant profiles have undoubtedly varied from study to study, but many factors seem to be nation-wide in their presence. Unfortunately, the results of these studies have had primary value in helping to call the dropout to the attention of the local community, but they have provided relatively few clues to remedial action. To illustrate, it is persistently true that dropouts usually are over-age for the grade in which they are enrolled just prior to leaving school, but this knowledge, of itself, offers little assistance as to how the problem of being over-age might be met.

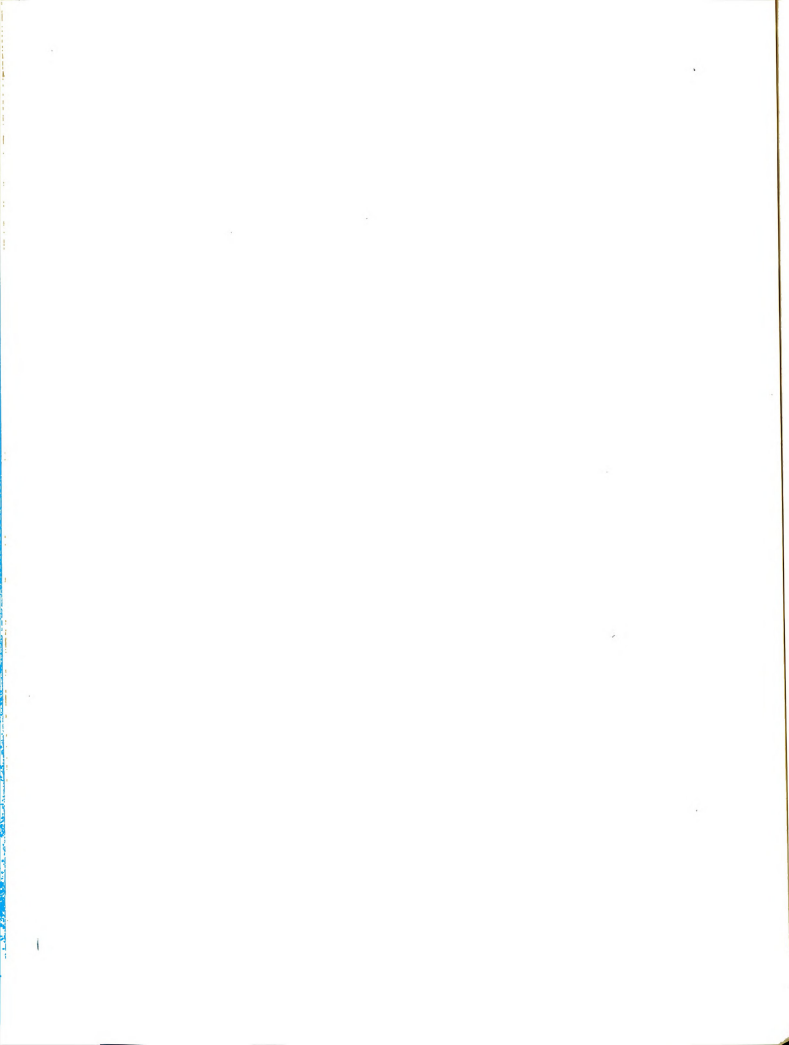
Another type of investigation has dealt with some of the more obvious sociological and psychological factors related to the dropout, including intelligence test scores and the socio-economic status of the family. This is probably an essential next step beyond the mere description of an early school leaver, though discovering that more than half of the



dropouts have measured intelligence in the normal, or above, range and that a vast majority come from economically deprived homes still does not suggest ready means of reducing the size of the group.

Recently, attention has turned to the more subtle, difficult-to-measure aspects of the question. Such items as motivation, need for achievement and aspiration levels are becoming the core of investigations which focus on non-graduates, and the current study will include some of these newer concepts while also retaining many of those found to be significant in previous work. Its purpose will be to deepen and widen the understanding of these young people and move society closer to prevention of the problem of inadequate training for a substantial portion of America's young workers.

Hypotheses. To base the hypotheses of this study upon such factors as intelligence, socio-economic status or being over-age would be repetitious of many previous investigations in which these have already proven persistent. In order to determine if, and to what extent, the psycho-social characteristic, aspiration, plays a part in the decision to leave school early, a scale designed to measure occupational aspiration has been included in the study and the hypotheses will be formed upon the significance of this factor in school retention (or its counterpart, early leaving).



Chapter II will provide a rational basis for considering occupational aspiration as an incorporation of many social and psychological forces bearing upon the school child.

The following hypotheses will be tested:

1. That occupational aspiration is significantly and positively related to remaining in school until graduation for both males and females.

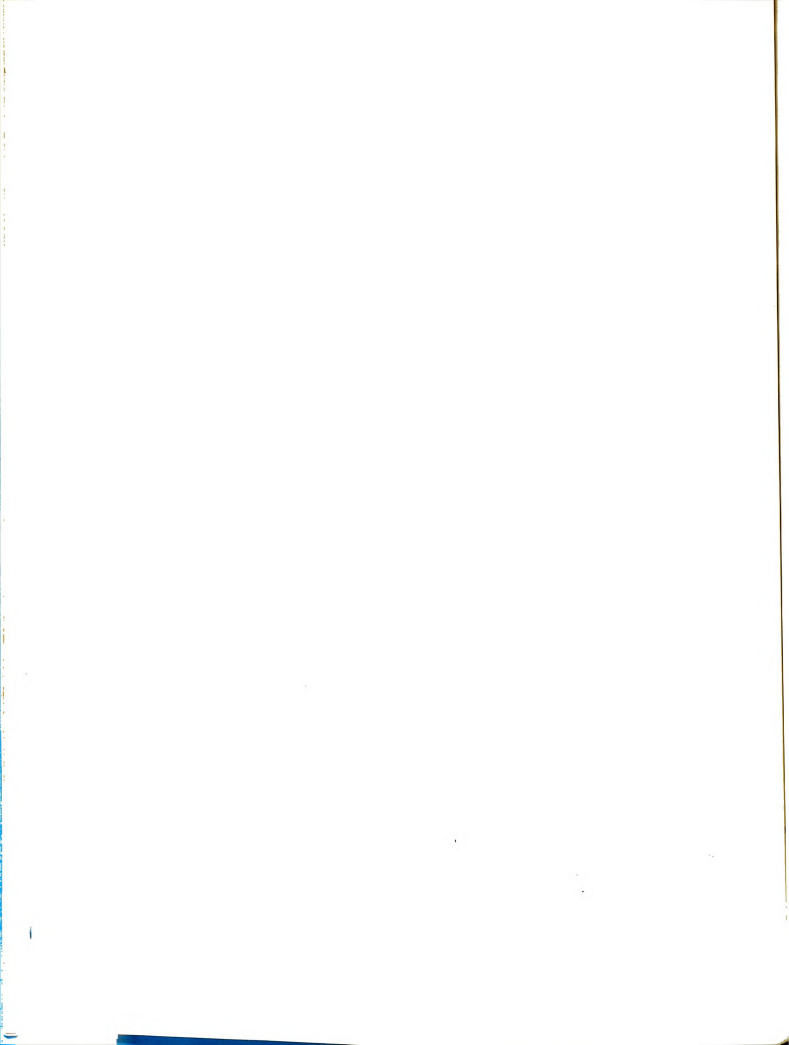
2. That occupational aspiration is a better predictor of school dropouts than any other factor measured in the study for both males and females.

3. Where the predictive efficiency of all factors is taken into account simultaneously (i.e. when all factors are statistically weighted), occupational aspiration is an important contributor to the prediction of school dropout.

#### NEED AND IMPORTANCE OF THE STUDY

Much of the need for the study has already been expressed above and repetition is not warranted here other than to re-emphasize the thesis that the central purpose of studying the school dropout is the discovery of underlying causes and, from these, the development of measures aimed at reducing the size of the early leaver group.

The importance of the current endeavor arises out of its emphasis upon factors which appear to have a causal rather than a symptomatic relationship to the problem of early school





leaving. Whereas being over-age for the grade in which a pupil is enrolled is characteristic of many dropouts, it cannot be said that there is a causal relationship between the two. Over-ageness may here be properly termed symptomatic since it does not seem to be dealing with the cause for being over-age. The same reasoning applies to the grade point average of a pupil and, to some extent, even to his achievement on a group intelligence test.

On the other hand, the socio-economic level of his family may play a dual role with the dropout in that it may be both a symptom and a cause, the latter having been established by many recent studies of motivation and aspiration in the various socio-economic levels of society.

But aspiration and/or motivation (and they are difficult to distinguish when operational) are found to be present in varying degrees in all levels of school achievement and social structure, and a study which attempts to measure the presence (or absence) of aspiration in the dropout group can and should make a significant contribution to both understanding and prevention.

#### LIMITATIONS AND SCOPE OF THE STUDY

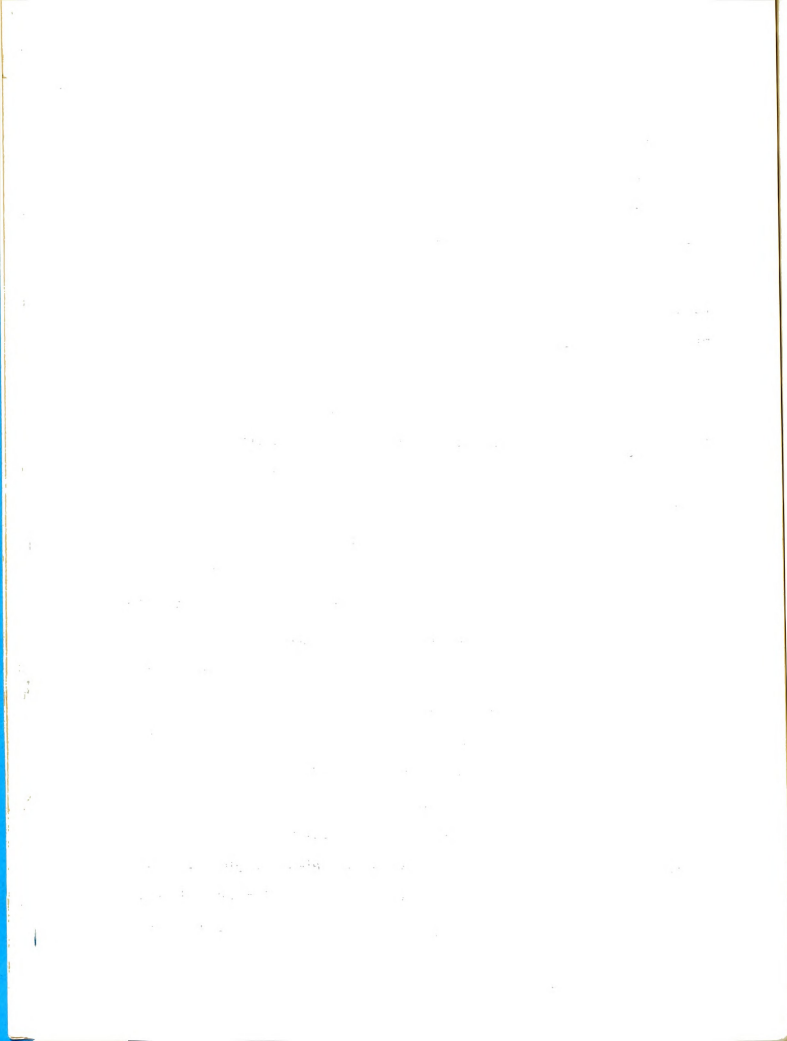
The current study is designed to be longitudinal in its structure, covering a period of approximately two years. The subjects were members of the eighth and ninth grades in



the eight secondary public schools in Grand Rapids, Michigan at the outset of the study, and each school contributed about thirty pupils from each of the two grades. In two schools where a previous study had found a higher dropout rate than in all other local schools, an additional thirty ninth graders were selected from each. In all, the original sample group numbered 521 students, including 233 eighth and 288 ninth graders.

No control or experimental groups were established due to the fact that no unique treatments or techniques were being studied. The 521 students were subject to the established academic, guidance and other curricular routines in their schools and were not made aware of the true purpose of the study. Other than through child accounting records, no follow-up or personal contact was made. The writer's only meetings with the subjects came during the two classroom visits when the standardized batteries employed in the study were administered. It was felt that either revealing the true purpose of the study or conducting any type of interview or conference with the students would introduce new variables which would be difficult to measure or control.

In summarizing the scope of the study, then, it was designed to measure certain information about eighth and ninth graders by means of objective and standardized observations, to allow these subjects to pursue educational goals in the



same manner as their peers, and then determine which of the data seemed significantly present in the group which dropped out of school shortly after reaching their sixteenth birthday, the "legal age" in the State of Michigan at which a pupil is no longer required to attend school.

Many limitations suggest themselves in this type of study and must be discussed in order to refine the expectations which may properly grow out of such a project.

First, in order to accept the conclusions which may be drawn, it will be necessary to assume that the sample is truly representative of the total eighth and ninth grade population of the Grand Rapids public schools, that the young people who participated are nearly representative of eighth and ninth graders in general, and that Grand Rapids is a typical metropolitan community in which a study such as this might be conducted. It must be borne in mind that insofar as any of the above assumptions are found not to be true, limitations are imposed, especially for any reader who might wish to draw implications for another school system. In making such interpretations, inaccuracies which arise out of either site or sample probably must be expected and compensated for in order to have the results meaningful.

Other limitations, wholly unintentional, may arise from the instrumentation employed or the actual timing of the study itself. Though great care has been exercised in the

selection and use of the standardized measures, there would be no means of testing whether they are the most appropriate and efficient for the work here reported except by the administration of all batteries available, a practical impossibility. Thus, in order to accept the conclusions of the current study, the assumption must be made that a typical population, normally distributed in the factors measured, is being tested by the most efficient tools at hand.

As for timing, at least two variables have been introduced within the span of the study which could alter the results, but there will be no possibility of controlling or measuring their effect upon the population. During the two years involved, the amount of counselor time available to secondary school youth in Grand Rapids has increased markedly, having doubled in the junior high schools and as much as quadrupled in the six-year schools. Also, this period has seen a great increase in tension on the international scene and a resultant step-up of demands for more personnel in the armed forces, providing an acceptable outlet for more of the youth already inclined towards leaving school before graduation.

It is possible that (1) these new variables may offset each other, (2) one variable may operate more strongly than the other to increase or reduce the dropout group, or (3) neither variable will have any effect upon the youth in the



current study. Perhaps the most important consideration regarding these two new variables is that they operate equally for all pupils in all the schools involved and their effect, if any, will cover the entire cross-section of the subjects.

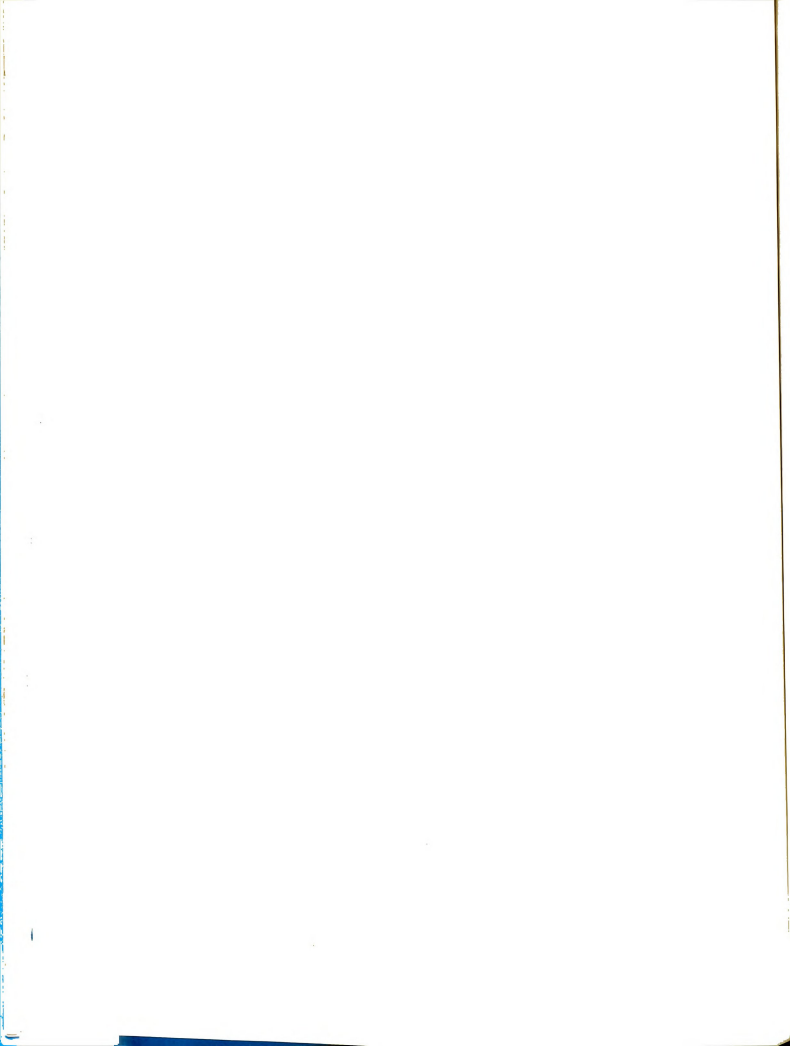
Another limitation warrants mention here - that the conclusions will not be interpreted in terms of techniques or means for overcoming the dropout problem. As was said earlier, this study is an attempt to probe more deeply into the forces which operate in such a way as to cause youth to drop out of school, but interpretation in the form of programs or projects will be left for other studies.

#### DEFINITION OF TERMS

Most of the terminology appearing in the study is used widely enough in educational circles as to require no further definition. Specific application of these terms will be revealed in Chapters II and III in the discussion of the rationale and instrumentation for the study. However, three should receive brief treatment at this point.

Occupational aspiration here should more accurately be referred to as Level of Occupational Aspiration (LOA). It will be expressed quantitatively and is considered to be high if subjects consistently choose from among those occupations which have been assigned high socio-economic ratings. Literally, it is used to denote the level of occupation which each





subject hopes to attain during his lifetime of employment.

Also, it is essential to set strict limits to the connotation of the term, dropout, for the operation of the study. Whereas it generally denotes any pupil who falls short of high school graduation, this will not be possible here due to the fact that none of the subjects will have progressed to graduation at the close of the period of time set aside.

Dropout here will denote any subject who will have reached his sixteenth birthday during the span of the study and have left school for any reason other than transferring to another school. Also, it will include any subject who has been excluded (dismissed) for excessive truancy or poor behavior, regardless of age. Further, any person will be termed a dropout who has once left school under the conditions stated above, regardless of whether he has re-entered school voluntarily or by reinstatement during the time of the study. This is necessary because of the fact that the forces inclining a subject towards leaving school or exclusion are assumed to have been operating at the time when the data were gathered.

For the purpose being served here, a stay-in is a subject who has remained in school continuously from the beginning to the close of the study, having left the school of origin only for the purpose of transferring to another school.

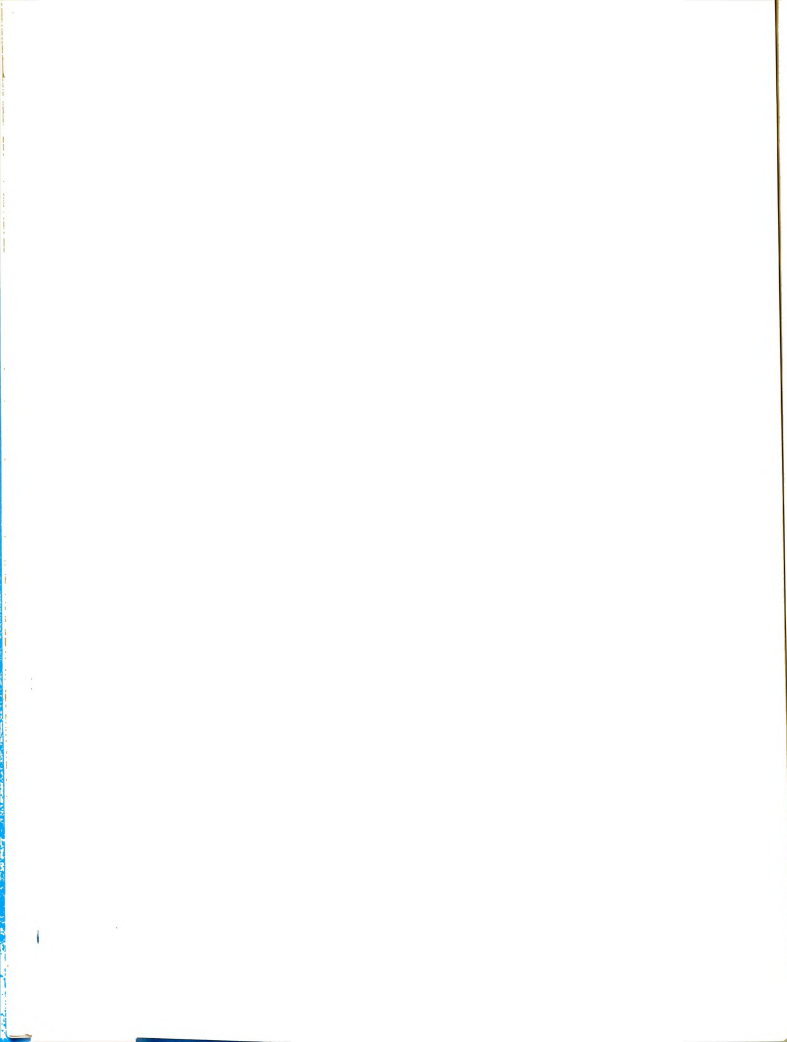
## PLAN OF THE STUDY

Previous portions of this chapter have already dealt with certain details regarding the plan of the study, particularly in the section devoted to the limitations and scope. Therefore, this brief discussion will serve only to clarify and to add a chronology of events to what has gone before.

Grand Rapids has eight public secondary schools, five serving grades 7-12 and three serving grades 7-9. Since all secondary schools share in the dropout problem to a greater or lesser degree, it was determined that the population for the study should represent a cross-section of all the pupils in Grand Rapids rather than concentrating the entire effort on all pupils in one or two schools. Consequently, about thirty 8th and thirty 9th graders were drawn from each of the eight schools with sixty additional ninth graders coming from two schools as mentioned earlier. The method of selection will be treated in the later discussion of the sample.

The structure of the study was finalized later in 1959, and the events took place in the following approximate chronological order:

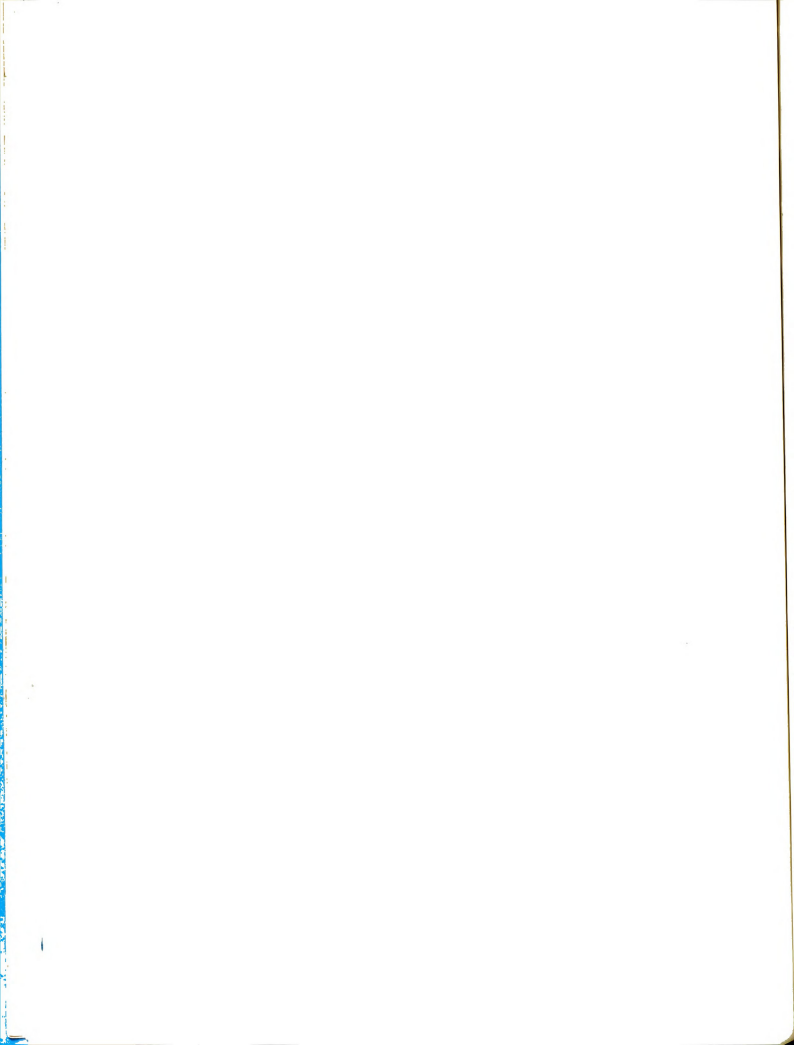
The actual gathering of data began in January, 1960. On the first visit to the schools all subjects responded to the Occupational Aspiration Scale (Haller) and an instrument designed to gather the data related to their family backgrounds.



The grade point average and certain Differential Aptitude Test scores were also gathered on this visit from the cumulative record cards.

The second visit came within a week or two of the first and was for the purpose of administering the Kuhlmann-Finch Intelligence Test and securing the subjects' responses as to their own personal educational plans. Shortly afterward, make-up tests were administered to those who were absent during either regular testing.

The period of time from the completion of the testing until the close of the study was devoted to scoring all instruments, preparation of data sheets for each subject, and the transcription of all information to IBM cards for machine processing. Through a system of control cards, a monthly check was made on all child accounting records at the Grand Rapids Board of Education and any changes in the status of the subjects were recorded. As the study drew to a close, a telephone or written follow-up was made of those who had transferred to other school districts with an inquiry as to whether these pupils had been continuously enrolled since entering the receiving school. Of 28 such inquiries which were made, 28, or 100%, brought a definite response from the receiving school. In all, 7 subjects were lost to the study through transfers to other schools for which no forwarding address was left or there was no record of their ever having entered



the high school mentioned during the exit interview in Grand Rapids.

Establishing a closing date for the study was a somewhat arbitrary process, based partially upon the desire to complete the project during the 1961-62 academic year and also on the fact that all 9th graders would have turned sixteen years of age by December 1, 1961 and would have been joined in this by all over-aged 8th grade pupils.

The data on age actually revealed that the subject ranking in the middle of the population would turn sixteen years of age during August, 1961, thus giving assurance that at least half of the group would begin the school year older than the age limit at which a young person may legally interrupt his formal schooling in the State of Michigan. The data further revealed that nearly another 25% would be added to the sixteen-year group during the first semester of 1961-62.

On the basis of the above considerations, the closing date for the purpose of the completion of this study was set at February 15, 1962, giving all sixteen-year-olds an opportunity to complete the first semester of the 1961-62 school year and decide not to return for the second semester.

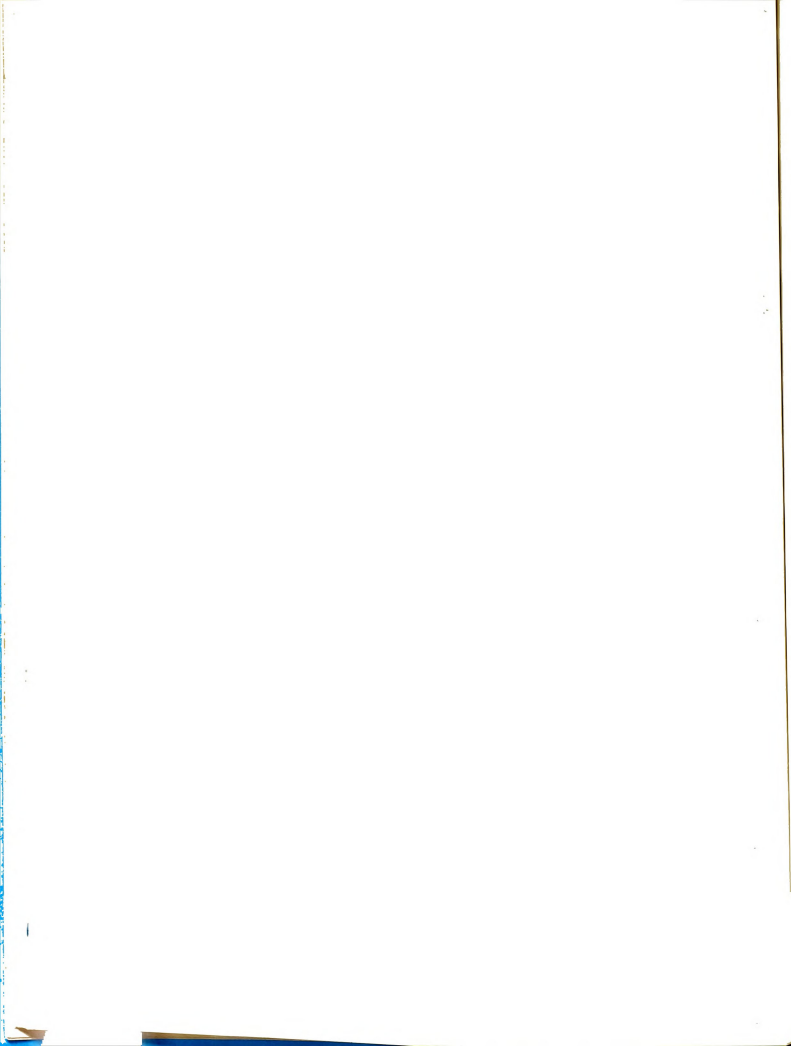
All statistical treatment of the data was performed after the cut-off date since the hypotheses would be meaningful only after it had been determined which subjects had dropped out and which had stayed in after reaching the legal age.

Tentatively, it was planned that all matrices, correlations and weightings would be performed with the subjects grouped on the basis of dropouts vs. stay-ins, males vs. females.

Summary. It has been the intent of Chapter I to reveal the problem of this study, the hypotheses which it tests, and the scope, limitations and plan of the study. It was also fashioned to familiarize the reader with the background from which the study grew.

Chapter II will establish a rationale for considering either Level of Aspiration or motivation (or both) in studying school dropouts. It will also review some of the significant findings of other studies centered upon the same topic.





## CHAPTER II

### REVIEW OF THE LITERATURE AND RATIONALE FOR THE STUDY

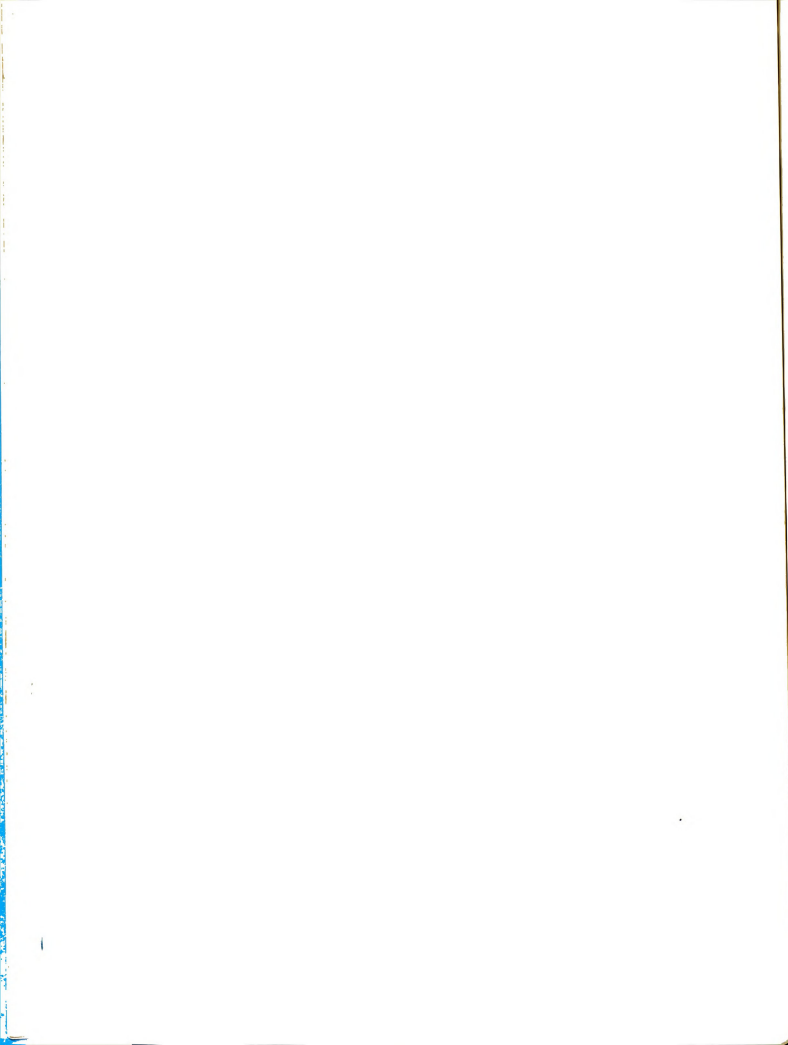
The complexity and gravity of the school dropout problem has caused it to appear as often in the professional literature as almost any other single topic. So widespread is the interest generated by those who annually leave schools before their training is complete that the topic has also appeared in popular weekly and monthly magazines as well as the most sophisticated journals dedicated to extensive research in human behavior. Newspapers, radio and television have always found a ready audience when discussing these children. So it is common today to find Life Magazine engaged in a pictorial discussion of what happens to out-of-school youth concurrent with an article in the American Sociological Review or the Journal of Educational Psychology reporting a recent dropout study, complete with rather detailed statistical analyses of the data gathered, hypotheses and findings.

Now that society has set about to either conquer or make great inroads upon the loss of pupils before graduation, organized groups such as the Michigan Committee on School Holding Power, under the present Chairmanship of Dr. George R. Meyers, have gathered together and developed bibliographical lists which would challenge even the most avid reader. It has been recently reported by Meyers (149) that 128 of the

318 high schools in the State of Michigan are either currently or have recently carried on systematic dropout studies.

In addition to the above-mentioned local efforts, some philanthropic foundations have recently granted rather substantial sums of money for intensive research projects in specific geographical areas, and the results of these studies are becoming available to the interested reader. One very active organization is the National Committee on the Employment of Youth, a United Fund Agency, and a typical subsidized effort is the Great Cities Improvement Project under the auspices of the Ford Foundation. While studies such as the latter one are primarily designed to be action programs, a great deal of printed material is already growing out of them. Another project which will be cited rather heavily in this paper has been in operation at Quincy, Illinois for a period of eight years and is under the joint sponsorship of the United States Office of Health, Education and Welfare and the University of Chicago Committee on Human Development.

However, due to the nature of the current study, another dimension must be added to the review of literature mentioned above. The previous Chapter has pointed out that in addition to the factors normally treated in a dropout study, the characteristic, aspiration, has been included in the present project. In order to accomplish a complete review and to build an adequate rationale, it will also be necessary to include



research findings from the work of sociologists and psychologists pertaining both to motivation and aspiration.

#### STUDIES MEASURING OR DESCRIBING THE DROPOUT

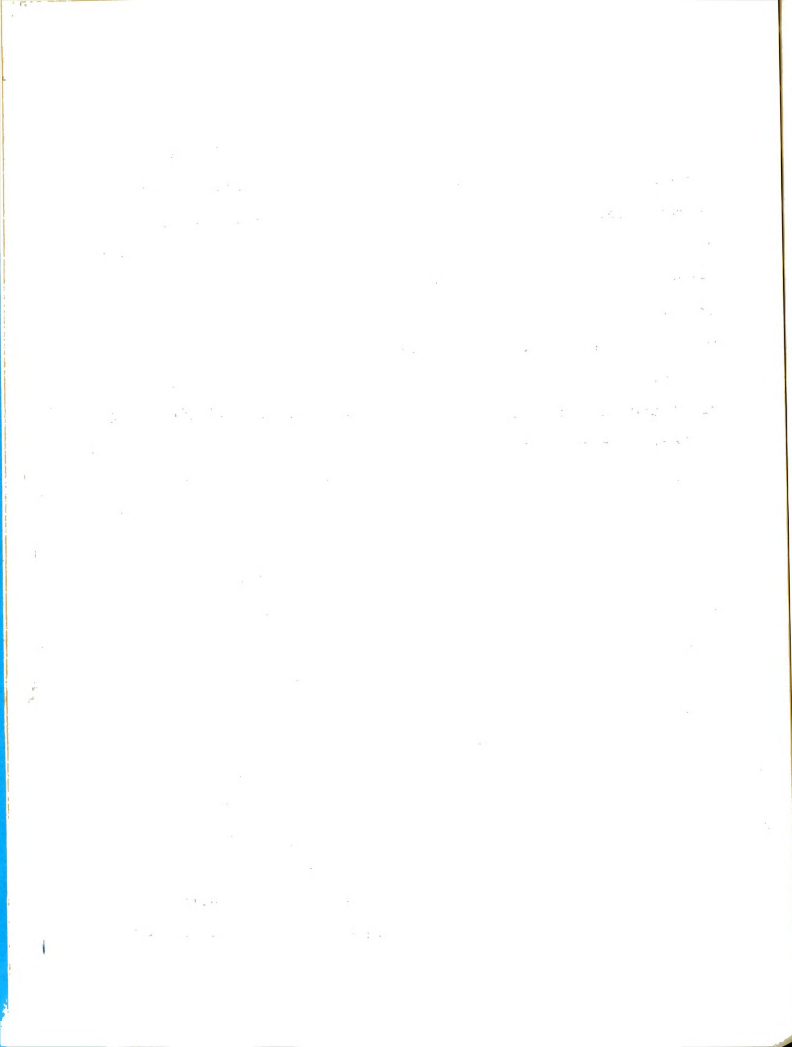
Reports and publications which fall under this general heading tend to vary from a few pages of duplicated material to printed volumes complete with data which have received statistical treatment. Because much of the methodology and findings are duplicated in these reports, only a sufficient number will be reviewed here to assure complete coverage of results, though many more will be found in the bibliography and are available to the interested reader.

The second half of the 20th Century has seen a sharp upswing in interest in the dropout problem, but concern over those who do not complete high school must not be considered peculiar to that period. In his doctoral study completed in 1952, Sando (197) reviewed about fifty studies of early school leavers, the earliest study dated 1872. He grouped the findings of these studies into four general categories: Grade and Age Placement of Dropouts, Economic Characteristics of Dropouts, Sociological Characteristics of Dropouts, and School Characteristics of Dropouts. Perhaps the most singularly significant finding of Sando's work was the relatively small degree of change in the profile of a dropout since 1872.

To cite some specific examples from Sando, he found

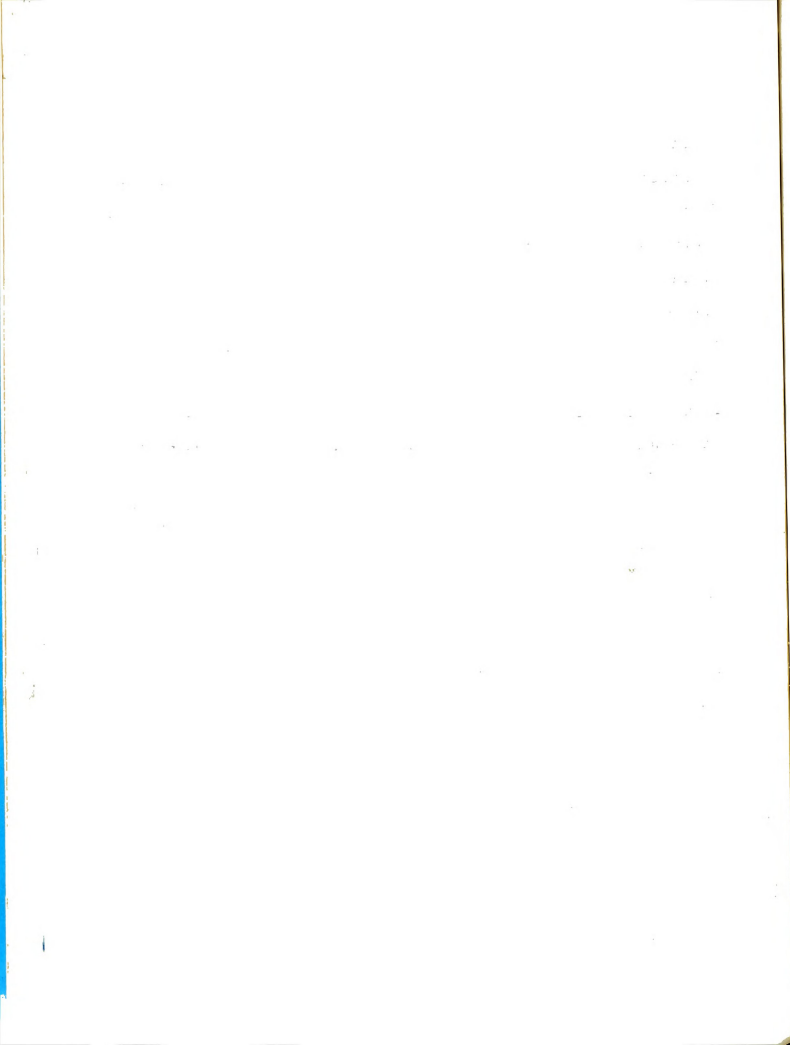
that Dillon (47), in one of the classic studies, discovered the ninth and tenth grades to be the critical periods in 1949 as reflected by leaving rates of 26% and 37% respectively. About 25 studies of economic characteristics showed that of the seven factors most commonly measured, only the father's occupation - the socio-economic status of the family, in other words - was consistently related to retention until graduation. Another 25 studies of the social aspects of early school leavers found parental attitudes and education rather significantly reflected in dropping out or staying in, also that boys left school in greater numbers. As far as in-school characteristics were concerned, the 44 writings reviewed by Sando identified only the repetition of grades (which grades not important) as consistently and positively related to early school leaving. As is known at the present time, the attendance record, when measured, becomes much more irregular as the "legal age" is neared, but this does not require statistical analysis because it is so obvious in almost every dropout case. In slight contrast with current findings, Sando's review did not reveal the IQ as a consistently related factor, finding it often tempered by other considerations when a part of a study, i.e., a pupil with a relatively low IQ rating might graduate from high school if sociological and economic conditions in the family demanded rather high academic performance from the child.

At the same time Sando was making his important review



of the literature which led to the summaries presented above, a committee of twenty-eight teachers, administrators and clerks in the public schools of Grand Rapids, Michigan (227) were conducting one of the most complete and practical investigations of those which were locally staffed and financed. The contributions of this study were noteworthy because of the methods employed, the involvement of local personnel, the factors which were identified as critical, and the interpretation of findings in terms of the impact upon the school program. This committee identified twenty-two characteristics of early school leavers in Grand Rapids and presented data in tabular form to show to what extent the factors were present. Though statistical validation of the data was not employed and many items might have been declared not significant had the dropouts been compared to stay-ins employed as a control group, it is of great importance that a majority of the factors identified in most other studies were also found to be critical to the Grand Rapids group, i.e., low intelligence, non-participation in activities, low socio-economic status, repetition of grades and sibling difficulties, to name but a few. As mentioned above, this project took on special local aspects when the committee went the next step beyond measuring the dropout to draw implications for holding power which might be affected within the school program, and it might be of interest to note that many of the changes have been instituted and retention





until graduation has been greatly increased. Numerically, the 1960 graduating class of the five high schools was 82% of the number of pupils at the beginning of the ninth grade four years earlier.

It has already been mentioned in this chapter that numerous American school systems have conducted investigations into the problem and profile of their dropout group and have reproduced their findings in rather brief tabular (or written) analyses. To cite two of these studies, both Kansas City (226) and York (5) performed such investigations prior to launching combined school-work programs for their non-graduates. Both cities found the 10th grade to have the highest incidence and both found the boys leaving school in greater numbers. The York study revealed the fact that 59% of the dropout group had at least normal intelligence, with 30% falling above an IQ rating of 100 on the standardized test regularly administered in the schools. While somewhat smaller in proportions, the Kansas City findings were similar, showing 50% with normal intelligence and about 17% falling above the 100 point.

Both the York and Kansas City studies reviewed carefully the academic performance of the school leavers and found that through the fourth grade they performed as well as their classmates, but that lowered achievement began to enter into the pattern from that time on with the ultimate result of poor

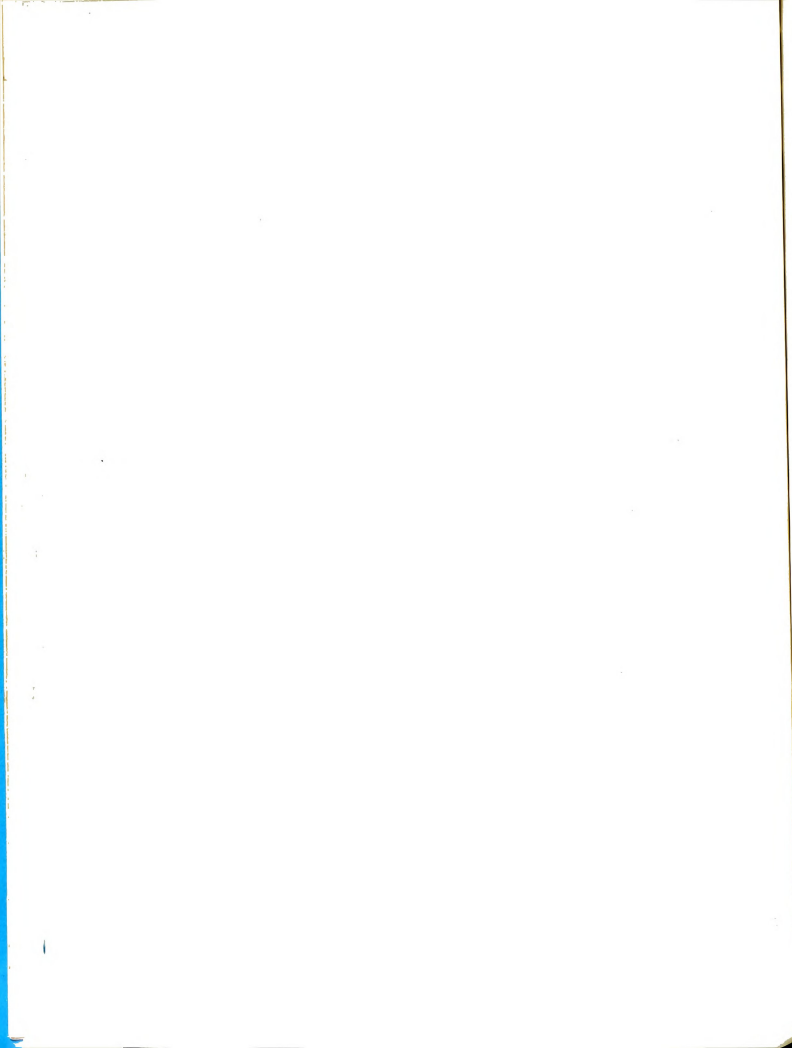
performance as a group by the time of leaving school. In York, a slightly different ingredient was introduced by the rural pupils who, so the writers pointed out, were members of families where good academic performance was not demanded or expected.

Both of the studies cited above were also concerned with the immediate experience following the act of dropping out. York found 160 of its 1959-60 school leavers employed, 60 unemployed, 13 in the Armed Forces, and at least 6 in detention homes. Kansas City compared its 1959 graduates against the dropouts for the same year and discovered only 3% of the former group unemployed as compared with approximately 50% of the latter.

In an eight-year study sponsored jointly by the U.S. Office of Education, Department of Health, Education and Welfare and by the University of Chicago under the title of Quincy Youth Development Project, Bowman and Matthews (23) and their staff found characteristics of their dropouts similar to those in almost all other carefully conducted projects. In the abstract of their report they make the following deductions from the data,

"The early school leaver is consistently found to be of low social status, below average intelligence, an academic failure, often absent from school, and more often retarded."

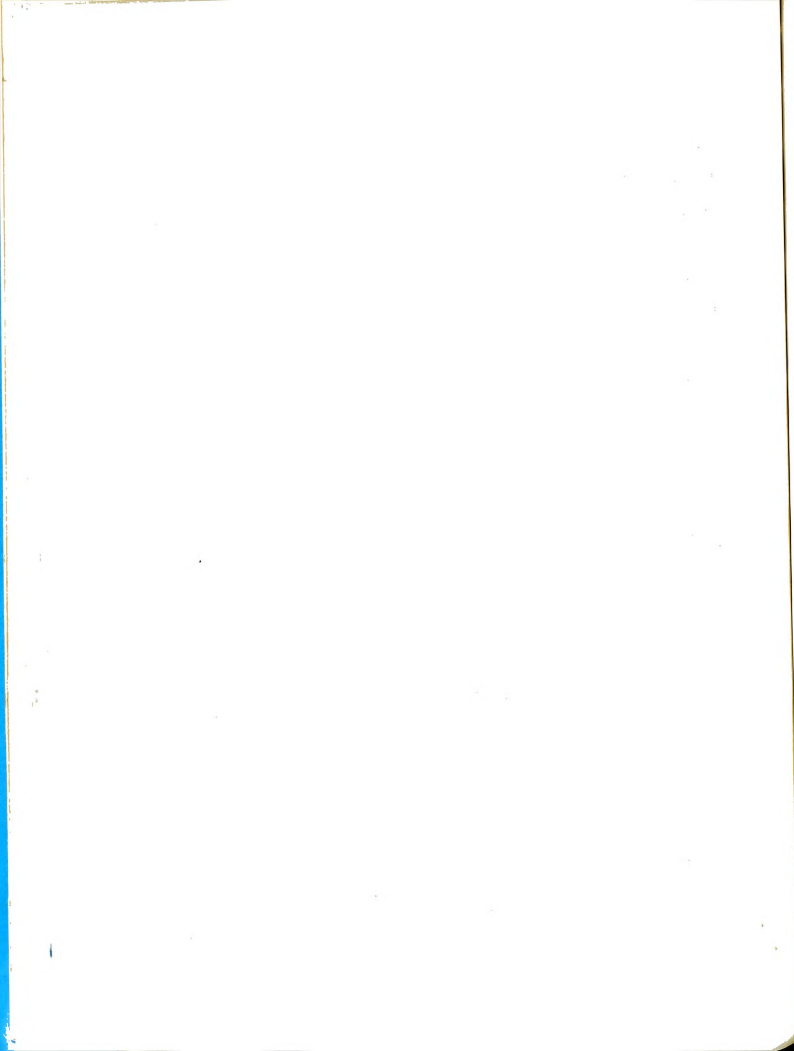
Though much more detailed and careful interpretation is offered in this report which would make a brief accounting



difficult, it should be mentioned that Bowman and Matthews found that the greatest number of pupils left between the ages of 16 and 16½ years, the modal grade of leaving was the ninth, the early dropouts (those who left as soon as legally possible) usually measured lower on the dimensions cited in the quotation above, they usually came from larger families and were not the first-born, they had poorer early job experience than graduates, and they seldom participated in extra-curricular activities while in school.

Bowman and Matthews reviewed the data gathered in St. Paul, Tacoma, Evansville and Louisville, and from these and other studies they drew up the following list of dropout characteristics:

- "Dropouts were more often boys.
- Dropouts were more often from the lower class.
- Dropouts were more often from minority groups.
- Dropouts came more often from broken homes, but the percentage difference was not pronounced.
- Dropouts' parents had little education.
- Dropouts had below-average intellectual potential as measured by IQ tests.
- Dropouts were usually retarded in reading and other skill areas.
- Dropouts were usually overage for their grade as a result of being retained in one or more grades.
- Dropouts (particularly boys) usually failed several courses in the year prior to leaving school.
- Dropouts had frequently moved from school to school.
- Dropouts showed a marked regression in attendance in junior and senior high.
- Dropouts usually were not active in the extra-curricular life of the school.
- Dropouts usually had enough money to continue in school.
- Although lack of money was not usually a major factor in early school leaving, indirectly it had an influence.
- Dropouts often had difficulty in getting and keeping a job.



Dropouts came from families in which parents less strongly support the schools' and their children's interest in education.

Dropouts placed little value on education as a help to themselves, and consequently had little further interest in school even though the adjustment to adult life had not been easy.

Dropouts felt that their education should have been more practical; it should have prepared them for a vocation.

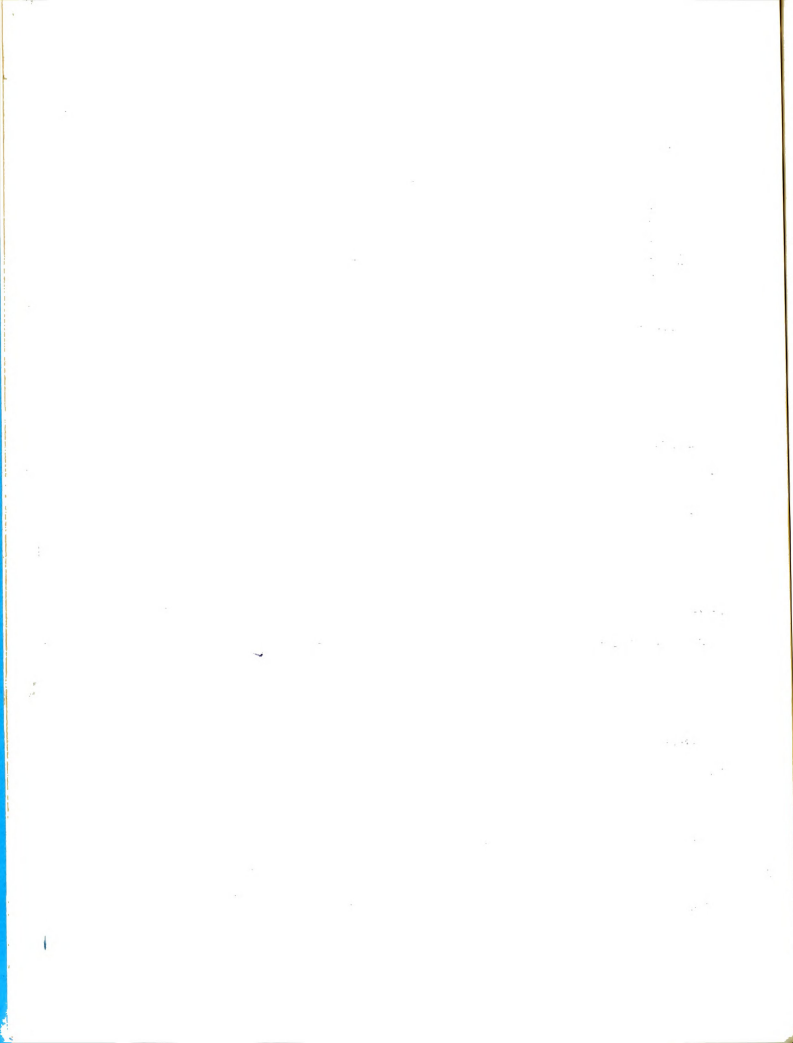
Dropouts felt insecure and lacked a feeling of belonging in school.

Dropouts felt poorly treated by their teachers, and were fearful of asking for help.

Dropouts were often dissatisfied with their social relationships in school, and they lacked friends."

It is noteworthy that this list of factors is similar in basic content to those identified in the Grand Rapids study mentioned earlier in this Chapter and to the list prepared by the Michigan State Committee on School Holding Power (142). Eventually, reviewing the reported results of studies on school dropouts leads the reader to believe that there is a common profile for most early school leavers with the significant variations being due to special local conditions.

As an example of the above, Bertrand and Smith (16) in 1960 found that at least 26% of the dropouts from two rural Louisiana school districts had repeated two grades, came from low socio-economic families, but showed no consistent tendency towards low mentality. In that particular study, the low socio-economic group accounting for a large portion of the dropouts came from farm laborer families living some distance from the schools and having little motivation towards continuous school attendance. Next to the farm group, children of





wage earner families contributed significantly to the early leaver numbers.

The writer recently completed an informal study of the 581 pupils, grades seven through twelve, who left the Grand Rapids Public Schools during the 1958-59 school year. As in the Bowman and Matthews report, it was found that a significant number had repeated grades, there was a mean reading retardation of  $1\frac{1}{2}$  years, many were members of larger-than-normal families, and there was a great deal of excessive absenteeism and tardiness just prior to dropping out. However, the role of intelligence in school leaving was not clear since even the presence of about thirty to forty mentally retarded youngsters in the dropout group failed to reduce the mean IQ rating below the normal range. The problem was recognized by Sando, who finally eliminated intelligence scores as a dependent variable, and by Bowman and Matthews, as is reflected by their statement in the review of related research,

"On the average the dropout has the intellectual potential to successfully finish high school, but the intellectual ability of dropouts as a group is distinctly below average when measured by group intellectual tests. Surely large numbers of children with no greater intellectual potential than the average dropout finish high school."

In the study of the early employment experience of youth in seven communities from 1952-57, the U.S. Department of Labor (180) found evidence which corroborates the concern over the IQ as a determining factor in dropping out of school. It

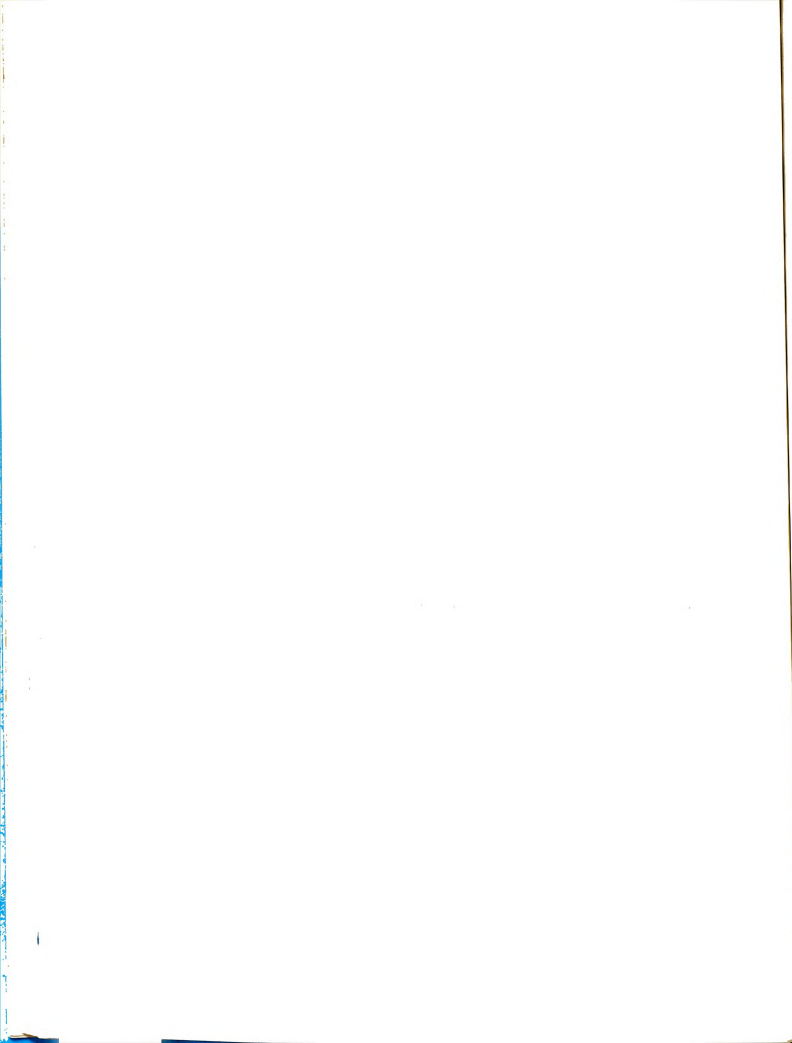
found nearly 48% of the early school leavers in the normal range (90-110) and an additional 6% in the "over 110" group, with the remaining 46% in the "below 90" area. This would indicate that the dropout cannot be written off as mentally incompetent without qualification.

The Department of Labor study also found other data closely paralleling the results of the surveys cited above. It found the mean age of dropping out to be between 16 and 17 years, the critical grade to be the tenth, and that 87% of the boys and 80% of the girls studied had repeated at least one grade. It related several significant details to illustrate the low employability of dropouts.

While not exhaustive of all of the studies which have been conducted on the subject of early school leavers, the above discussion has revealed most of the factors which have been discovered significant to the act of dropping out of school. To cite further studies would be mere repetition, so it seems appropriate to move now to the second aspect to be covered by the writer - studies of the role of motivation and aspiration in school attendance.

#### STUDIES OF MOTIVATION AND ASPIRATION

The discussion in the previous portion of this chapter has covered material which bears obvious relationship to the school dropout because it comes primarily from the measure-

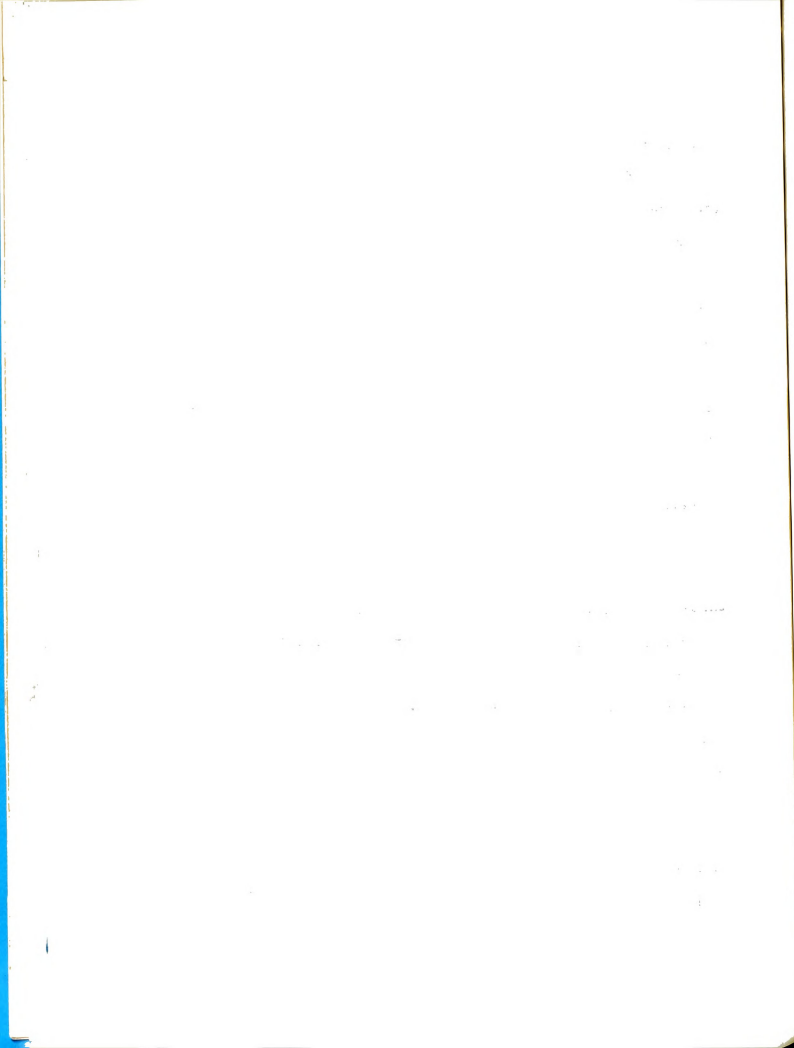


ment and observation of early school leavers themselves.

While it undoubtedly also seems obvious that aspiration and motivation play an important role in staying in or dropping out of school, the relationship is established more by inference than by direct investigation, since there has apparently been little effort to study the motivational or aspirational patterns of dropouts. This makes it necessary to draw upon research which seems to be related by virtue of its having dealt with various aspects of educational and occupational goals.

In reviewing the following studies the writer will endeavor to build a case for the inclusion of motivation and aspiration in an investigation of early school leavers.

It is held by many psychologists and sociologists that these two factors, like other facets of the human personality, are a product of the social climate in which they are nurtured, this climate based upon the total behavior pattern of the parents. According to many writers, some of whom will be cited, it is typically true of the American people that they hold firm belief in social mobility in the United States, and that this mobility is an economic phenomenon based upon a better job made available primarily through more education. It is also apparently true that the "typical" American parent believes that his children - sons, more specifically - can and should have a better job than their father, and he therefore

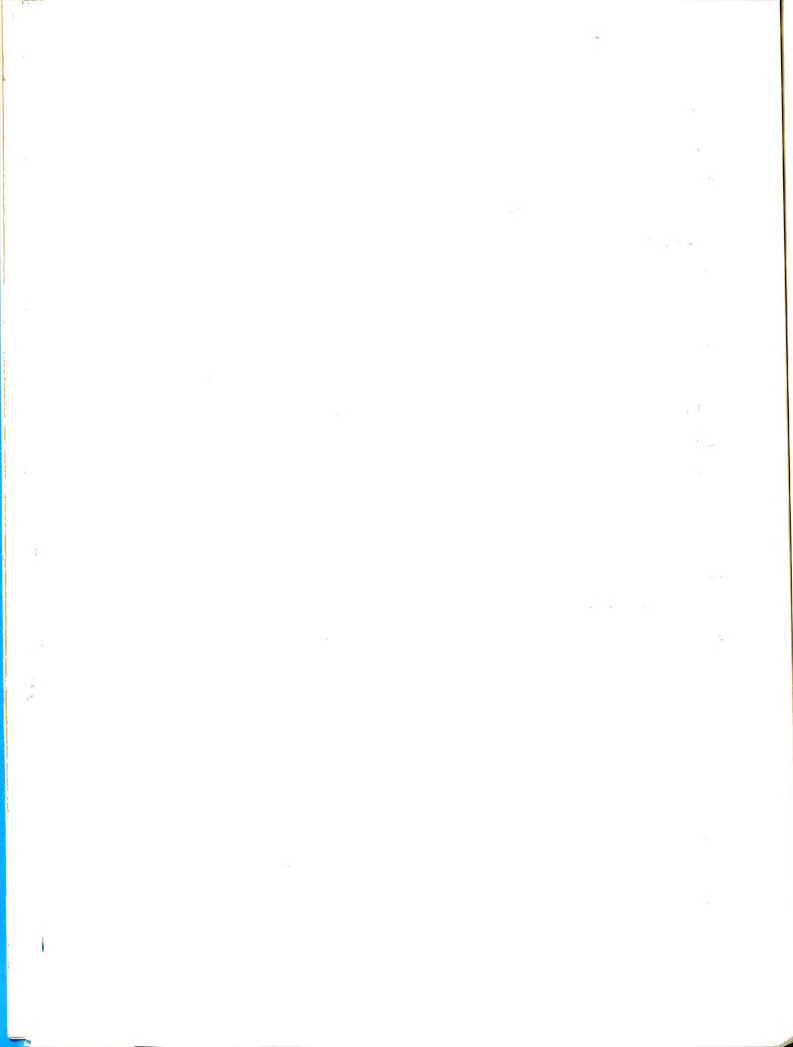


aspires for more education for the offspring as a means of social mobility.

The above being true, and if the younger generation internalized these values for themselves, it is entirely possible that the resultant high aspirations of youth cause them to pursue a high school diploma and more. If dropping out of high school before graduation cannot be closely allied to the lack of ability, and it apparently cannot, then the answer must lie more closely to the self-concept of the child, and aspirations - motivations or goals, if more appropriate - are related closely to the self-concept.

The above premise having been accepted, it may then be reasoned that children of low socio-economic means drop out of school more frequently because of a rather barren intellectual atmosphere of their homes accompanied by an absence of aspiration for mobility as well. Those of families with higher socio-economic means may fail to pursue adequate educational training because they have failed to internalize mobility goals or levels of occupational aspiration commensurate with the current status of their families. These premises must now be examined in the light of the findings of research in the area of motivation and aspiration.

Lipset (127), writing of his study in Oakland, found much to support his premise that social mobility is a real belief in the United States. He gathered evidence to show

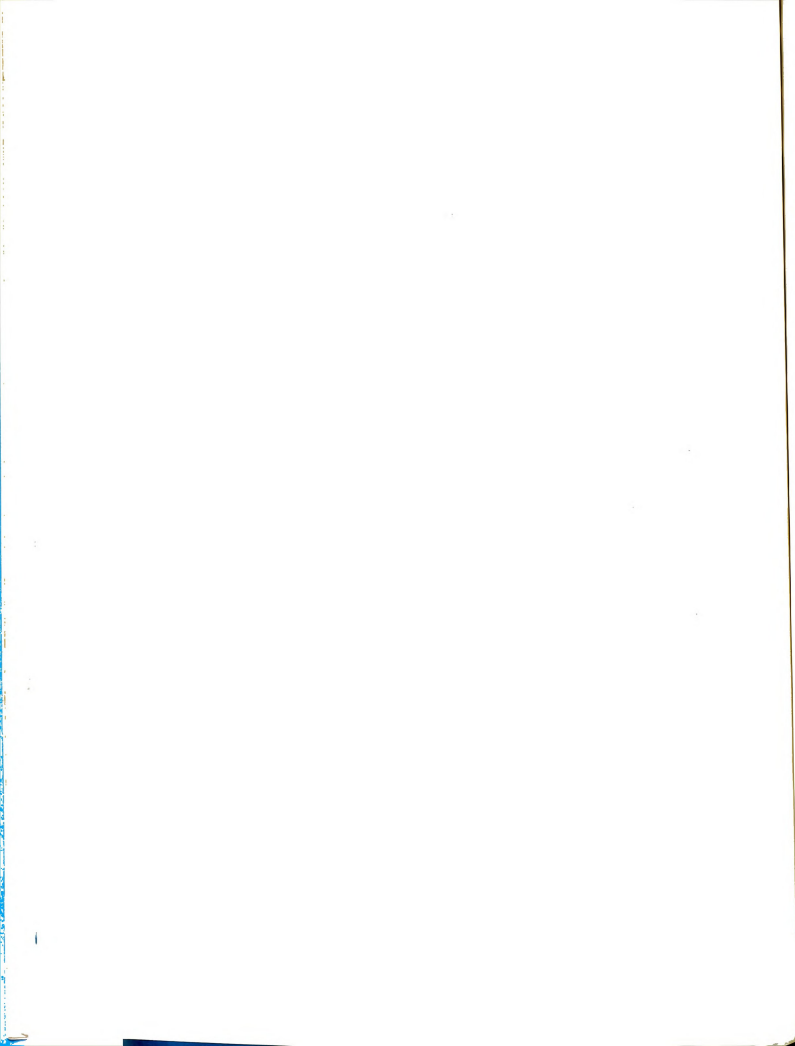


that is is available throughout the entire world but feels that the distinctive aspect of the belief as held in the United States is the faith placed in the availability of mobility, even though 90% of the children of manual workers do not strive for it through higher education. He noted that while intelligence sometimes plays a part in upward or downward mobility, the upward-moving child frequently received training for independence earlier, had more contact with adults, and identified with reference groups which promoted mobility. He found among parents a commonly held tenet that it is entirely possible and normal that offspring achieve higher social status than the previous generation. Further, he sees "the American university as an avenue of social mobility and an institutional bulwark of ideological equalitarianism".

At this point, the question may be logically raised as to how these values, goals and aspirations are internalized by the offspring in the families in which they develop. Much investigation has already been carried on to seek answers to this very question, and it is appropriate to turn to the findings at this point.

Atkinson (8) and his associates, working primarily at the University of Michigan, came upon strong evidence to support the contention that values form early and persist because of reinforcement from the parents. Below are quotations





from several of the writers who conducted studies:

McClelland (p. 439) in speaking of motives, said,

"Many of these same reasons would lead us to expect that these (early childhood)\* experiences may form the basis we have been seeking for the formation of the strong secondary motives that obviously persist for long periods in a person's life."

Again, speaking on the subject of value attitudes,

"Furthermore, Linton goes on to link the formation of generalized value attitudes to early childhood. They 'seem to be easy to establish in childhood, but exceedingly difficult to establish in adult life', possibly because of 'some inability on the part of small children to differentiate between related situations'."

Rosen (p. 498) in his investigation of achievement motivation, reports evidence that middle class parents look for and reward signs of achievement from infancy. He sees this as an achievement-oriented class in which academic success becomes a goal and a demand. Again, he feels that children of these families seize upon these values as their own,

"Achievement motivation, on the other hand, probably has its origins in certain kinds of parent-child interactions that occur early in the child's life and are likely to be emotional and un verbalized."

Donvan's study (p. 516) confirmed that

"Middle class parents, in rearing their children, assert demands for individual success earlier and more regularly than do parents in the working class."

There is evidence available to support the contention of some writers that the term "middle class" as used above

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\*Parentheses ours

may not be a reflection of current economic status, but a set of values which, when weighed, add up to a state of "middle classness" when adhered to by the members of the family.

This is borne out by Stefflre (218), who found that

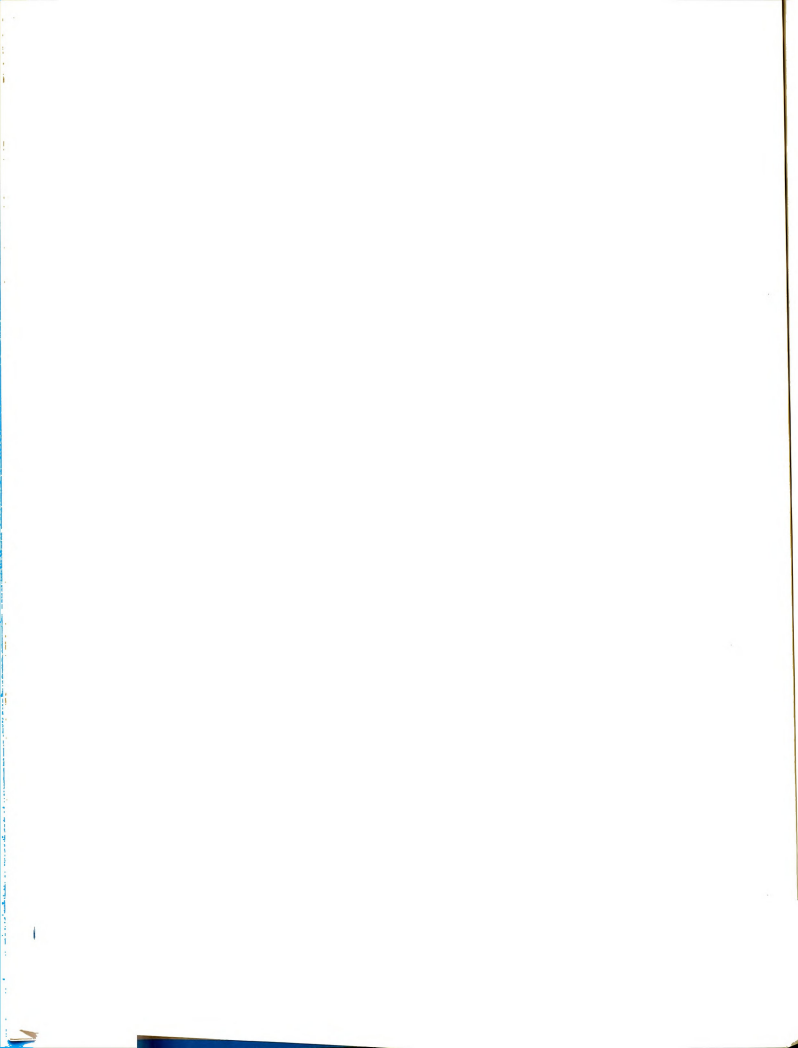
"The most important conclusion to be drawn from the study seems to be that it is less accurate to talk of an upward mobile type, a stable type, and a downward mobile type than it is to talk of white collar and manual types."

And again, closely related to the above premise,

"The speculation by such writers as Kinsey that children very early in life take on the coloration of the social level they are moving toward seems to be well supported by this study, since those aspiring to work at manual occupations are much alike regardless of the social level of their parents."

Bertrand and Smith (16) in their Louisiana study found that the value systems of dropout parents lacked stress on educational or occupational achievement. In fact, they collected many references to school as being a "useless waste of time" or contentions "that children learned 'laziness' in school". On the other hand, families of in-school youth are found more often stressing the desirability of professional and proprietary positions. The authors theorize a close relationship between occupational aspiration and educational values.

Kahl (113), in studying boys of "common man" families, found that those who held aspirations toward mobility came from families who wanted to "get ahead", who constantly referred to those working at occupations more significant than

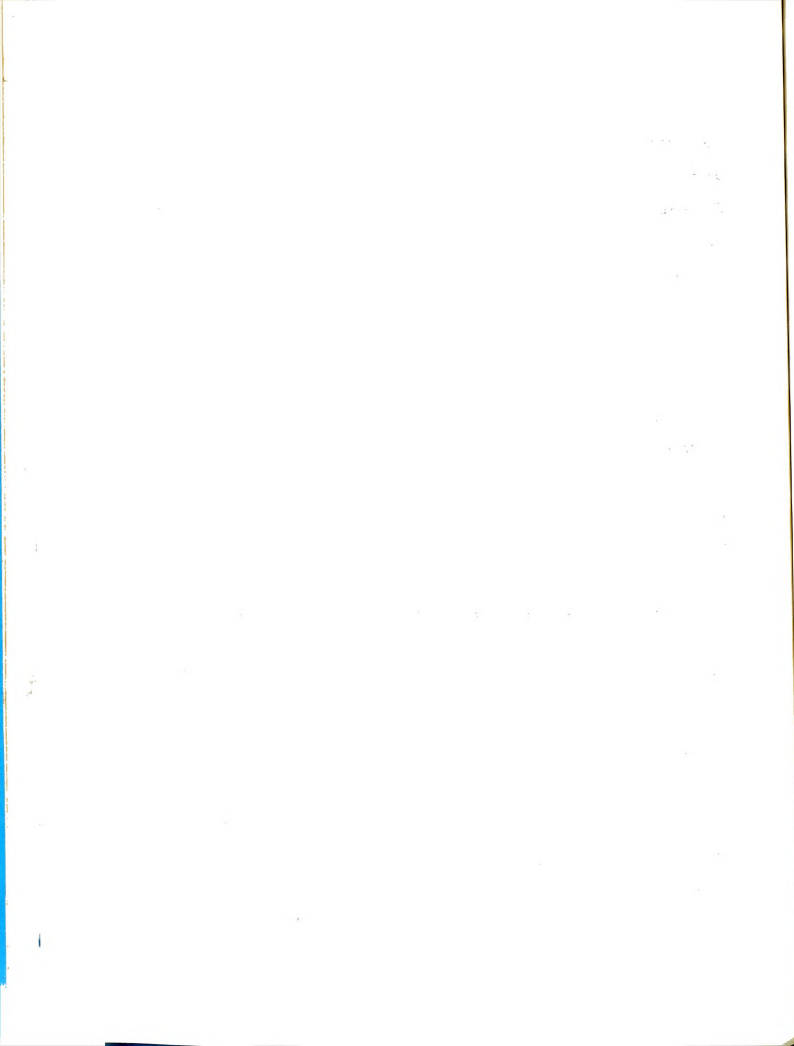


the breadwinner of their own family as being at that level because of advanced education. Speaking of those boys who did not aspire upwards, on the other hand, he identified one of the shortcomings of the "common man" station of life through the statement of one parent,

"...., they understood that such people were professionals and made a lot of money, but they did not know any such people socially and had no concrete thoughts of what such life might be."

Sewell, Haller and Straus (208) found that, with the effects of intelligence controlled, there was a significant and positive relationship between the socio-economic status of the family and the level of occupational and educational aspirations of the offspring, except that the positive relationship was not consistent for the educational aspirations of females.

Tyler (122), during the 1960 series of discussions centering around the Strong Interest Inventory at the University of Minnesota, revealed some of her preliminary findings in her investigations of the development of vocational interests. She has reason to believe in the presence of an "attitude toward work factor" in each measurement taken thus far in the kindergarten, first and fourth grades. If this be the case, it might also be assumed that there exists an "inclination toward level of work" factor, possibly even a leaning towards a level of aspiration, during the pre-school years. It may be reasoned that when Tyler's findings are



integrated with some of the other material cited in the pages above, the "attitude toward work factors" and early aspirational levels are a product of the atmosphere surrounding infancy and the remaining early life of a child.

What is evolving from this discussion, then, is the suggestion that occupational, and possibly educational, aspiration has roots in the same bases as the personality structure, begins in infancy, is a product of the total value and aspirational pattern of the family, and should be a central factor in the completion of high school or dropping out before graduation. If there is validity to this line of reasoning, then the measurement of occupational and educational aspirations of pre-dropouts or pre-graduates is a valid activity.

There is a growing body of evidence that occupational aspiration and vocational decision-making start early and steadily develop and refine to the point of specific choice. Super (173) notes that Ginzberg and his associates traced the development of occupational choice through at least three identifiable stages: fantasy choices (ages 6 to 11); tentative choices (during adolescence); and realistic choices (early adulthood). Later, in the same work, Super himself draws an almost identical premise,

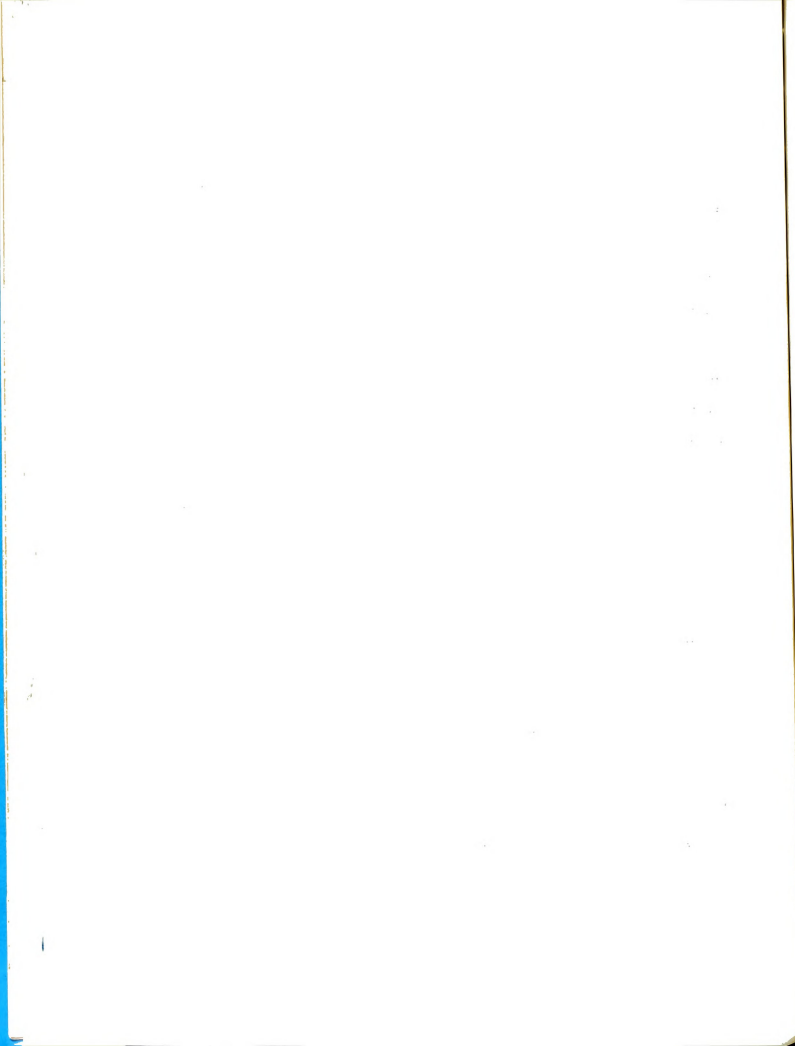
"Vocational choice is seen as a process, extending over a period of time. It is a sequence of lesser decisions, some of them decisions as to the level toward which to strive, some of them decisions as to the field in which to work, which bring about a progressive reduction of the

number of alternatives open to the chooser."

In his efforts to measure the vocational maturity of adolescent boys, Super learned that the more academically capable and active boys in school were also those who had reached a greater level of vocational sophistication as reflected in their accepting responsibility for choice, using resource material, and being informed about their preferred occupation. Also, he discovered that those with high occupational aspiration levels were more frequently found in the Regents courses as provided for in the State of New York. This data lends weight to the suspected relationship between occupational aspiration and school retention. Super also found a  $+ .32$  correlation between a ninth grade boy's occupational aspiration level and his school achievement when a coefficient of  $.23$  was significant at the  $.01$  level of confidence.

Stephenson (220) found ninth graders capable of differentiating between their vocational aspirations and their realistic job plans, this capability based upon what he calls a degree of "integrated self structure". Consistent relationship was discovered between the father's level of occupation (socio-economic status) and the aspirations and plans of their offspring, and there was an identifiable parallel between the occupational aspirations and the job plans of ninth graders and their curricular choices and





educational plans. With perhaps more confidence than most writers, Stephenson asserts,

"Not only does the early adolescent possess the capacity and potential, but he has also acquired a body of knowledge and experience which is rooted in the realities of his family situation, his community and his culture, as well as of his own traits and characteristics."

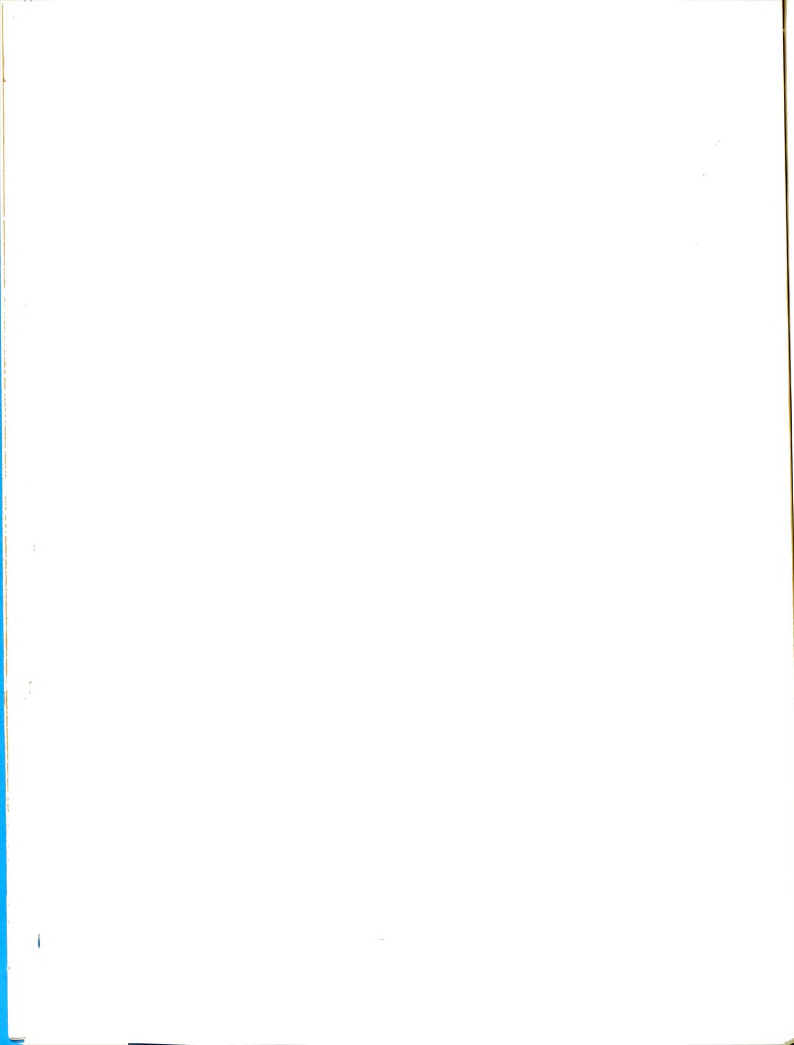
Hamburger (87) concluded that there was considerable support for assuming realism in both the educational and vocational aspirations of all ninth grade boys in Middletown, New York in 1958. He established significant relationships between both socio-economic levels and intelligence and the vocational and educational aspirations of these youth. There was ample evidence to support the hypothesis that vocational plans of early adolescent boys are both organized and integrated.

Summary. Chapter II has reviewed significant information from studies which have (1) measured or described dropouts, and (2) weighed the importance of motivation and aspiration in educational and occupational aspirations and plans. Particular attention has been focused on those findings which have relevance to the data included in the current study.

If, indeed, ninth grade boys are capable of a degree of vocational maturity (and if, because of more rapid maturation at this age, the same may be applied to females), if intelligence and socio-economic status are related to aspira-

tions and plans, if early adolescents are capable of organized and integrated vocational plans, if the father's occupation is related to the level of aspirations and plans and these plans are, in turn, highly correlated with school achievement, then the measurement of these factors - intelligence, father's occupation, occupational aspiration, educational plans, grade point average - should lead to highly significant information regarding those who graduate or fail to complete high school.

Chapter III will provide specific information pertinent to the current study regarding the community in which the project is set, the students included in the sample and the instrumentation utilized in gathering the data.



## CHAPTER III

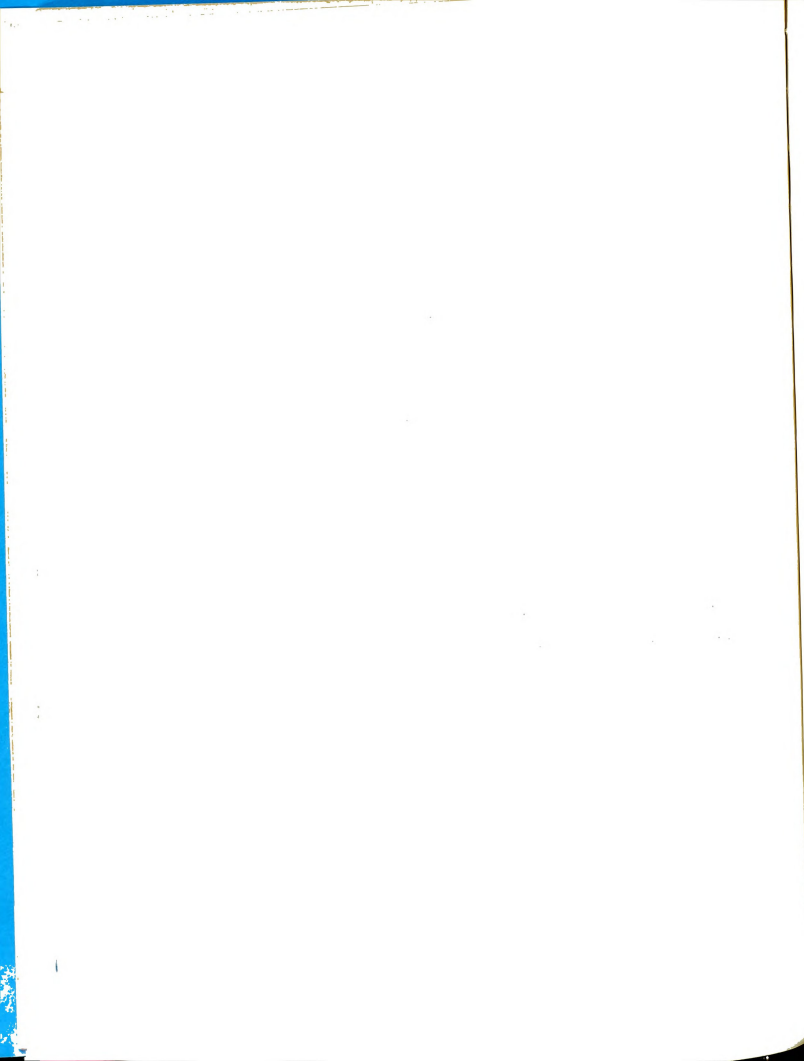
### SITE, SAMPLE AND INSTRUMENTATION

Every community has distinctive features which sets it apart from all others, and each group of people has characteristics which makes it unlike any other group. The purpose of this chapter will be to so describe the community in which the study took place and the group of adolescent boys and girls who participated that the reader's interpretation of the findings will be meaningful. The description will also be helpful if the findings are to be related to other groups or communities to determine whether they are applicable elsewhere.

A discussion of the instruments employed in gathering the data for the study is also essential for a satisfactory interpretation of the results. A description and sample of these instruments will be presented along with material to support their inclusion in the project.

#### THE SITE

Grand Rapids, Michigan, the second largest city in the State with a population of 201,000, according to the 1960 Census of Population, is located on the western side of the Lower Peninsula. It is approximately thirty miles inland from Lake Michigan and about one hundred miles north of the

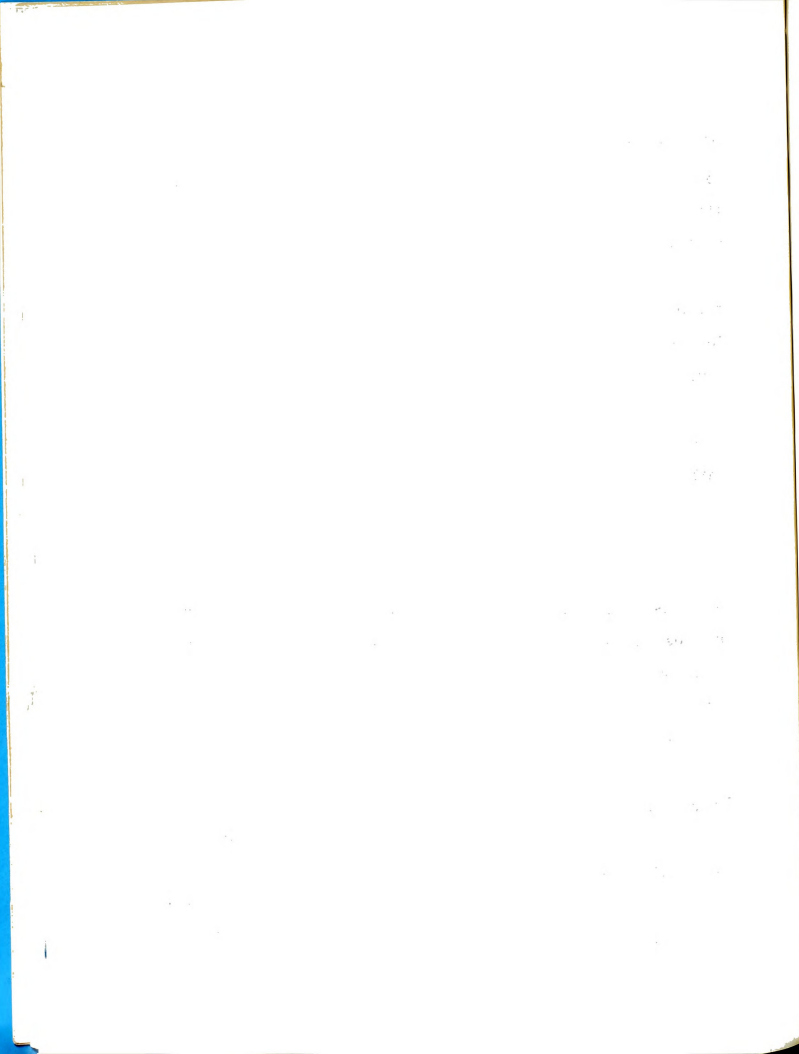


Michigan-Indiana border line. The beauty of the city is greatly enhanced by the rolling terrain on which it is situated, and the major downtown business district borders the east bank of the Grand River.

Like many Michigan communities, Grand Rapids began as a lumbering center which explains, in part, the location along the Grand River. In the early history of the city the immigration of skilled artisans made transition to the manufacture of fine furniture a natural process, and early in the 20th Century the City became known as the "Furniture Capital". While the production of high quality furniture still continues today, the community is presently characterized by a diversity of light industry and an absence of heavy industry. This industrial make-up plus the fact that Grand Rapids is the wholesale distribution center for the entire western Michigan area provides a rather attractive employment picture for both females and youthful workers, thus making it more possible for dropouts to find employment than if manufacturing were vested primarily in heavy industry.

Though the city has a reputation of being composed largely of home owners, the annual mobility rate of 18% is very nearly equal to the nation as a whole. Approximately 60% of the citizens claim church membership.

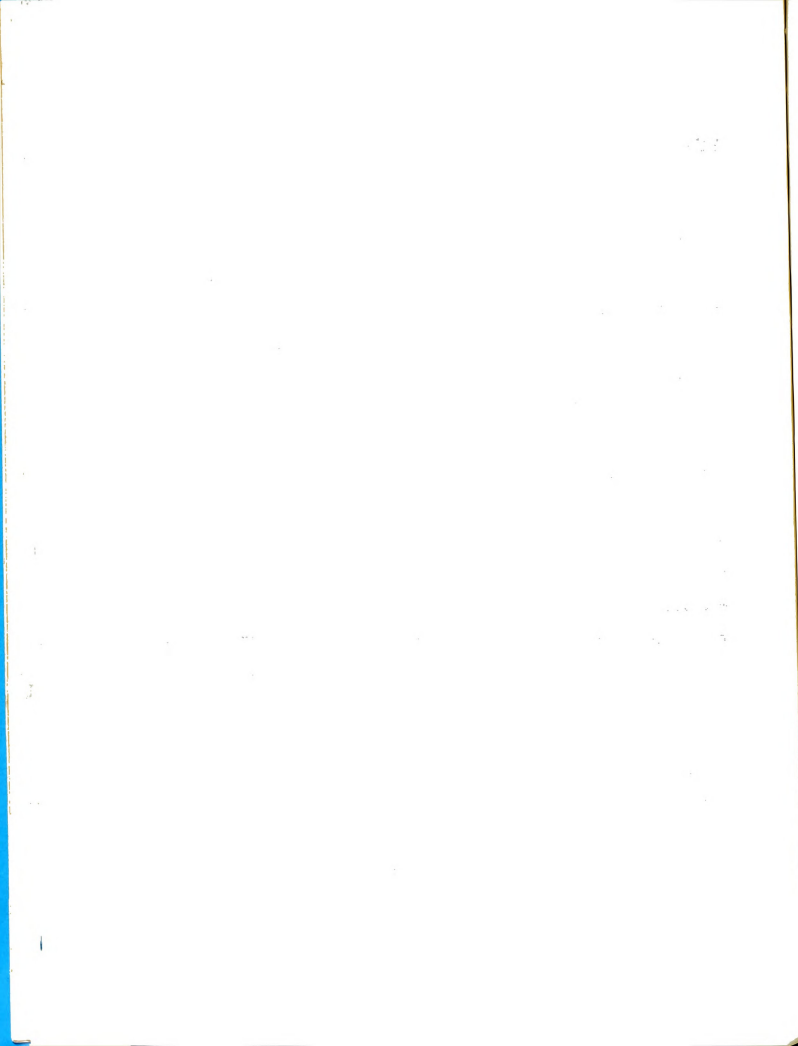
Grand Rapids may be said to be rather highly oriented towards education as is reflected in the fact that the





Detailed Characteristics of Population (241) for the 1950 census shows the average grade of completion for all 24-year-olds to be 12.2 for males and 12.4 for females as compared with 12.0 and 12.2 respectively for the State of Michigan as a whole. Within the City are two privately-supported four-year colleges enrolling over 3,000 students and a public junior college with approximately 3,000 enrollment for the 1961-62 school year. The junior college also sponsors an evening high school at which about 500 students are in attendance. There are also at least three Bible schools for post-high-school training and a seminary in conjunction with one of the privately supported colleges. An extensive non-credit evening school is offered for adults by the Board of Education, and three large public universities - Michigan, Michigan State and Western Michigan - all provide large graduate and undergraduate centers, two with resident directors and staff members. A large business college is located in the downtown area.

The metropolitan area is enriched by a local symphony orchestra, a civic theater, the public museum, an active art gallery and a civic auditorium which attracts many cultural activities. Concern for the well-being of children is reflected in the local child guidance clinic, the Family Service Association, the Adult Mental Health Center and a multitude of other services for troubled youth and their parents. Three large general hospitals and a new osteopathic hospital

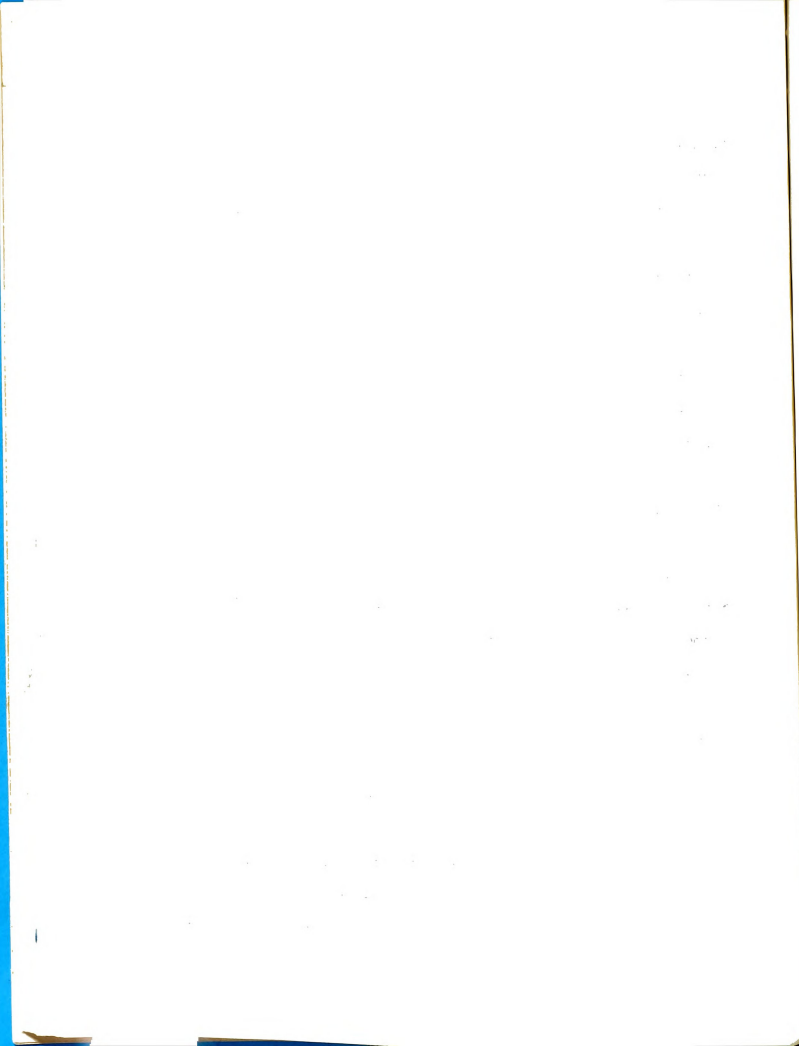


minister to the health needs of the community, and all furnish resident training for doctors and nurses.

The non-public school enrollment in Grand Rapids is found to be unusually high as compared with most other communities in the United States. The public school enrollment is about 64% of the total school population, with another 23% in the Catholic, 12% in the Christian Reformed, and .5% in the Lutheran and Seventh Day Adventist School respectively. The Negro children, almost entirely enrolled in the public schools, constitute approximately 13% of that enrollment.

According to the General Population Characteristics of the 1960 Census of Population (242), Grand Rapids showed only .5% increase over the 1950 census, rather typical of the lack of growth within the limits of the large cities in the United States. However, within a few months after the completion of enumeration, the city nearly doubled its size in land and increased from 177,000 population to the present 201,000 by means of several annexations. The racial distribution before annexation revealed a Negro ratio of 8.3% as compared with 9.4% for the entire state.

The community seems slightly favored in occupational distribution with about 8.5% of the employed persons falling into the category known as Professional, Technical and Kindred Workers as compared with 8.46% for the state. About 9.13% are engaged as Managers, Officials and Proprietors (except



farm) as against 7.91% in all of Michigan.

Thus Grand Rapids may be characterized as a moderately large American community, rather highly oriented towards education and cultural enrichment, capable of area-wide growth through consolidation or annexation, somewhat over-represented in its occupational profile by professional and managerial personnel, and drawing primarily upon wholesale distribution and diversified light industry for its employment. Its educational system is marked by a rather low percentage of Negroes and a larger-than-normal proportion of non-public population.

#### THE INSTRUMENTATION

It is the purpose of this portion of Chapter III to thoroughly acquaint the reader with the data which has been assembled on the subjects who participated in the study and the instruments which were employed to gather the data.

For each variable appearing in the data a rationale for its inclusion in the study will be offered in addition to the name of the instrument and validating evidence (where available), the method and meaning of scoring, and any other essential information which has bearing upon the problem.

Identification. Though this information does not appear directly in the report of the study, it played a key

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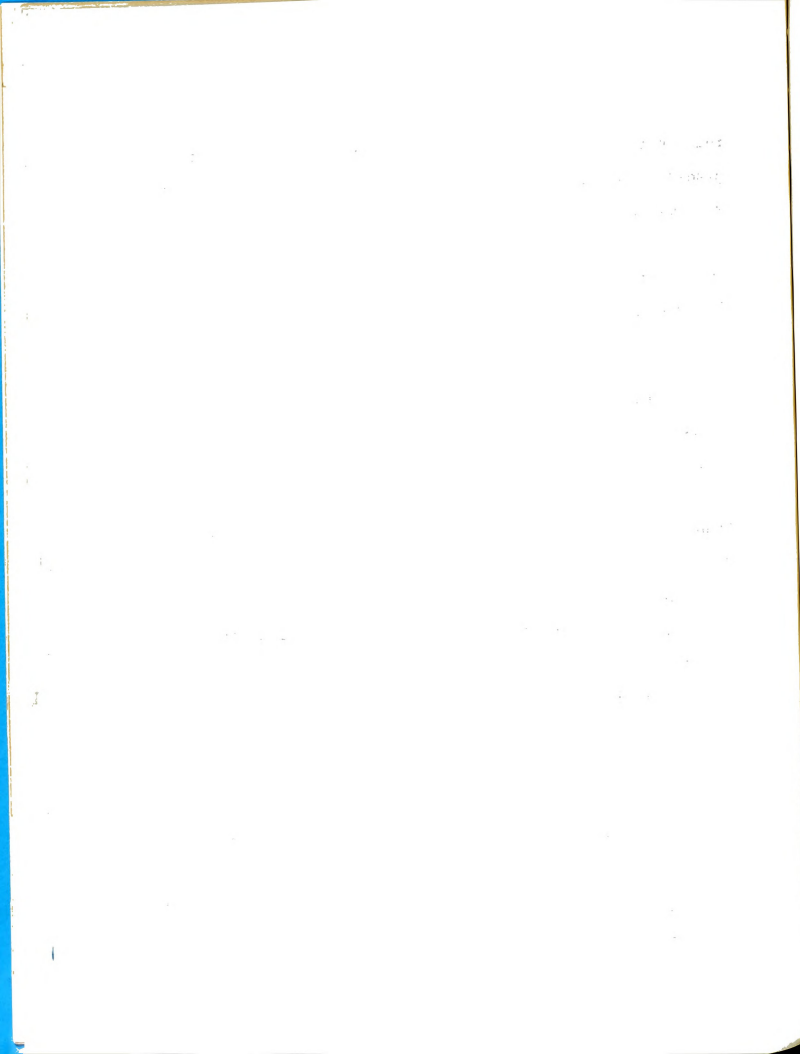
role in the processing of the data. After the subjects were placed in alphabetical order by their last names, code numbers were assigned from 001 to 521 and were punched in the IBM cards. All subsequent handling of data was through identification numbers where cases required individual handling, i.e., filling in missing scores, etc..

Race. It was not originally intended to make a point of differentiating the subjects by race, but two considerations caused this factor to be added after the original gathering of data.

In the first place, the Human Relations Commission of Grand Rapids made a specific request that race be included in the material for possible later utilization in studying certain aspects of Negro adolescents.

Secondly, the literature on motivation and aspiration frequently refers to the Negro group as measuring consistently lower than most other social and ethnic groups on these two characteristics. Also, most dropout studies have referred with regularity to the over-representation of Negroes in the early leaver group.

The two factors above give ample cause for including race as a variable, though two considerations make it problematical as to whether it will be used as a control factor in the processing of the data, namely, (1) the size of the





Negro group in the study and (2) the rationalization that typical Negro reaction is more the operation of socio-economic status and the low educational level of parents rather than any innate qualities peculiar to the race itself; and both of these socio-economic aspects are already measured in the study by other data.

Sex. For various reasons, it was felt to be of great importance to be able to treat the data with the sex of the subjects controlled. The literature refers constantly to the higher achievement levels of females, the greater percentage of girls in the graduating classes, the lesser frequency of grade repetition among females and the more rapid maturation of adolescent girls.

On the other hand, males presently attend college in greater proportion than the opposite sex, and most of the research performed in the area of occupational aspiration to date has been with adolescent boys, almost to the complete exclusion of girls.

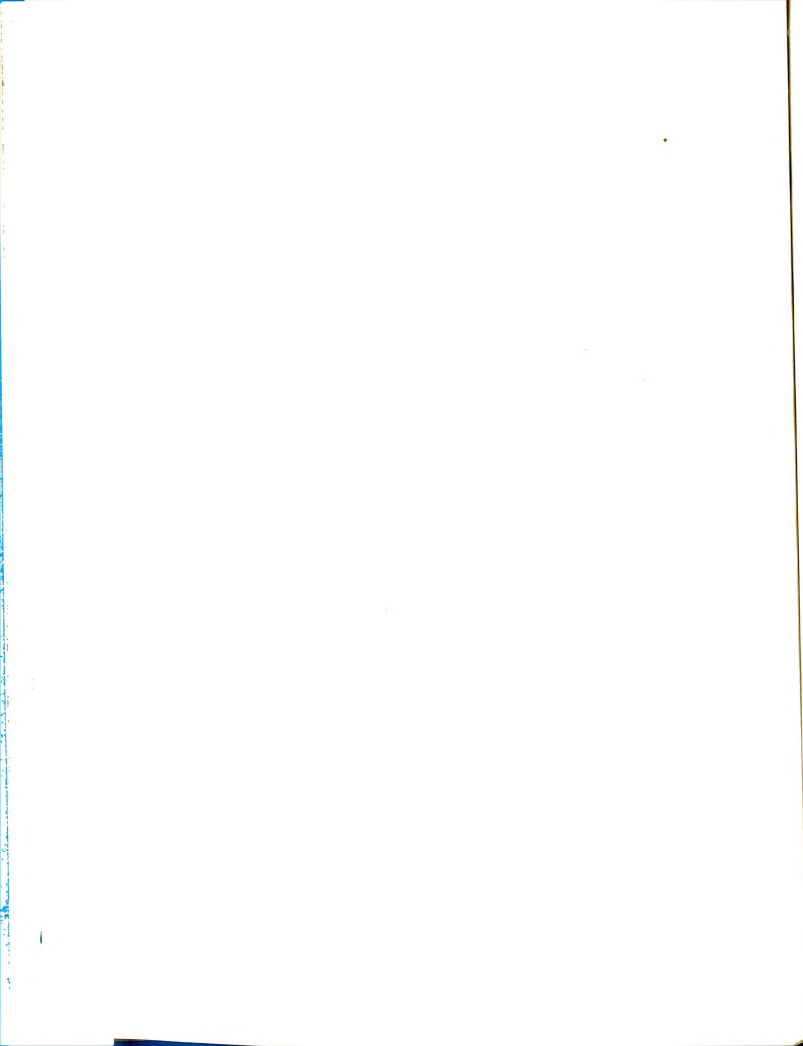
The above seems to furnish ample cause for the use of the sex variable as a constant control throughout the study and the statistical processing.

Age. Chapter II pointed out the age of a pupil as being one of two characteristics which consistently play a part in early school leaving. Being over-age for the grade

of enrollment is usually the result of grade repetition, the latter, in turn, being caused by poor achievement, and a common result of all these factors is dropping out of school. This being true, it is highly essential for the age of each subject to be included with the data in the study.

The compulsory school attendance laws of the State of Michigan provide for continuous enrollment and attendance in school until the sixteenth birthday. They also restrict entry into kindergarten to those who will be five years of age on or before December 1 of any given year. The important aspect of these two facts for the study is that they result in the sixteenth birthday of the youngest eighth grader falling on or before December 1, 1962, the youngest ninth grader on or before December 1, 1961.

It was necessary that a coding system be adopted which would lend itself to IBM processing, and it was decided to make one month the smallest unit of measure. The code begins with the number 01 assigned to the month during which the youngest pupil will have reached his sixteenth birthday (November 2 to December 1, 1962) and so numbers the months in reverse order chronologically until the sixteenth birthday of the oldest subject in the study is reached in month number 58. For purpose of orientation, it is useful to illustrate the code by pointing out that age code 12 for a subject denotes that he will have reached the sixteenth birthday between

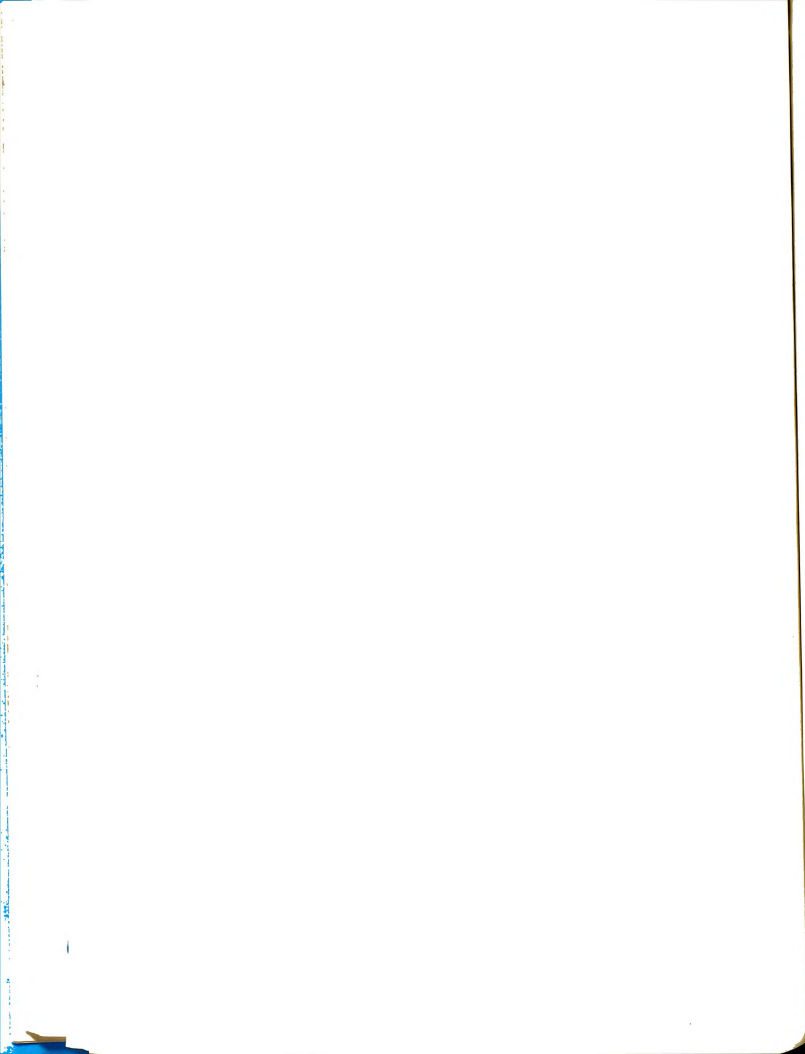


December 2, 1961 and January 1, 1962. Parenthetically, it was necessary to code 00 because one or two underage subjects were discovered.

The arrangement of the age code requires special attention for the proper interpretation of the statistical procedures to be followed. The scoring of most items in the data awards the lowest value to the responses least favorable to remaining in school, but in the case of age, the lower numerical designations have been assigned to the younger subjects who, according to the literature, are in a more favorable position to remain in school. Restated, the above points out that if the literature is correct in its assumptions, those coded highest in age should be most prone to drop out of school.

All of the above statements being true, a negative correlation may be anticipated between the age factor and all factors favorable to school retention. A complete listing of months and codings may be found in Appendix B.

School. As in the case of the identification number of each subject, the designation of the school of enrollment has no direct bearing upon the actual study other than for the purpose of easy access to sources of information. Also, a certain amount of feedback has been pledged and the information will generally be furnished to each school only on the

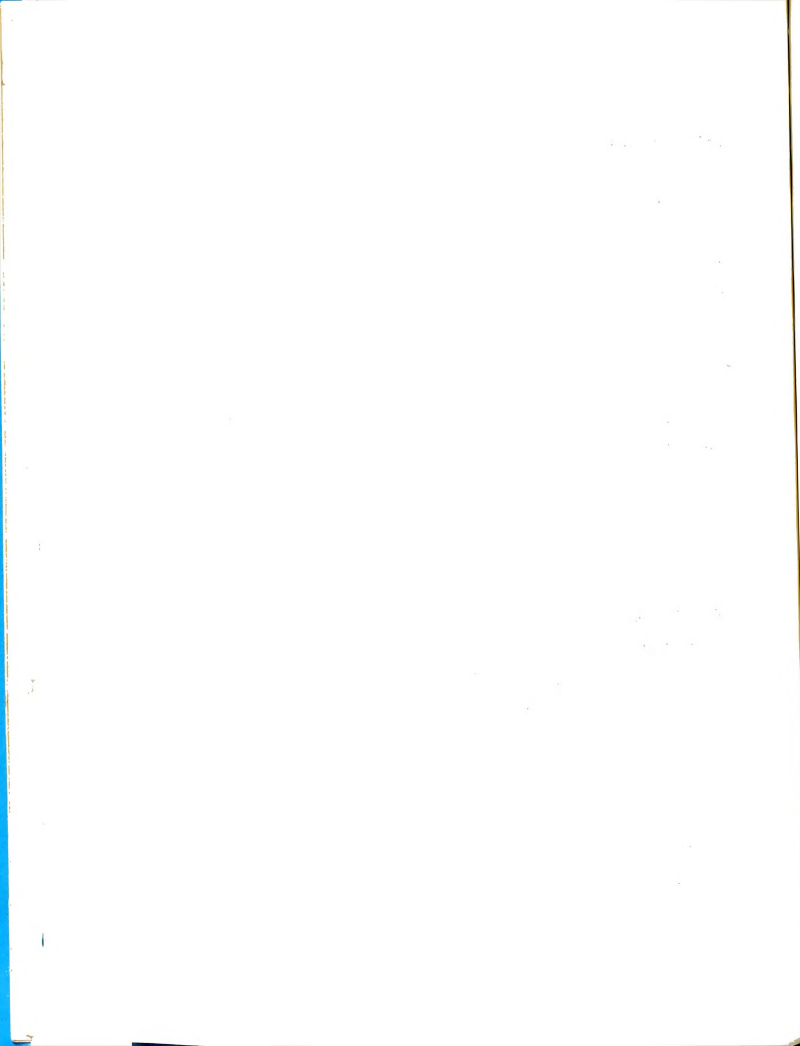


pupils of its district.

Grade. Though grade is important indirectly to the study for purposes of identifying and locating subjects, it will not appear as a variable in the data. The procedures will be run on the basis of whether a subject has reached age sixteen, irregardless of grade at the time the material was assembled.

IQ. Scores earned on group tests of intelligence have appeared consistently in studies of dropouts. As was pointed out in an earlier chapter, the variable has been found related to early school leaving in a somewhat unstable fashion. At times, the correlation between low IQ and dropout has been extremely significant, and at others, almost without significance. Under these circumstances, it is mandatory that the factor be measured for this study.

The Kuhlmann-Finch Intelligence Test, second edition, for Junior High School was selected for the study. With copyright dates of 1953, 1954 and 1956, the Kuhlmann-Finch is one of the newer intelligence scales which provide for a deviation IQ score rather than using the older method of dividing the MA by the CA. Though the test is timed, the allotment is generous enough that for the greater majority of respondents the maximum achievement is reached before the time runs out. Thus its authors claim that it is more correct to



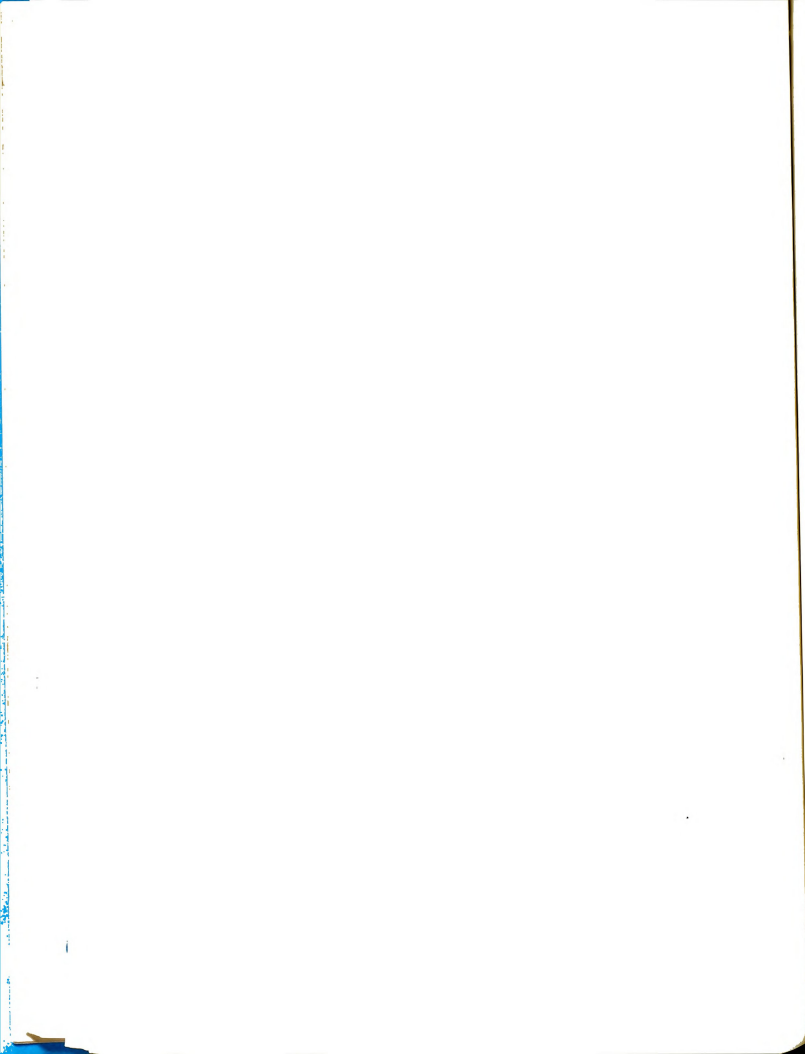
designate the Kuhlmann-Finch as a power rather than a timed test. The IQ score is determined by the location of the median raw score of the five subtests on the scale provided.

Standardization of the Kuhlmann-Finch Tests is based upon 10,144 students in 22 states, six of which are located in the Midwest, and a corroborative study was conducted in 19 states, five in the Midwest. Reliability  $r$ 's are reported on the basis of split-half studies, acceptable in this instance because the authors present evidence to the effect that time is an unimportant factor in the administration of the test. Reliability is given for each age level from six to seventeen. It is claimed that the K-F has a built-in validity as evidenced by the low correlation between subtests and the fact that the average score increases from age to chronological age. Unfortunately, the only comparison with other tests was made with the Kuhlmann-Anderson, the results here being very similar IQ scores for the same subjects. There is apparently very little sex or racial bias in the tests.

Reviewing the Kuhlmann-Finch in Buros (26), Walter N. Durost says,

"For the most part, such tests are used to predict school learning capacity. This capacity measure is desirable in order that such things as the following may be accomplished: (a) the identification of slow learning and talented children for whom curriculum modification is needed; (b) the detection of children with mental potential not being realized in their school output; and (c) the determination of a community's capacity to reach or exceed national achievement test norms. In fairness to these tests, it





must be said that few extant intelligence tests provide more convincing and definitive evidence of their usefulness along the lines indicated."

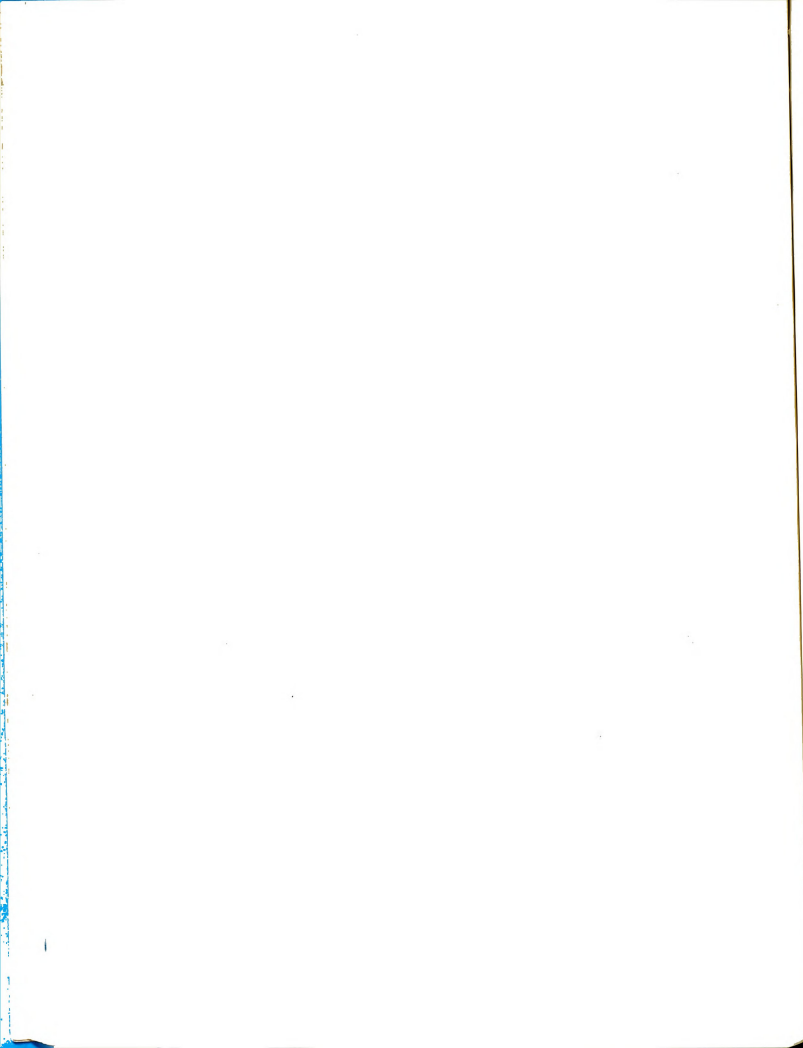
In the same volume, Neidt remarks,

"In summary, the Kuhlmann-Finch Tests are based upon extensive item analysis data and are highly usable in terms of the availability of booklets for each grade level and their ease of administration and scoring."

As will be reported later in the chapter, the favorable aspects of the Kuhlmann-Finch Tests seem to be borne out by the results achieved by the subjects in the study.

Differential Aptitude Tests. Super (230) remarks that "the DAT may be characterized as currently the best battery for use in educational guidance in the high school . . .". After a rather exhaustive, critical review in the Personnel and Guidance Journal of the various multi-factor tests currently available, he and several collaborating critics gave the DAT and the GATB (by the United States Employment Service) the only unqualified recommendations for use in counseling, the latter battery to be used in vocational planning.

The DAT is a series of tests which measure in eight areas - Verbal Reasoning (VR), Numerical Ability (NA), Abstract Reasoning (AR), Space Relations (SR), Mechanical Reasoning (MR), Clerical Speed and Accuracy (CSA), Language Usage-Spelling (LU-Spelling), and Language Usage-Sentences (LU-Sentences). The CSA test is timed, but all other subtests are intended to be power tests. The battery is suitable for

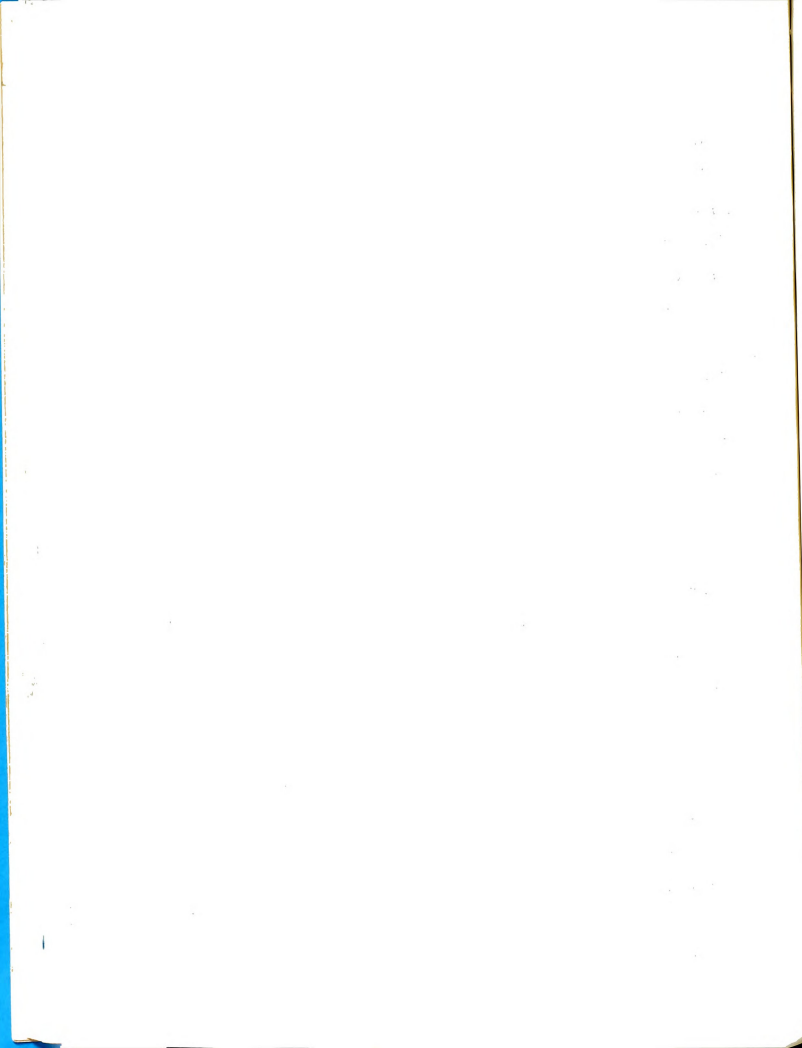


administration in grades eight through twelve, and the reliabilities were all determined by the split-half method except for CSA which was established by administration of both forms within an hour. Reliability  $r$ 's are presented in tabular form for each grade level and for each sex separately.

Validity for the DAT was established by two means, content and predictive. The former was established by using the type of items already proven useful in mental testing or by drawing upon material with obvious relationship to the area being tested, and the latter validity was proven through extensive predictive studies on thousands of high school students, sponsored both by the publisher and other sources. Validities are reported primarily for prediction of school grades, achievement test scores, college grades and educational and vocational placement. However, it is felt that there is insufficient data on vocational placement to make it advisable to use the battery for this type of counseling.

The norm tables provided for the DAT convert raw scores into percentile rankings which may be plotted on a profile sheet for interpretive purposes. The norms are presented for each grade and sex.

It has been found in validation studies that the various subtests frequently predict well in multiple areas or else in areas not at all intended at the outset. For example, the VR test predicts well for academic work in almost all sub-



jects, while NA predicts performance in English and social studies as accurately as in mathematics and science. AR, on the other hand, is as well related to office practice and industrial arts as to science.

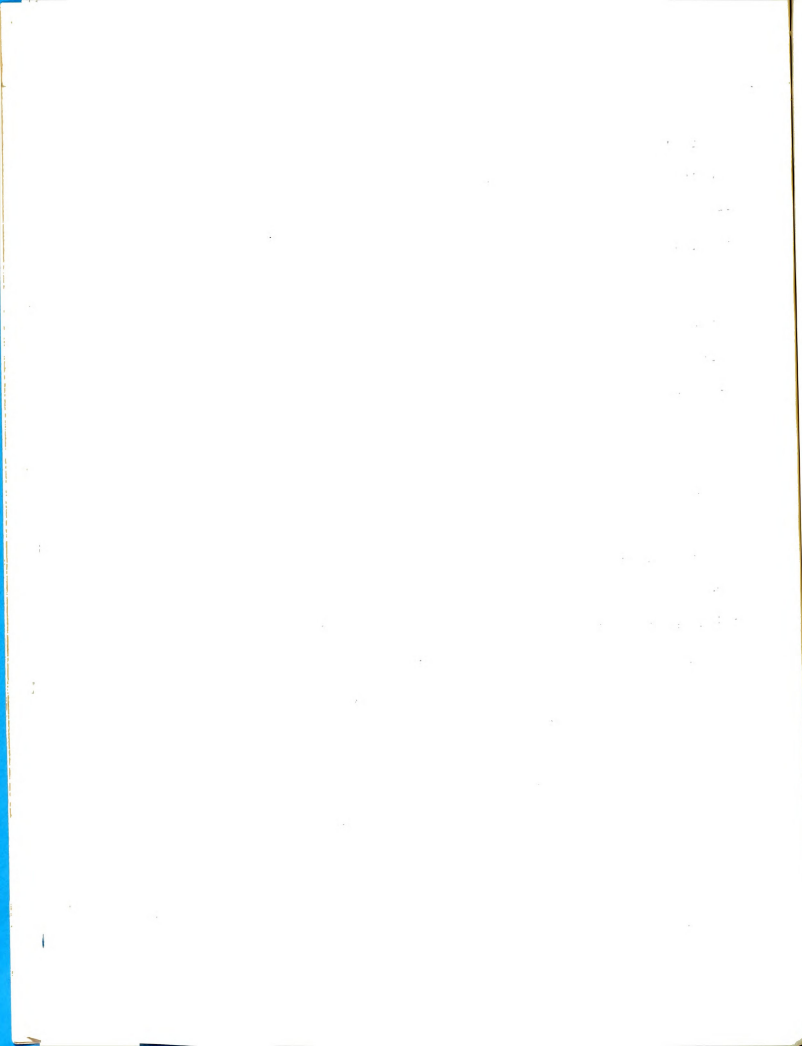
One outstanding disadvantage is present in the DAT - the relatively high intercorrelation between the various subtests, usually considered undesirable for multi-factor tests because this undermines their ability to predict differentially.

For the purpose of the study, only the VR, NA and AR scores were utilized, mainly because of the important relationship between these three and school achievement. Also, the use of DAT scores is the only tie-in with the existing testing and counseling program of the Grand Rapids Public Schools, and it will provide an important body of information for use locally at the close of the study.

Reviewing the DAT in Buros, Carroll says,

"The authors have done such a thorough and technically satisfactory job that a reviewer finds it hard to make himself appear sufficiently critical. With one or two possible exceptions, the tests are excellent in format, item construction, standardization, validation, and just about every other aspect which is regarded as important in the testing fraternity."

Grade Point Average. In studies cited in Chapter II references were made to the achievement record of school dropouts who apparently fared as well as classmates through the



fourth grade and then gradually dropped off until they reached a near-failure level just prior to leaving school. The inclusion of this variable in the study provides an opportunity to test its predictive power against that of the other criteria.

In addition, Haller, Miller and others (82) found a correlation of +.50 between the students' GPA and the Occupational Aspiration Scale scores (to be discussed later in this chapter). This suggests a relationship which makes the inclusion of GPA a veritable "must" in the study.

The GPA of each student was computed for the full school year prior to the one during which the data was gathered (seventh grade for the eighth graders, eighth grade marks for the ninth graders) and was based only on the academic classes which met for one full class period daily. Values assigned were: A = 4 points, B = 3 points, C = 2 points, D = 1 point and E = 0 points. A positive correlation is anticipated between a high GPA and staying in school, between low GPA and dropping out of school.

Educational Plans. The inclusion of the expression of a subject's educational plans may simply arise from the advisability of seeking his estimate of the length of time he will spend in school.

But certain correlations have been established statis-





tically which lead to the conclusion that the variable must be included. A typical example of this is the  $r$  of  $+.64$  found by Haller between the Occupational Aspiration Scale and the number of years of college training desired by a group of adolescent boys. The correlation between a free-response occupational aspiration battery scored with the North-Hatt Scale and the number of years training desired was a  $+.67$ .

A sample of the scale used to measure the educational plans of the subjects may be found in Appendix A. The scoring was based on "0" for the poorest response - "I do not intend to graduate from high school" - and "5" for the response representing the highest aspiration - "I intend to get additional training beyond college graduation".

High correlation might be anticipated between a high Educational Plans score and school retention, between a low score and dropping out of school.

Occupational Aspiration Scale. In the final report of his study of the relation of occupational aspiration to educational, social and psychological factors, Haller (82) says,

"This chapter has shown by empirical means that LOA (Level of Occupational Aspiration)\* is a valid concept in the sense that its behavior is lawful. This, in turn, shows that a reliable, valid and practicable LOA instrument would be useful. Chapter II showed that the theory of LOA may be of importance to the behavioral sciences, especially to

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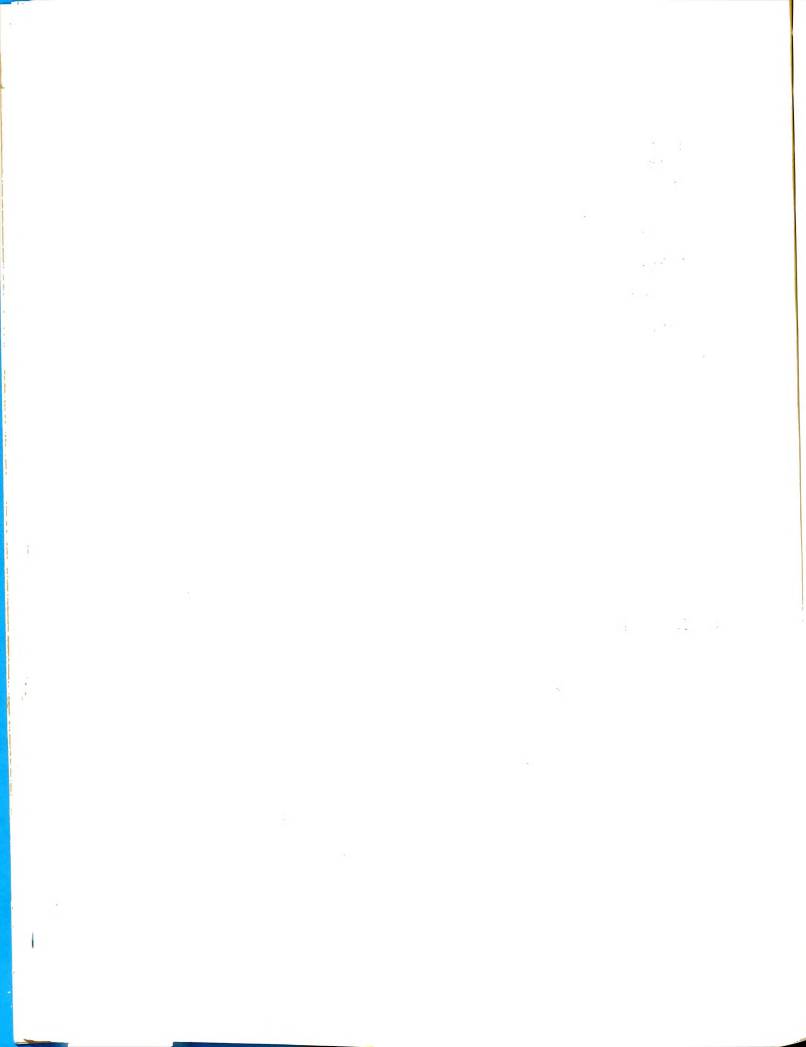
\*Parentheses ours

social mobility, education and related uses. Chapter III showed that no existing LOA instrument is reliable, valid and practicable, although some instruments have some of these characteristics. Together these findings point to the need for an LOA instrument which has all three of the above characteristics. Present evidence suggests that the Occupational Aspiration Scale meets most of these requirements quite well."

The OAS, a copyrighted instrument not yet available for commercial distribution but already well-substantiated by extensive empirical research, is an eight-item multiple-choice battery which is administered within a period of twenty minutes and is easily scored. It has grown out of an established need for an instrument to measure the LOA, draws on the National Opinion Research Center's 1947 study of the prestige ranking of ninety occupations, and was inspired by the unpublished work of Sewell and others in Wisconsin in 1948 and 1955.

The OAS gives opportunity for response in two time dimensions, age 30 and end of schooling, and on two levels of expression of LOA, idealistic and realistic. These two sets of qualities may be combined into four patterns - age 30-realistic, age 30-idealistic, end of schooling-realistic, and end of schooling-idealistic - and each of these combinations appears twice in the scale.

Within the framework of the above combinations, each of the eight items presents ten occupations which also appeared in the NORC study of which one is to be selected by the respondent as the alternative which most appropriately fits the con-



ditions set forth in the question and best describes his feelings about himself. The ten responses in each item cover the entire range of prestige and are scored from a low of "0" to a high of "9", thus making the possible total score for all eight questions vary from zero to 72. A score of 9 on a single item indicates that the subject has selected the alternative with the highest North-Hatt prestige value on that particular question. No occupation is presented twice as an alternative, and the entire scale makes use of eighty of the ninety NORC titles.

A sample copy of the OAS is presented in Appendix A, and the scoring key, identical for all eight items on the Scale, is to be found in the Appendix B.

At present, there are no norms for the use of counselors, since the OAS has been used primarily for research and most subjects have not yet reached the level of maturity where aspiration may be checked against achievement. Reliability seems to be about  $+ .80$  and has been established by the split-half method as well as the administration of two different forms.

Unfortunately, there is no current evidence of predictive validity, due mainly to the reasons stated above. Evidence is presented by Haller to support a concurrent validity of  $+ .62$ , and ample evidence of construct validity is also given.

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Correlations between GPA and OAS and between educational aspiration and OAS have already been given. Other positive  $r$ 's have been found between the Scale and various personality orientations, and still others will be presented in the discussion of other data.

Miller (145) concludes that,

"The OAS appears to be a reliable and factorially pure measure of LOA, and the total score may be taken as a measure of this variable."

Father's Occupation. Sando (197) found that one of the two factors bearing a consistent and significant relationship to dropping out of school was the socio-economic status of the families of pupils, those from deprived homes being more prone to leave school before graduation. Studies which he reviewed had used many indicators of socio-economic status, including the presence or absence of telephones, number and type of periodicals regularly received in the home, and others.

However, much evidence has recently been gathered to show the advisability of using the father's occupation as one of the most reliable reflectors of the status of the family. Almost all of the sociological studies cited in Chapter II stratified the participants into classes on the basis of the occupation of the principal wage earner of each home, and there appears to be no new technique on the visible horizon which will supplant this practice.

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But having established the above premise, it still remains a problem to determine which aspect of an occupation should be used as the criterion on which the rankings might be established. While many occupations are nation-wide, even world-wide, in their existence, local conditions alter such aspects as income, hours of work, regularity of employment, educational preparation, personality requirements, etc., to the extent that consistent rankings might be difficult to establish. In searching for the logical answer to this problem, Haller (82) points out,

"Of the above dimensions, those which are the most obviously hierarchical, such as average income per occupation and average prestige per occupation, average intelligence per occupation, and average education per occupation are probably very highly intercorrelated. This assumption may be true or false; so far as the writers know there are no published data testing it. If it is true, it will make little difference which of the several variables is selected to be the hierarchical dimension of LOA. If it is false than the decision as to which to use must be based on other criteria. In this case, one may turn to sociological theory of stratification. Stratification theorists generally agree that the differential societal evaluation of occupations, or occupational prestige, is the most adequate way of placing them in a hierarchy (Kahl, 1957)."

Accepting Haller's assumption as valid, the next task is that of determining which occupational prestige study is the most comprehensive and universal and, therefore, most usable.

Mention was made earlier in this chapter, in connection with the Occupational Aspiration Scale, of the 1947 study by the National Opinion Research Center (160) which resulted in the North-Hatt occupational rating scale. Since this study

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was conducted throughout the entire country and apparently has not been duplicated or expanded upon by further field research, it seems to be the most appropriate to be applied to the current study in which the specific occupation of the father was sought from each subject.

However, as has already been pointed out, the original North-Hatt Scale contained only ninety occupations, and a group of 521 subjects would be certain to present a much broader representation of job titles than would be covered by this scale. Therefore, it was necessary to employ several interpolations made by Dynes and others at Ohio State University,; by Silverman, Cook and Haller at the University of Wisconsin; by Smith (212); and by Haller in order to achieve a complete coding of father's occupations as listed by the participants.

It should be pointed out here that though the subjects were admonished to describe the actual work performed by their fathers, the responses were occasionally so vague that coding of the occupation was difficult. A second source of difficulty came from the fact that death or marital discord had removed the father from a home and the subject was unaware of his occupation, thus necessitating the search for information from other sources. The Grand Rapids City Directory (182) (183) was especially helpful in this matter.

However, in spite of the above shortcomings of the rating scale and those of securing adequate information from

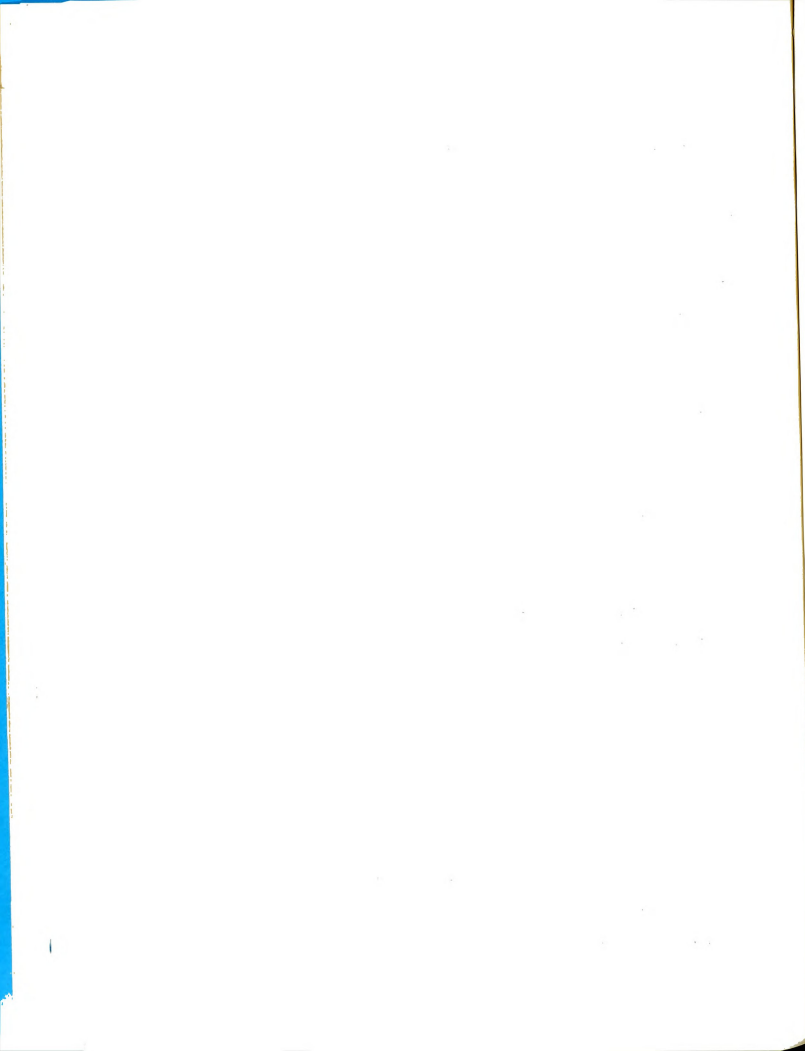


certain subjects, the North-Hatt ratings were felt to be the appropriate indication of socio-economic status at the outset of the study and are represented in the data.

Approximately one year after the opening of the study, however, a new Socio-Economic Index was introduced by Duncan (50), and it was felt that this contribution to sociological research was of sufficient significance that the Index should also be utilized in the coding of the father's occupation in the current project.

Whereas the NORC (North-Hatt) ratings are based solely on the prestige rankings made by some 2,900 persons, the Duncan Index attempts to characterize occupations according to the educational preparation necessary for entry and the achieved income of those actively engaged in the occupations. Duncan rationalized that these two elements, when corrected for an age factor, constitute the prime ingredients in the prestige value assigned by the population in general, and he has developed a coding system for the occupations which appeared in the "Occupational Characteristics" of the 1950 Census of Population.

Within a relatively short time, it may be anticipated that Duncan's scale will become the instrument generally considered to be more useful for research purposes, since its development came as the direct result of empirical study designed to produce such a scale. The North-Hatt scale, on



the other hand, was developed somewhat incidentally from an opinion survey which had a completely different orientation at its outset, and it is also limited in its accuracy by the presence of numerous interpolations which have been made for the sake of comprehensiveness. If at any time during the study it becomes expedient to reduce the measurement of father's occupation to one score, the North-Hatt ratings will be dropped in favor of the SEI.

But the data for the major portion of the study will be found with two indications for the father's occupation or, more precisely, for the socio-economic status of the subjects, and each will be treated as a separate variable. The North-Hatt ratings will be referred to as NH and the Duncan Index will be identified as SEI.

Parents' Education. It may be rationalized that while the educational preparation of a job-holder may be reflected in the prestige ranking of his occupation, the concept held by an adolescent of the educational achievement of his mother and father may be important to the level of educational and occupational aspiration which he sets for himself.

Such is the nature of this variable in the study. The subjects were requested to respond to an item of six alternatives from which they were to select the one which fit each parent. The response which ranked lowest and received a

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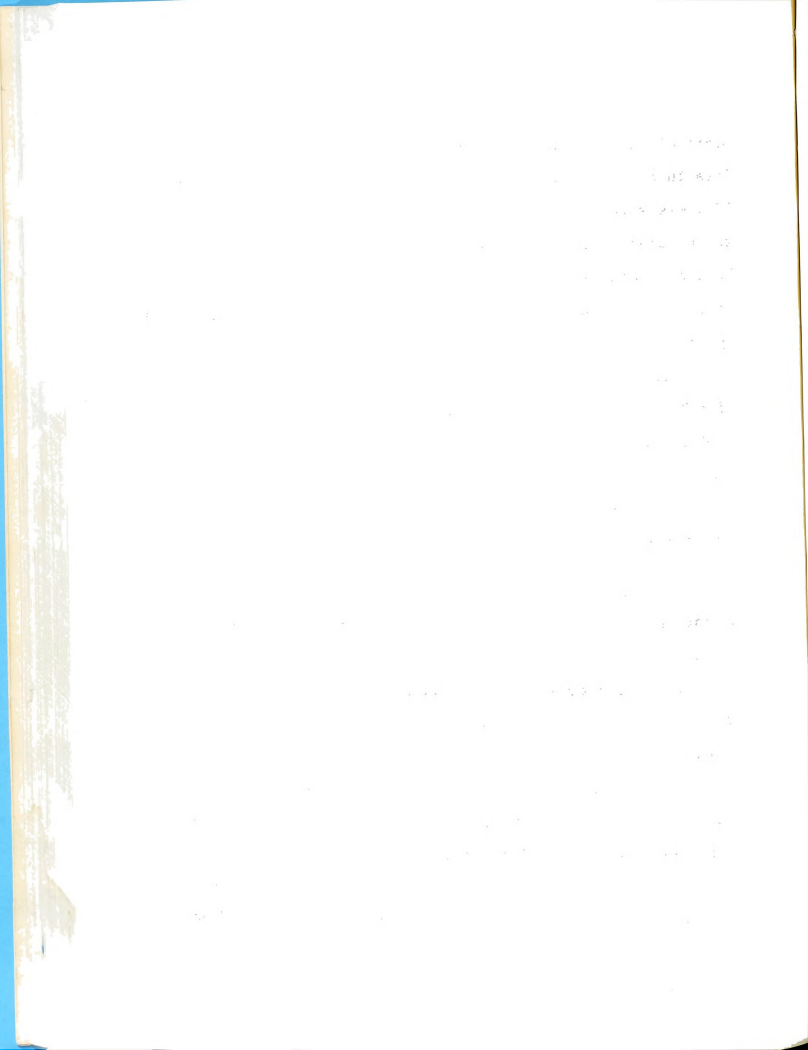
score of "0" was worded, "In school, my mother/father finished less than 8th grade", and the response with the highest value, "5", was worded "college graduate". It is obvious that had the accurate response been sought here, the questions would have been addressed to the parents themselves, but the important emphasis was placed on the estimate of the correct answer by the subjects.

In a similar situation, Haller (82) found a correlation of  $+ .29$  between the OAS and the education of the father, a  $+ .30$  for the education of the mother as estimated by their sons.

A sample of the instrument employed for this variable may be found in Appendix A.

Parental Aspirations. As in the variable, Parents' Education, the subjects were also requested to estimate the level of their parents' aspirations for the subjects' education and occupation. The same rationale for seeking the response of the subjects rather than their parents applies in this instance. There is a possibility that in responding to this item, the subjects may be revealing an important phase of their own self-concept, but there is little in the literature to substantiate this.

However, Haller found a  $+ .22$  correlation between the OAS and the sons' estimates of their parents' level of occu-



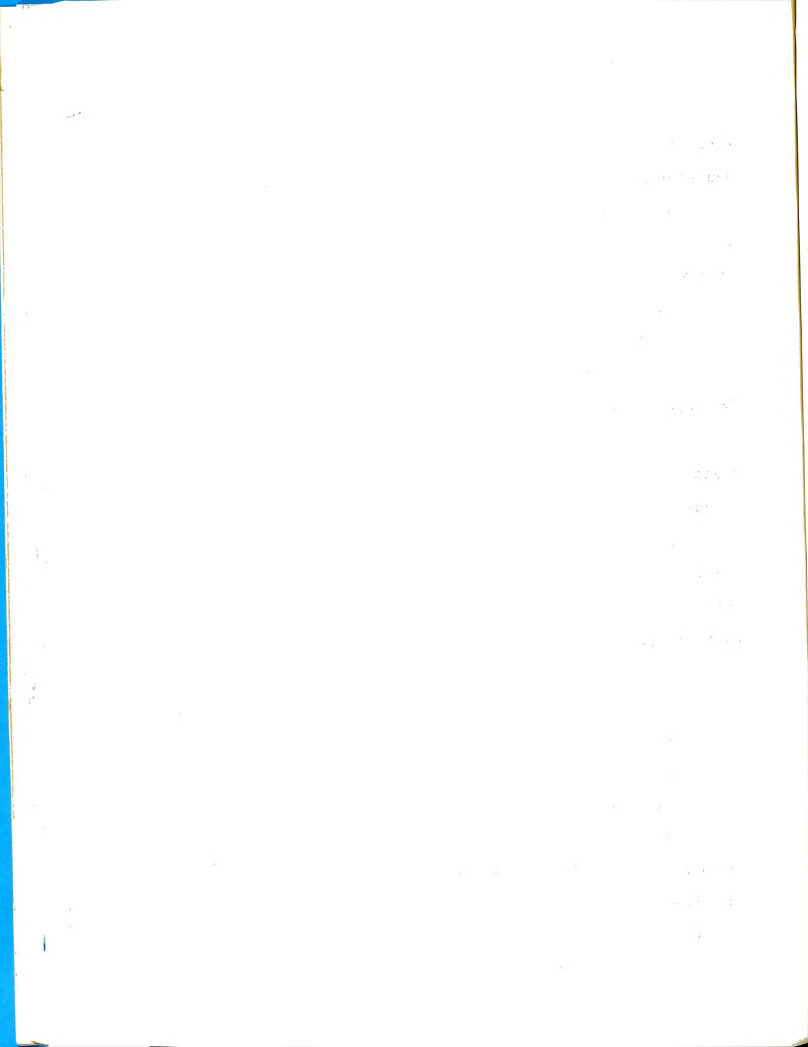
pational aspirations for them and a  $+ .44$  for the level of educational aspiration, implying a substantial relationship.

A sample of the instrument employed to gather the data may be found together with that used for Parents' Education in the Appendix A.

The response which scored a value of "0" was worded "feels I should quit high school and go to work" (educational aspiration), and "does not care how good the job I go into is" (occupational aspiration). A score of "4" was awarded to the response "has strongly urged me to continue" (educational) and "wants me to have a very important job" (occupational). The questions were asked separately for the father and mother for each the educational and occupational aspiration, and the individual item scores were also combined to show the total parental score for each type of aspiration as an over-all score.

#### THE SAMPLE

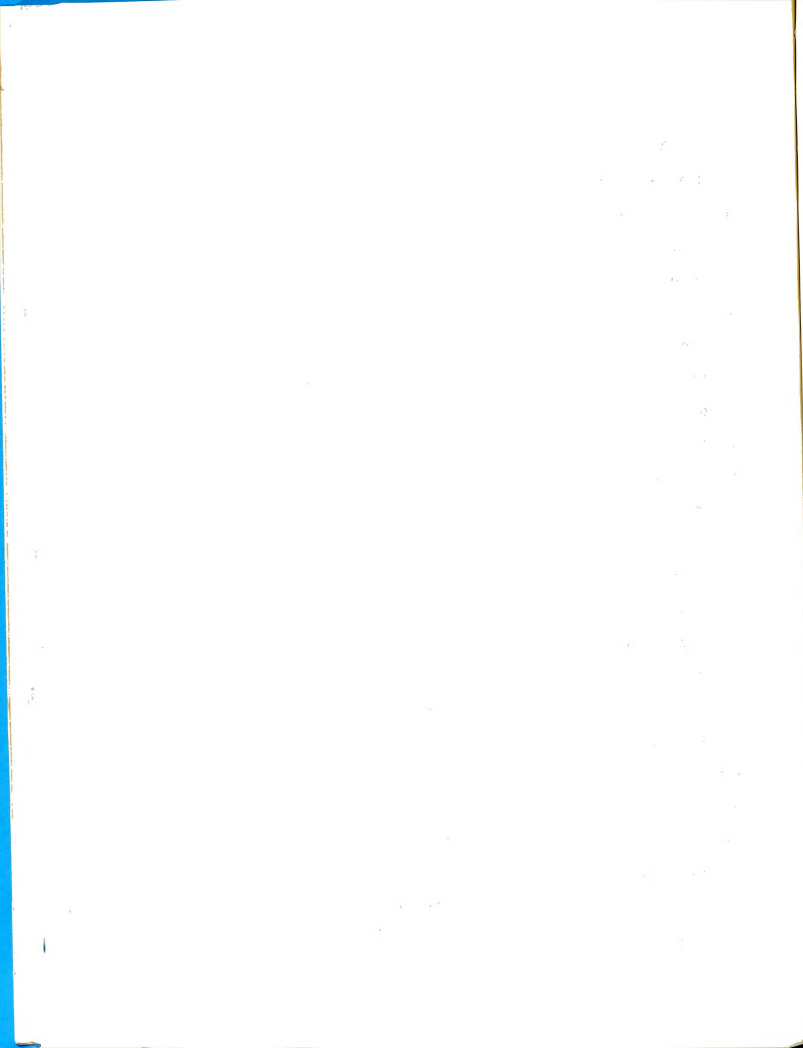
During the 1959-60 school year, at the midpoint of which the primary data for the study was gathered, Grand Rapids operated eight secondary schools of which three were junior highs (grades 7-9) and five were six-year senior highs (grades 7-12). Since that year, two new junior high schools have been added, one through construction and the other through the annexations mentioned above.



At the outset of the study, there were 10,249 pupils in grades 7 through 12 in these schools of which 1,546 were in the 8th and 1,752 in the 9th grade. Of these 3,298 8th and 9th graders, 350 were Negro students, concentrated largely in three of the senior high schools. As is the case nationally, the non-white group is consistently over-represented in the percentage of dropouts, though intense activity on the part of the National Association for the Advancement of Colored People and the Grand Rapids Urban League is making inroads upon the percentage through counseling programs and working with employers to open new job opportunities in the white collar ranks.

Of the 3,298 8th and 9th graders, 521 were selected for participation in the study, coming from all eight secondary schools. Though formal random sampling techniques were not employed in the selection, the information presented in ensuing tables will reveal that a representative cross-section of students was achieved. In each school the instructional leader (usually the assistant principal) was requested to recommend a group of pupils who would be neither above or below average in ability and achievement as an entire group so as to avoid bias in the sample towards high or low educational aspiration.

Since grouping in these two grades, if employed at all, has usually been on the basis of keeping the spread of reading



abilities within a two-year span, and since the students in most of the schools were "sectioned" for a two-hour block of time in English and social studies, it was possible to find entire classes of pupils who fit the criteria mentioned in the paragraph above and also do the necessary testing within regularly scheduled class periods.

Included in the 521 subjects were 233 8th and 288 9th graders. Of the 291 males, 268 were white and 23 non-white; the 230 females divided into 202 white and 28 non-white pupils. The 51 Negro subjects represented approximately 10% of the sample, almost exactly the same proportion as in the total 8th and 9th grades.

Of significance in Table I is the fact that though the Negro pupils scored lower as a group on the tests of aptitude and ability, they were very nearly equal to the white group in educational plans and only moderately lower in achievement.

In general, the total sample group seems to tend towards "normalcy" in the aspects detailed in Table I, averaging near the 100-mark in IQ and a "C" (2.0) in achievement, and planning some training beyond high school graduation, apparently quite representative of the community as a whole in light of the data on the level of achieved education of 24-year-olds mentioned earlier in this chapter.

Aside from the mean scores presented in Table I, some of the actual distributions deserve mention. The GPA range

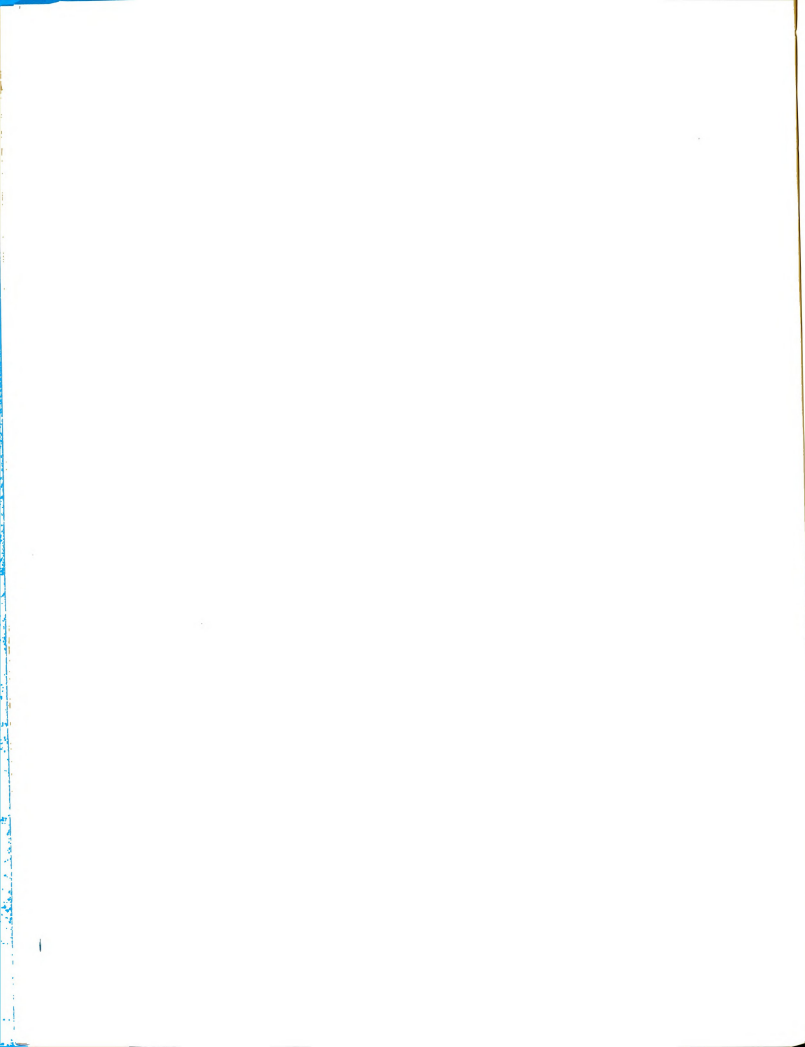




TABLE I  
EDUCATIONAL CHARACTERISTICS OF SAMPLE GROUP  
BY RACE AND SEX

Characteristic	N	White		Non-White		Total
		Male	Female	Male	Female	
IQ Score	502	103.4	106.3	92.2	92.2	103.2
GPA	509	2.1	2.6	1.7	1.9	2.2
DAT - Verbal	399*	49.15 <sup>+</sup>	49.33	43.28	44.39	48.86
- Abstract	401	52.93	55.28	43.97	45.03	53.28
- Numerical	402	50.70	51.77	46.47	43.68	50.73
Educational Plans	502	2.8	2.6	2.7	2.5	2.7

\*It should be noted here that about 110 subjects are not represented in these DAT scores due to the fact that three schools were administering the test in the 9th grade whereas all others were testing in the 8th grade. The missing scores, of course, will be found before the close of the study, the above being based only on those gathered during the initial visits to the schools. However, there is little reason to expect the mean scores of the total group to vary significantly from those in the table above since the subjects whose DAT scores are not included performed comparably on all other measures.

<sup>+</sup>In Grand Rapids all DAT results are recorded on the cumulative record cards in percentiles only. Therefore, it was necessary to convert the centiles to T-scores for purposes of research. The following procedure was employed:

- a. Find z-score equivalent of the percentile ranking
- b.  $Z\text{-score} \times 10 + 50 = T\text{-score}$
- c. Example: For a percentile ranking of 5  
 $5\text{th \%ile} = -1.65 \text{ (z-score)}$   
 $-1.65 \times 10 + 50 = 33.5 \text{ (T-score)}$

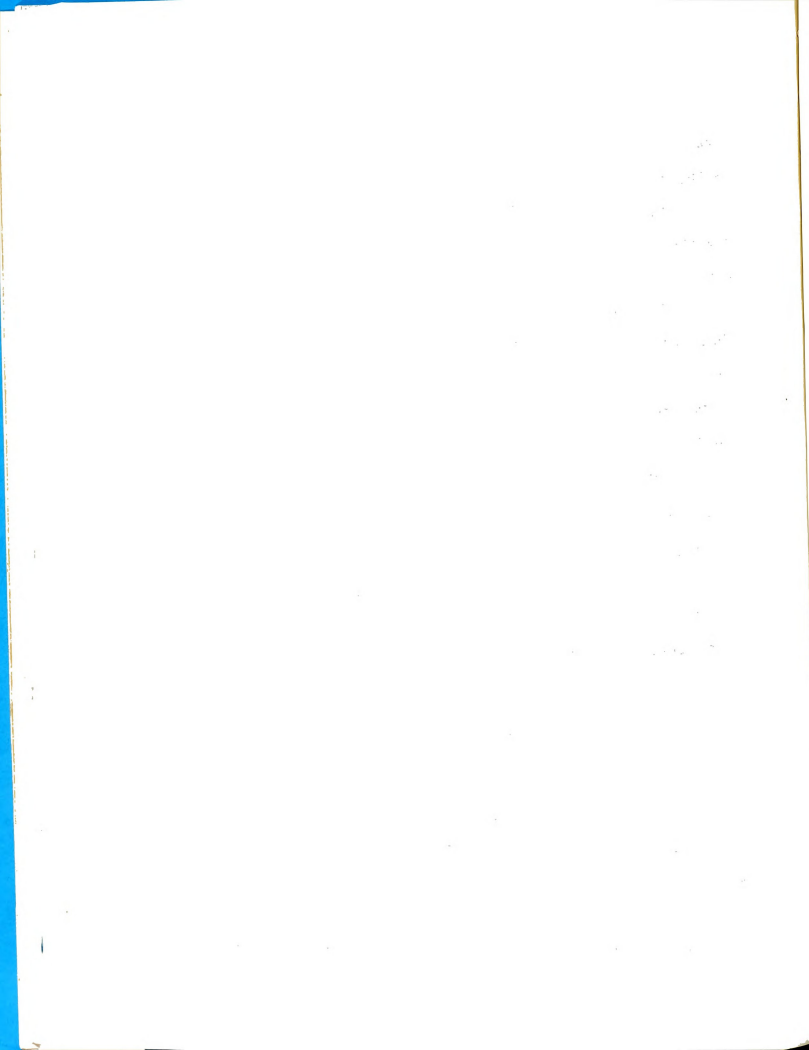
A complete table of T-score conversions is included in Appendix B.

covered the entire scale of possibility, with two subjects having an 0.0 (failure) record and sixteen scoring 4.0 (all A's). IQ scores ranged from a low of 62 to a high of 139, and the same range of distribution was found among the various DAT scores.

On all items in Table II the total group scores somewhat above the mid-point, particularly on the Idealistic total. Of special interest is the relative instability of the Negro responses in comparison with both the white group and the mean scores for the entire sample. Also, with the exception of one item, the white female mean on the Idealistic total, the females tend to score consistently lower on all items than the males. The Negro females outscored their white counterparts on both the Age 30 and Realistic totals, and the Negro males had higher means for Age 30 and Idealistic items than did white males.

The above seems to be somewhat important in light of the information presented in Table I. It appears that lower levels of ability have not been reflected in correspondingly reduced levels of achievement, plans or aspirations for the non-white pupils in the study.

In general, it may be said that the distribution of choices on each OAS item by the males assumed a very nearly normal pattern, whereas the females tended to choose in clusters, avoiding some occupations completely and over-selecting



others. This "clustering", however, did not result in either wide departure from the mid-point or mean scores significantly above or below those of the boys.

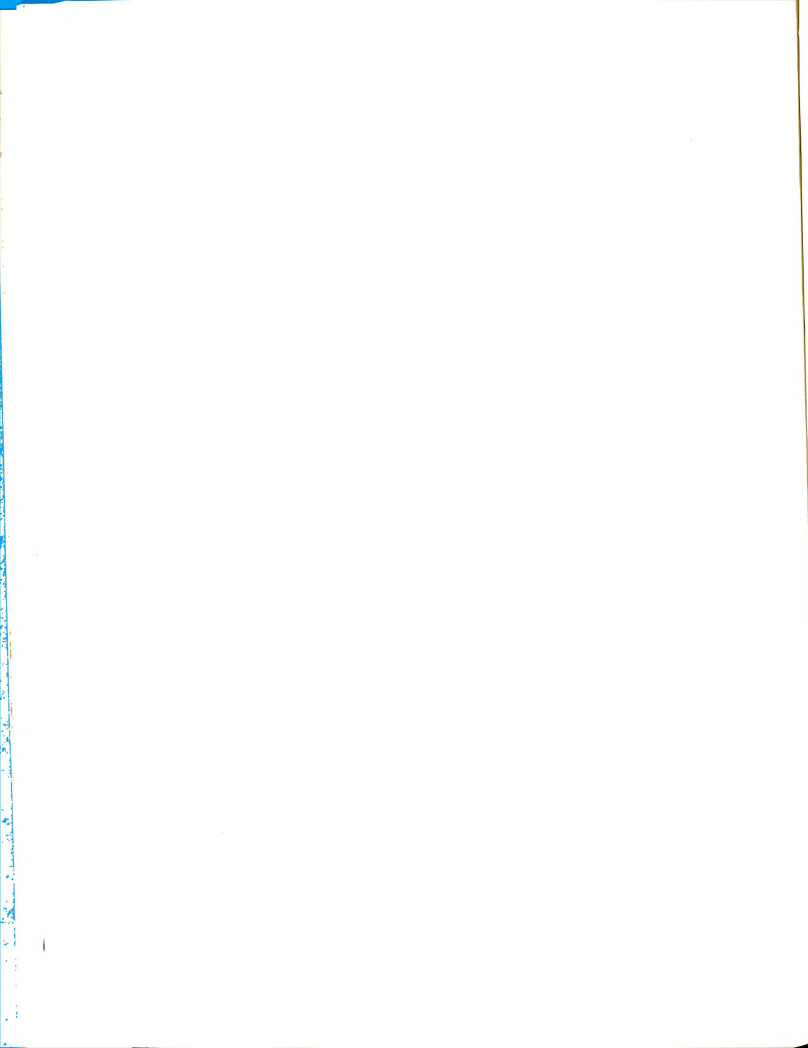
TABLE II  
MEAN OCCUPATIONAL ASPIRATION SCORES  
OF SAMPLE GROUP BY  
SEX AND RACE

Characteristic	N	White		Non-White		Total
		Male	Female	Male	Female	
Realistic-ES	507	9.4	8.4	7.8	8.6	8.9'
Idealistic-ES	509	11.2	11.6	10.7	9.3	11.2
Realistic-Age 30	501	9.8	8.6	9.3	8.0	9.3
Idealistic-Age 30	506	11.1	11.3	12.2	12.3	11.3
End of Schooling	506	20.7	20.0	18.1	17.9	20.1*
Age 30	498	20.8	19.9	22.0	21.0	20.6
Realistic	500	19.3	17.0	17.5	17.1	18.2
Idealistic	505	22.3	22.9	24.0	21.6	22.5
Total Score	497	41.5	39.9	40.1	38.9	40.8+

'On the first four items in this table the highest possible score would be 18, the lowest 0.

\*On items five through eight the highest possible score would be 36, the lowest 0.

+The highest possible score for the Total on the OAS would be 72, the lowest 0.



In interpreting Table III it must be kept in mind that there is serious doubt as to the accuracy of the subjects' reports on the amount of education achieved by their parents due to the fact that the subjects, not their parents, reported this. The rationale for utilizing this type of response was given earlier in the chapter.

As might be expected at the current stage of the development of social status of Negro workers, the occupational ranking for the fathers of Negro subjects falls several points below that of the fathers of white pupils. With one exception, the Negroes saw their parents as having achieved less education than the white subjects.

Regarding parental aspirations for their childrens' occupations and education, the Negro subjects consistently selected responses of higher value than did the white students. This brings about the interesting speculation that the topics of education and occupation are discussed more frequently in the non-white homes, thus causing the children to feel that their parents are aspiring high; whereas the white subjects may gain their impressions of parental aspirations more through sensing feelings than by open discussion. Also, the term "better job than anyone else around here" may carry different connotations in the homes of the two different races.



TABLE III  
MEAN SCORE CHARACTERISTICS OF PARENTS  
BY SEX AND RACE OF SUBJECTS

Characteristic	N	White		Non-White		Total
		Male	Female	Male	Female	
Father's Occupation (NH only)	461	65.3	61.8	59.6	58.1	63.5
Father's Education	492	2.7	2.8	1.9	2.8	2.7*
Mother's Education	502	2.8	2.8	1.8	2.5	2.8
Parental Aspiration for Sub.'s Education	492	6.4	6.3	6.3	7.2	6.4*
Parental Aspiration for Sub.'s Occupation	488	5.2	4.5	5.8	6.4	5.0 <sup>†</sup>

\*The response to the question on the educational level of the parents which was awarded a score of 2 points was worded "9th through 11th grade"; the 3-point response was "high school graduate". The subjects in the sample thus saw their parents as having nearly finished high school as a group.

†This combined total for the educational aspiration of the parents for their children falls between the two responses worded "has given me some encouragement to continue" and "has strongly urged me to continue".

'This combined total for the occupational aspiration of the parents for their children falls between the two responses worded "wants me to have a job that is a little better than most jobs around here" and "wants me to have a job that is quite a bit better than most jobs around here".



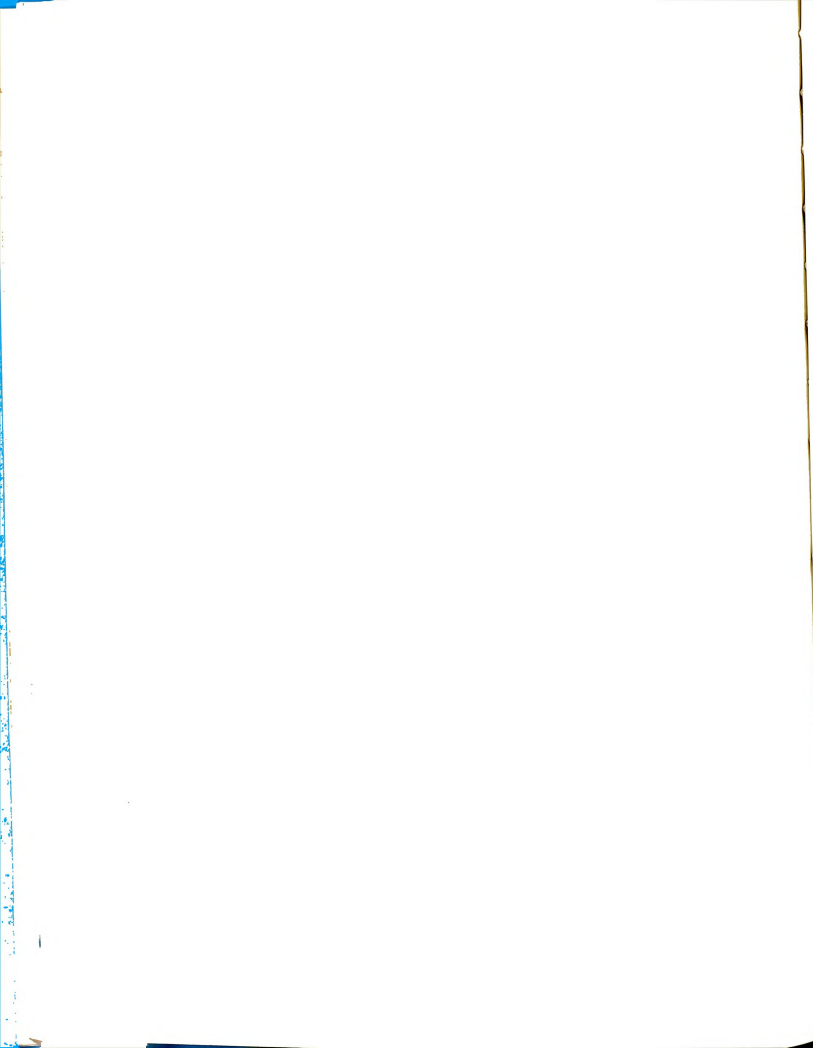


Table IV reveals a rather normal pattern of development among adolescents, both males and females. The latter are found to be four months younger as a group (indicating less repetition of grades and fewer failures), about two points high on the IQ tests, consistently higher on the three DAT scores, and .4 (nearly half a letter grade) higher than the males. While it is assumed that boys, in general, are more effective in the numerical skills than girls, the fact that the females in the study averaged higher on the DAT NR test may be explained by the fact that this subtest predicts over-all academic efficiency rather than just quantitative skill.

In spite of the comparison brought out in the above paragraph, the males in the study aspire at a higher level than females in both education and occupation. This seems normal, especially for education, since men attend college in larger percentages than women at present. However, so little work has been done on the occupational aspirations of females that there is insufficient basis on which to judge whether the comparison between male and female aspirational levels in the current study is typical.

Effect of Age on the Variables. Because so many studies of school dropouts have emphasized the importance of the effect of being over-age, it was decided that the characteris-

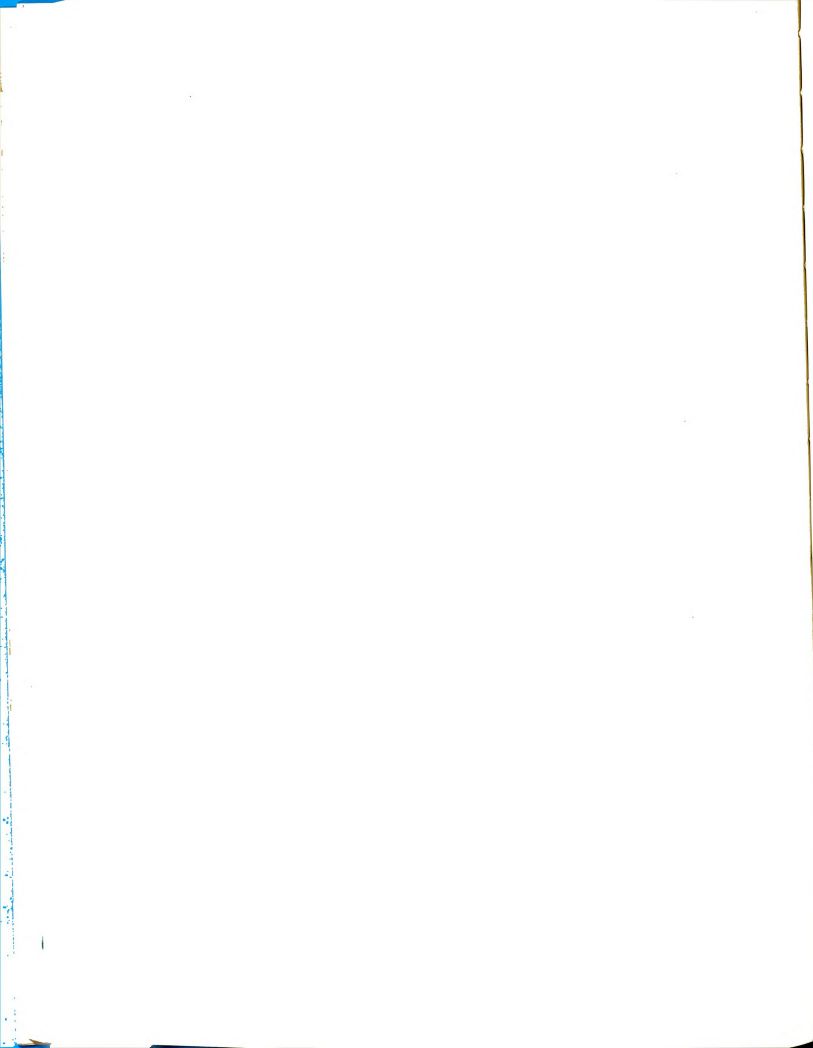


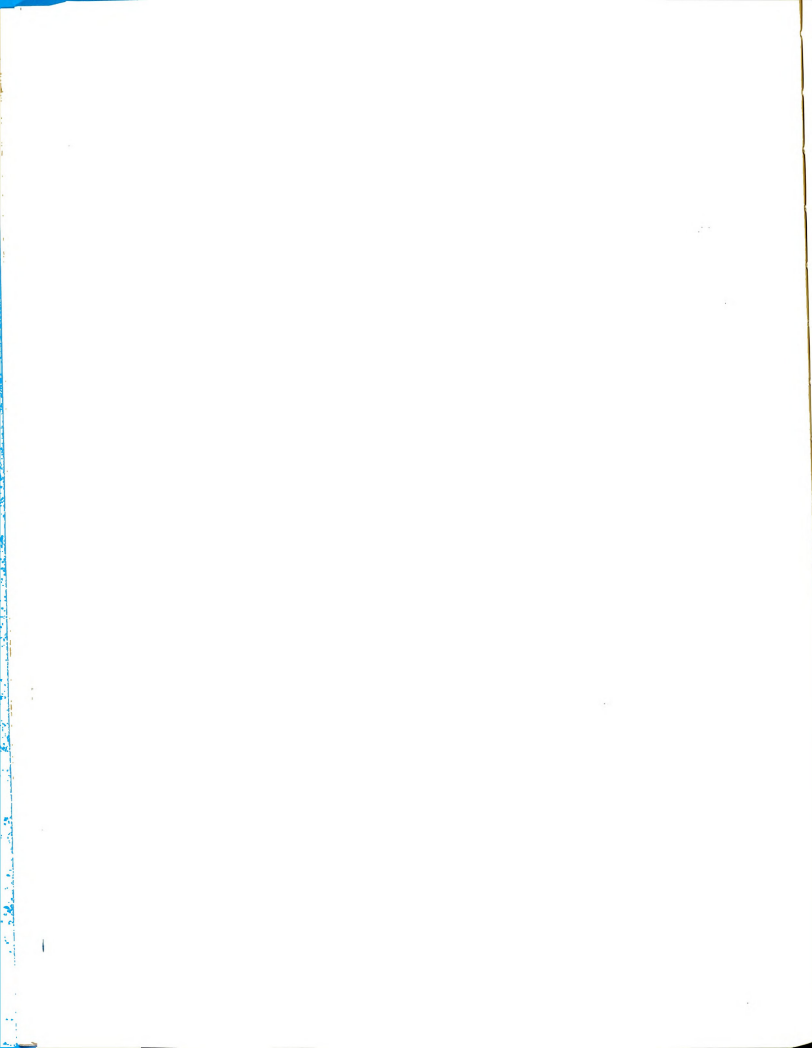
TABLE IV  
MEAN SCORE CHARACTERISTICS BY SEX

Characteristic	Male	Female	Total
Age <sup>1</sup>	18.3	14.5	16.6
IQ	102.5	104.6	103.2
DAT - Verbal*	48.80	48.95	48.86
- Abstract	52.42	54.49	53.28
- Numerical	50.42	54.49	53.28
GPA	2.1	2.5	2.2
Educational Plans	2.8	2.6	2.7
OAS - Realistic <sup>+</sup>	19.1	17.1	18.2
- Idealistic	22.4	22.7	22.5
- Realistic-ES	9.2	8.4	8.9
- Idealistic-ES	11.2	11.3	11.2
- Realistic-Age 30	9.8	8.6	9.3
- Idealistic-Age 30	11.2	11.4	11.3
- ES	20.4	19.8	20.1
- Age 30	20.9	20.0	20.6
- Total	41.6	39.8	40.8

<sup>1</sup>In months prior to December 1, 1962. See explanation this chapter.

\*See Table I for method of finding T-scores

<sup>+</sup>Table II interprets these means in terms of the highest and lowest possible scores.



tics of the subjects should be presented with the sample stratified into four equal groups based on their ages. While an effort was made to keep the groups exactly equal in number, the eventual inequality was due to the necessity of including all subjects of any particular age in a single group rather than dividing them between two groups if the numerical division fell in the middle of a single age bracket.

Much of Table V is self-interpreting, though certain aspects probably deserve special mention. It will be noted that the middle two quartiles represent the smallest range of ages, the second covering only seven months and the third, six months. The fourth quartile, with its spread of thirty-five months, has obviously caught up the bulk of the over-age repeaters.

There seems to be an under-representation of Negroes in the first quartile and a correspondingly large number in the fourth quartile. While males and females are in fairly equal numbers in the first three age groups, the boys outnumber the girls in a ratio very nearly 3 : 1 in the over-age quartile.

In the remainder of Table V a consistent pattern evolves. The youngest group scores most favorably in all characteristics, and it may be safely assumed that this group comprises eighth graders who are at the proper grade level for their age and are achieving at a normal rate. The second

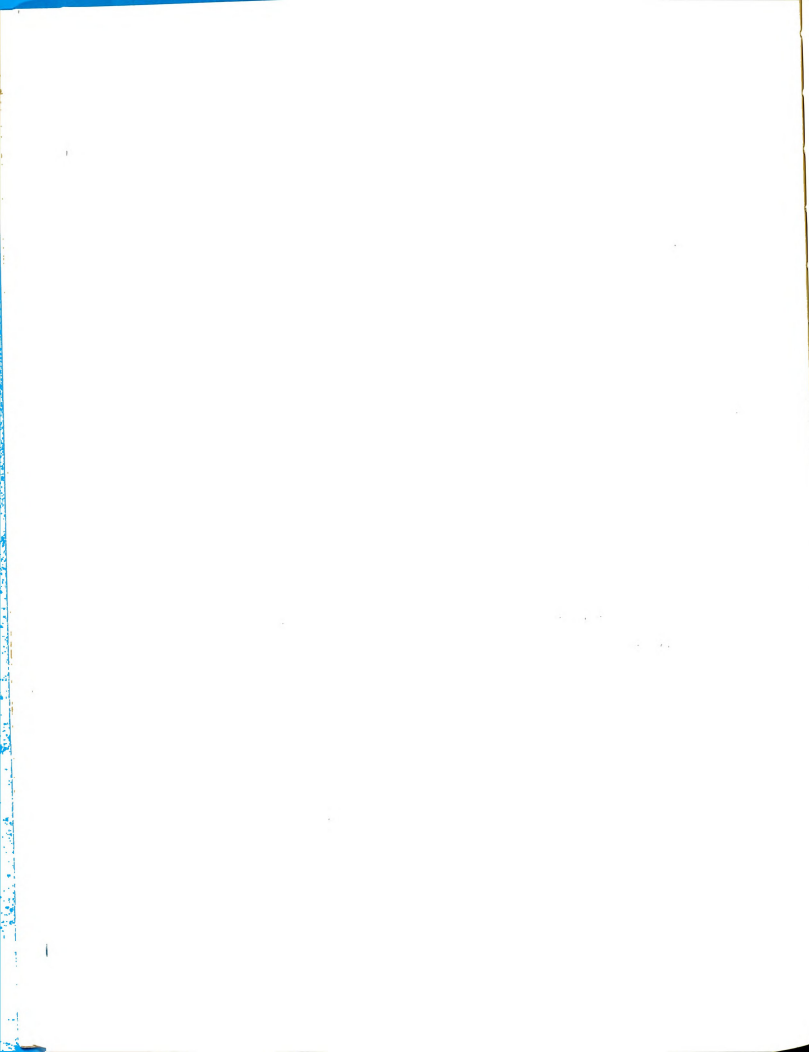
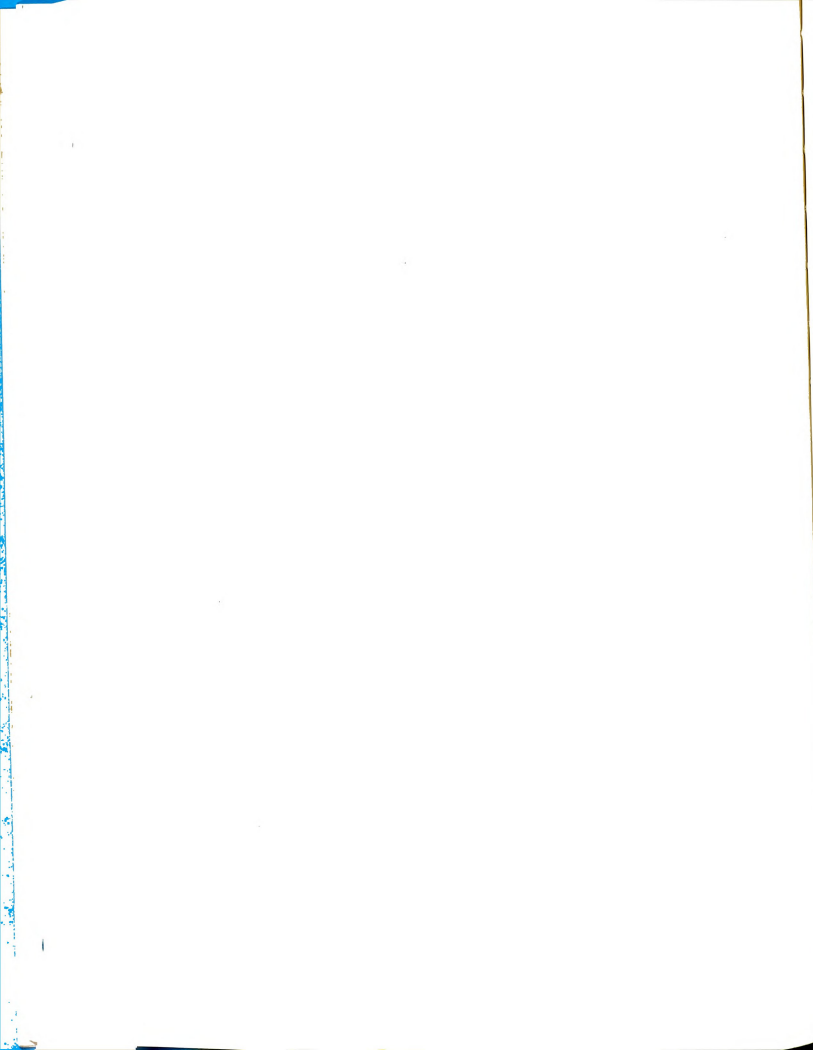


TABLE V  
MEAN SCORE CHARACTERISTICS BY MEMBERSHIP  
WITHIN AGE QUARTILES

Characteristic	1st $\frac{1}{4}$ tile	2nd $\frac{1}{4}$ tile	3rd $\frac{1}{4}$ tile	4th $\frac{1}{4}$ tile	Total
N	136	126	135	124	521
Range of Age Scores	00-09	10-16	17-22	23-58	00-58
Race - White	130	118	117	105	470
- Negro	6	8	18	19	51
Sex - Male	58	76	67	90	291
- Female	78	50	68	34	230
IQ	109.3	106.0	101.3	95.5	103.2
DAT* - Verbal	51.11	49.25	49.69	45.74	48.86
- Abstract	56.24	53.79	54.01	49.59	53.28
- Numerical	52.52	51.58	50.84	48.31	50.73
GPA	2.5	2.3	2.3	1.8	2.2
Educational Plans	3.1	2.8	2.6	2.2	2.7
OAS - Realistic	18.4	18.7	18.9	16.7	18.2
- Idealistic	22.9	23.2	23.1	20.7	22.5
- Total	41.4	41.9	42.0	37.5	40.8
Father's Occupation	64.9	64.9	61.6	62.7	63.5

\*Reference is again made to the incomplete DAT data due to the nature of the testing program in three schools. In spite of the over-representation of eighth graders in the youngest group, however, the number of subjects without DAT scores is distributed throughout the entire continuum of ages.



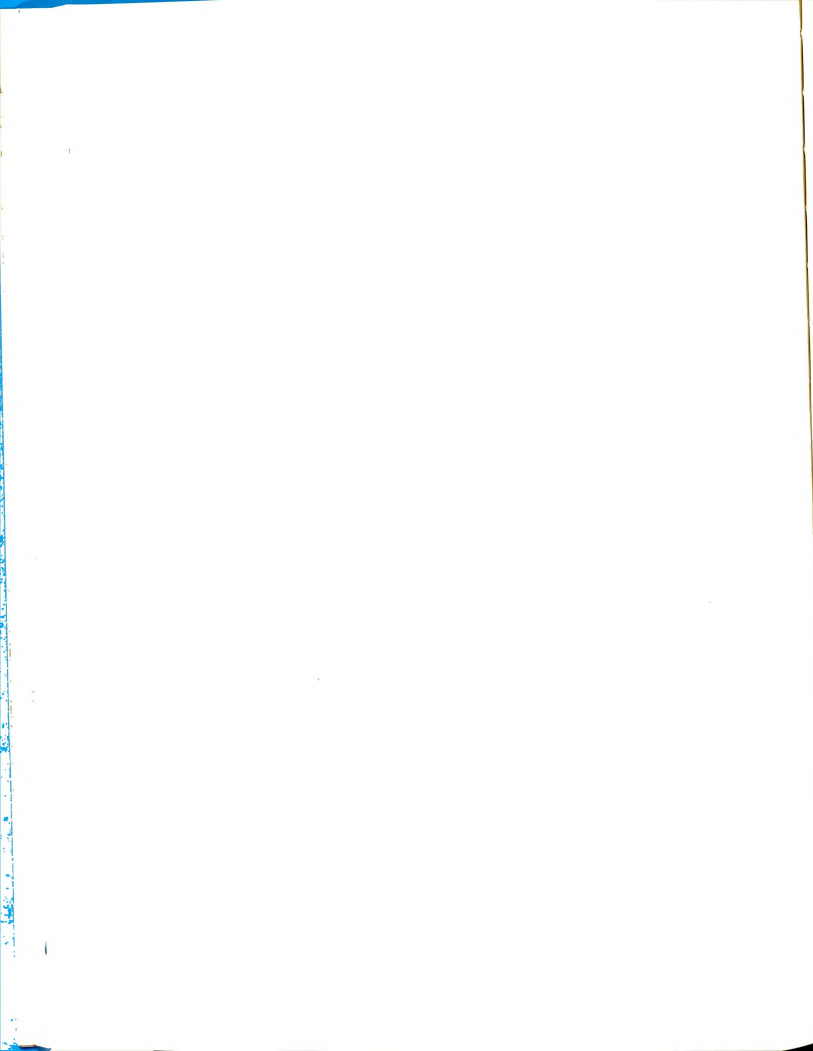


and third quartiles compare favorably with the first and the mean scores for the entire sample, and it is probably true that most of the ninth graders who are at grade level and are achieving normally are mixed with some "normal" and some "repeater" eighth graders here. Quartile number four scores lowest on all measures and is undoubtedly made up of grade repeaters from both grades.

The Sample - A Concluding Statement. The foregoing pages attempted to acquaint the reader with the adolescent boys and girls who make up the sample represented in the study. All data seems to point with a great deal of finality to the normal and cross-sectional character of the group. There is reason to believe that these 521 pupils are rather typical in all aspects which have been measured.

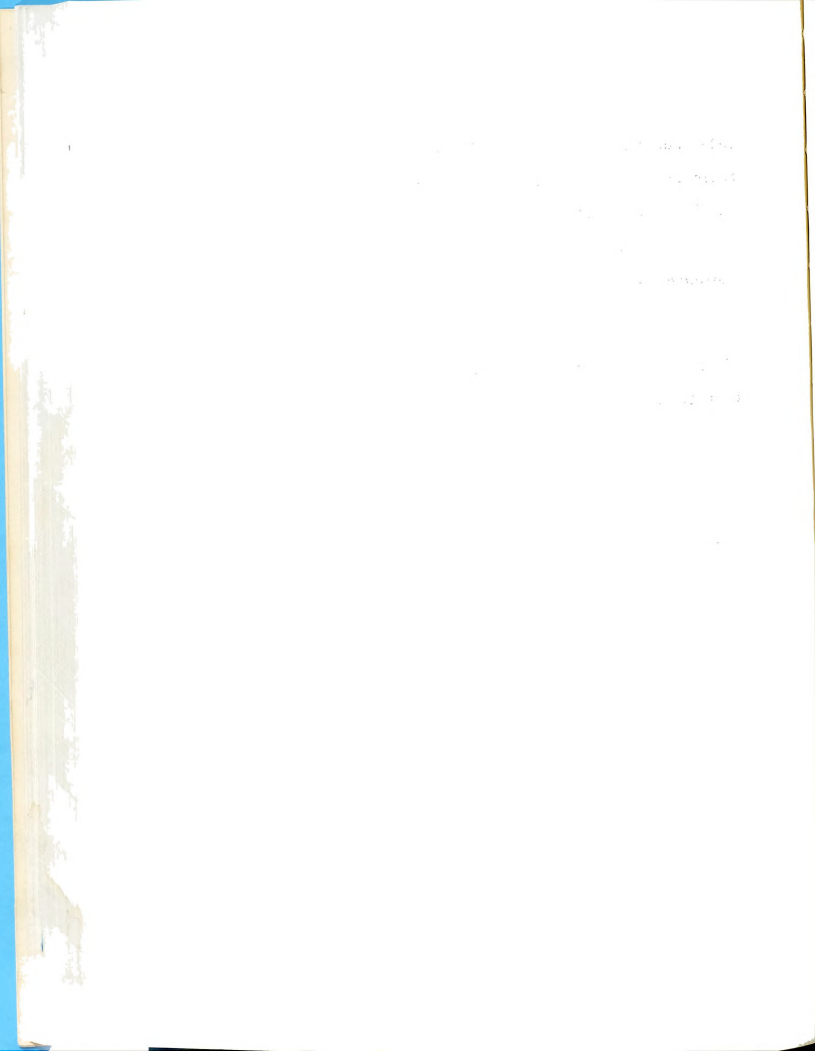
It should be borne in mind that all data presented in this chapter must be considered raw data in that it appears as it stood at the close of the first testing period in early 1960, in some cases even rather incomplete. For this reason, the information has been used in a descriptive fashion only, and no conclusions should be drawn until statistical validation has been accomplished.

Summary. Chapter III has attempted to present to the reader a description of Grand Rapids (the Site), of the adolescents who make up the sample on which the study has been



made, and the instruments which were employed to gather the basic data. It was so designed as to make interpretation of the final results meaningful and also to facilitate relating the conclusions to other geographical areas, other groups of adolescents and to other similar studies.

Chapter IV will present an account of the processing of the data, showing the operational hypotheses and how they were tested.



## CHAPTER IV

### ANALYSIS OF THE DATA

At this point in the study, the reader should be thoroughly acquainted with such details as the general plan which has been followed, the hypotheses being tested, the results of other appropriate research and writings, the site of the project, the instruments employed to gather data, and the subjects who participated in the current study.

It is for Chapter IV to present the description of the closing phases of the project, give further information on the sample, restate the hypotheses, discuss the statistical procedures employed to analyze the data, and show relevant results of these procedures.

Closing the Study. With a single major exception, the project moved forward in much the same manner as had been planned. The exception came in the form of an earlier closing date than had originally been projected, when an unforeseen incident moved the date ahead approximately fifteen days to February 2, 1962.

The losses from this change were not great, however, since only four subjects would have turned sixteen years of age in the period between February 2 and February 15, and none seemed "dropout prone" according to the measures dis-

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cussed in Chapter II. At the same time, the new date still allowed for the completion of the first semester of the 1961-62 school year and moved one week into the second term.

A constant careful check was maintained on all participating subjects, and changes in their status were noted in order to facilitate the follow-up which would be required at closing time on those who had left the Grand Rapids Schools.

The last few months were devoted to gathering missing data which was noted at the time the tables were constructed for Chapter III.

Missing data showed up primarily in two important variables: DAT and Father's Occupation. Also, some difficulty was encountered where subjects had failed to respond to all eight items on the OAS, and a very few pupils were missing when the intelligence test was administered.

As was stated in an earlier chapter, the missing data for the DAT came, in part, from the fact that three schools were administering the test in grade nine and the eighth graders had no scores at the time of the opening of the study. Other difficulties came because some non-resident students in the study had transferred for the ninth grade into Grand Rapids Schools which administer the DAT in the eighth grade and another, shorter test had been substituted for the DAT; and it was frankly felt that a carefully-estimated score would be more suitable than that from an out-dated, unreliable



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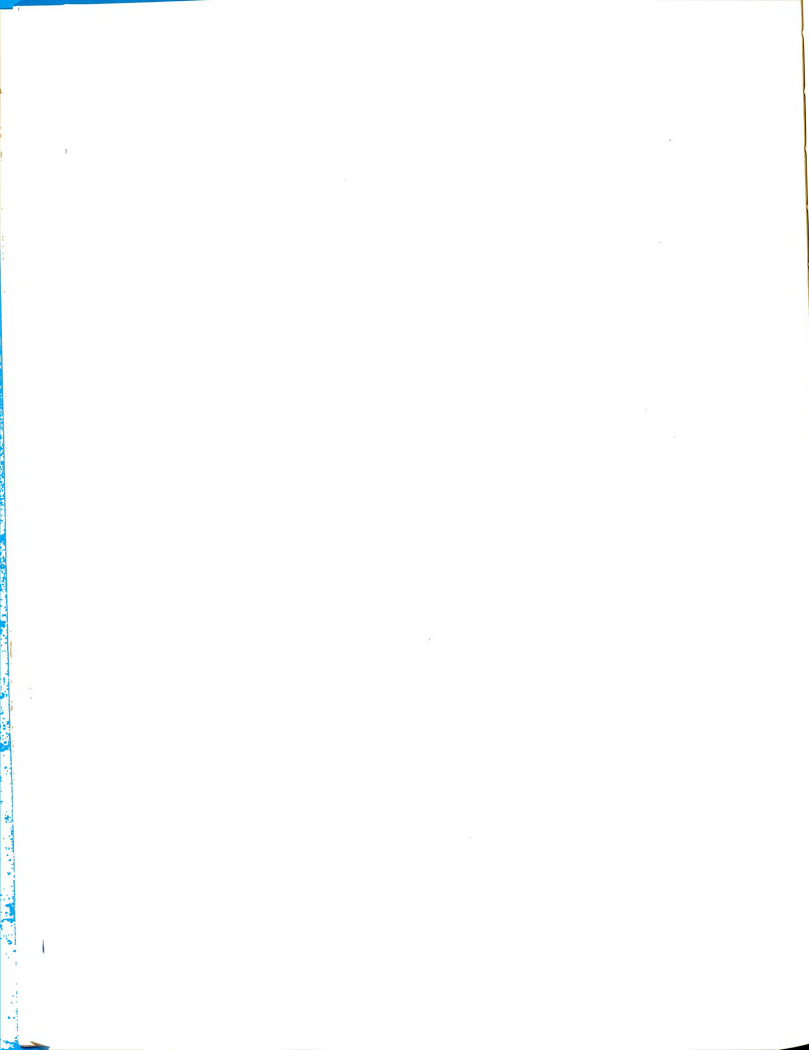
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test. Also, some older eighth graders in schools where the DAT was employed in the ninth grade became dropouts before they reached testing time, and no score was ever obtained from them.

In all, sixty-three subjects in the final sample were without DAT scores, of which twenty-nine were found recorded on cumulative record cards upon subsequent revisits to the schools. The remaining thirty-four scores were estimated by matching IQ scores within racial and sex groups, arranging the three DAT scores in ascending order and assigning the median values to the subject for whom the estimate was being made. The rationale for this procedure lies within the consistently high correlation found between IQ and DAT scores and the relatively high power of predictability of both for school achievement.

It will be well for the above to be borne in mind as the results are studied, since estimated scores occasionally result in somewhat spurious relationships.

The subjects responded in a puzzling fashion to the question of the father's occupation, some choosing to leave a blank answer rather than guess. As a result, thirty-seven subjects in the final sample group were without this response in their data. However, the Grand Rapids City Directories for 1961 and 1960 proved very helpful in that they list the occupation of the principal wage earner in each family, and



the information for these pupils was secured from this source.

Seven students did not respond to all OAS items, and a formula was developed whereby the scores earned on the answered items were used to approximate scores which would have been achieved had a response been made to the others.

Since a high correlation has been established between the scores achieved on the Kuhlmann-Finch and the Kuhlmann-Anderson Intelligence Tests, the scores earned by fourteen subjects when they took the latter as a part of the regular Grand Rapids testing program were substituted in the data due to the fact that they missed both the first and the make-up administrations of the Kuhlmann-Finch.

#### REFINING THE SAMPLE

Though the project began with a sample of 521 pupils, it was obvious that the group would be considerably reduced in number at the closing date, due mainly to the fact that a portion would not reach their sixteenth birthday until after the close of the study.

In reality, 355 subjects are included in the final analysis of the data, 311 of whom stayed in school continuously throughout the duration. By the definitions set forth in Chapter I, the remaining 44 are classified as dropouts, having interrupted their schooling during the study. Of the 311 stayins, 119 were females and 192 were males.

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Among the 44 dropouts there were two who became so as the result of exclusion on the basis of behavior, and all others left voluntarily for work, marriage, military service and other reasons mentioned earlier. Though these pupils are dropouts by definition, it is of interest to note that ten of them reentered the Grand Rapids schools in September, 1961. However, one of these had been re-excluded and another had again dropped out before the study closed. Included in the final sample were 17 female and 27 male dropouts.

The 166 subjects who are not included in the final analysis were dropped for the following reasons:

Too young (16th birthday after 2/2/62) - Males	65
- Females	83
Insufficient data	10
Left Grand Rapids - No information - Males	5
- Females	2
Duplicate - two records on same individual	<u>1</u>
Total	166

It was an unfortunate discovery late in the study that of the ten pupils on whom insufficient data was recorded, four were known dropouts at the close. By the time this became known, they had already disappeared and were not available for follow-up testing. It is apparent that they were displaying a pre-dropout characteristic - absenteeism - during the early months of the study when the original testing was conducted.

Of those subjects who were too young to remain in the

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final sample, three females and six males had moved to other communities.

Among the 51 Negro pupils who were included in the original sample of 521, 43 still remain in the final sample, 32 as stayins and 11 as dropouts. As was stated earlier, race was not to be employed as a dependent variable (in part because of the size of the Negro N) in the analysis of the data, so this factor does not appear as a criterion item in the testing of the hypotheses.

Comparison of the original and final samples. Table VI purports primarily to demonstrate that the loss of 166 subjects from the original sample did little significant statistical damage to the study other than to reduce the total N of the group. In a project where the sample is randomly selected and includes a considerable number who will be lost to the group, there is a risk of significant alteration of the group profile from the outset to the close.

Table VI points out that this has not happened in the current study. The only noteworthy alteration was in the mean age of the two samples, a change which was anticipated due to the reason for dropping some of the participants - the fact that they had not reached their sixteenth birthday within the time span of the study, causing the final sample to be approximately 4.5 months older than the original.

It is noted that the 355 pupils who completed the study



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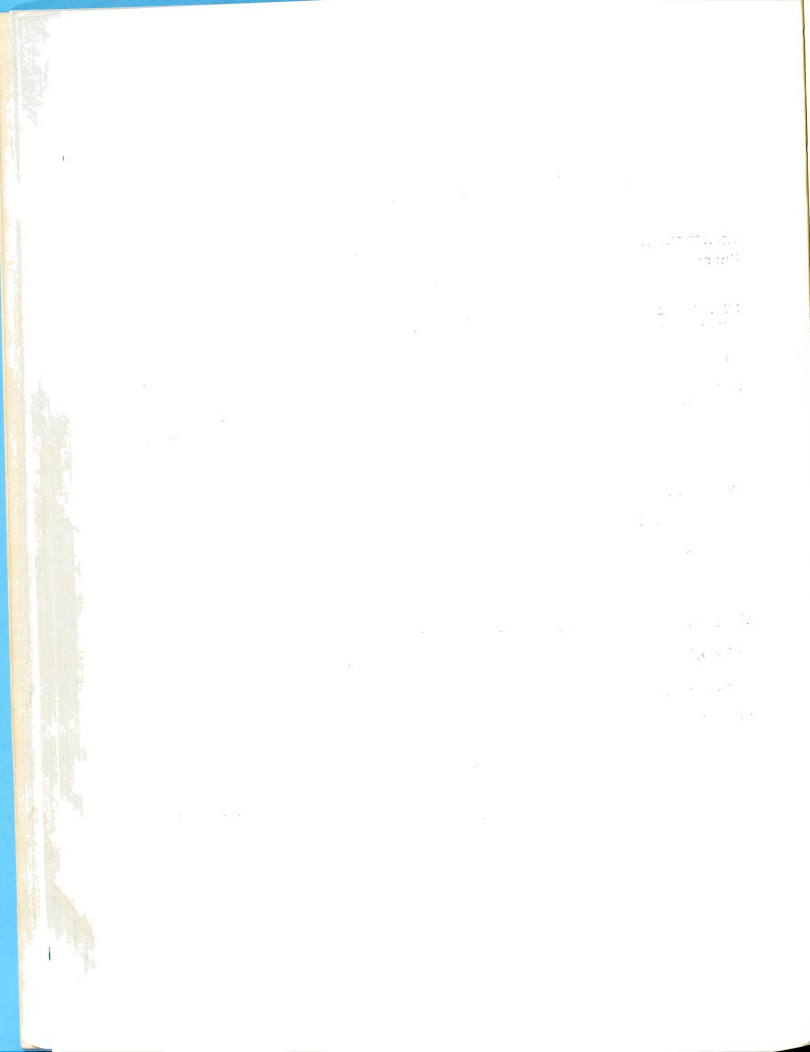
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TABLE VI  
COMPARISON OF MEAN SCORE CHARACTERISTICS  
OF ORIGINAL AND FINAL SAMPLES

Characteristic	Males		Females		Total	
	Original	Final	Original	Final	Original	Final
Age (In months)	18.3	22.1	14.5	19.7	16.6	21.1
IQ	102.5	100.1	104.6	102.2	103.2	101.0
DAT - V	48.80	47.20	48.95	46.81	48.86	47.11
- A	52.42	50.96	54.59	52.60	53.28	51.60
- N	50.43	49.01	51.15	49.84	50.73	49.35
GPA	2.1	2.0	2.5	2.4	2.2	2.1
Ed. Plans	2.8	2.6	2.6	2.4	2.7	2.5
OAS - A (R-ES)	9.2	9.1	8.4	8.7	8.9	8.8
- B (I-ES)	11.2	10.9	11.3	11.3	11.2	11.0
- C (R-30)	9.8	9.8	8.6	8.9	9.3	9.3
- D (I-30)	11.2	11.2	11.4	11.5	11.3	11.2
- Total	41.6	40.0	39.8	40.3	40.8	40.2
Fa's Ed.	2.67	2.6	2.75	2.5	2.7	2.6
Mo's Ed.	2.74	2.7	2.79	2.7	2.76	2.7
Fa's Ed. Asp.	3.1	3.1	3.1	3.1	3.1	3.1
Mo's Ed. Asp.	3.3	3.3	3.3	3.3	3.3	3.3
Soc.-Econ. Ind.	---	35.6	---	36.9	---	36.3



fell about two IQ points lower than the entire 521, which left the males at the point commonly assumed to be the midpoint of all IQ scores, 100, and the entire group at 101.

At first glance, some of the drop in DAT means seem great, but it must be borne in mind when interpreting these scores that they are percentile rankings converted to T-scores through z-score values and the largest loss (DAT-V for females from 48.95 to 46.81) represents a change from a percentile of 46 down to 38. The other losses are considerably smaller, such as the change in the Numerical for the entire samples from the 53rd for the original to the 47th for the final. However, it should be noted that the final sample was consistently lower on all DAT items than the original group.

In GPA and Educational Plans the final sample ranked only .1 and .2 lower respectively than the 521 pupils at the outset, hardly a major change. There is also a considerable stability of OAS scores between the larger and smaller samples, though there were small gains and losses. For example, the females in the final sample tended to score higher on the Realistic items while the males declined somewhat on the End of Schooling questions, as did the total N.

There was an almost unnoticed drop in the estimate of parents' educational achievement in the smaller sample, while no change was apparent in the pupils' concept of their parents' aspirations for the education of sons and daughters.

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Since the Socio-Economic Index was added later in the study, no distribution or mean score study was performed on the original sample and there is thus no possibility of comparing the two groups on the variable. Of interest is the fact that the mean for the total final group falls at the occupational level of such workers as proprietors of automobile garages, railroad foremen, jewelers and watchmakers, etc.. This seems to be an employment level somewhat above that represented by the mean North-Hatt score for the entire sample at the outset of the project.

Though there were alterations in the mean values for the variables between the original and final samples, there appears to be none significant enough to damage the operation of the study or to cause the group to appear other than normal in the characteristics measured. It is perhaps sufficient to simply remark that there was a slight downward tendency from the larger to the smaller group on all except the expressions of aspirations.

#### OPERATIONAL HYPOTHESES

In Chapter I (page 5) the hypotheses which were felt to be basic to the entire study were presented. All three dealt with the Level of Occupational Aspiration expressed by the subjects and the importance to the degree of academic persistence which might be displayed by high school pupils.

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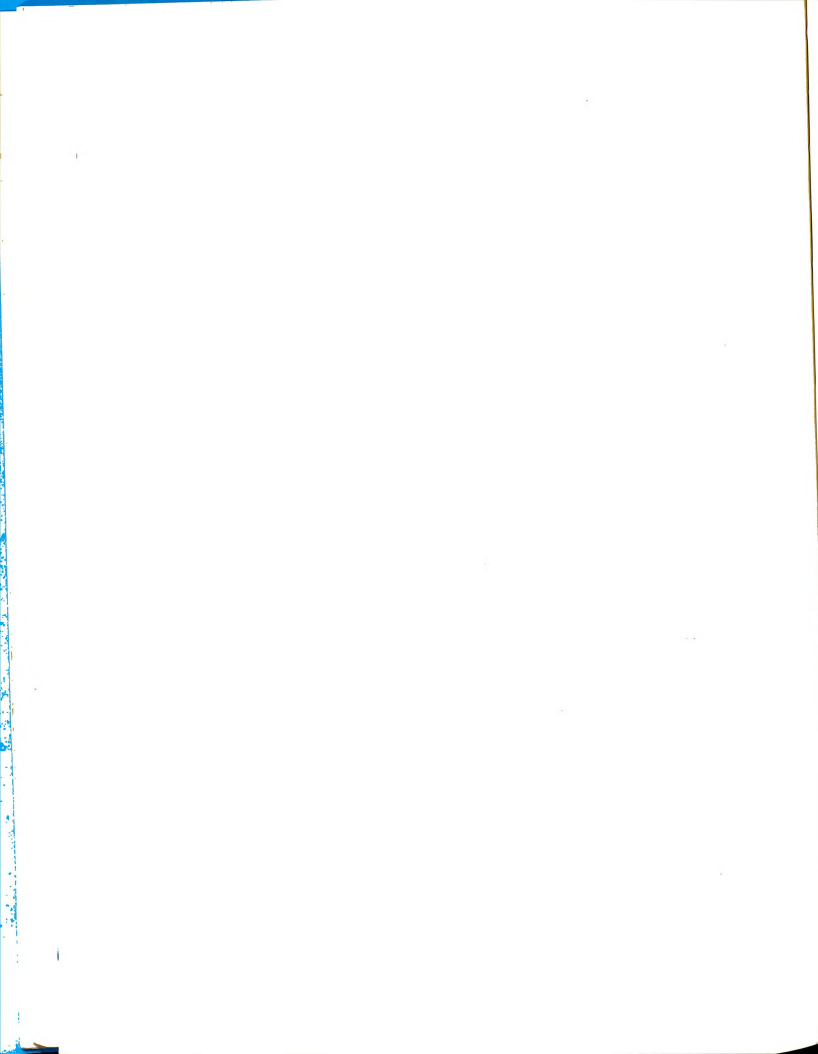
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Subsequent chapters also revealed the LOA concept to be a relatively new technique in the investigation of school persistence, the more common elements being those such as IQ, socio-economic level, age-grade status, and others. It was also learned that though low IQ, low socio-economic status and being over-age for the grade of enrollment were all found with consistency among dropouts (though the relationship of IQ was not as clear as the others), frequently no statistical tests of significance were applied to determine whether their presence in this group was markedly different than in the opposite population, the stayins. In other words, many of the studies cited in Chapter II dealt with the presence of these three factors, but seldom was this presence tested statistically against the degree to which they existed among the persisting students. For a typical example, pupils from the lower social strata of American cities are still dropping out of school in large numbers, but the current trends - counseling, financial aid, the changing job picture - may be reversing the trend to the point that this rate may have lost its significance when both dropouts and stayins are considered.

Consequently, the above considerations give rise to the question as to whether the study will have completed its task if only those hypotheses concerning the LOA are tested, ignoring the relationship of IQ, socio-economic status and age among the 355 pupils who completed the time period of the





study. Perhaps the very presence of data on these variables furnishes the most powerful argument for formulating and testing hypotheses regarding them.

The question seems nearly redundant, and the only task is to set up operational hypotheses for all four variables so that the power of each within the study may be tested, individually, against the others and in combination with others. The hypotheses are as follows:

A. Regarding the LOA:

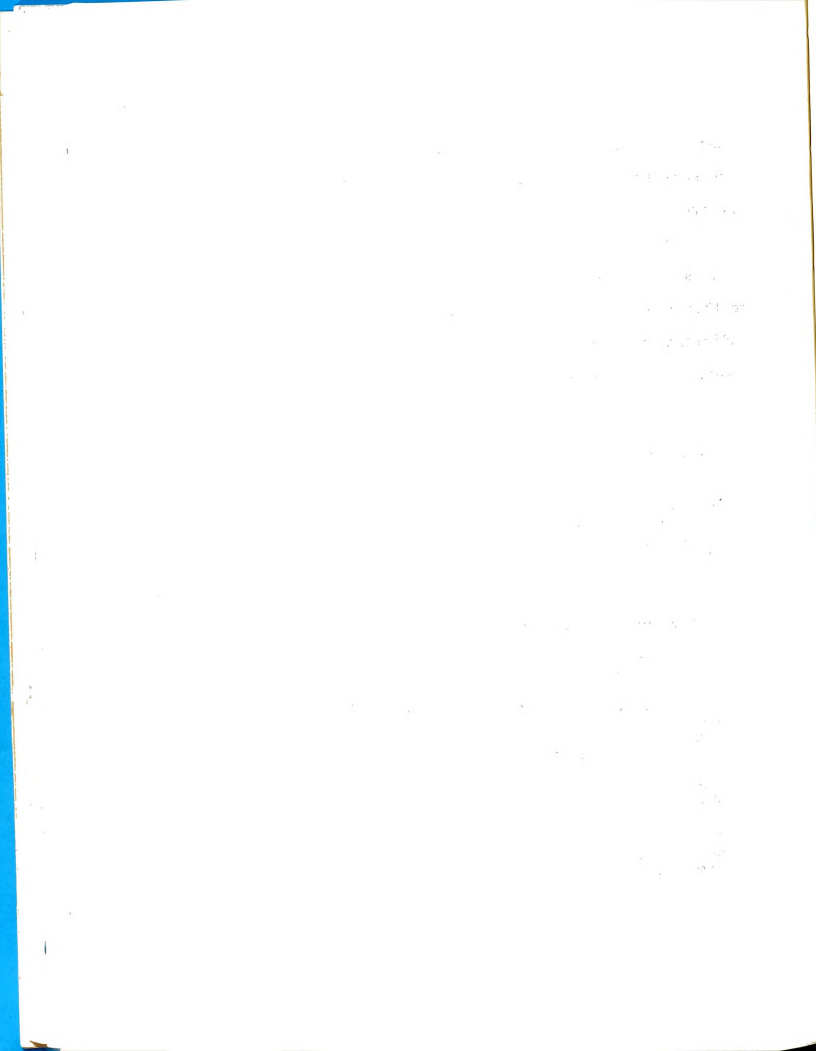
1. LOA is significantly and positively related to school status, i.e., to staying in or dropping out, for males, females and the entire group.
2. That when a zero-order correlation study is performed, LOA predicts (or is more highly correlated with) school status better than any other factor measured in the study, for males, females and the entire group.
3. When the predictive efficiency of all the variables is studied simultaneously, LOA is an important contributor to the prediction of school status, for males, females and the entire group.

B. Regarding the IQ:

1. The IQ score earned on the Kuhlmann-Finch Tests by subjects in the study is significantly and positively related to school status, for males, females and the entire group.
2. That when a zero-order correlation study is performed, IQ predicts school status better than any other factor measured in the study, for males, females and the entire group.
3. When the predictive efficiency of all factors is studied simultaneously, IQ is an important contributor to the prediction of school status for males, females and the entire group.

C. Regarding socio-economic status (SES):

1. The SES of the subjects in the study



is significantly and positively related to school status, for males, females and the total group.

2. That when a zero-order correlation study is performed, SES predicts school status better than any other factor measured in the study, for males, females and the total group.

3. When the predictive efficiency of all variables is studied simultaneously, SES is an important contributor to the prediction of school status, for males, females and the entire group.

D. Regarding the age of pupils, particularly their being over-age:

1. That being over-age for the grade of enrollment is significantly and positively related to dropping out of school (or, conversely, negatively related to persisting in school), for males, females and the entire group.

2. That when a zero-order correlation study is performed, age status predicts school status better than any other factor measured in the study, for males, females and the entire group.

3. Where the predictive efficiency of all factors is studied simultaneously, age status is an important contributor to the prediction of school status, for males, females and the entire group.

#### Consequences of accepting or rejecting the hypotheses.

In general, it may be said of LOA that if any of the hypotheses are accepted, a relatively new dimension has been added to the profile of the dropout, that thoughts and plans about occupation probably are operating to hold students in school, and that lack of them (or lack of organization of them) probably tends to permit early school leaving. If these hypotheses are rejected, it would probably serve as an indication that occupation, and the attendant level of education required, does not seem to be related to school persistence in the minds of young adolescents and, therefore, does not have



a role in holding students in school.

The decision to accept or reject the proposals regarding the other three factors being tested basically amounts to confirming or denying the results of a multitude of other studies as they apply to the population in the current study. Statistically, these hypotheses are questioning whether the conditions of low IQ, low SES and being over-age are still accurate predictors of early school leaving for the sample of Grand Rapids adolescents represented.

Rejecting the IQ score as a dependable predictor would amount to confirming the doubts raised by Bowman and Matthews (23) and others, but accepting it would raise several ramifications which require further contemplation and investigation, i.e., is the significance related to the fact that dropouts in the study are early dropouts, there having been no opportunity to test the data for those who may leave school between the close of the study and graduation time for the 9th graders in June, 1963.

The consequences of acceptance or rejection of the role of SES have already been discussed prior to the presentation of the hypotheses. If family economic status is losing its power as a determinant, many social phenomena suggest themselves, such as the possibility that lower class families are increasingly adopting middle class educational values for their children, that schools may be deliberately planning

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more "breaks" for the lesser-privileged pupils, that more curricular adjustments are available, etc..

Accepting the hypotheses regarding age will probably amount to a confirmation of the fact that grade repetition in school still promotes discouragement among pupils with various learning problems, whether they be physical, social or psychological. As was discussed earlier in the study, this does not establish over-ageness necessarily as a cause, but more likely a reflection of the true causes which express themselves in the form of poor achievement and slow progress.

#### STATISTICAL PROCEDURES

As the hypotheses are presented above, it is implied that they must be treated in two separate and distinct procedures, one testing their individual relationships with the criterion (school status. i.e., dropout vs. stayin) and the other testing the predictive power of the variables in combination.

It was determined that a simple linear regression analysis would be most suited to the accomplishment of the former task, but the selection of the method to be employed in studying the relative weights of the variables when tested in combination received rather careful and lengthy consideration. Where statistical methods have been applied in educational prediction studies, the most commonly-used technique has been



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the multiple correlation, also known as multiple regression. Since the purpose of multiple regression - to test the possibility of straight line linear relationship between the criterion and the variables as a group - is somewhat the same as that of the simple linear regression which involves only one variable at a time with the criterion, the multiple analysis was performed as a logical next step after the simple correlations in order to test the third hypothesis established for each of the four variables.

For the purpose of performing the multiple correlations, only fourteen of the twenty-nine variables shown in Appendix C were retained: age, IQ, DAT-VR, DAT-AR, DAT-NR, GPA, educational plans, OAS Total, mother's education, father's education, father's educational aspiration, mother's educational aspiration, SEI, and the criterion. The variable, race, was dropped from the multiple regression pattern on the basis of the earlier argument that race behavior, especially that of negro vs. white students, was primarily the expression of social class influence, which is measured by other variables in the study such as father's occupation, educational aspiration of the parents, the subjects' educational plans, etc.. On the other hand, in the second multiple study described below, this variable was allowed to remain.

All OAS scores but the Total were eliminated in order to avoid redundant information within the multiple correla-



tions. There exists the possibility that certain combined partial OAS scores - ES-Realistic, for example - might increase the power of the prediction if used in place of the Total, but the latter is the only score containing the results from all eight items, and Miller <sup>(143)</sup> has already concluded that this score may be accepted as a valid indication of LOA, thus the decision to employ only the OAS Total in the analysis.

The North-Hatt rating was dropped from the multiple analyses because, as was mentioned earlier, the Duncan SEI is currently considered the better empirical instrument and it seemed statistically unwise to have two indications of the same characteristic in this portion of the study.

Because of their seeming lack of significance in the simple correlations, all indications of the parents' occupational aspirations were dropped from the multiple regressions. Likewise, it was decided to study the educational aspirations of the two parents separately due to the fact that the simple correlations revealed this factor to be functioning somewhat within like sexes, i.e., mothers with daughters, fathers with sons.

As here reported, the results of a multiple correlation analysis are shown first in the form of a single correlation score for each group being studied, followed by a series of Beta weights which would be applied to the

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scores of an individual from the appropriate group for prediction purposes.

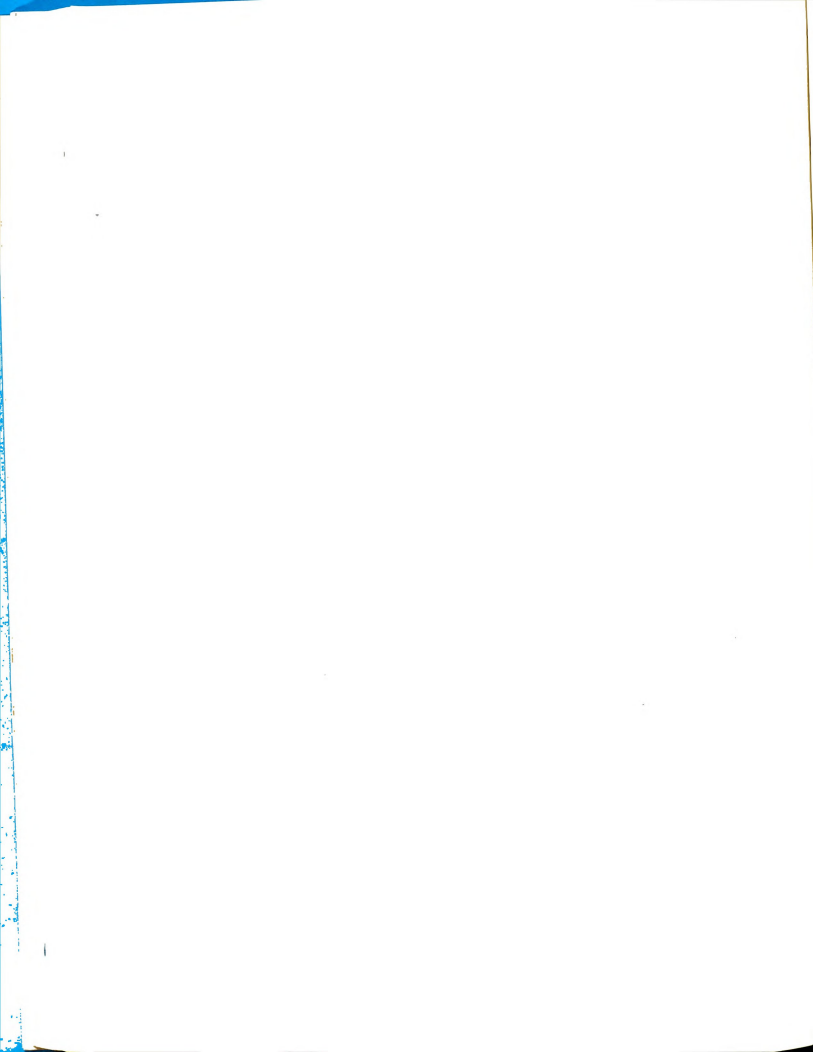
That the variables listed above have valid predictive relationships to the criterion is borne out by the respective multiple  $r$ 's of  $+.5035$  for all males and  $+.4452$  for all females. Both of these, when tested by the formula mentioned on page 324 of Walker and Lev (121):

$$F = \frac{R^2}{1-R^2} \cdot \frac{N-K-1}{K}$$

achieved significance at better than the  $.01$  level when entered in Snedecor's  $F$  distribution Table with  $n_1 = K$  and  $n_2 = N-K-1$ .

The Beta weights shown in Table VII were tested by formula (13.27) found on page 337 of Walker and Lev, the results of each test being entered into a table of percentile values of "students" distribution. Table VII reveals that all but one Beta weight, that for GPA among females, are significantly different from zero at either the  $.0005$  or  $.01$  level. Consequently, it must be assumed that these variables contribute to the prediction of school status in a manner which is significantly different from chance alone.

It should be noted that the Beta scores shown in Table VII are based on non-standardized data and, therefore, not available for use in the multiple regression prediction equation on page 318 of Walker and Lev. Table VIII shows



the "b" scores which are suitable for this equation and also the formula by which they were obtained from the Betas in Table VII.

In general, it may be concluded that the variables selected for the multiple regression study are significantly correlated as a group with the school status of the subjects in the study for both the males and females. With one exception, the regression weights of these same variables are also significant and may be utilized in the multiple regression equation which would be employed for predictive purposes. The presence of about an equal number of positive and negative signs among the Betas in Table VII would indicate that special attention must be accorded the matter of direction in the prediction procedure.

Multiple discriminant analysis. However, recent publications have brought rather cogent criticism of the power and accuracy of multiple regression equations in making predictions. As Calia (30) has so critically remarked,

"The persistent inability of investigators to improve the accuracy of their predictions of academic success and the specificity of findings of reported prediction studies would appear to be, at least in part, the result of both the exclusive interpretation of college success in terms of semester grades and the nature of the statistical procedures commonly employed."

Calia's study, incidentally, was one in which the ultimate goal was the ability to predict "survival versus attri-



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TABLE VII  
MULTIPLE CORRELATIONS AND BETA WEIGHTS BY SEX

Variable	Males (N-236)		Females (N-119)	
	R = +.503510663	Level of	R = +.445164787	Level of
	Betas	Signif.	Betas	Signif.
Age	-0.428106711	.0005	-0.216673939	.0005
IQ	-0.205221060	.0005	-0.059043013	.01
DAT - VR	-0.089536350	.0005	+0.116972239	.0005
- AR	+0.084426514	.0005	-0.046154840	.01
- NR	+0.063927075	.0005	+0.081641269	.0005
GPA	+0.209950564	.0005	+0.031134270	Not Sig.
Educ. Plans	+0.159110261	.0005	-0.219226593	.0005
OAS Total	-0.037989783	.0005	+0.211294288	.0005
Mo's Educ.	-0.096912030	.0005	+0.109800325	.0005
Fa's Educ.	+0.087192574	.0005	+0.079587478	.0005
Fa's Ed. Asp.	+0.067232543	.0005	-0.064837000	.0005
Mo's Ed. Asp.	-0.028068321	.0005	+0.250669719	.0005
SEI	-0.047376503	.0005	+0.028614897	.01
School Status	-1.000000000	Crit.	-1.000000000	Crit.

A table of standard deviations for these variables may be found on page 177, Appendix C.

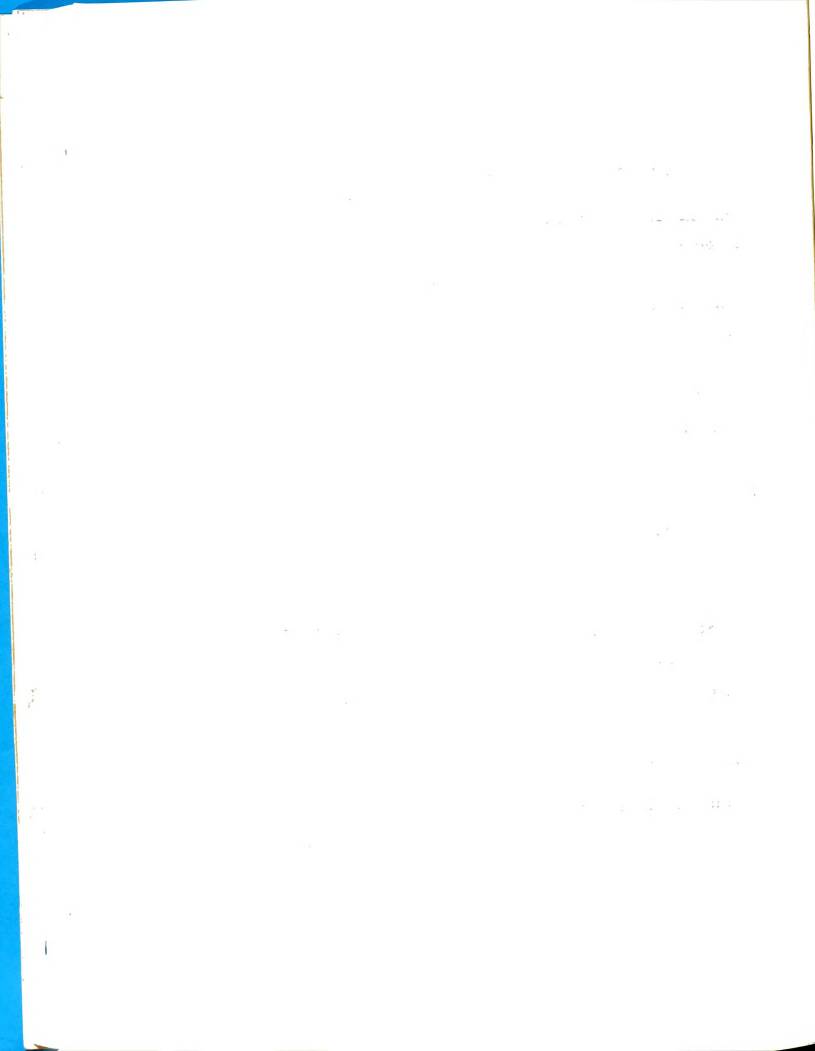
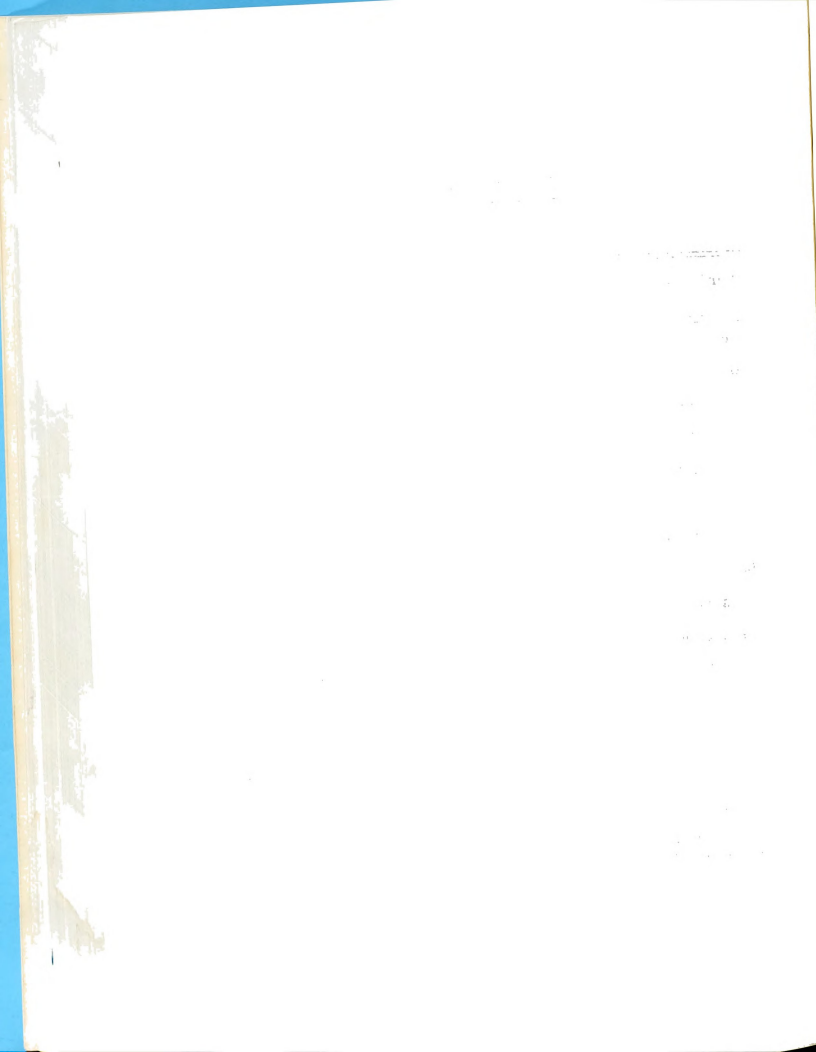


TABLE VIII  
STANDARDIZED REGRESSION WEIGHTS (b)  
CONVERTED FROM BETA WEIGHTS (b\*)

Variable	Males	Females
Age	-0.0171242684	-0.0119192334
IQ	-0.0053767918	-0.0015879618
DAT - VR	-0.0033128450	+0.0043045784
- AR	+0.0029549280	-0.0015618798
- NR	+0.0025506903	+0.0029096948
GPA	+0.9771148422	+0.0113328743
Educ. Plans	+0.0360193809	-0.0497946899
OAS Total	-0.0010218492	+0.0065131464
Mo's Educ.	-0.0272322804	+0.0332815765
Fa's Educ.	+0.0215609797	+0.0201961184
Fa's Ed. Asp.	+0.0217651911	-0.0221774959
Mo's Ed. Asp.	-0.0092734926	+0.0908401995
SEI	-0.0007121636	+0.0004383516
School Status	-1.0000000000	-1.0000000000

The following formula was applied to the b\* weights shown in Table VII to arrive at the b weights shown above:

$$b = b^* \cdot \frac{S_y}{S_j}, \text{ where } S_y \text{ is the standard deviation of the criterion and } S_j \text{ the standard deviation of the variable for which the } b^* \text{ weight is being converted.}$$

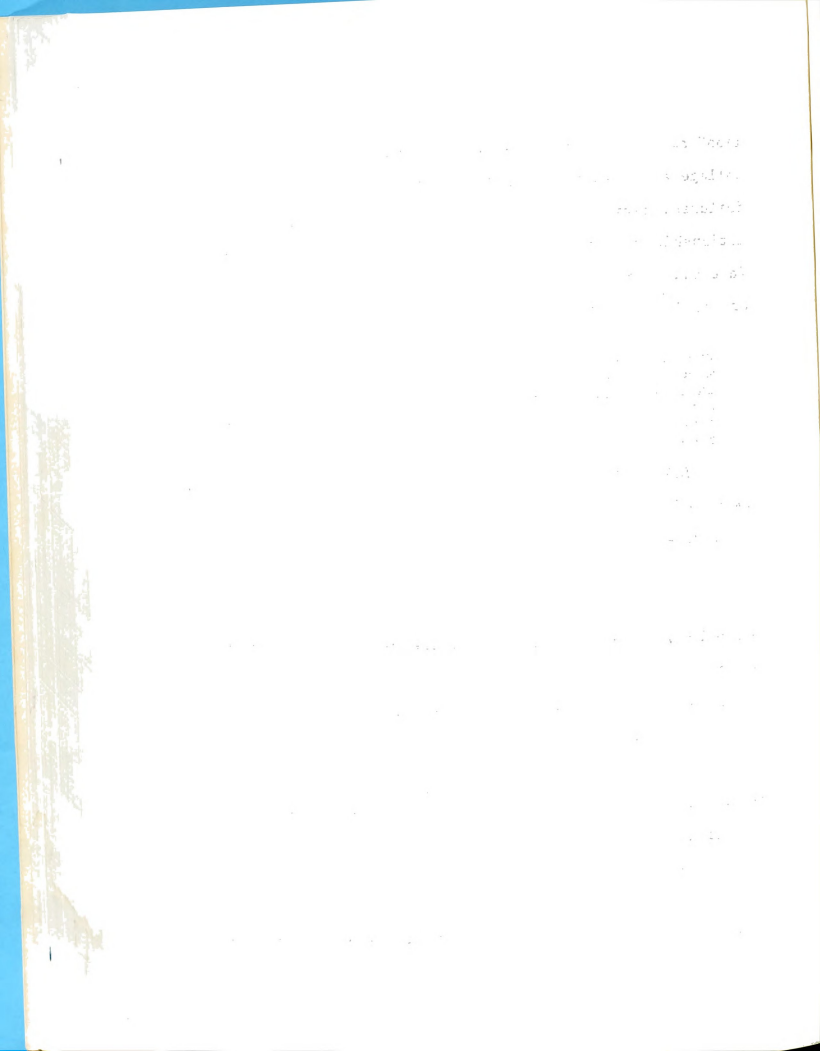


tion" among entering freshmen at Boston University Junior College and also to classify these students as potential failures, terminal students or transfer students. Its relationship to the current study is further enhanced by the fact that the DAT, GPA and IQ measure (Otis) are all a part of the 33 variables employed. He continues,

" . . . ., regression techniques are designed to answer the question 'how can I analyze these data so I may determine the group in which the individual will perform best?' In effect, one obtains a measure of relative efficiency within a group, i.e., at what point on an achievement continuum ranging from poor to excellent will a particular student fall?"

Like Calia's study, the current project desires to answer a different question, "How can I analyze these data so I may determine the group which an individual is most like?" Since, as the literature implies, dropping out of school is a highly complex, personal and complicated phenomenon, it would be well if the analysis of the data for the current study were to identify critical variables in the issue of school status and their relative power as causes so that prediction might be accomplished with an acceptable degree of certainty.

A frank analysis reveals that multiple regression has failed of consistency in similar studies, especially when many of the variables are contributory but none truly dominate in their relationship to the criterion. Such is apparently the condition with dropouts, where the presence of certain variables may be offset by others which serve to counteract



their effect. Consequently, a newer, less frequently-used method has also been employed in the current study.

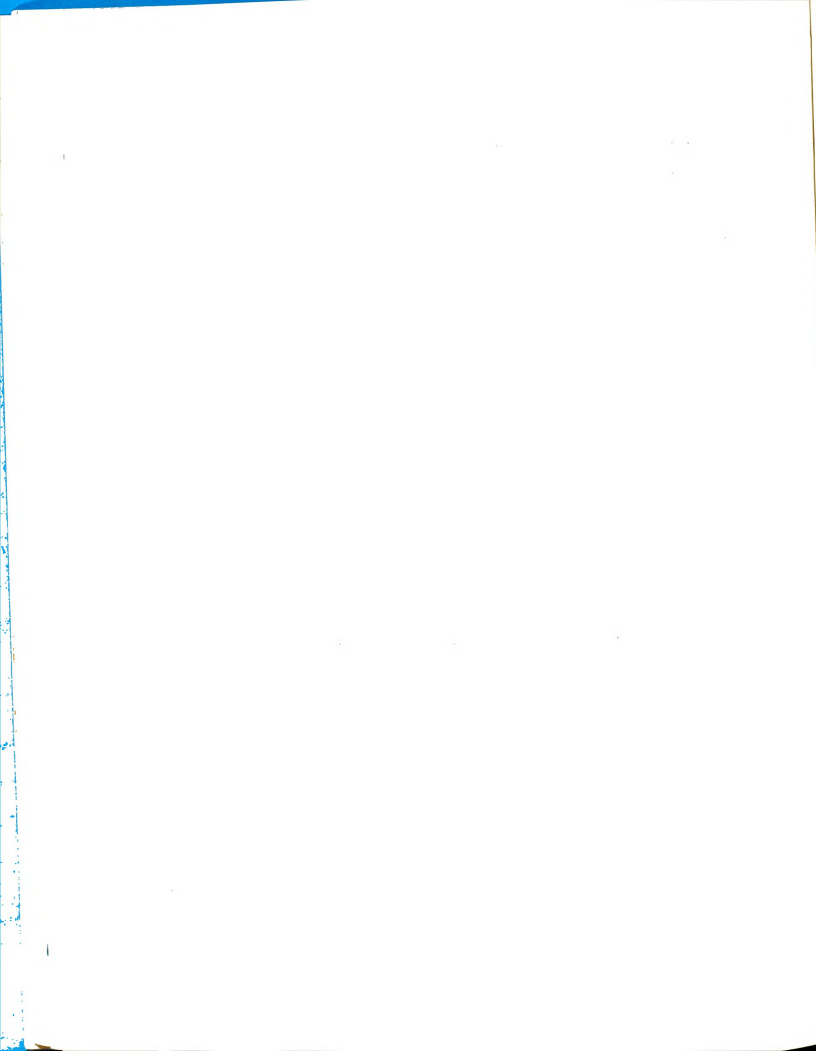
"Significance, distance, direction and assignment," say Tatsuoaka and Tiedeman (233), "are the issues of discriminant analysis," but "despite the extensive theoretical developments noted here, discriminant analysis is virtually unused in education and psychology."

Most certainly the current study is concerned with the functions mentioned above, and the method appears much more related to the nature of the problem at hand than is multiple regression. Working primarily through the sums-of-squares and sums-of-cross-products, and using the ratios between these characteristics for the within-groups and the among-groups (the discriminant criterion), discriminant analysis seems to weigh the presence of factors more carefully and accurately in attempting to assign individuals than if they were employed to establish a cut-off score on a continuum by merely working a composite correlation among the variables with the criterion.

Tatsuoaka and Tiedeman summarize the usefulness and operation of multiple discriminant analysis in the following statement:

"Thus, we see that discriminant analysis can be used as a unified approach in solving a research problem involving multivariate comparison of several groups, which is likely to have as its three phases, (a) the establishment of significant group differences, (b) the study and explanation





of these differences, and finally (c) the utilization of multivariate information from the sample studied in classifying a future individual known to belong to one of the groups represented."

On the basis of the above arguments in its favor, the multiple discriminant analysis technique was applied to selected data from the current study in addition to the multiple correlation technique. As was implied earlier, the variable, race, was allowed to remain in this analysis while the criterion, school status, was eliminated, though still employed as a dependent variable on which the groups were dichotomized.

In addition to school status, the sample was also divided on a second criterion - sex - thus providing four groups within which the discriminant analysis was made. Since the procedure for this function limits the number of discriminant functions to the number of groups minus one or the number of variables minus one (whichever is the smaller result), the number of functions for the four groups was set at three; but an examination of the eigen values listed below:

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 -00.0317764284  
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revealed that only the thirteenth achieved significance, and this was determined to be the only discriminant function associated with the groups and variables being tested. However, though there is serious question as to its significance, the second discriminant function is included in the discussion for the sake of greater interest and depth of interpretation. It is represented by the second highest positive eigen value in the list above, the seventh.

In interpreting the discriminant analysis, it is well to bear in mind the earlier statement that this technique concerns itself with both distance and direction, thus the size of the eigen vectors as well as the preceding sign must be considered. The eigen vectors for both the first and second functions are found in Table IX.

Another dimension must be noted, particularly for purposes of interpreting the discriminant analysis, which has hitherto gone unmentioned in the current discussion. There is a tendency for the variables to fall into one of two categories - self-evaluative or objective - and they take on added meaning if the discrimination is discussed within each of these.

Such items as educational plans, OAS Total, mother's education, father's education, and father's and mother's educational aspirations for the child (recalling that the last four are estimates made by the subjects themselves) may all

1941-1942

1943-1944

1945-1946

1947-1948

1949-1950

1951-1952

1953-1954

1955-1956

1957-1958

1959-1960

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be assumed to represent measures of the subjects' self-esteem and therefore form a logical core within which to perform one analysis.

While the remaining characteristics have a bearing upon this self-esteem, in fact may have much to do with forming it, they are measured with objective instruments and are a matter of record, and they therefore are either unalterable or are an account of accomplishment to date. This latter group of variables are more nearly similar to those which have been studied in past dropout programs, with or without statistical treatment, but the unique nature of the self-evaluative portion of the data warrants treatment for its own intrinsic value.

Among the self-evaluative vectors, there is a strong, positive indication for the mother's educational aspirations, while the largest negative weights are found for the father's educational aspiration and the subjects' own educational plans. The other variables, with the possible exception of the mother's education, seem to be inoperative within the function. This strong indication of the mother's aspirations leads to the interesting speculation that perhaps the criticism of American family and school life as a matriarchal phenomenon receives support from this analysis of the data. Were the second function operative and significant, the father's education and educational aspirations would assume the highest positive

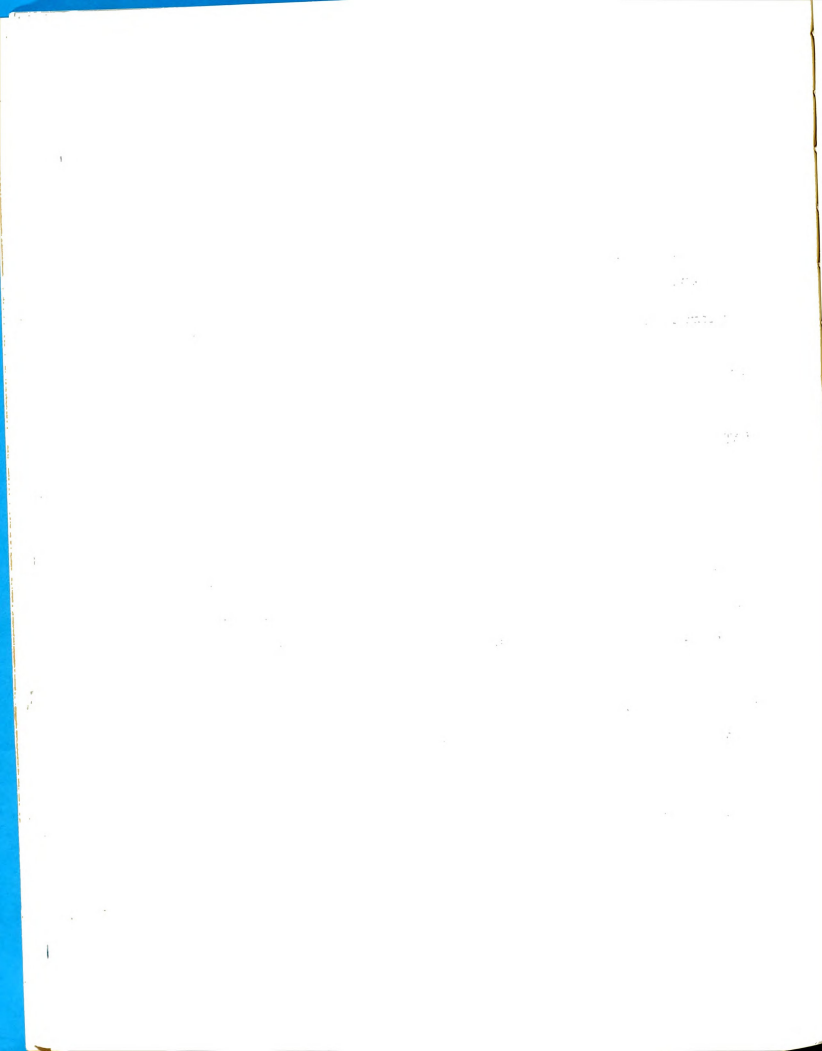


TABLE IX  
EIGEN VECTORS FOR THE FIRST AND SECOND  
DISCRIMINANT FUNCTIONS

Variable	First Function	Second Function
Race	-0.9995330561	-1.1390899429
IQ	-0.1955867946	-1.3852701045
Age	-0.5393520143	-0.1132314041
DAT - VR	-0.1330717410	-0.5017315103
- AR	-0.3104978461	+0.3033251050
- NR	+1.7077450753	-0.1280410372
GPA	-1.4418587672	+9.6373004841
Educational Plans	-1.7071935814	-0.3321294160
OAS Total	-0.1299042470	+0.0335336906
Mother's Education	-0.5379913235	-0.3950825711
Father's Education	+0.0957844515	+1.1898554133
Fa's Educ. Asp.	-2.0279248575	+1.3515320040
Mo's Educ. Asp.	+9.2853583489	-0.1422485313
SEI	+0.0540929381	-0.0531888510

Attention is again called to the table of standard deviations on page 177, Appendix C.



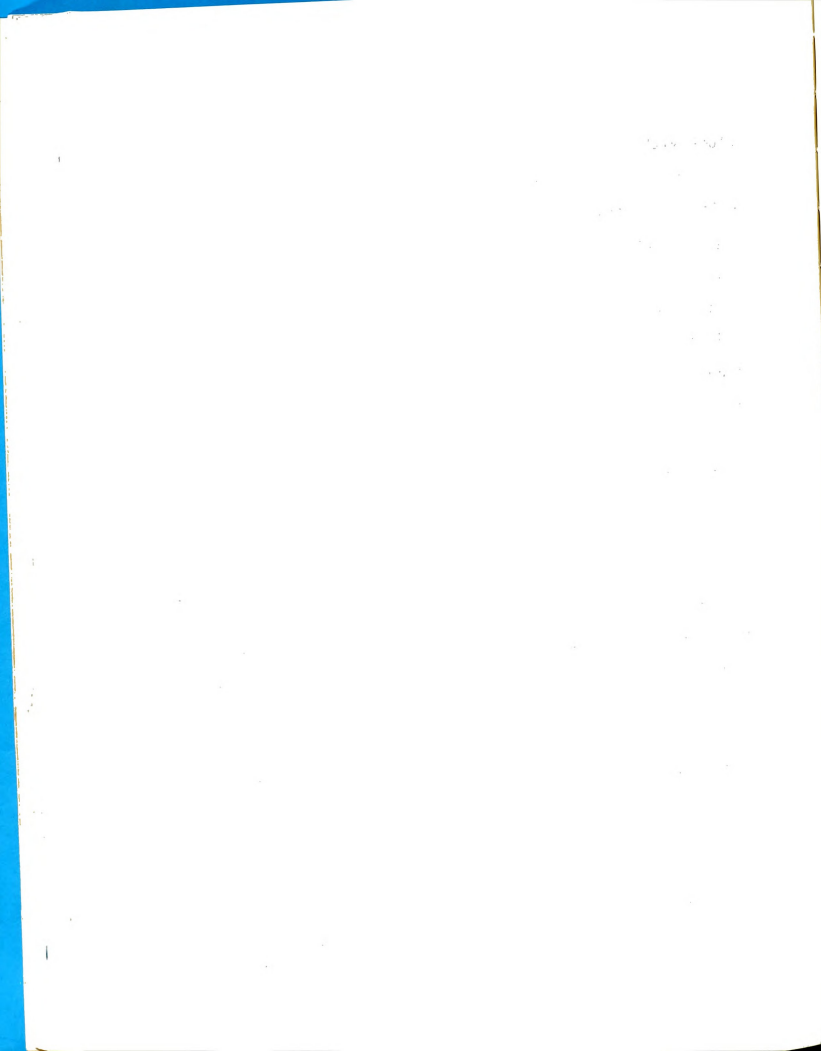


values with the mother's scores inoperative.

Within the other vectors, only one of the two positive indications seems to be operative, the DAT-NR, with GPA its largest negative counterpart. Other negative values worthy of consideration are race and age, while IQ, DAT-VR and AR, and SEI do not seem to operate. If it were accepted as significant, the second function would show race and IQ as the strong negative factors with GPA as the most powerful positive influence in the variables.

Complete evaluation of the implications of the discriminant function analysis for the study is difficult, but some outstanding characteristics are worthy of mention. Of prime importance is the dominance of parental educational aspirations for their children, this being the largest eigen vector in the first function and the second largest in the second function. Within the self-evaluative variables, the subjects' estimates of their mothers' education and of their own educational plans were found to be discriminants, though in the opposite direction from the parental aspirations. There exists the possibility that the subjects identify their own educational aspirations more closely with their perception of mother's educational achievement than with what they believe are their parents' aspirations for them.

As might be anticipated, the vectors for the objective variables in the first function show ability, as reflected in

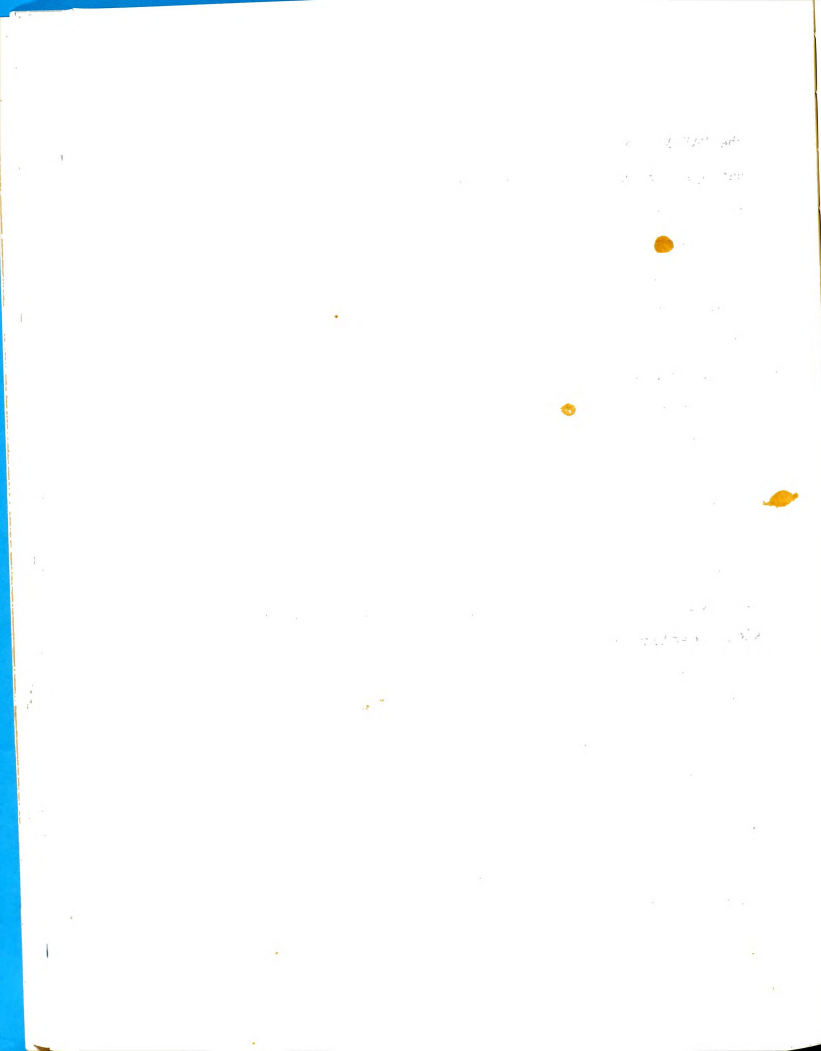


the DAT-NR, discriminating in the opposite direction from race and age. Somewhat more surprising is the opposite polarity of GPA and DAT-VR, though it would be anticipated that the two would serve as discriminants in school status. Likewise, the second function also finds achievement (GPA), this time as the positive vector, discriminating with opposite polarity but equal significance with ability (IQ) and race. From this, it may be safely concluded that race, age, ability and achievement are statistically proven discriminators among school dropouts and stayins in the current study.

In general, then, it is found that among the self-evaluative vectors the parental educational aspirations, mother's education and the subjects' own educational plans tend to discriminate for school status prediction. Among objective measures, race, age, ability and achievement are found to be significantly present.

In the first, and perhaps the only significant function, ability and mother's educational aspirations tend to discriminate in the opposite direction from race, age, GPA, and educational plans, and combinations of these variables - regardless of direction - might produce dropout or stayin conditions.

In the second, questionable function parental aspirations and school achievement tend to discriminate in the opposite direction from mother's education, educational plans,



race, and ability (IQ and DAT-VR), and it is also assumed that various combinations of these may be found contributing to school status.

It is clear that there is a great deal of similarity between the first and second discriminant functions, a fact which may well account for the apparent lack of significance in the latter. It is entirely possible that the major difference between the two lies in the dominance of mother's aspirations in the first and the father's in the second, leading to the speculation that the former is a female discriminant function and the latter a male function.

Also of importance to the current study is the fact that both SEI and the OAS Total, found to have achieved significance in the multiple regressions performed earlier, are apparently non-contributory or dormant in the discriminant functions. For the SEI, this tends to reinforce the findings among the simple regressions, but the issue is less clear for OAS, since it was found to be highly significant among females in the simple correlations. This clouded role may well point to the variable as a supportive factor, not dominant but crucial where the school status of an individual is a borderline case.

All three of the above-mentioned procedures - simple linear regression, multiple correlation, and discriminant analysis - are programmed for the electronic computer, MISTIC,



available on the Michigan State University campus. Without this electronic equipment, all would have been extremely lengthy and, perhaps, prohibitive in their accomplishment, and their absence would have greatly reduced the power of the study. The 38 variables would have made impractical the calculation of all but the simplest of statistical procedures.

The MISTIC program, K-5M, by which the simple regression matrices were constructed also provides for a table of means and standard deviations for all variables as well as a matrix of variance-covariances. The table comparing the mean scores of several groups and the simple regression matrices found in Appendix C were constructed for the following groups: Total Sample, All Males, All Females, All Dropouts, All Stay-ins, Male Dropouts, Male Stayins, Female Dropouts, and Female Stayins. The Among-Groups and Within-Groups matrices in Appendix C grew out of the discriminant function analysis, while the Deleted Matrix was constructed as a part of the multiple correlation study.

The first two hypotheses regarding each variable - LOA, IQ, SES and Age - were tested by the correlations found in the first three simple regression matrices listed above, the last six being ineffective in doing so because the criterion - school status - was employed to dichotomize the sample and there was consequently no variance in that factor upon which correlations with the other variables might be established.





The third hypothesis for each of the four variables was tested by the results of both the multiple regression and the discriminant function analyses.

It will be noted that the individual OAS scores are deleted from the simple correlation matrices in Appendix C. This stems primarily from the fact that (1) MISTIC program K-5M is designed to handle a maximum of 34 variables and there were 38 when the individual OAS items were included in addition to the identification number, grade and school, and (2) the effect of the individual OAS items is caught up in items A, B, C, D, ES, 30, R, I and Total, which are combination scores.

#### TESTING THE HYPOTHESES

In this portion of Chapter IV, the operational hypotheses of the study will be tested. They will not be repeated in the language employed earlier in the chapter, but will be identified by the letters and numbers which appeared when they were stated. The evidence from appropriate matrices or other computational results will be presented and, on these bases, the hypotheses will be accepted or rejected without further comment.

##### A. Regarding the LOA:

1. With a correlation of .136 needed for .01 significance, the correlation between school status and the OAS Total score is +.20 for the total sample. With

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1899-1900

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1901-1902

.222 needed for .01 significance, the same correlation is +.28 for all females; and with .174 required for all males, the actual relationship is +.19.

Result: Accept hypothesis A1. LOA is positively and significantly related to school status, for males, females and the total group.

2. For the total sample, the correlation between the OAS Total and the criterion +.20, is equaled by a +.20 for the Total Parents' Educational Aspiration, is exceeded by the +.26 for GPA, +.21 for IQ and -.35 for Age.

For the females, the correlation between the OAS Total and the criterion, +.28, is larger than all other similar correlations.

For the males, the correlation between the OAS Total and the criterion, +.19, is exceeded by the +.20 for the Father's Educational Aspiration +.21 for the Total Parents' Educational Aspiration, +.26 for Educational Plans, +.26 for GPA, -.42 for Age; and is equaled by +.19 for IQ.

Result: Accept hypothesis A2 for females, reject it for the total group and for males.

3. Table VII reveals that the Beta weights for the OAS Total in the multiple regression study achieved significance at the .005 level, for both males and females. In the discriminant function analysis, OAS Total was not found to be a discriminant of significance in dichotomizing the total group by sex and school status.

Result: Accept hypothesis A3 for males and females in the multiple correlation procedure. Reject it for the total group in the multiple discriminant analysis.

#### B. Regarding the IQ:

1. For the total group, with .136 required for .01 significance, the correlation between IQ and the criterion is +.21. For females with .222 required, the correlation is +.18, but .18 is significant at the .05 level with .170 needed. For males, with .174 needed, the correlation is +.19.

Result: Accept hypothesis B1 for the total group and all males; tentatively accept B1 for all females.

2. For the total group, the correlation between IQ and the criterion, +.21, is equaled by +.21 for Educational Plans and exceeded by -.35 for Age, by +.26 for GPA.



For the females, the correlation of  $+ .18$  between IQ and the criterion is equaled by  $+ .18$  for DAT-VR, and exceeded by  $-.27$  for Race,  $-.25$  for Age,  $+ .20$  for GPA,  $+ .28$  for OAS Total,  $+ .21$  for Mother's Education,  $+ .24$  for Mother's Educational Aspiration and  $+ .20$  for Total Parents' Educational Aspiration.

For the males, the correlation of  $+ .19$  between IQ and the criterion is equaled by  $+ .19$  for OAS Total and exceeded by  $-.42$  for Age,  $+ .26$  for GPA,  $+ .26$  for Educational Plans,  $+ .20$  for Father's Educational Aspiration and  $+ .21$  for Total Parents' Educational Aspiration.

Result: Reject hypothesis B2 for the total group, all males and all females.

3. Table VII reveals that the Beta weights for the IQ in the multiple regression study achieved significance at the  $.0005$  level for all males and  $.01$  for all females. In the discriminant function analysis, the IQ did not discriminate within the first function, though it did discriminate in the second function, the significance of which is in doubt. However, it should be noted that another measure of ability, DAT, discriminated within both functions.

Result: Accept hypothesis B3 for males and females in the multiple correlation procedure. Tentatively reject B3 for the total group in the multiple discriminant analysis.

#### C) Regarding the Socio-Economic Status:

1. For the total group, significance at the  $.05$  level requires a correlation of  $.104$ . The N-H correlation of  $+ .07$  and that of the SEI,  $+ .10$ , fall short of this.

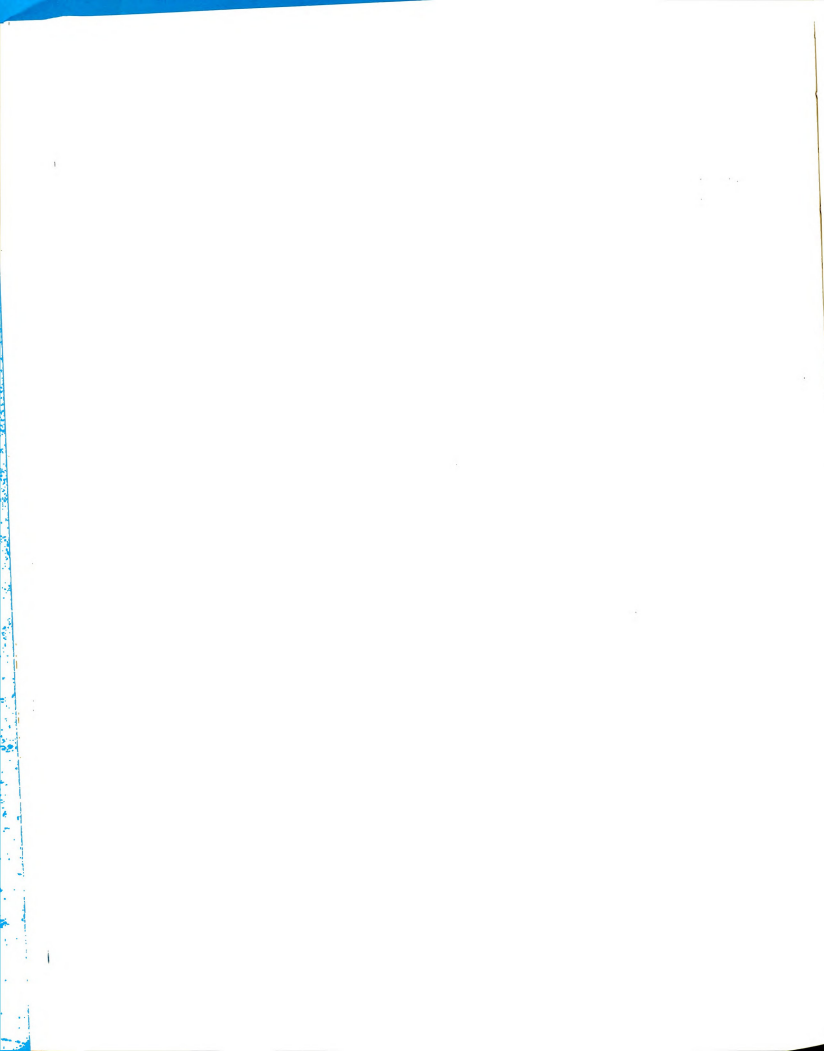
For the females, with  $.17$  needed for  $.05$  significance, the N-H correlation is  $+ .13$  and the SEI,  $+ .14$ .

For the males, with  $.133$  required for  $.05$  significance, the N-H correlation is  $+ .08$  and the SEI,  $+ .08$ .

Result: Reject hypothesis C1 for the total group, all males and all females.

2. Since all of the SES correlations failed to achieve significance at the  $.05$  level, and since other variables achieved significance at the  $.01$  level, hypothesis C2 should be rejected for the total group, all males and all females.

3. Table VII reveals that the Beta weights



for the SEI in the multiple regression study achieved significance at the .0005 level for all males and .01 for all females. In the discriminant function analysis, SEI was not found to be a discriminant of significance in dichotomizing the total group by sex and school status.

Result: Tentatively accept hypothesis C3 for all males and all females in the multiple regression procedure. Reject C3 for the total group in the multiple discriminant analysis.

#### D. Regarding Age:

1. For the total group, with .136 needed for significance at the .01 level the correlation between Age and the criterion is  $-.35$ .

For the females, with .222 required for .01 significance the correlation between Age and the criterion is  $-.25$ .

For the males with .174 required for .01 significance, the correlation between Age and the criterion is  $-.42$ .

Result: Accept hypothesis D1 for the total group, all males and all females.

2. For the total group, the correlation of  $-.35$  between Age and the criterion exceeds all others.

For the females the correlation of  $-.25$  between Age and the criterion is exceeded by  $-.27$  for Race and  $+.28$  for the OAS Total.

For the males the correlation of  $-.42$  between Age and the criterion exceeds all others.

Result: Accept hypothesis D2 for the total group and all males; reject D2 for all females.

3. Table VII reveals that the Beta weights for Age in the multiple regression study achieved significance at the .0005 level for all males and females. In the discriminant function analysis, Age was found to be a significant discriminant in the first function.

Result: Accept hypothesis D3 for all males and females in the multiple correlation procedure. Accept D3 for the total group in the multiple discriminant analysis.

Summary. Chapter IV first discussed the details connected with closing the study and refining the original sample of





521 subjects to the final group of 355.

After stating the operational hypotheses, the chapter then described the statistical procedures which would be employed in testing those hypotheses, i.e., simple correlations, multiple regression, and multiple discriminant function analysis.

The chapter closed with the actual testing of the hypotheses, twelve in all.

Chapter V will present a brief summary of the study and some conclusions which may be drawn. It will also discuss some implications for future studies.

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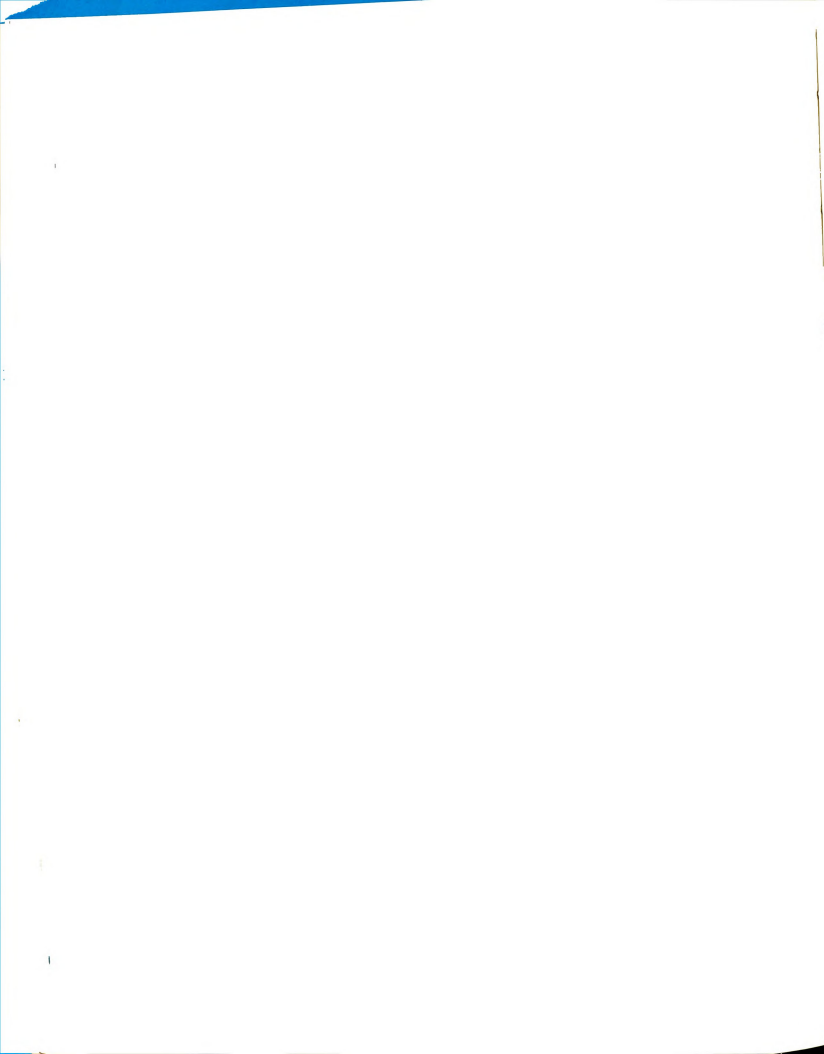
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## CHAPTER V

### SUMMARY AND CONCLUSIONS

The first four chapters have described the entire study from its beginning phases to the statistical analysis of the data and testing of the hypotheses. It is now the responsibility of Chapter V to address itself briefly to three remaining considerations, namely, (1) a short summary of the study, (2) a few important conclusions growing out of the project, and (3) implications for future studies.

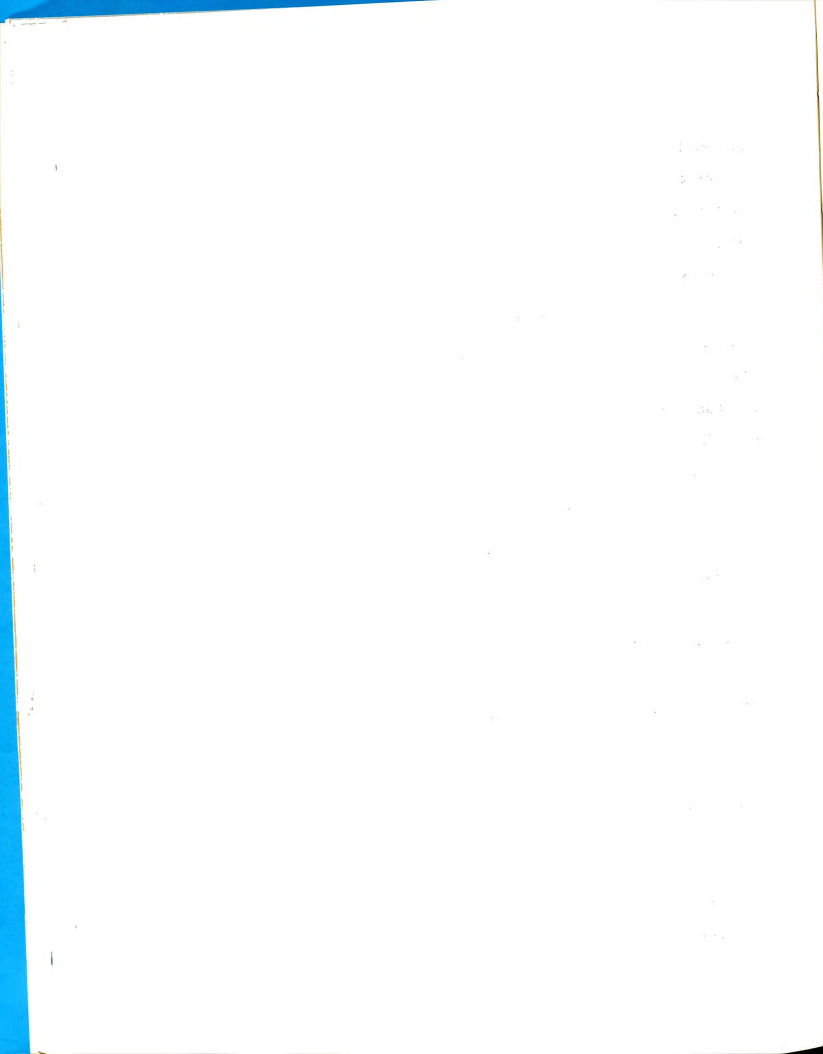
Summary of the study. The current study draws its importance from the growing concern of American people regarding those who fail to achieve high school graduation and whose problems are being intensified by the evolving technical and professional nature of occupational organization and the urbanization of society. It is an attempt to fuse the traditional type of dropout study in which such objective measures as socio-economic status, age, IQ, GPA, and others are gathered and summarized, with the psycho-sociological techniques employed to measure such self-evaluative criteria as educational plans, level of occupational aspiration, perception of parents' aspirations (educational and occupational) for the subjects, etc.. The former techniques have been employed primarily by educators, often as a step preliminary to establish-



ing some type of prevention or action program, whereas the latter procedures have often been used in empirical research on such personality factors as motivation and/or aspiration, the influence of social class on educational or occupational plans, and other similar goals or facets of social adjustment.

In January, 1960 about 521 eighth and ninth grade pupils from the eight secondary public schools in Grand Rapids were selected for participation in the study. Two testing periods were conducted within regular classroom settings, and certain other information was gathered from the cumulative record cards. The following data were gathered on each subject--race, sex, age, IQ, DAT-VR, DAT-AR, DAT-NR, GPA, educational plans, Occupational Aspiration Scale scores, father's occupation (coded with two different systems), the subjects' perception of their parents' educational level, and the subjects' estimate of their parents' educational and occupational aspirations for their children. An indication of the final variable, dropout or stayin, was determined on February 2, 1962, the closing date of the study, when it was found that 355 subjects had reached the age of sixteen, that point at which they might legally leave school. Of this number, 311 had been continuously enrolled and 44 had at some time during the two years interrupted their schooling and were considered dropouts.

Since the purpose of the study was to test the efficiency of the criteria mentioned above in predicting school drop-



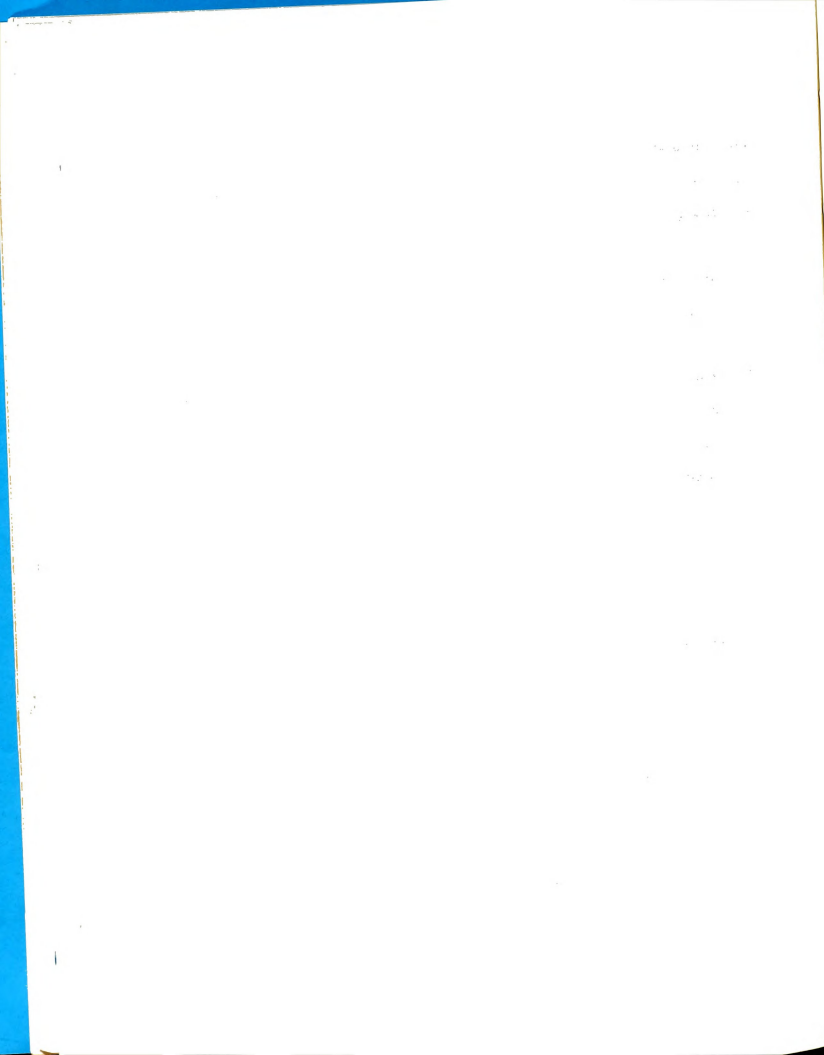
out, no special prevention or counseling techniques were employed, though careful check was maintained on the subjects, and changes in status were noted on individual control cards.

Hypotheses were formed around four of the variables listed above - IQ, age, SES, and LOA - and were concerned with their significance and size among the simple correlations with school status as well as the importance of their contribution when the variables were weighed simultaneously. The data were studied by means of simple correlations, multiple regression analysis, and multiple discriminant function analysis, and the hypotheses were tested within those results.

In brief, it was found that the LOA, IQ, and age achieved significance among the simple correlations, but the SES failed to do so. It was found that the LOA had the highest correlation with the criterion for the females, but age played the most important role among the females and the total group. The hypotheses that the four variables being tested made a significant contribution to prediction among the males and females within the multiple regression analysis were accepted for each, but only the age variable proved to be a significant discriminant in the other analysis, with IQ achieving tentative significance.

The literature regarding school dropouts holds that being a grade-repeater (over-age) and/or being a member of a family with low socio-economic status causes a pupil to be





highly dropout prone. It also ascribes a less stable or predictable role for IQ, the strength of this factor seeming to depend upon the location and sample selected for the study. It may also be implied from the literature elsewhere regarding motivation and aspiration that level of occupational plans probably helps to determine school persistence among adolescents.

The results of the current study confirm with little doubt or exception the role of age in causing dropout, and it also emphasizes the somewhat capricious instability of IQ as a determinant. Because of its consistently high simple correlations with the criterion as well as its significance in the multiple correlation analysis, LOA must be regarded as a factor in school status, even though it was found inoperative in the discriminant analysis.

Noteworthy, and perhaps most important among all of the results emanating from the study, is the failure of the analysis of data to support the claim of other reports regarding the socio-economic status of the families, for the N-H and Duncan SEI scales failed completely to achieve significance either in the simple regressions or the discriminant analysis. Furthermore, the significance which it did achieve in the multiple correlations was the weakest among the variables, as may be verified by glancing at the standardized b weights in Table VIII on page 92. Possible causes for this lack of signifi-

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cance have been mentioned earlier, but one tentative reason could lie in the fact that these are early dropouts and more likely a function of lack of ability and/or achievement regardless of economic means. At any rate, it must be borne in mind that in order to establish the low levels of correlation, many lesser-privileged pupils are persisting in school at this stage of their development.

But there are other relationships which have been established in the study over and above those tested in the hypotheses, and they are discussed here because they are either related to other studies or they offer possible clues for future projects.

It is noteworthy that parental educational aspirations should have assumed such prominence in the study, and this is especially dramatized by the fact that these are expressions of the subjects' perceptions of those parental levels and not directly of the parents themselves. The statistical significance persisted throughout all groups in all three procedures and therefore must cause this expression of aspirations to assume a role of prime importance in the study along with age. A strong argument may be put forth that this and other self-evaluative data must be included in future dropout studies in order to achieve a more complete understanding of the problem.

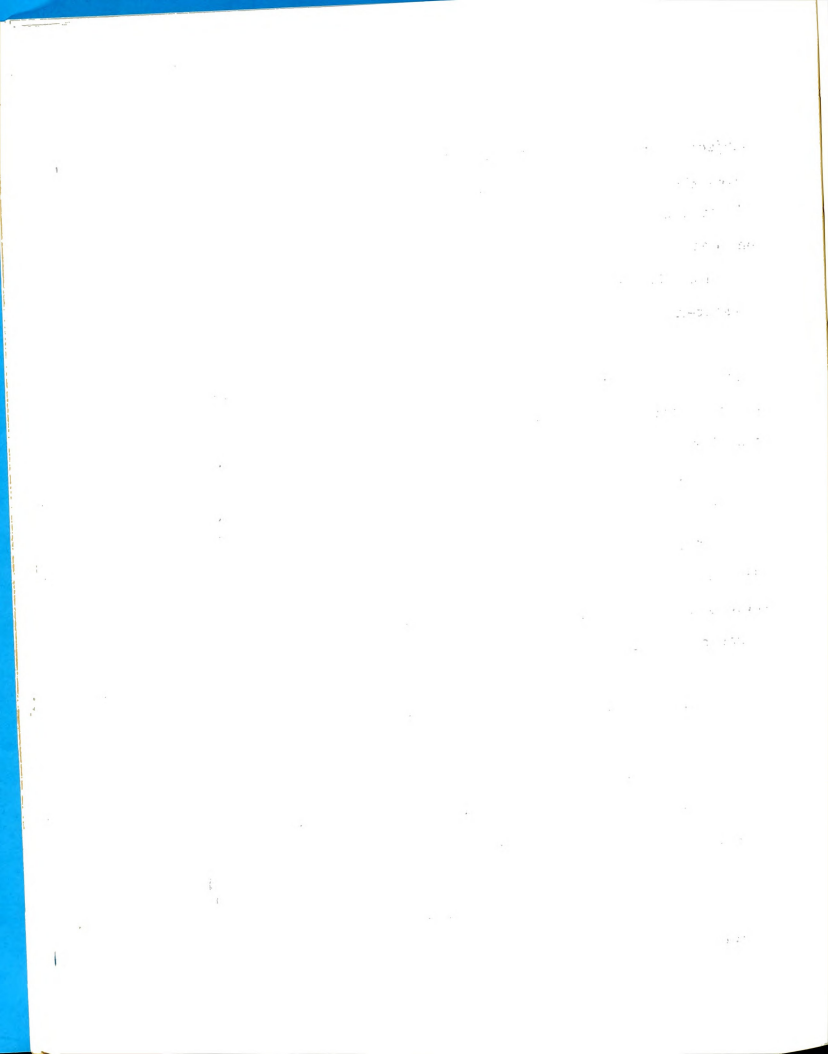
Attention must also be directed towards the race of the



subjects, which achieved significance among the females and total group in the simple correlations and also the discriminant analysis. It is probably not necessary to speculate on reasons for this since it has already been pointed out that many believe "typical" negro behavior as regards school persistence to be more a socio-economic phenomenon than an inherent racial matter. Perhaps the statistical results serve merely as a progress report reminder that at this particular point, being a member of the minority negro group makes a school pupil more prone to dropout, for whatever causes.

The literature in the past has persistently referred to the GPA as a vital factor in the decision to remain in school, a rather obvious relationship, since constant failure becomes disheartening regardless of the nature of the endeavor. All three statistical functions bear out the significance of GPA to school status, though this carries no element of surprise.

Apparently, an adolescent's expression of his own educational plans bears less consistent statistical significance than his (or her) interpretation of parents' educational aspirations, since this variable failed to reach even the .05 level among the girls in the simple correlations. However, it is important that when studied simultaneously with other factors, the variable achieved significance in both analyses. Both the DAT and parents' education performed in a rather unpredictable manner, for they alternated freely between



significance and the lack of it in the simple correlations but managed participation in the multiple analyses. This seems to give them importance only when operating in conjunction with other factors, making them unreliable predictors when they stand alone.

Conclusions. In general, then, it can be said that, with one exception, the behavior of the variables present in the study was as predicted by the literature.

As anticipated, age proved to be an extremely powerful predictor, and was joined in this by the parental educational aspirations, GPA and race. Also, the LOA must be given high ranking among the predictors, and is followed by the less-stable IQ.

Among the less reliable predictor variables are found the subjects' own educational plans, parents' education and the DAT subtests. All of these seem to perform better as part of a group of predictors than as individual measures.

The notable exception to the literature, as mentioned above, was the socio-economic factor. The current study found no particular support for the claim that this is a reliable predictor of school status, though it showed very slight power in the multiple correlations.

Implications for future studies. At the outset, it should be pointed out that, while the major objectives of the



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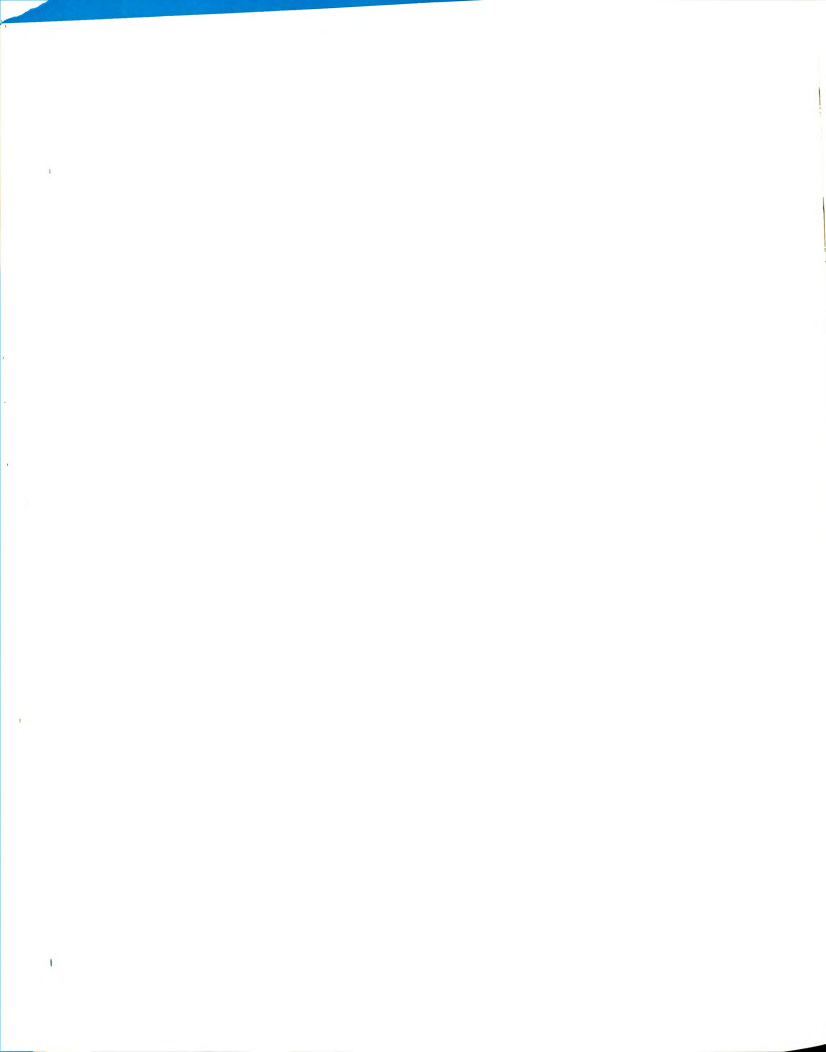
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current study - testing the efficiency of certain criteria in predicting school dropout - has been accomplished, the next logical step would be the application of the prediction formulae developed by the multiple analyses. Since there currently exists no other group which has taken exactly the same battery of tests, no validation study can be immediately performed, but another longitudinal study is indicated for the immediate future, using the approximately 150 subjects who were too young to be included in the final analysis of the data for the current study. It is planned that prediction of school status will be performed on the basis of the same data which were assembled concurrently with that on the 355 subjects included in the present analysis. It is intended that the verification of the predictions will be checked at the close of the 1962-63 school year.

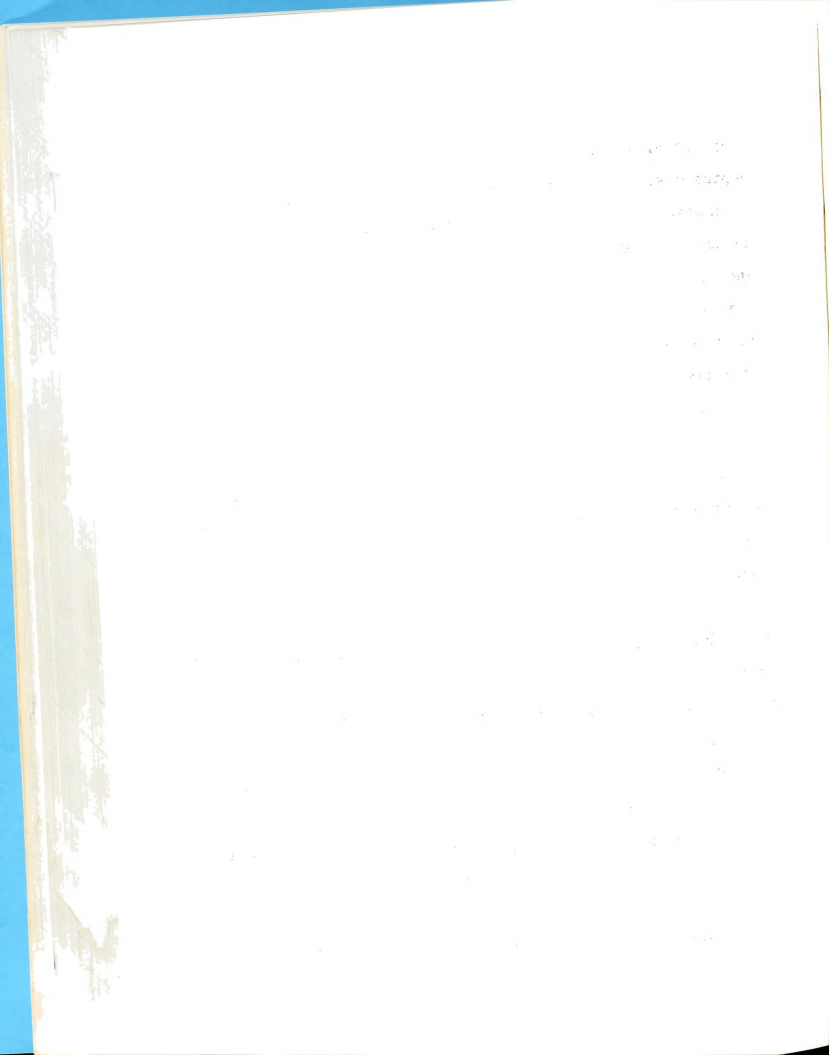
Other possibilities suggest themselves and have already been mentioned previously in the study. Future studies of dropouts must surely include more, and more refined, instruments designed to measure self-concept or self-evaluation. New scales to measure motivation are currently being developed at Michigan State University by Farquhar and others, and similar projects are surely under way at other centers. This type of information must now be sought in order to get at the heart of the dropout problem. It is no longer sufficient to merely check the age, GPA, and the social level of pupils who



drop out of school when seeking causes, for the psychological depths must be probed for more personal and vital clues. Parenthetically, it is well to mention that more detailed analysis of the data being assembled in such studies is becoming increasingly possible with the advent of, and steady improvement in, the modern electronic computer. Behavioral science is in an era marked by larger samples, a growing number of variables, and increasing efficiency and intricacy in the statistical methods employed to make them meaningful.

The success of the Occupational Aspiration Scale in the current study leads to the belief that much more needs to be learned regarding the process of job-planning of adolescents and the resultant importance which the plans place upon education. The simple correlations between the OAS Total and many educational factors in the study -  $+ .49$  with GPA,  $+ .63$  with educational plans, etc. for the total sample - suggest high inter-relationships which must be further investigated. Also, more should be learned about the possibilities of changing levels of aspiration through counseling and other techniques, and, perhaps even more basic, it would seem essential that investigation should be made to discover whether LOA might be developmental and could be deliberately planned for in the manner similar to academic skills and self-discipline.

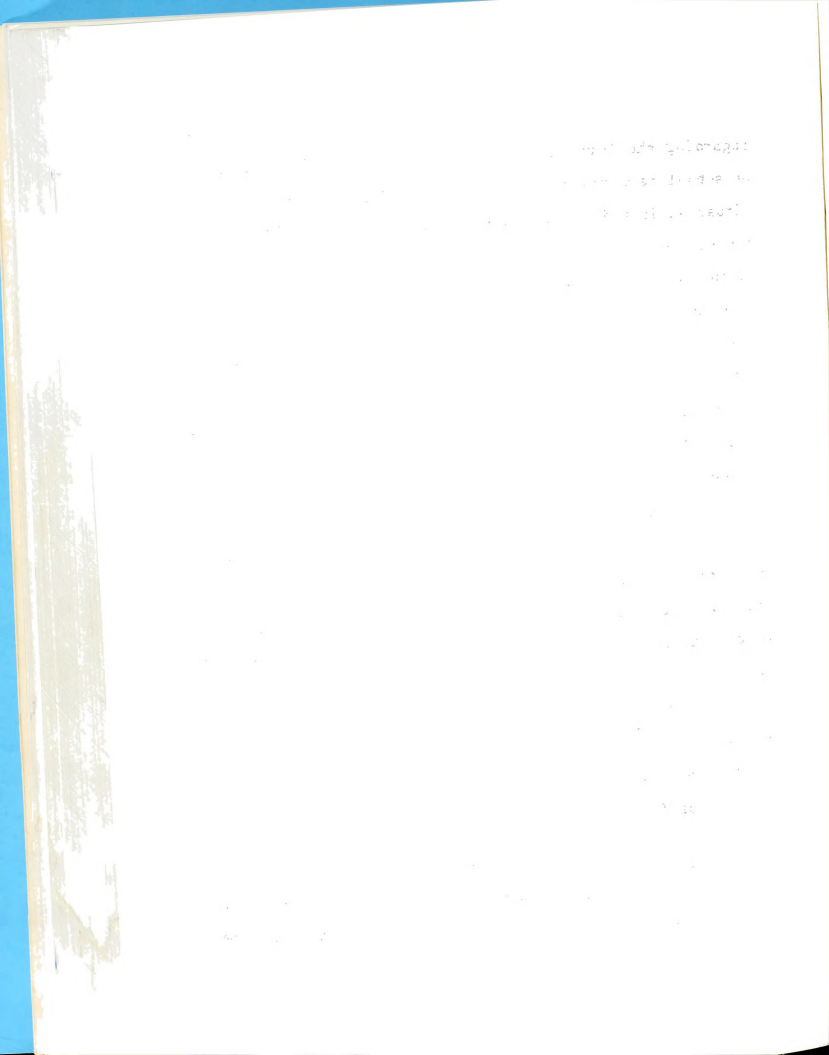
Along with the LOA, more study should be conducted



regarding the level of parental aspiration and its impact upon school performance. The current project revealed a strange situation in which the subjects' estimate of their parents' aspirations played a vital role in school status, particularly in the multiple analyses, despite the fact that many students and observers of adolescent behavior feel that rebellion against parents is typical and fully expected. Behavioral scientists and educators should learn whether parental aspirations are subject to change, whether the actual aspirations of parents coincide with those perceived by their offspring, and whether the pupils' evaluation of their parents' hopes for them tends to be consistent.

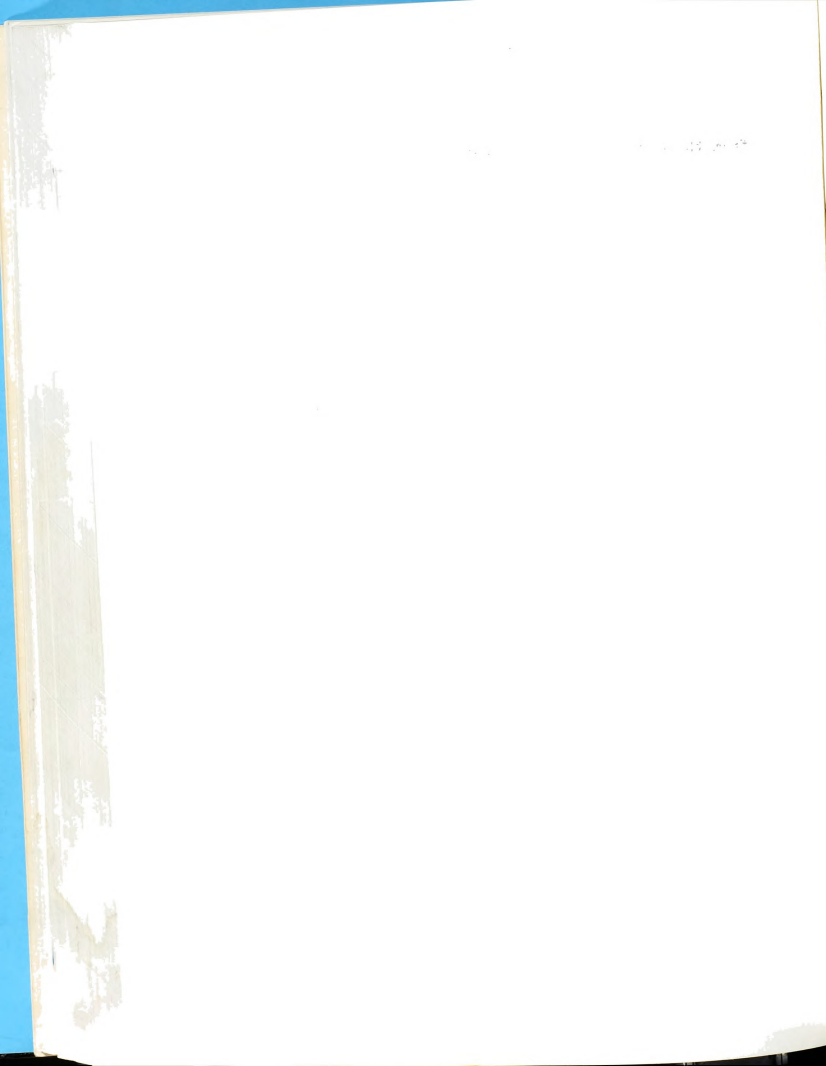
As America moves in the direction of increased levels of education for all, more and more must be learned about those with ability who fail to challenge that ability by persisting in school. The current study has attempted to open new horizons in understanding. Future studies must build on the simple beginnings represented here, to identify areas of self-evaluation which tend to thwart school persistence and discover action programs which will serve to alter these patterns of self-concept.

Summary. Chapter V has reviewed the essential elements of the current study, presented the results of the statistical analyses incorporated within the project, and has drawn



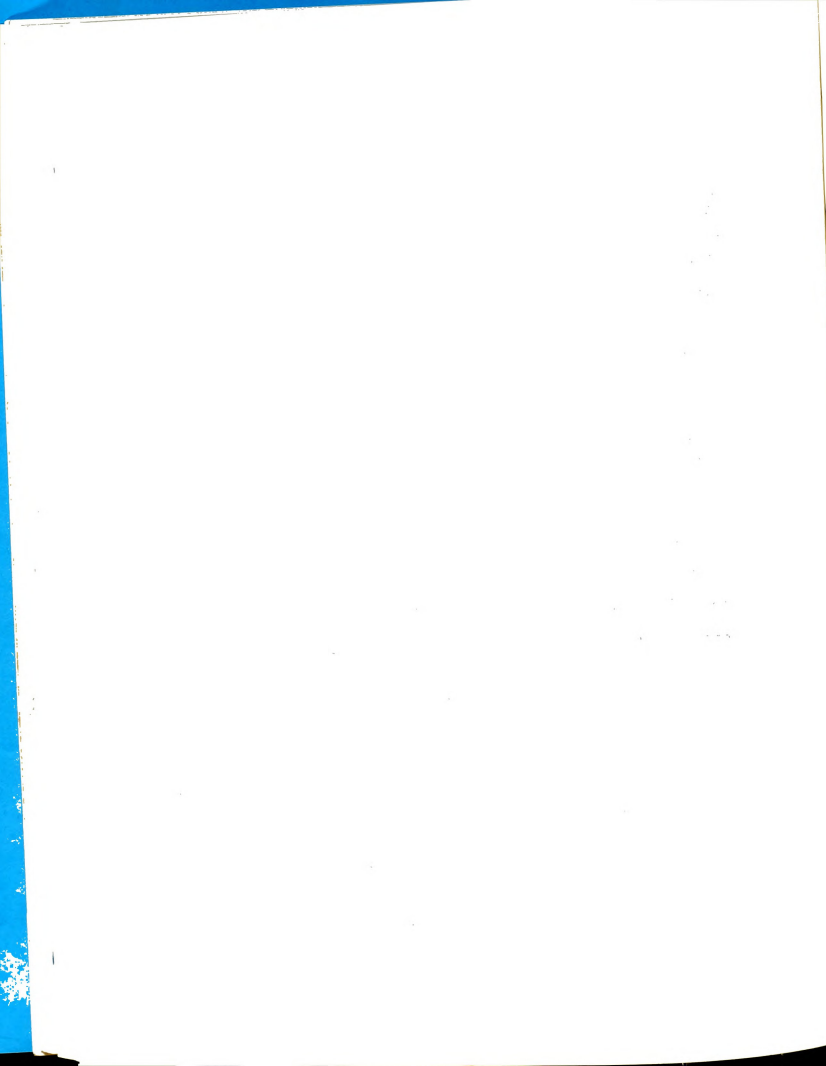
from these implications for future studies.





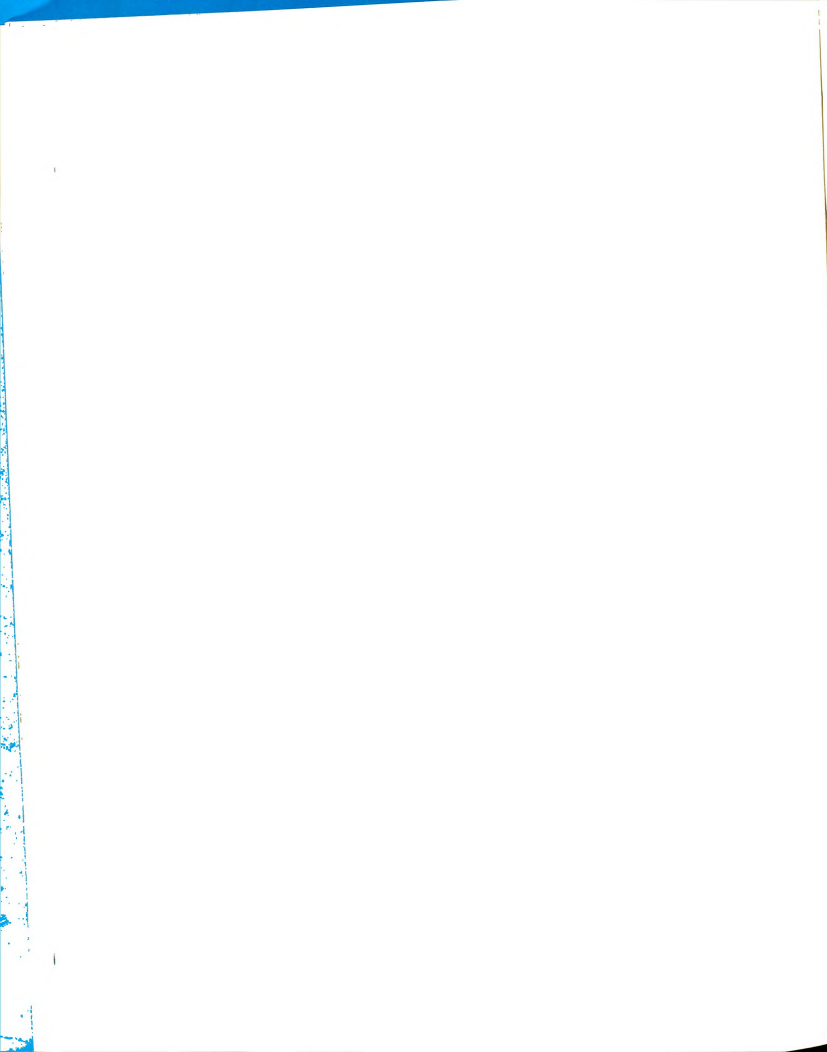
# BIBLIOGRAPHY

1. George C. Ackerlund, "A High School Diploma For Whom?" School Executive, 73, No. 3:43, November, 1953.
2. Charles M. Allen, Combating the Dropout Problem. (Chicago: Science Research Associates, Inc., 1956)
3. Philip J. Allen, "Childhood Background of Success in a Profession," American Sociological Review, April, 1955 p. 186.
4. Lazelle D. Alway, "A Coordinated Community Approach to the Dropout Problem in York, Pennsylvania," (Speech at National Conference on Social Welfare, Atlantic City, J.J., June 9, 1960)
5. "An Examination of the Statistics of 1959-60 School Dropouts in York County, Pennsylvania," (Unpublished Bulletin of the York County Schools)
6. Ethylwyne G. Arnholter, "School Persistence and Personality Factors," Personnel and Guidance Journal, 35:107, October, 1956.
7. Association for Supervision and Curriculum Development, A Look at Continuity in the School Program. (Washington: The Association, 1958 Yearbook)
8. John W. Atkinson, editor, Motives in Fantasy, Action and Society. (Princeton: D. VanNostrandCo., Inc., 1958)
9. Leonard P. Ayers, Laggard in Our Schools. (New York: The Russell Sage Foundation Series, Chariteer Publishing Co., 1909)
10. George B. Baldwin and George P. Shultz. "Automation: A New Dimension to Old Problems," Readings in Unemployment. (Washington: U.S. Congress, Senate, Government Printing Office, 1960)
11. G. J. Barnett, L. H. Stewart, and D. E. Super, "Level of Occupational Interest: Dead Weight or Dynamism?" Educational and Psychological Measurement, 13:193.
12. C. E. Bash and E. H. Johnson, "How to make and Utilize Follow-Up Studies of School Leavers," National Association

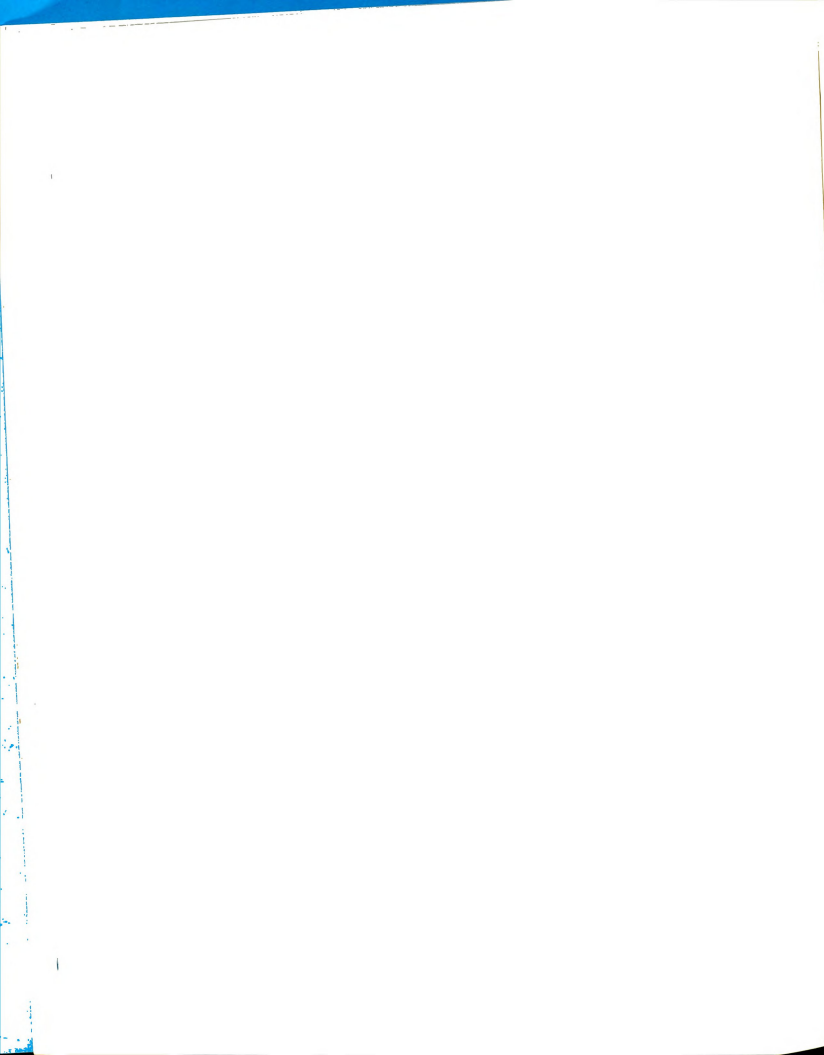


of Secondary School Principals Bulletin, 41:212, February, 1957.

13. V. E. Benson, "Intelligence and Later Scholastic Success of Sixth Grade Pupils," School and Society, 55:163, February 7, 1942.
14. Ralph F. Berdie, "Why Don't They Go to College?" Personnel and Guidance Journal, 31:352, March, 1953.
15. H. M. Berston, "The School Dropout Problem," Clearing House, 35:207, December, 1960.
16. Alvin I. Bertrand and Marion B. Smith, Environmental Factors and School Attendance. (Baton Rouge: Louisiana State University, Bulletin No. 533, May, 1960)
17. G. W. Blackwell and W. L. Godwin, "Social Class and Economic Problems of Adolescents," High School Journal, 35:166, March, 1952.
18. Peter M. Blau, "Occupational Bias and Mobility," American Sociological Review, 22:392, 1957.
19. Peter M. Blau et al, "Occupational Choice: A Conceptual Framework," Industrial Labor Relations Review, 9:256, July, 1956.
20. Joseph Bledsoe, "An Investigation of Six Correlates of Student Withdrawal From High School," Journal of Educational Research, 53 No. 1:3, September, 1959.
21. Earl J. Boggan. "What Are the Major Causes of Student Dropouts and What Should the School Do About the Present Condition?" Bulletin of the National Association of Secondary School Principals, 39:84, April, 1955.
22. David J. Bordua, "Educational Aspirations and Parental Stress on College," Social Forces, 38:262, March, 1960.
23. Paul H. Bowman and Charles V. Matthews, Motivations of Youth for Leaving School. (Quincy: Quincy Youth Development Project, Project No. 200, Cooperative Research Program, U. S. Office of Education, September, 1960)
24. Samuel M. Brownell, "Preparation of All Pupils for the World of Work: A Task of City Schools." (Speech delivered to the Detroit School Supervisory Staff, January, 1961)



25. Bureau of Social Science Research, Employment Opportunities for High School Dropouts, A Study of Employers' Practices, Needs, and Attitudes in District of Columbia. (Washington: The Bureau, 1958)
26. Oscar K. Buros, editor, The Fifth Mental Measurements Yearbook. (Highland Park: The Gryphon Press, 1959)
27. C. C. Byerly and E. A. McDonald, "How Can a School Increase Its Holding Power of Youth?" National Association of Secondary School Principals Bulletin, 37:186, April, 1953.
28. C. C. Byers, "Plan for Tomorrow, Stay in School Now," School Executive, 71:63, October, 1951.
29. Richard H. Byrne, "Beware the Stay-In-School Bandwagon," Personnel and Guidance Journal, 36:493, March, 1958.
30. V. F. Calia, "The Use of Discriminant Analysis in the Prediction of Scholastic Performance," The Personnel and Guidance Journal, 34:No.3:184, November, 1960.
31. Louis J. Cantoni, "Stay-ins Get Better Jobs," Personnel and Guidance Journal, 33:531, May, 1955.
32. G. E. Carrothers, "Why Do High School Pupils Fail?" Bulletin of the National Association of Secondary School Principals, 30:29, March, 1946.
33. E. R. Caverly and J. M. Brewer, "Elimination -- Sinister," Clearing House, 13:26, September, 1938.
34. R. Centers, "Social Class, Occupation, and Imputed Belief," American Journal of Sociology, 58:543, 1953.
35. A. W. Clevenger, "Responsibility of the Public Secondary School for the Education and Welfare of the Out-of-School Youth," North Central Association Quarterly, 13:185, October, 1938.
36. Eli E. Cohn, "How School People Can Help the Dropout," (Speech delivered before a workshop of the St. Louis, Mo. Board of Education, August 26, 1960)
37. James B. Conant, The American High School Today. (New York: McGraw-Hill, 1959)
38. James B. Conant, Slums and Suburbs. (New York: McGraw-Hill Book C., 1961)



39. Edward S. Cook, Jr., "An Analysis of Factors Related to Withdrawal From High School Prior to Graduation," Journal of Educational Research, 50:191, November, 1956.  
(Unpublished Doctor's thesis, University of Georgia, 1953)
40. Edward S. Cook, Jr., "How IQ Figures in the Dropout Problem," School Executive, 74:56, September, 1954.
41. Sophia Cooper, "Employment of June 1960 High School Graduates," Monthly Labor Review 84:463, May, 1961.
42. L. J. Cronbach, Essentials of Psychological Testing. (New York: Harper and Brothers, second edition, 1960)
43. J. Culbertson and R. Morse, "Early School Leaver: Why Doesn't He Leave Later?" University of Oregon, 1959.
44. Olga Curtis, "Bright Students: How Can We Keep Them From Quitting School?" Parade: Detroit Free Press, October 25, 1959.
45. A. F. Davies, "The Prestige of Occupations," British Journal of Sociology, 3:134, 1952.
46. Allison Davis, Social Class Influences Upon Learning. (Cambridge: Harvard University Press, 1950)
47. Harold J. Dillon, Early School Leavers, A Major Educational Problem. (New York: National Child Labor Committee, Publication No. 401, 1949)
48. Wilfrid J. Dixon and Frank J. Massey, Jr., Introduction to Statistical Analysis. (New York: McGraw-Hill, 1957)
49. Richard S. Dresher, "Factors In Voluntary Dropouts in the Public Schools of Detroit, Michigan," Personnel and Guidance Journal, 32:287, January, 1954.
50. Otis Dudley Duncan, "A Socio-Economic Index for All Occupations," (Unpublished research paper, University of Chicago Population Research and Training Center 1961)
51. R. R. Dynes, A. C. Clarke and S. Dinitz, "Levels of Occupational Aspirations: Some Aspects of Family Experience As a Variable," American Sociological Review, 21:212, 1956.
52. George Edberg, Minard W. Stout and Glenn F. Varne, A Guide for the Study of Holding Power in Minnesota



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Secondary Schools." (St. Paul: State Department of Education, Bulletin No. 21, 1952)

- J. B. Edlefsen and M. J. Crowe, Teen-agers' Occupational Aspirations. (Pullman: Washington State University Institute of Agricultural Sciences, Bulletin No. 618, July, 1960)
- Education Summary, "To Know Why Johnny Leaves School," Education Summary, September, 1953.
- LaMar T. Empey, "Social Class and Occupational Aspiration," American Sociological Review, 21:703, 1956.
- William Evraiff, "How Different Are Our Dropouts?" Bulletin of the National Association of Secondary School Principals, 41:212, February, 1957.
- Joan M. First, "Dropouts," Michigan Education Journal, 38:250, November 1, 1960.
- William A. Fitzpatrick, "Keep Young People in School," National Association of Secondary School Principals Bulletin, 42:154, May, 1958.
- Robert R. Fleming, "How To Make and Utilize Follow-Up Studies of School Leavers," Bulletin of the National Association of Secondary School Principals, 36:74, March, 1952.
- H. J. Flynn, N. Saunders and Robert Hoppock, "Course For Dropouts," Clearing House, 28:486, April, 1954.
- E. M. Foster, "School Survival Rates," School Life, 22:13, September, 1936; and 23:365, March, 1938.
- Marcia K. Freedman, "Work and the Adolescent," Children and Youth in the 1960's. (Washington: The 1960 White House Conference on Children and Youth, 1960)
- Marcia K. Freedman, "Special Problems in Youth Employment," Reference Papers on Children and Youth. (Washington: The 1960 White House Conference on Children and Youth, 1960.)
- Gary Public Schools, A Study of Possible Influences on Student Holding Power: Grades 7-12. (Gary: Board of Education, 1958)



John W. Gardner, "From High School to Job," Carnegie Corporation 1960 Annual Report. (New York: The Corporation, 1961)

Stuart Garfinkle, "Military Manpower and the High School Student," Occupational Outlook Quarterly, 3:9, Sept., 1959.

Walter H. Gaumnitz, High School Retention by State. (Washington: Office of Education, Circular No. 398, June, 1954)

Walter H. Gaumnitz and Ellsworth Thompkins, Holding Power and Size of High Schools. (Washington: Office of Education, Circular No. 322, 1950)

Donald J. Giese, "I Was a High School Dropout," Readers Digest (Reprint from Coronet) December, 1961.

Edwin D. Goldfield, Director, Statistical Abstract of the United States. (Washington: U. S. Department of Commerce, Bureau of the Census, 1961)

Edwin D. Goldfield, Director, Statistical Abstract of the United States. (Washington: U. S. Department of Commerce, Bureau of the Census, 1957)

W. L. Gragg, "Some Factors Which Distinguish Dropouts From High School Graduates," Occupations, 27:457, September, 1949.

W. L. Gragg, "School Leavers: They Can Be Spotted in Junior High," Clearing House, 25:72, October, 1950.

Donald A. Green, "School Dropouts, A Matter of Philosophy," The Vocational Guidance Quarterly, 9:124, Winter, 1960-61.

Richard Hall, Your Child's Golden Chance. (New York: Alumni Publications, 1957)

A. O. Haller with L. Burchinal and M. Taves, "Choosing an Occupation," (Unpublished paper written for the North Central Research Committee, Sub-Committee on Youth and the Family, June 21, 1961)

A. O. Haller, W. H. Sewell and I. Q. Miller, "The Factorial Structure of Level of Occupational Aspiration." (Unpublished paper)



- A. O. Haller and W. H. Sewell, "Farm Residence and Levels of Educational and Occupational Aspiration," American Journal of Sociology, 62:407, January, 1957.
- A. O. Haller, "The Influence of Planning to Enter Farming on Plans to Attend College," Rural Sociology, 22:137, June, 1957.
- A. O. Haller and I. Q. Miller, "Measurement of Occupational Aspiration," (Unpublished Research Paper)
- A. O. Haller, "The Occupational Achievement Process of Farm-Reared Youth in Urban-Industrial Societies," Rural Sociology, 1961
- A. O. Haller, I. W. Miller, et al, "The Occupational Aspiration Scale. (Final Report to the U. S. Office of Health, Education and Welfare, Michigan State University, February, 1961)
- A. O. Haller and C. E. Butterworth, "Peer Influences on Levels of Occupational and Educational Aspiration," Social Forces, 1959
- A. O. Haller, "Planning to Farm: A Social Psychological Interpretation," Social Forces, 37:263, March, 1959.
- A. O. Haller, "Relational Fertility of LOA," (Unpublished Research Paper, Michigan State University. Feb., 1960)
- A. O. Haller, "Research Problems on the Occupational Achievement Levels of Farm-Reared People," Rural Sociology, 23:355, December, 1958.
- Martin Hamburger, Realism and Consistency in Early Adolescent Aspirations and Expectations. (Unpublished Doctor's Thesis. Columbia University. New York, 1958)
- J. N. Hanthorn, "A Study of Major Causes For Quitting High School," School and Community, 30:272, October, 1944.
- Paul K. Hatt "Stratification in the Mass Society," American Sociological Review, 15:216, April, 1960.
- Robert J. Havighurst, "Improving Holding Power With Minority Group Students," (Speech Delivered at the Fourth Grand Rapids Board of Education Human Relations Conference, April 26, 1960)



. C. Hearn, "Increasing the School's Holding Power Through Improved Articulation," Educational Administration and Supervision, 42:214, April, 1956.

Stanley L. Hecker, Early School Leavers in Kentucky (Lexington: Bureau of School Service, College of Education, University of Kentucky 25:78, June, 1953)

Theodosia C. Hewlett, "What Employers Look For in Young Workers," Occupations, 27, May, 1949.

Howard W. Hightower, "Mystery of the Elementary Dropout" Phi Delta Kappan, 38:62.

Arthur A. Hitchcock, "Guidance in American Education," Supplement to Reference Papers on Children and Youth. (Washington: 1960 White House Conference on Children and Youth)

Elmer S. Holbeck, "Seven Ways to Help Prevent Dropouts," The Nation's Schools, 45:35, May, 1950.

August B. Hollingshead, Elmtown's Youth. (New York: John Wiley and Sons, 1949)

Robert Hoppock. Occupational Information. (New York: McGraw-Hill, 1957)

John A. Hornaday and G. Frederic Kuder "A Study of Male Occupational Interest Scales Applied to Women," Educational and Psychological Measurement, 21:859, Winter, 1961.

H. M. Hosp, "Exodus from the Secondary Schools," American Association of University Women's Journal, 37:107, January, 1944.

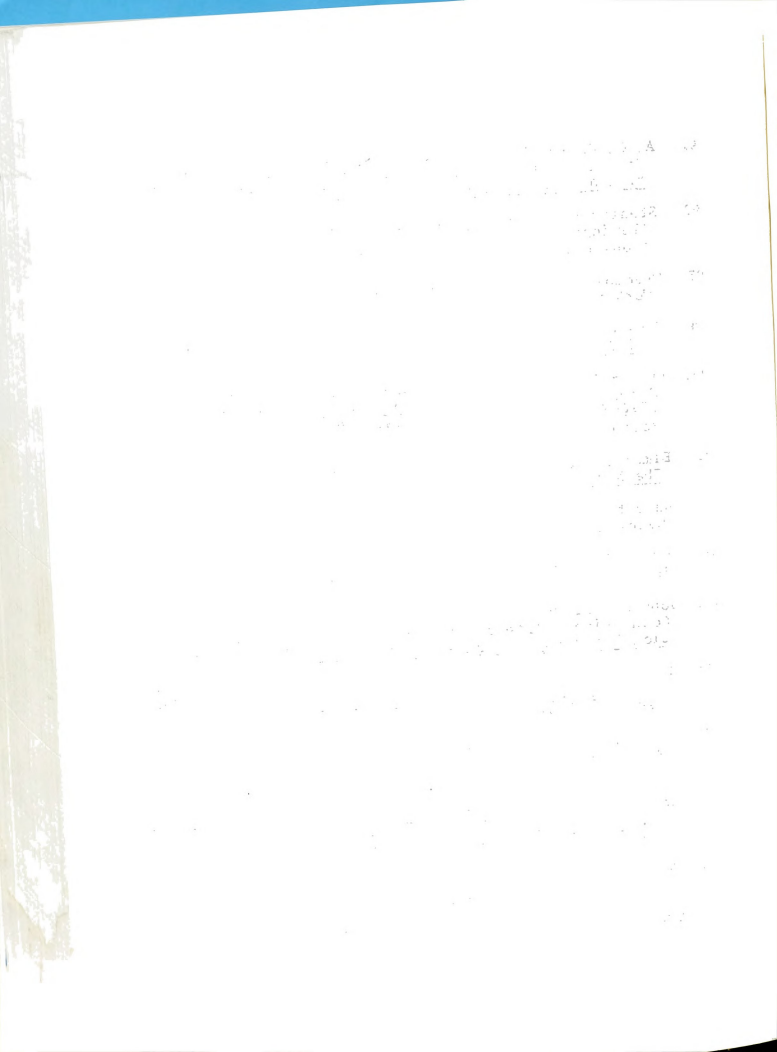
J. D. Hull and H. Cummings, "Discovering the Extent to Which Youth Needs Are Being Met," National Society for the Study of Education Yearbook, 1:62, 1952.

DeWitt Hunt, Work Experience Education Programs In American Secondary Schools. (Washington: Office of Education, Department of Health, Education and Welfare, Bulletin.)

Paul R. Hunt, "Job Upgrading: Rehabilitation for the Dropout," Phi Delta Kappan, 40:219, February, 1959.

Stanley O. Okenberry, "Factors in College Persistence,"





- Journal of Counseling Psychology, 8:322, Winter, 1961.
- Howard P. Iker and Norman C. Perry, "A Further Note Concerning the Reliability of the Point Biserial Correlation," Educational and Psychological Measurement, 20: 505, 1960.
- Indianapolis Public Schools, "Why Indianapolis High School Students Leave High School,": The Researcher, 4: 1, November, 1959.
- Alex Inkeles and Peter H. Rossi, "National Comparisons of Occupational Prestige, American Journal of Sociology, 61:329, 1956.
- Jefferson Public Schools, Your Jefferson County Schools, 3:1, September, 1959.
- J. Jennings, "Dropouts in High School," National Association of Women Deans and Counselors Journal, 22:37, October, 1958.
- Elizabeth S. Johnson, "Employment Problems of Out-of-School Youth," Monthly Labor Review, 65, December, 1947.
- Palmer O. Johnson, Statistical Methods in Research, (New York: Prentice-Hall, Inc., 1949) p. 343
- J. A. Kahl, The American Class Structure. (New York: Rinehart, 1957)
- J. A. Kahl, "Educational and Occupational Aspirations of 'Common Man' Boys," Harvard Educational Review, 23: 186, Summer, 1953.
- Arnold Katz, "Educational Attainment of Workers, 1959," Monthly Labor Review, 83:113, February, 1960.
- W. E. Kendall, "The Occupational Level Scale of the Strong Vocational Interest Blank," Journal of Applied Psychology, 31:282, 1947.
- A. C. Kerckhoff, "Anomie and Achievement Motivation," Social Forces, 37:196, March, 1959.
- E. J. Kline, "Significant Changes in the Curve of Elimination Since 1900," Journal of Educational Research, 26:606, April, 1933.



- Morris Krugman, "Programs to Reduce School Dropouts," Reference Papers on Children and Youth, (Washington: 1960 White House Conference on Children and Youth, 1960)
- J. A. Lanier, "Guidance-Faculty Study of Student Withdrawals," Journal of Educational Research, 43:205, November, 1949.
- Sam Lambert, "Increasing Education's Holding Power," National Education Association Journal, p 664, December, 1950.
- Warren K. Layton, Special Services for the Dropout and the Potential Dropout, (New York: National Child Labor Committee, Publication No. 408, October, 1952)
- Wilbur L. Layton, Editor, The Strong Vocational Interest Blank, Research and Uses. (Minneapolis: The University of Minnesota Press, 1960)
- Joseph Lev and Helen M. Walker, Statistical Inference. (New York: Henry Holt and Company, 1953)
- Morton Levine, "Rising Education Attainment and the Implications for Employment," Occupational Outlook Quarterly, 3:No. 3:21, September, 1959.
- Alfred J. Lewis, Study of Problems Which During the Past Fifteen Years Have Caused Boys and Girls to Leave Syracuse Central High School Before Graduation. (Syracuse: Syracuse University, 1952)
- Gordon P. Liddle, "Slow Learners in the Secondary Schools", (Unpublished Report, The University of Chicago, Quincy Youth Development Project, May, 1959)
- Seymour M. Lipset and Richard Bendix, Social Mobility In Industrial Society. (Berkley: University of California Press, 1959)
- Seymour M. Lipset, "Social Mobility and Urbanization," Rural Sociology, 20:220, September-December, 1955.
- T. M. Livesay, "Test Intelligence and College Expectation of High School Seniors in Hawaii," Journal of Educational Research, 35:334, January, 1942.
- T. M. Livesay, "Test Intelligence and Future Vocation of High School Seniors in Hawaii," Journal of Applied



Psychology, 25:679, December, 1941.

A. High Livingston, "High School Graduates and Dropouts- A New Look at a Persistent Problem," School Review, 66:195, Summer, 1958.

A. High Livingston, "Key to the Dropout Problem: The Elementary School," Elementary Journal, 59:267, February 1959.

C. D. Long, School-Leaving Youth and Employment. (New York: Teachers College Bureau of Publications, 1941)

L. L. Lorwin, Youth Work Programs: Problems and Policies. (Washington: American Council on Education, 1941)

Los Angeles City School Districts, Transfers, Entrants, and Dropouts in Los Angeles City Secondary Schools, 1959-1960. (Los Angeles: Board of Education, Research Report No. 233, March, 1961)

W. A. Lurie, "Estimating the Level of Vocational Aspiration," Journal of Social Psychology, 10:467, 1939

Manpower - Challenge of the 1960's. (Washington: U. S. Department of Labor, 1960)

Manpower in Michigan - A Look at the 1960's. (Detroit: Michigan Employment Security Commission, 1960.)

D. C. McClelland, J. W. Atkinson, R. A. Clark and E. L. Lowell, The Achievement Motive. (New York: Appleton-Century-Crofts, Inc., 1953)

William H. McCreary and Donald E. Kitch, Now Hear Youth. (Sacramento: California State Department of Education, Bulletin, Vol. 22, No. 9, 1953)

Michigan State Committee on School Holding Power, Questions and Answers. (Lansing: Department of Public Instruction, 1960)

Michigan State Curriculum Committee on Holding Power, Quickie Kit on School Holding Power. (Lansing: Department of Public Instruction, Publication No. 507, 1960)

Michigan State Curriculum on School Holding Power, The Teacher and School Holding Power. (Lansing: Department of Public Instruction, 1959)



- R. Middleton and C. M. Grigg, "Rural-Urban Differences in Occupational and Educational Aspirations," Rural Sociology, 24:347, December, 1959.
- Irwin W. Miller, Jr., "Level of Occupational Aspirations: Problems in its Conceptualization and Measurement," (Unpublished Masters Thesis, Michigan State University, East Lansing, 1960)
- Irwin W. Miller, "Peer Influence on Occupational Aspiration and V-Achievement," (Unpublished Research Paper, Michigan State University, East Lansing)
- Raymond A. Mulligan, "Socio-Economic Background and College Enrollment," American Sociological Review, p. 188, April, 1951.
- Virgil Murk, "A Follow-Up Study on Students Who Drop Out of High School," Bulletin of the National Association of Secondary School Principals, 44:73, February 1960.
- George R. Myers, "Curriculum Improvement Through Holding Power Follow-Up Studies," Michigan Journal of Secondary Education, 2:110, Winter, 1961.
- National Association of Secondary School Principals, "Guidance Procedures in the Secondary School," Bulletin of the National Association of Secondary School Principals, 45:No. 265, May, 1961.
- National Child Labor Committee, Youth and You. (New York: The Committee, Publication No. 418, October, 1955)
- National Child Labor Committee, Youth Work Camps. (New York: The Committee, 41:No. 3, May, 1959)
- National Committee on Employment of Youth, Automation and Youth. (New York: The Committee, The American Child 42:No. 2, March, 1960)
- National Committee on Employment of Youth, Dropouts: Number One Challenge to America's Schools. (New York: The Committee, The American Child, 42:No. 4, March, 1961)
- National Committee on Employment of Youth, Job Help For Youth in the Sixties. (New York: The Committee: The American Child, 42:No. 4, November, 1960)
- National Committee on Employment of Youth, "Youth and





Work," (New York: The Committee, Bimonthly Newsletter)

National Education Association, High School Dropouts. (Washington: The Association, Research Division and Department of Classroom Teachers, Discussion Pamphlet No. 3, September, 1959.)

National Education Association, School Dropouts. (Washington: The Association, Research Division Bulletin, August, 1961)

National Manpower Council, Education and Manpower. (New York: Columbia University Press, 1960)

National Opinion Research Center, "Jobs and Occupations: A Popular Evaluation," Opinion News, 9:3, 1947.

National Parent Teacher, "Two Million Absentees," National Parent Teacher, 51:25, September, 1956.

Nation's Schools, "Helping Potential Dropouts," Reprinted from Roving Reporter, The Nation's Schools, November, 1955.

New York State Department of Education, Improvement of Holding Power Through A Continuous Study of Youth In School. (Albany: The University of New York Press, 1952)

News Item in The Grand Rapids Press: "Fifth of Yanks in 'One city'," November 27, 1961.

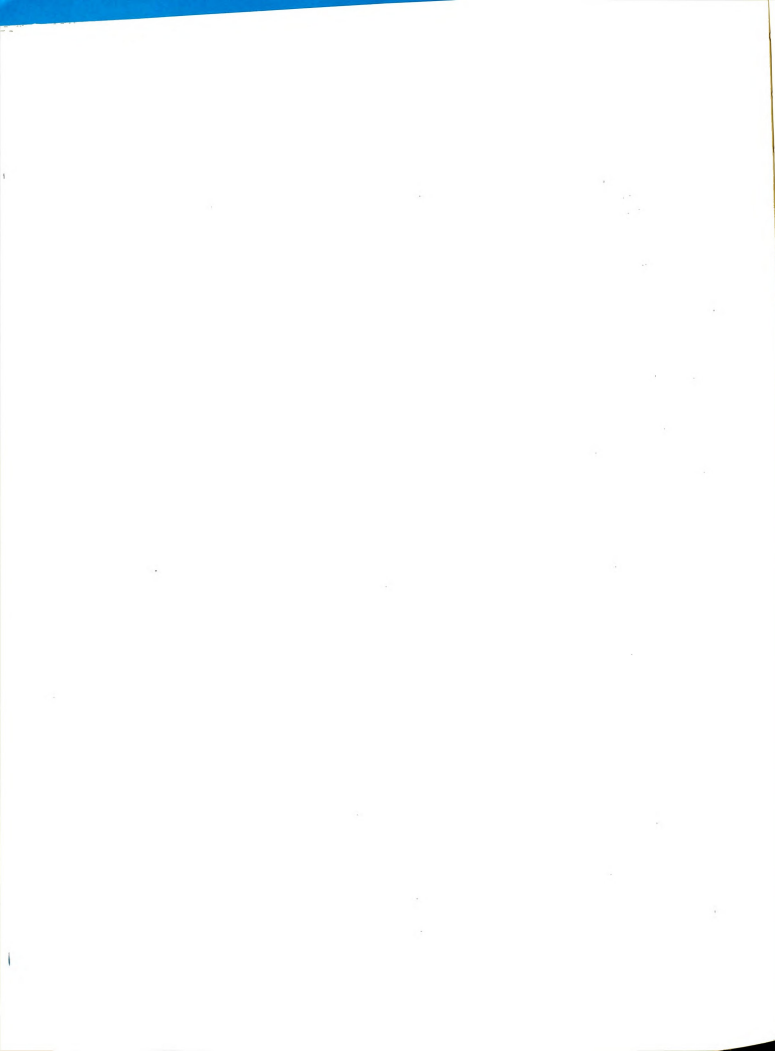
Office of Education, A Look Ahead In Secondary Education. (Washington: U. S. Office of Health, Education and Welfare Bulletin No. 4, 1954)

Office of Education, After Teen-Agers Quit School. (Washington: U. S. Department of Labor Bulletin No. 150, 1956)

Office of Education, Holding Power and Size of High Schools. (Washington, U. S. Federal Security Agency, Circular No. 322, 1950)

Office of Education, Improving School Holding Power. (Washington: U. S. Security Agency, Some Research Proposals, Circular No. 291, February, 1951)

Office of Education, National Stay-In-School Campaign: Handbook For Communities. (Washington: United States



Government Printing Office, Revised 1958)

70. Office of Education, "Pressing Problems in American Education - A Graphic Presentation," School Life, 36:120; 126.
71. Office of Education, Retention in High Schools in Large Cities. (Washington: U. S. Office of Health, Education and Welfare, Bulletin No. 15, 1957)
72. Office of Education, Why Do Boys and Girls Drop Out of School, and What Can We Do About It? (Washington: Federal Security Agency Circular No. 269, 1950)
73. Phoebe L. Overstreet, Donald E. Super, et al, The Vocational Maturity of Ninth Grade Boys. (New York: Teachers College Press, 1960)
74. Parade, "Why Half Our Kids Quit School: This is a Shocking Figure," Parade, Detroit Free Press, April 15, 1956.
75. Franklin K. Patterson et al, The Adolescent Citizen. (Glencoe: The Free Press, 1960)
76. Walter G. Patterson, "Why Do Young People Stay in High School?" Clearing House, 79:93, October, 1954.
77. Ruth C. Penty, "Reading Ability and High School Dropouts" Journal of the National Association of Women Deans and Counselors, 23:11, October, 1959.
78. Norman C. Perry and William B. Michael, "A Note Concerning the Reliability of a Point Biserial Coefficient for Large Samples," Educational and Psychological Measurement, 28:139, 1958.
79. Personnel and Guidance Journal, "Intensive Guidance Given Potential High School Dropouts," Personnel and Guidance Journal, 35:564, May 1957.
80. Margaret L. Plunkett, "From School to Work: The Early Employment Experience of Youth in ~~Seven~~ Communities - 1952-57." (Washington: U. S. Department of Labor, Bureau of Labor Statistics, March, 1960)
81. Margaret L. Plunkett, "Youth - Its Employment and Occupational Outlook," Studies in Unemployment. (Washington: U. S. Congress, Senate, Government Printing Office, 1960)



2. R. L. Polk, Grand Rapids City Directory, 1960. (Detroit: R. L. Polk and Co., Vol. 78, 1960)
3. R. L. Polk, Grand Rapids City Directory, 1961. (Detroit: R. L. Polk and Co., Vol. 79, 1961)
4. J. Richard Porter, "Predicting the Vocational Plans of High School Senior Boys," Personnel and Guidance Journal, 33:215, 1954.
5. Sylvia Porter, Dropouts and Unemployment. (New York: National Committee on Employment of Youth, 1961)
6. I. R. Power, "Student Dropouts: What's The Answer?" American Business Education, 14:108, December, 1957.
7. R. R. Ratliff, "Joe Is Leaving School," Journal of Education, 133:174, September, 1950.
8. R. R. Ratliff, "Hold Those Dropouts," Education, June, 1950, p 646.
9. William C. Reavis, "Excerpts From the Annual Meeting of Secondary School Principals: The Lack of School Holding Power," School Review, 60:189, April, 1952.
0. Leonard Reissman, "Levels of Aspiration and Social Class," American Sociological Review, 18:233, June, 1953.
1. Naomi Riches, "Youth in the Labor Market: Work Experience of Young People Leaving School in an Area of Limited Employment Opportunities," Occupational Outlook Quarterly, 1:23, October, 1957.
2. Joseph W. Rioux, "The Extent, Form and Future of Educational Provisions for Dropouts," (Unpublished Doctor's dissertation, Wayne State University, Detroit, 1961)
3. R. O. Roberts and J. McGeever, "A Junior Occupational Program," Bulletin of the National Association of Secondary School Principals, 41:43, November, 1957.
4. Anne Roe, The Psychology of Occupations. (New York: John Wiley and Sons, 1956)
5. B. C. Rosen, "Race, Ethnicity and Achievement," American Sociological Review 24:47, February, 1959.
6. W. C. Ryan, "Mental Health Problems of School Leaving,"



Understanding the Child, 25:98, October, 1956.

Rudolph F. Sando, "A Comparative Study of Early School Leavers." (Unpublished Doctor's dissertation, University of California, Berkley, August, 1952)

J. H. Schad, "Deficiency in Studies: A Basis for Exclusion?" American School Board Journal.

J. L. Schmidt and J. W. M. Rothney, "Variability of Vocational Choices of High School Students," Personnel and Guidance Journal, 34:142, November, 1955.

L. Schneider and S. Lysgaard, "The Deferred Gratification Pattern, A Preliminary Study," American Sociological Review, 18:142, 1953.

A. R. Schumann, "Exit Interview," Wisconsin Journal of Education, 91:14. March, 1959.

Science Research Associates, "The Potential Dropout: How Can Schools Help Him?" S. R. A. Guidance Newsletter, November, 1957.

Paul Schutzer, photographer, "School Problem, Huge But Ignored - Dropout Tragedies" Life Magazine, May 2, 1960.

David Segel, Frustration in Adolescent Youth. (Washington: U. S. Department of Health, Education and Welfare, Bulletin No. 1, 1951, 1954 Reprint)

David Segel, "How to Estimate the Number of Dropouts Occuring in a School System," (Washington: U. S. Office of Education. Division of Elementary and Secondary Schools)

David Segel and Oscar J. Schwarm, Retention in High Schools in Large Cities. (Washington: U. S. Office of Education, Bulletin 1957, No. 15)

W. H. Sewell and A. O. Haller, "Factors in the Relationships Between Social Status and the Personality Adjustment of the Child," American Sociological Review, 24:511

W. H. Sewell, A. O. Haller, and M. A. Straus. "Social Status and Educational and Occupational Aspiration," American Sociological Review. 22:67, February, 1957.

Herman L. Shibler, "Attacking the Dropout Problem,"





- National Education Association Journal, 44:24, January, 1955.
- S. L. Singer and B. Stefflre, "A Note on Racial Differences in Job Values and Desires," Journal of Social Psychology, 43:333, 1956.
- S. L. Singer and B. Stefflre, "The Relationship of Job Values to Vocational Aspirations of Adolescents," Journal of Applied Psychology, 38:419, 1954.
- Mapheus Smith, "An Empirical Scale of Prestige Status of Occupations," American Sociological Review, 8:185, 1943.
- Daniel W. Snepp, "Can We Salvage the Dropouts?" Clearing House, 31:49, September, 1956.
- Daniel W. Snepp, "Why They Drop Out - Eight Clues to Greater Holding Power," Clearing House, 27:492, April, 1953.
- G. P. Snyderman, "Serving the Hard-to-Place Youth," Reprinted from Employment Security Review, March, 1959.
- Mourits A. Sorensen, "Low Ability Dropouts Versus the Low Ability Graduates," Personnel and Guidance Journal, 39:144, October, 1960.
- B. Stefflre, "Analysis of the Inter-Relationships of Rankings of Occupations," Personnel and Guidance Journal, p. 435, February, 1959.
- B. Stefflre, "Psychological Factors Associated With Aspirations for Socio-Economic Mobility," California Journal of Educational Research, 6, March, 1955.
- Robert Stein "How to Keep Our Teen-Agers In School," American Family, 5:8, May 1952.
- R. M. Stephenson, "Mobility Orientation and Stratification of 1,000 Ninth Graders," American Sociological Review, 22:204, April, 1957.
- Henry Stetler, Comparative Study of Negro and White Dropouts in Selected Connecticut High Schools. (Hartford: Connecticut Commission on Civil Rights, 1959)
- Glenn Stice, Talent Losses Before High School Gradua-



tion. (Princeton: Educational Testing Service. 1960)

Merrel R. Stockey, "A Comparison of the Effectiveness of Group Counseling, Individual Counseling, and Employment Among Adolescent Boys With Adjustment Problems," (Unpublished Doctor's dissertation, University of Michigan. Ann Arbor, 1961)

L. Joseph Stone and Joseph Church, Childhood and Adolescence. (New York: Random House, 1957)

Carol L. Stone, High School Dropouts in a Rural County. (Pullman: State College of Washington, Institute of Agricultural Sciences, Bulletin No. 565, March. 1956)

"Student Dropouts in the Kansas City, Missouri Public Secondary Schools First Semester, 1959-60," (Unpublished Bulletin of the Department of Guidance and Counseling, December, 1960)

Study Committee on Holding Power, "Holding Power in the Grand Rapids, Michigan Public Schools, K-14," (Unpublished Progress Report, May, 1953)

Ernst H. Suerken, "When Dropouts Go Job Hunting," Clearing House, 27:268, January, 1953.

Sun Life Assurance Company of Canada, Why Stay in School? (Montreal: The Company, The Values In Education Series)

Donald E. Super, "The Multifactor Tests: Summing Up," Personnel and Guidance Journal, 36:No. 1:17, September, 1957

Donald E. Super, The Psychology of Careers. (New York: Harper and Brothers, 1957)

Donald E. Super, Vocational Development - A Framework for Research. (New York: Teachers College Press 1957)

M. M. Tatsuoka and D. V. Tiedeman, "Discriminant Analysis," Review of Educational Research, 24:No. 5:402, December, 1954.

Florence Taylor, Why Stay In School? (Chicago: Science Research Associates 1948)

R. A. Tesseneer and L. M. Tesseneer, "Review of Literature on School Dropouts," Bulletin of the National



Association of Secondary School Principals, 42:141, May, 1958.

L. G. Thomas, The Occupational Structure and Education (Englewood Cliffs: Prentice-Hall, 1956)

R. J. Thomas, "An Empirical Study of High School Drop-Outs in Regard to Ten Possibly Related Factors," Journal of Educational Sociology, 28:11, September, 1954.

E. E. Tompkins, "How Can the School Reduce the Number of Early School Leavers?" National Association of Secondary School Principals Bulletin, 35:307 March, 1951.

United States Army, Straight Talk About Staying in School. (Washington: U. S. Army Recruiting Service, no date)

United States Department of Commerce, Bureau of the Census, "General Population Characteristics," United States Census of Population - 1960. (Washington: The Bureau, Series PC (1):24B - Michigan)

United States Department of Commerce, Bureau of the Census, "Detailed Characteristics," United States Census of Population - 1950. (Washington: The Bureau - Michigan)

United States Department of Commerce, Bureau of the Census, "Number of Inhabitants," United States Census of Population - 1960. (Washington: The Bureau, Series PC (1) 24A - Michigan)

United States Department of Labor, Bureau of Labor Standards, After Teen-Agers Quit School. (Washington Government Printing Office, 1951)

United States Department of Labor, Bureau of Employment Security Job Guide For Young Workers. (Washington: Government Printing Office, 1958)

United States Department of Labor: U. S. Department of Health, Education and Welfare, Office of Education; and U. S. Department of Defense, National Stay-in-School Campaign. (Washington: Superintendent of Documents, Government Printing Office, 1957)

United States Department of Labor, Bureau of Labor Statistics, Occupational Outlook Handbook. (Washington: Government Printing Office, Bulletin No. 1255, 1959)



- United States Department of Labor, Bureau of Labor Standards, Young Workers Under 18, Today and Tomorrow. (Washington: Government Printing Office, 1958)
- United States Office of Education, State Legislation on School Attendance. (Washington: Government Printing Office, 1959)
- United States Office of Education, Federal Security Agency, Why Do Boys and Girls Drop Out of School, and What Can We Do About It? (Washington: Superintendent of Documents, Government Printing Office, Circular No. 269, 1950)
- United States Navy, Stay In School. (Washington: U. S. Navy, Local Recruiting Service, 1951)
- L. A. VanDyke and K. B. Hoyt, The Dropout Problem in Iowa High Schools. (Iowa City: State University of Iowa, College of Education in Cooperation with U. S. Office of Education, 1958)
- Warner, Havighurst and Loeb, Who Shall Be Educated? (New York: Harper Brothers, 1944)
- Doron Warren, "Who Are Most Likely To Drop Out?" School Science and Mathematics, 54:185, March, 1954.
- Bettina Weary, School Retention - Selected List of References. (Washington: Department of Health, Education and Welfare, Office of Education, September, 1958)
- Morris Williams, "What Are the Schools Doing About School Leavers?" National Association of Secondary School Principals Bulletin, 37:54, April, 1953.
- C. C. Wills, Jr., "Program To Decrease the Number of Early School Leavers," National Association of Secondary School Principals Bulletin, 40:93, September, 1957.
- Alan B. Wilson, "Residential Segregation of Social Classes and Aspirations of High School Boys," American Sociological Review, 24:836, December, 1959.
- Seymour L. Wolfbein, "Education and Employment," The Nation's Children, 2:138, 1960.
- S. L. Wolfbein, "Transition From School to Work: A Study of the School Leaver," Personnel and Guidance Journal,





38:98, October, 1959.

Wilford Woody and C. L. Cushman, "A Study of Continuance and Discontinuance," Journal of Educational Research, 30:183, November 1936.

Grace S. Wright, "High School Attendance and Family Income," School Life, 29:7, June, 1947.

Wendell W. Wright and Christian W. Jung, Why Capable High School Students Do Not Continue Their Schooling. (Indiana University, Division of Research and Field Services in Cooperation with U. S. Office of Education)

J. M. Young, "Can Counseling Reduce Dropouts?" Clearing House, 30:22, September, 1956.

J. M. Young, "Lost, Strayed, or Stolen," Clearing House, 29:89, October 1954.



APPENDIX A

Occupational Aspiration Scale

Relationships Between Me and My Parents

Future Educational Plans



## OCCUPATIONAL ASPIRATION SCALE

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by Archie O. Haller

Form Y \_\_\_\_\_

YOUR NAME: \_\_\_\_\_ School \_\_\_\_\_ Grade \_\_\_\_\_

INSTRUCTIONS: This set of eight questions concerns your feelings about different kinds of jobs. Each one asks you to choose ONE job out of ten presented. This is not a test. There are no right or wrong answers except what is right or wrong for YOU.

Indicate your choice by marking an X in the square next to the job.

Read each question CAREFULLY. They are all DIFFERENT.

Answer each one the best you can. DO NOT OMIT ANY.

Be sure your name is on the top of this page.

QUESTION 1: Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU CAN GET when your SCHOOLING IS OVER?

- |     |                          |  |
|-----|--------------------------|--|
| 1.1 | <input type="checkbox"/> | Owner of a factory that employs about 100 people |
| 1.2 | <input type="checkbox"/> | Playground director                              |
| 1.3 | <input type="checkbox"/> | Dentist  |
| 1.4 | <input type="checkbox"/> | Lumberjack                                       |
| 1.5 | <input type="checkbox"/> | Scientist  |
| 1.6 | <input type="checkbox"/> | Shoeshiner                                       |
| 1.7 | <input type="checkbox"/> | Public school teacher                            |
| 1.8 | <input type="checkbox"/> | Owner-operator of a lunch stand                  |



1.9 ☐ Trained machinist

1.10 ☐ Dock worker

QUESTION 2: Of the jobs listed in this question, which ONE would you choose if you were FREE TO CHOOSE ANY of them you wished when your SCHOOLING IS OVER?

2.1 ☐ Member of the board of directors of a large corporation

2.2 ☐ Undertaker

2.3 ☐ Banker

2.4 ☐ Machine operator in a factory

2.5 ☐ Physician (doctor)

2.6 ☐ Clothes presser in a laundry

2.7 ☐ Accountant for a large business

2.8 ☐ Railroad conductor

2.9 ☐ Railroad engineer

2.10 ☐ Singer in a night club

QUESTION 3: Of the jobs listed in this question which is the BEST ONE you are REALLY SURE YOU CAN GET when your SCHOOLING IS OVER?

3.1 ☐ Nuclear physicist

3.2 ☐ Reporter for a daily newspaper

3.3 ☐ County judge

3.4 ☐ Barber

3.5 ☐ State governor

3.6 ☐ Soda fountain clerk

3.7 ☐ Biologist

3.8 ☐ Mail carrier





3.9 ☐ Official of an international labor union

3.10 ☐ Farm Hand

QUESTION 4: Of the jobs listed in this question, which ONE would you choose if you were FREE TO CHOOSE ANY of them you wished when your schooling is OVER?

4.1 ☐ Psychologist

4.2 ☐ Manager of a small store in a city

4.3 ☐ Head of a department in state government

4.4 ☐ Clerk in a store

4.5 ☐ Cabinet member in the federal government

4.6 ☐ Janitor

4.7 ☐ Musician in a symphony orchestra

4.8 ☐ Carpenter

4.9 ☐ Radio announcer

4.10 ☐ Coal miner

QUESTION 5: Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU CAN HAVE by the time you are 30 YEARS OLD?

5.1 ☐ Civil engineer

5.2 ☐ Bookkeeper

5.3 ☐ Minister or Priest

5.4 ☐ Streetcar motorman or city bus driver

5.5 ☐ Diplomat in the United States Foreign Service



- 5.6 ☐ Share cropper (One who owns no livestock or farm machinery, and does not manage the farm)
- 5.7 ☐ Author of novels
- 5.8 ☐ Plumber
- 5.9 ☐ Newspaper columnist
- 5.10 ☐ Taxi driver

QUESTION 6: Of the jobs listed in this question, which ONE would you choose to have when you are 30 YEARS OLD, if you were FREE TO HAVE ANY of them you wished?

- 6.1 ☐ Airline pilot
- 6.2 ☐ Insurance agent
- 6.3 ☐ Architect
- 6.4 ☐ Milk route man
- 6.5 ☐ Mayor of a large city
- 6.6 ☐ Garbage collector
- 6.7 ☐ Captain in the army
- 6.8 ☐ Garage mechanic
- 6.9 ☐ Owner-operator of a printing shop
- 6.10 ☐ Railroad section hand

QUESTION 7: Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU CAN HAVE by the time you are 30 YEARS OLD?

- 7.1 ☐ Artist who paints pictures that are exhibited in galleries
- 7.2 ☐ Traveling salesman for a whole-sale concern
- 7.3 ☐ Chemist



- |      |                          |                                 |
|------|--------------------------|---------------------------------|
| 7.4  | <input type="checkbox"/> | Truck driver                    |
| 7.5  | <input type="checkbox"/> | College professor               |
| 7.6  | <input type="checkbox"/> | Street sweeper                  |
| 7.7  | <input type="checkbox"/> | Building contractor             |
| 7.8  | <input type="checkbox"/> | Local official of a labor union |
| 7.9  | <input type="checkbox"/> | Electrician                     |
| 7.10 | <input type="checkbox"/> | Restaurant waiter               |

QUESTION 8: Of the jobs listed in this question, which ONE would you choose to have when you are 30 YEARS OLD, if you were FREE TO HAVE ANY of them you wished?

- |      |                          |  |
|------|--------------------------|--|
| 8.1  | <input type="checkbox"/> | Lawyer                                   |
| 8.2  | <input type="checkbox"/> | Welfare worker for a city government     |
| 8.3  | <input type="checkbox"/> | United States representative in Congress |
| 8.4  | <input type="checkbox"/> | Corporal in the Army                     |
| 8.5  | <input type="checkbox"/> | United States Supreme Court Justice      |
| 8.6  | <input type="checkbox"/> | Night watchman                           |
| 8.7  | <input type="checkbox"/> | Sociologist                              |
| 8.8  | <input type="checkbox"/> | Policeman                                |
| 8.9  | <input type="checkbox"/> | County agricultural agent                |
| 8.10 | <input type="checkbox"/> | Filling station attendant                |

---

DO NOT WRITE BELOW THIS LINE



$$R - ES = \underline{\hspace{2cm}} 1+3 \text{ (A)}$$

$$ES = \underline{\hspace{2cm}} (A+B)$$

$$I - ES = \underline{\hspace{2cm}} 2+4 \text{ (B)}$$

$$30 = \underline{\hspace{2cm}} (C+D)$$

$$R - 30 = \underline{\hspace{2cm}} 5+7 \text{ (C)}$$

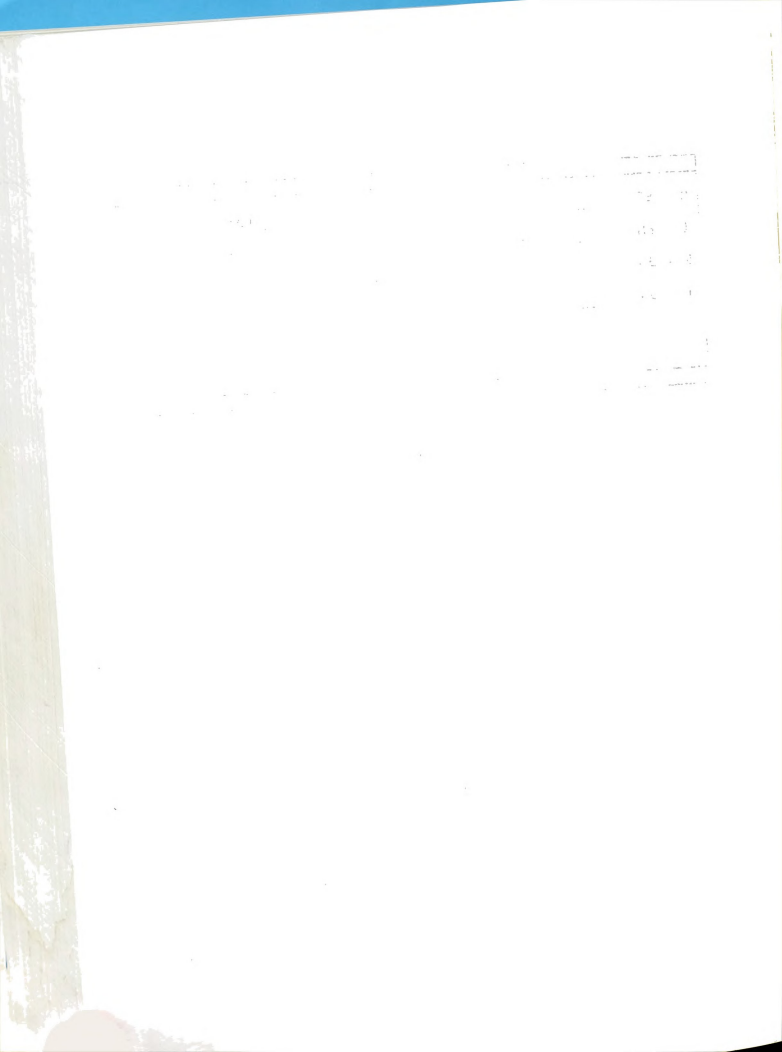
$$R = \underline{\hspace{2cm}} (A+C)$$

$$I - 30 = \underline{\hspace{2cm}} 6+8 \text{ (D)}$$

$$I = \underline{\hspace{2cm}} (B+D)$$

$$\text{TOTAL OAS SCORE } \underline{\hspace{2cm}} (R+I)$$





## ABOUT ME AND MY PARENTS

## 1. AS TO CONTINUING MY EDUCATION BEYOND HIGH SCHOOL MY FATHER:

- ( ) has strongly encouraged me to continue.
- ( ) has given me some encouragement to continue.
- ( ) has never said much about it.
- ( ) feels that I would be better off going to work after high school.
- ( ) feels that I should quit high school and go to work.

## 2. AS TO CONTINUING MY EDUCATION BEYOND HIGH SCHOOL MY MOTHER:

- ( ) has strongly encouraged me to continue.
- ( ) has given me some encouragement to continue.
- ( ) has never said much about it.
- ( ) feels that I would be better off going to work after high school.
- ( ) feels that I should quit high school and go to work.

## 3. AS TO THE KIND OF JOB I GO INTO, MY FATHER:

- ( ) wants me to have a very important job.
- ( ) wants me to have a job that is quite a bit better than most jobs around here.
- ( ) wants me to have a job that is a little bit better than most jobs around here.
- ( ) feels that the job I take should be as good as most jobs around here.
- ( ) does not care how good the job I go into is.

## 4. AS TO THE KIND OF JOB I GO INTO, MY MOTHER:

- ( ) wants me to have a very important job.
- ( ) wants me to have a job that is quite a bit better than most jobs around here.
- ( ) wants me to have a job that is a little bit better than most jobs around here.
- ( ) feels that the job I take should be as good as most jobs around here.
- ( ) does not care how good the job I go into is.

5. My father's occupation is \_\_\_\_\_  
(Please specify type of work, not place, i.e., Lawyer, dispatcher for trucking firm, sweeper, tool and die maker, etc.)6. In school, my mother finished - ( ) less than 8th grade  
( ) 8th grade



(check one)

- ☐ 9th through 11th grade
- ☐ high school graduate
- ☐ some college
- ☐ college graduate

7. In school, my father finished -

- ☐ less than 8th grade
- ☐ 8th grade
- ☐ 9th through 11th grade
- ☐ high school graduate
- ☐ some college
- ☐ college graduate



## My Educational Plans

Name \_\_\_\_\_ Grade \_\_\_\_\_  
School \_\_\_\_\_

As far as I know now, my plans for schooling are as follows:

- ( ) I intend to get additional training beyond college graduation
- ( ) I intend to graduate from college
- ( ) I intend to go to college for 3 or 4 years
- ( ) I intend to go to college for 1 or 2 years
- ( ) I intend to graduate from high school and get a job
- ( ) I do not intend to graduate from high school



## APPENDIX B

Scoring Keys For:

Occupational Aspiration Scale

About Me and My Parents

My Educational Plans

Conversion Tables - DAT Percentiles to T-Scores

Age Conversion Tables





## Occupational Aspiration Scale

Scoring Instructions

All eight Questions are scored the same.

There are ten alternatives for each question, and only one alternative may be checked.

The scores for each alternative are as follows:

<u>Alternative</u>	<u>Score</u>
1	7
2	4
3	8
4	2
5	9
6	0
7	6
8	3
9	5
10	1

The total score is the sum of the scores for each of the eight questions.

1. AS

(4)

(3)

(2)

(1)

(0)

2. AS

(4)

(3)

(2)

(1)

(0)

3. AS

(4)

(3)

(2)

(1)

(0)

4. A

(4)

(3)

(2)

(1)

(0)

5.

6.

## ABOUT ME AND MY PARENTS

## 1. AS TO CONTINUING MY EDUCATION BEYOND HIGH SCHOOL MY FATHER:

- (4) has strongly encouraged me to continue.
- (3) has given me some encouragement to continue.
- (2) has never said much about it.
- (1) feels that I would be better off going to work after high school.
- (0) feels that I should quit high school and go to work.

## 2. AS TO CONTINUING MY EDUCATION BEYOND HIGH SCHOOL MY MOTHER:

- (4) has strongly encouraged me to continue.
- (3) has given me some encouragement to continue.
- (2) has never said much about it.
- (1) feels that I would be better off going to work after high school.
- (0) feels that I should quit high school and go to work.

## 3. AS TO THE KIND OF JOB I GO INTO, MY FATHER:

- (4) wants me to have a very important job.
- (3) wants me to have a job that is quite a bit better than most jobs around here.
- (2) wants me to have a job that is a little bit better than most jobs around here.
- (1) feels that the job I take should be as good as most jobs around here.
- (0) does not care how good the job I go into is.

## 4. AS TO THE KIND OF JOB I GO INTO, MY MOTHER:

- (4) wants me to have a very important job.
- (3) wants me to have a job that is quite a bit better than most jobs around here.
- (2) wants me to have a job that is a little bit better than most jobs around here.
- (1) feels that the job I take should be as good as most jobs around here.
- (0) does not care how good the job I go into is.

5. My father's occupation is \_\_\_\_\_  
(Please specify type of work, not place i.e., Lawyer, dispatcher for trucking firm, sweeper, tool and die maker, etc.)6. In school, my mother finished - (0) less than 8th grade  
(1) 8th grade



- (check one)
- (2) 9th through 11th grade
  - (3) high school graduate
  - (4) some college
  - (5) college graduate

7. In school, my father finished -
- (0) less than 8th grade
  - (1) 8th grade
  - (2) 9th through 11th grade
  - (3) high school graduate
  - (4) some college
  - (5) college graduate

Name \_\_\_\_\_

As

(5) I i  
gra

(4) I i

(3) I i

(2) I i

(1) I f

(0) T d

## My Educational Plans

Name \_\_\_\_\_ Grade \_\_\_\_\_  
School \_\_\_\_\_

As far as I know now, my plans for schooling are as follows:

- (5) I intend to get additional training beyond college graduation
- (4) I intend to graduate from college
- (3) I intend to go to college for 3 or 4 years
- (2) I intend to go to college for 1 or 2 years
- (1) I intend to graduate from high school and get a job
- (0) I do not intend to graduate from high school



## Conversion T

Formula:  $T = 10_z +$ Percentile Z-score

1	-2.33
2	-2.06
3	-1.89
4	-1.76
5	-1.65
6	-1.56
7	-1.48
8	-1.41
9	-1.34
10	-1.28
11	-1.23
12	-1.18
13	-1.13
14	-1.08
15	-1.04
16	-0.99
17	-0.95
18	-0.92
19	-0.88
20	-0.84
21	-0.81
22	-0.77
23	-0.74
24	-0.71
25	-0.68
26	-0.64
27	-0.61
28	-0.58
29	-0.55
30	-0.53
31	-0.51
32	-0.49
33	-0.47
34	-0.45
35	-0.43
36	-0.41
37	-0.39
38	-0.37
39	-0.35
40	-0.33
41	-0.31
42	-0.29

## Conversion Tables - DAT Percentiles to T-Scores

Formula:  $T = 10_z + 50$ 

<u>Percentile</u>	<u>Z-score</u>	<u>x10</u>	<u>+50</u>
1	-2.33	-23.3	26.7
2	-2.06	-20.6	29.4
3	-1.89	-18.9	31.1
4	-1.76	-17.6	32.4
5	-1.65	-16.5	33.5
6	-1.56	-15.6	34.4
7	-1.48	-14.8	35.2
8	-1.41	-14.1	35.9
9	-1.34	-13.4	36.6
10	-1.28	-12.8	37.2
11	-1.23	-12.3	37.7
12	-1.18	-11.8	38.2
13	-1.13	-11.3	38.7
14	-1.08	-10.8	39.2
15	-1.04	-10.4	39.6
16	-0.99	- 9.9	40.1
17	-0.95	- 9.5	40.5
18	-0.92	- 9.2	40.8
19	-0.88	- 8.8	41.2
20	-0.84	- 8.4	41.6
21	-0.81	- 8.1	41.9
22	-0.77	- 7.7	42.3
23	-0.74	- 7.4	42.6
24	-0.71	- 7.1	42.9
25	-0.68	- 6.8	43.2
26	-0.64	- 6.4	43.6
27	-0.61	- 6.1	43.9
28	-0.58	- 5.8	44.2
29	-0.55	- 5.5	44.5
30	-0.52	- 5.2	44.8
31	-0.50	- 5.0	45.0
32	-0.47	- 4.7	45.3
33	-0.44	- 4.4	45.6
34	-0.41	- 4.1	45.9
35	-0.39	- 3.9	46.1
36	-0.36	- 3.6	46.4
37	-0.33	- 3.3	46.7
38	-0.31	- 3.1	46.9
39	-0.28	- 2.8	47.2
40	-0.25	- 2.5	47.5
41	-0.23	- 2.3	47.7
42	-0.20	- 2.0	48.0

Percentile Z-score

43	-0.18
44	-0.15
45	-0.13
46	-0.10
47	-0.08
48	-0.05
49	-0.03
50	0.00
51	0.03
52	0.05
53	0.08
54	0.10
55	0.13
56	0.15
57	0.18
58	0.20
59	0.23
60	0.25
61	0.28
62	0.31
63	0.33
64	0.36
65	0.39
66	0.41
67	0.44
68	0.47
69	0.50
70	0.53
71	0.55
72	0.58
73	0.61
74	0.64
75	0.67
76	0.70
77	0.73
78	0.76
79	0.79
80	0.82
81	0.85
82	0.88
83	0.91
84	0.94
85	0.97
86	1.00
87	1.03
88	1.06
89	1.09

<u>Percentile</u>	<u>Z-score</u>	<u>x10</u>	<u>+50</u>
43	-0.18	- 1.8	48.2
44	-0.15	- 1.5	48.5
45	-0.13	- 1.3	48.7
46	-0.10	- 1.0	49.0
47	-0.08	- 0.8	49.2
48	-0.05	- 0.5	49.5
49	-0.03	- 0.3	49.7
50	0.00	0.0	50.0
51	- .03	0.3	50.3
52	0.05	0.5	50.5
53	0.08	0.8	50.8
54	0.10	1.0	51.0
55	0.13	1.3	51.3
56	0.15	1.5	51.5
57	0.18	1.8	51.8
58	0.20	2.0	52.0
59	0.23	2.3	52.3
60	0.25	2.5	52.5
61	0.28	2.8	52.8
62	0.31	3.1	53.1
63	0.33	3.3	53.3
64	0.36	3.6	53.6
65	0.39	3.9	53.9
66	0.41	4.1	54.1
67	0.44	4.4	54.4
68	0.47	4.7	54.7
69	0.50	5.0	55.0
70	0.52	5.2	55.2
71	0.55	5.5	55.5
72	0.58	5.8	55.8
73	0.61	6.1	56.1
74	0.64	6.4	56.4
75	0.68	6.8	56.8
76	0.71	7.1	57.1
77	0.74	7.4	57.4
78	0.77	7.7	57.7
79	0.81	8.1	58.1
80	0.84	8.4	58.4
81	0.88	8.8	58.8
82	0.92	9.2	59.2
83	0.95	9.5	59.5
84	0.99	9.9	59.9
85	1.04	10.4	60.4
86	1.08	10.8	60.8
87	1.13	11.3	61.3
88	1.18	11.8	61.8
89	1.23	12.3	62.3

Percentile Z-score

90	1.28
91	1.34
92	1.41
93	1.48
94	1.56
95	1.65
96	1.76
97	1.89
98	2.06
99	2.33

<u>Percentile</u>	<u>Z-score</u>	<u>x10</u>	<u>+50</u>
90	1.28	12.8	62.8
91	1.34	13.4	63.4
92	1.41	14.1	64.1
93	1.48	14.8	64.8
94	1.56	15.6	65.6
95	1.65	16.5	66.5
96	1.76	17.6	67.6
97	1.89	18.9	68.9
98	2.06	20.6	70.6
99	2.33	23.3	73.3

AC

For

Month of B

After December 1,  
November 2 to Decem  
October 2 to Novem  
September 2 to Oct  
August 2 to Septem  
July 2 to August 1  
June 2 to July 1,  
May 2 to June 1, 1  
April 2 to May 1,  
March 2 to April 1  
February 2 to Marc  
January 2 to Februa  
December 2, 1961 t

November 2 to Dece  
October 2 to Novem  
September 2 to Oct  
August 2 to Septem  
July 2 to August 1  
June 2 to July 1,  
May 2 to June 1, 1  
April 2 to May 1,  
March 2 to April 1  
February 2 to Marc  
January 2 to Februa  
December 2, 1960 t

November 2 to Dece  
October 2 to Novem  
September 2 to Oct  
August 2 to Septem  
July 2 to August 1  
June 2 to July 1,  
May 2 to June 1,  
April 2 to May 1,  
March 2 to April 1  
February 2 to Mar  
January 2 to Febr  
December 2, 1959

## AGE CONVERSION TABLES

For Use In Coding Birthdates

Month of Birth	Code
After December 1, 1962	00
November 2 to December 1, 1962	01
October 2 to November 1, 1962	02
September 2 to October 1, 1962	03
August 2 to September 1, 1962	04
July 2 to August 1, 1962	05
June 2 to July 1, 1962	06
May 2 to June 1, 1962	07
April 2 to May 1, 1962	08
March 2 to April 1, 1952	09
February 2 to March 1, 1962	10
January 2 to February 1, 1962	11
December 2, 1961 to January 1, 1962	12
November 2 to December 1, 1961	13
October 2 to November 1, 1961	14
September 2 to October 1, 1961	15
August 2 to September 1, 1961	16
July 2 to August 1, 1961	17
June 2 to July 1, 1961	18
May 2 to June 1, 1961	19
April 2 to May 1, 1961	20
March 2 to April 1, 1961	21
February 2 to March 1, 1961	22
January 2 to February 1, 1961	23
December 2, 1960 to January 1, 1961	24
November 2 to December 1, 1960	25
October 2 to November 1, 1960	26
September 2 to October 1, 1960	27
August 2 to September 1, 1960	28
July 2 to August 1, 1960	29
June 2 to July 1, 1960	30
May 2 to June 1, 1960	31
April 2 to May 1, 1960	32
March 2 to April 1, 1960	33
February 2 to March 1, 1960	34
January 2 to February 1, 1960	35
December 2, 1959 to January 1, 1960	36



Month of Bi

November 2 to Decem  
October 2 to Novemb  
September 2 to Octo  
August 2 to Septemb  
July 2 to August 1,  
June 2 to July 1, 1  
May 2 to June 1, 19  
April 2 to May 1, 1  
March 2 to April 1,  
February 2 to March  
January 2 to Februa  
December 2, 1958 to

November 2 to Decem  
October 2 to Novemb  
September 2 to Octo  
August 2 to Septemb  
July 2 to August 1,  
June 2 to July 1, 1  
May 2 to June 1, 1  
April 2 to May 1,  
March 2 to April 1  
February 2 to Marc

Month of Birth	Code
November 2 to December 1, 1959	37
October 2 to November 1, 1959	38
September 2 to October 1, 1959	39
August 2 to September 1, 1959	40
July 2 to August 1, 1959	41
June 2 to July 1, 1959	42
May 2 to June 1, 1959	43
April 2 to May 1, 1959	44
March 2 to April 1, 1959	45
February 2 to March 1, 1959	46
January 2 to February 1, 1959	47
December 2, 1958 to January 1, 1959	48
November 2 to December 1, 1958	49
October 2 to November 1, 1958	50
September 2 to October 1, 1958	51
August 2 to September 1, 1958	52
July 2 to August 1, 1958	53
June 2 to July 1, 1958	54
May 2 to June 1, 1958	55
April 2 to May 1, 1958	56
March 2 to April 1, 1958	57
February 2 to March 1, 1958	58

Correlation Matrix

1. Total
2. Males
3. Female
4. All Dr
5. All St
6. Male I
7. Male S
8. Female
9. Female

Table of mean scores  
sample

Deleted Matrix for

Deleted Matrix for

Among-Groups Matrix

Within-Groups Matrix  
function

Table of standard deviations  
and totals

## APPENDIX C

### Correlation Matrices:

1. Total Group
2. Males
3. Females
4. All Dropouts
5. All Stayins
6. Male Dropouts
7. Male Stayins
8. Female Dropouts
9. Female Stayins

Table of mean scores for the various representations of the sample

Deleted Matrix for use with multiple correlations - Males

Deleted Matrix for use with multiple correlations - Females

Among-Groups Matrix for use with multiple discriminant function

Within-Groups Matrix for use with multiple discriminant function

Table of standard deviations for selected variables by sex and total group

Race (2)  
Sex (3)  
Age (4)

Item 2 1.0  
3 +.08 1.0  
4 +.16 -.15 1.0  
7 -.26 +.08 -.39 1  
8 -.20 -.03 -.23 +  
9 -.25 +.08 -.22 +  
10 -.22 +.04 -.19 +  
11 -.11 +.20 -.30 +  
12 -.02 -.06 -.20 +  
13 -.05 -.03 -.13 +  
14 -.05 +.05 -.18 +  
15 +.04 -.07 -.10  
16 +.12 +.08 -.14  
17 -.06 +.02 -.18  
18 +.09 -.01 -.15  
19 -.01 -.05 -.12  
20 +.03 +.06 -.20  
21 +.01 .00 -.18  
22 -.23 -.04 -.11  
23 -.17 .00 -.18  
24 -.09 -.02 -.08  
25 +.03 +.02 -.19  
26 +.05 +.01 -.13  
27 +.04 +.02 -.17  
28 +.15 -.06 -.02  
29 +.17 -.04 .00  
30 +.17 -.05 -.01  
31 +.13 -.03 -.10  
32 -.20 +.02 -.15  
33 -.15 .00 -.35

Status (33)

**Fa. Occ. SEI (32)**

**Tot. Pt's Asp. (31)**

Tot. Occ. Asp. (30)

**DATA-V (8)**

I.Q. (7)

**ABO (4)**

**Sex (3)**

Race (2)

Item	2	1.0			
	3	+ .08	1.0		
	4	+ .16	- .15	1.0	
	7	- .26	+ .08	- .39	1.0
	8	- .20	- .03	- .23	+ .71 1.0
	9	- .25	+ .08	- .22	+ .63 + .5
	10	- .22	+ .04	- .19	+ .67 + .5
	11	- .11	+ .20	- .30	+ .65 + .5
	12	- .02	- .06	- .20	+ .47 + .4
	13	- .05	- .03	- .13	+ .34 + .3
	14	- .05	+ .05	- .18	+ .39 + .3
	15	+ .04	- .07	- .10	+ .34 + .3
	16	+ .12	+ .08	- .14	+ .27 + .3
	17	- .06	+ .02	- .18	+ .42 + .3
	18	+ .09	- .01	- .15	+ .37 + .3
	19	- .01	- .05	- .12	+ .38 + .3
	20	+ .03	+ .06	- .20	+ .40 + .3
	21	+ .01	.00	- .18	+ .44 + .4
	22	- .23	- .04	- .11	+ .20 + .1
	23	- .17	.00	- .18	+ .19 + .1
	24	- .09	- .02	- .08	+ .14 + .1
	25	+ .03	+ .02	- .19	+ .26 + .1
	26	+ .05	+ .01	- .13	+ .24 + .1
	27	+ .04	+ .02	- .17	+ .27 + .1
	28	+ .15	- .06	- .02	+ .08 + .0
	29	+ .17	- .04	.00	+ .09 + .94 1.0
	30	+ .17	- .05	- .01	+ .09 + .82 + .88 1.0
	31	+ .13	- .03	- .10	+ .20 + .01 + .02 + .09 1.0
	32	- .20	+ .02	- .15	+ .24 + .01 + .02 + .12 + .10 1.0
	33	- .15	.00	- .35	+ .21 + .

Age (1.)  
Sex (3)  
Race (2)

2m 2 1.0  
3 +.01 1.0  
4 +.17 -.00 1.0  
7 -.20 -.00 -.39 1  
8 -.16 -.00 -.30 +  
9 -.18 -.00 -.20 +  
10 -.13 -.00 -.18 +  
11 -.11 .00 -.24 +  
12 -.00 .00 -.25 +  
13 -.09 .00 -.01 +  
14 -.01 .00 -.14 +  
15 .00 .00 -.01 +  
16 +.06 .00 -.01 +  
17 -.06 .00 -.19 +  
18 +.07 .00 -.21 +  
19 -.04 .00 -.15 +  
20 +.04 .00 -.11 +  
21 +.01 .00 -.26 +  
22 -.20 .00 -.17 +  
23 -.25 .00 -.19 +  
24 -.18 .00 -.09 +  
25 -.07 .00 -.23 +  
26 +.05 .00 -.12 +  
27 -.01 .00 -.22 +  
28 +.09 .00 -.05 +  
29 +.10 .00 -.01 +  
30 +.11 .00 -.07 +  
31 +.05 .00 -.06 +  
32 -.19 .00 -.18 +  
33 -.05 .00 -.42

Status (33)

Fa. Ucc. SEI (32)

Tot. Pt's. Asp. (31)

Tot. Occ. Asp. (30)

Mo's Occ. Asp. (29)

I.Q. (7)

$$\text{Age (4)}$$

Sex (3)

Race (2)

item	2	1.0			
3	+.01	1.0			
4	+.17	-.00	1.0		
7	-.20	-.00	-.39	1.0	
8	-.16	-.00	-.30	+.70	1
9	-.18	-.00	-.20	+.59	+
10	-.13	-.00	-.18	+.66	+
11	-.11	.00	-.24	+.65	+
12	-.00	.00	-.25	+.49	+
13	-.09	.00	-.01	+.40	+
14	-.01	.00	-.14	+.45	+
15	.00	.00	-.01	+.38	+
16	+.06	.00	-.01	+.41	+
17	-.06	.00	-.19	+.47	+
18	+.07	.00	-.21	+.43	+
19	-.04	.00	-.15	+.43	+
20	+.04	.00	-.11	+.49	+
21	+.01	.00	-.24	+.46	+
22	-.20	.00	-.17	+.09	+
23	-.25	.00	-.19	+.23	+
24	-.18	.00	-.09	+.19	+
25	-.07	.00	-.23	+.31	+
26	+.05	.00	-.12	+.30	+
27	-.01	.00	-.22	+.30	+
28	+.09	.00	-.05	+.17	+
29	+.10	.00	-.01	+.18	+
30	+.11	.00	-.07	+.14	+
31	+.05	.00	-.06	+.34	+
32	-.19	.00	-.18	+.21	+
33	-.05	.00	-.42	+.19	+



Age (4)  
Sex (3)  
Race (2)

1.0  
2 1.0  
3 .00 1.0  
4 +.20 .00 1.0  
5 -.36 .00 -.31 1.  
6 -.24 .00 -.14 +.  
7 -.35 .00 -.23 +.  
8 -.35 .00 -.21 +.  
9 -.15 .00 -.27 +.  
10 -.03 .00 -.15 +.  
11 +.02 .00 -.13 +.  
12 -.13 .00 -.13 +.  
13 +.09 .00 +.03 +.  
14 +.14 .00 -.06 -.  
15 -.07 .00 -.15 +.  
16 +.14 .00 -.02 +.  
17 +.06 .00 -.04 +.  
18 -.02 .00 -.14 +.  
19 +.03 .00 -.10 +.  
20 -.24 .00 -.08 +.  
21 -.05 .00 -.11 +.  
22 +.04 .00 -.06 +.  
23 +.16 .00 -.10 +.  
24 +.05 .00 -.09 +.  
25 +.12 .00 -.10 +.  
26 +.24 .00 +.03 -.  
27 +.26 .00 +.09 -.  
28 +.26 .00 +.06 -.  
29 +.23 .00 -.01 +.  
30 -.22 .00 -.08 +.  
31 -.27 .00 -.25 +.

Item	Race (2)	Sex (3)	Age (4)	I.Q. (7)	DAI-V (8)	Tot. Occ. Asp. (30)	Tot. Pl's Asp. (31)	Fa. Occ. SEI (32)	Status (33)
2	1.0								
3	.00	1.0							
4	+.20	.00	1.0						
7	-.36	.00	-.31	1.0					
8	-.24	.00	-.14	+.68	1.0				
9	-.35	.00	-.23	+.68	+.5				
10	-.35	.00	-.21	+.69	+.5				
11	-.15	.00	-.27	+.66	+.5				
12	-.03	.00	-.15	+.39	+.4				
13	+.02	.00	-.13	+.28	+.2				
14	-.13	.00	-.13	+.34	+.2				
15	+.09	.00	+.03	+.30	+.3				
16	+.14	.00	-.06	-.01	+.1				
17	-.07	.00	-.15	+.35	+.3				
18	+.14	.00	-.02	+.21	+.3				
19	+.06	.00	-.04	+.33	+.3				
20	-.02	.00	-.14	+.24	+.2				
21	+.03	.00	-.10	+.32	+.3				
22	-.24	.00	-.08	+.28	+.2				
23	-.05	.00	-.11	+.14	+.1				
24	+.04	.00	-.06	+.05	+.0				
25	+.16	.00	-.10	+.14	+.1				
26	+.05	.00	-.09	+.18	+.1				
27	+.12	.00	-.10	+.17	+.1				
28	+.24	.00	+.03	-.05	-.0				
29	+.26	.00	+.09	-.01	-.00				
30	+.26	.00	+.06	-.03	-.096	1.0			
31	+.23	.00	-.01	+.06	+.086	+.90	1.0		
32	-.22	.00	-.08	+.26	+.205	-.02	+.08	1.0	
33	-.27	.00	-.25	+.18	+.107	+.08	+.16	+.14	1.0

Age (4)  
Sex (3)  
Race (2)

Item 2 1.0  
3 +.30 1.0  
4 +.20 -.30 1.0  
7 -.16 +.15 -.47  
8 -.12 -.15 -.36  
9 -.08 +.11 -.24  
10 +.01 +.09 -.21  
11 +.07 +.39 -.29  
12 +.04 +.09 -.09  
13 -.04 -.22 .00  
14 -.30 -.09 -.24  
15 +.08 -.04 -.04  
16 +.12 +.14 -.37  
17 -.22 -.20 -.15  
18 +.15 +.01 -.25  
19 +.03 -.13 -.02  
20 -.10 -.02 -.38  
21 -.04 -.10 -.22  
22 -.20 -.21 -.05  
23 -.15 -.11 -.15  
24 -.23 -.11 -.06  
25 +.01 +.10 -.21  
26 +.06 -.04 -.11  
27 +.04 +.03 -.21  
28 +.19 -.20 +.21  
29 +.27 -.15 +.01  
30 +.26 -.20 +.11  
31 +.21 -.12 -.06  
32 -.23 -.09 -.11  
33



Race (2)

Item 2	1.0
3	+.04
4	+.09
7	-.25
8	-.20
9	-.26
10	-.24
11	-.10
12	+.10
13	-.02
14	+.0
15	+.0
16	+.1
17	.0
18	+.1
19	+.0
20	+.0
21	+.0
22	-.0
23	-.0
24	-.0
25	+.0
26	+.0
27	+.0
28	+.0
29	+.0
30	+.0
31	+.0
32	-.0
33	-.0

		Status (33)		
			Fa. Occ. SEI (32)	
			Tot. Pt's Asp. (31)	
			Tot. Occ. Asp. (30)	
			Mo's Occ. Asp. (29)	
		I.Q. (7)		
		Age (4)		
		Sex (3)		
		Race (2)		
Item 2	1.0			
3	+ .04 1.0			
4	+ .09 - .13 1.0			
7	- .25 + .07 - .33 1.0			
8	- .20 - .01 - .17 + .71			
9	- .26 + .08 - .17 + .61			
10	- .24 + .04 - .13 + .67			
11	- .10 + .18 - .22 + .64			
12	+ .10 - .08 - .15 + .46			
13	- .02 .00 - .09 + .35			
14	+ .02 + .07 - .10 + .38			
15	+ .05 - .07 - .07 + .37			
16	+ .15 + .07 - .02 + .24			
17	.00 + .04 - .12 + .43			
18	+ .12 - .01 - .06 + .38			
19	+ .02 - .04 - .09 + .41			
20	+ .09 + .08 - .08 + .38			
21	+ .06 + .02 - .10 + .45			
22	- .23 - .02 - .11 + .20			
23	- .15 + .02 - .14 + .18			
24	- .04 - .01 - .03 + .12			
25	+ .06 .00 - .12 + .22			
26	+ .09 + .03 - .04 + .16			
27	+ .08 + .01 - .09 + .21			
28	+ .15 - .04 - .08 + .14			
29	+ .15 - .02 - .01 + .12			1.0
30	+ .16 - .03 - .05 + .14			+ .95 1.0
31	+ .15 - .02 - .07 + .20			+ .84 + .90 1.0
32	- .19 + .03 - .13 + .22			.00 + .02 + .09 1.0
33				

Sex (3)  
Race (2)

Item	2	1.0
3	.00	1.0
4	+.47	.00
7	-.30	.00
8	-.15	.00
9	+.03	.00
10	+.09	.00
11	-.24	.00
12	+.04	.00
13	-.04	.00
14	-.25	.00
15	-.10	.00
16	+.11	.00
17	-.18	.00
18	-.01	.00
19	-.08	.00
20	-.09	.00
21	-.10	.00
22	-.06	.00
23	-.35	.00
24	-.39	.00
25	-.09	.00
26	+.13	.00
27	+.03	.00
28	+.14	.00
29	+.12	.00
30	+.16	.00
31	+.14	.00
32	-.15	.00
33		

		Mo's Occ. Asp. (29)		Tot. Occ. Asp. (30)		Tot. Pt's Asp. (31)		Pa. Occ. SEI (32)		Status (33)	
Item											
2	1.0										
3	.00	1.0									
4	+.47	.00	1.0								
7	-.30	.00	-.53	1.0							
8	-.15	.00	-.58	+.72	1						
9	+.03	.00	-.15	+.72	+						
10	+.09	.00	-.22	+.57	+						
11	-.24	.00	-.14	+.49	+						
12	+.04	.00	-.21	+.44	+						
13	-.04	.00	+.05	.00							
14	-.25	.00	-.37	+.43							
15	-.10	.00	-.07	+.04							
16	+.11	.00	-.46	+.37							
17	-.18	.00	-.18	+.26							
18	-.01	.00	-.30	+.23							
19	-.08	.00	-.01	+.02							
20	-.09	.00	-.51	+.50							
21	-.10	.00	-.26	+.26							
22	-.06	.00	-.24	+.12							
23	-.35	.00	-.25	+.09							
24	-.39	.00	-.18	+.17							
25	-.09	.00	-.28	+.47							
26	+.13	.00	-.25	+.57							
27	+.03	.00	-.30	+.58							
28	+.14	.00	+.23	-.47							
29	+.12	.00	-.12	-.15							
30	+.16	.00	+.07	-.38							
31	+.14	.00	-.20	-.23							
32	-.15	.00	-.18	+.32							
33											

.0  
.81 1.0  
+.59 +.55 1.0  
+.22 -.19 -.22 1.0



Age (4)  
Sex (3)  
Race (2)

Item 2	1.0	
3	.00	1.0
4	+.08	.00 1.0
7	-.17	.00 -.34
8	-.16	.00 -.21
9	-.21	.00 -.16
10	-.16	.00 -.10
11	-.08	.00 -.20
12	+.01	.00 -.16
13	-.10	.00 -.14
14	+.04	.00 -.11
15	+.05	.00 -.16
16	+.11	.00 -.02
17	-.03	.00 -.16
18	+.10	.00 -.11
19	-.02	.00 -.17
20	+.09	.00 -.08
21	+.03	.00 -.14
22	-.23	.00 -.14
23	-.22	.00 -.17
24	-.14	.00 -.03
25	-.05	.00 -.13
26	+.04	.00 -.03
27	.00	.00 -.09
28	+.08	.00 -.14
29	+.11	.00 -.05
30	+.10	.00 -.10
31	+.06	.00 -.12
32	-.20	.00 -.17
33	.00	1.0

[illegible]

Age (4)  
Sex (3)  
Race (2)

2	1.0		
3	.00	1.0	
4	+.13	.00	1.0
7	-.13	.00	-.2
8	.00	.00	-.0
9	+.28	.00	-.3
10	-.16	.00	-.1
11	+.10	.00	-.3
12	-.01	.00	+.1
13	+.15	.00	-.4
14	-.36	.00	-.1
15	+.51	.00	-.0
16	+.05	.00	-.1
17	-.19	.00	-.3
18	+.48	.00	-.1
19	+.40	.00	-.2
20	-.13	.00	-.1
21	+.16	.00	-.28
22	-.22	.00	.00
23	+.18	.00	-.0
24	+.05	.00	.00
25	+.07	.00	.00
26	+.01	.00	+.02
27	+.04	.00	+.02
28	+.39	.00	+.15
29	+.56	.00	+.17
30	+.48	.00	+.16
31	+.36	.00	+.12
32	-.32	.00	-.06
33			

Fa. Ccc. SEI (32)

Tot. Pt's Asp. (31)

Tot. Occ. Asp. (30)

Mo'g Occ. Asp. (29)  
DAT-V (8)

I.Q. (7)

$$A_{\mathcal{B}e}(4)$$

Sex (3)

Race (2)

Item	2	1.0			
3	.00	1.0			
4	+.13	.00	1.0		
7	-.13	.00	-.22	1.0	
8	.00	.00	-.07	+.65	1.0
9	-.28	.00	-.34	+.63	+.4
10	-.16	.00	-.14	+.74	+.3
11	+.10	.00	-.30	+.53	+.4
12	-.01	.00	+.14	-.05	+.1
13	+.15	.00	-.46	+.33	+.2
14	-.36	.00	-.10	-.15	-.1
15	+.51	.00	-.02	+.16	+.2
16	+.05	.00	-.11	+.12	+.1
17	-.19	.00	-.33	+.07	+.0
18	+.48	.00	-.13	-.03	+.0
19	+.40	.00	-.27	+.29	+.3
20	-.13	.00	-.17	-.22	-.2
21	+.16	.00	-.28	+.03	+.0
22	-.22	.00	.00	+.17	+.5
23	+.18	.00	-.04	+.13	-.1
24	+.05	.00	.00	-.13	-.3
25	+.07	.00	.00	-.25	-.3
26	+.01	.00	+.02	+.16	-.1
27	+.04	.00	+.02	-.04	-.2
28	+.39	.00	+.15	-.23	-.1
29	+.56	.00	+.17	-.16	+.0
30	+.48	.00	+.16	-.20	-.0
31	+.36	.00	+.12	-.16	-.1
32	-.32	.00	-.06	+.31	+.4
33					

Sex (3)  
Race (2)

Item 2	1.0	
3	.00	1.0
4	+.14	.0
7	-.37	.0
8	-.25	.0
9	-.34	.0
10	-.36	.0
11	-.15	.0
12	+.02	.0
13	+.11	.0
14	-.01	.0
15	+.06	.0
16	+.23	.0
17	+.05	.0
18	+.15	.0
19	+.09	.0
20	+.10	.0
21	+.11	.0
22	-.22	.0
23	-.04	.0
24	+.10	.0
25	+.24	.0
26	+.15	.0
27	+.22	.0
28	+.26	.0
29	+.23	.0
30	+.25	.0
31	+.27	.0
32	-.18	.0
33		



Total Group  
N=355

All Males  
N=219

All Females  
N=136

All Dropouts  
N=44

All Stayins  
N=311

Male Dropouts  
N=27

Male Stayins  
N=192

Female Dropouts  
N=17

Female Stayins  
N=119

	Age	Pa's Occ. Asp.	Mo's Occ. Asp.	Tot. Occ. Asp.	Tot. Pt's Asp.	Pa. Occ. SEI
Total Group N=355	21 4	2.5	2.6	5.0	11.4	36.3
All Males N=219	22 3	2.5	2.6	5.1	11.6	35.6
All Females N=136	19 4	2.4	2.5	4.9	11.3	36.9
All Dropouts N=44	28 4	2.4	2.5	4.9	10.3	30.8
All Stayins N=311	20 5	2.5	2.6	5.1	11.5	37.1
Male Dropouts N=27	31 3	2.6	2.7	5.3	10.6	32.0
Male Stayins N=192	20 5	2.5	2.6	5.1	11.6	36.5
Female Dropouts N=17	23 5	2.1	2.3	4.4	9.8	28.8
Female Stayins N=119	19 5	2.4	2.5	5.0	11.5	38.0



1. Race	+100
2. Age	-03
3. IQ	-02
4. DAT - VR	-02
5. DAT - AR	-01
6. DAT - NR	-02
7. GPA	-02
8. Ed Plans	-02
9. Total CAS	-01
10. Mo's Ed.	-00
11. Fa's Ed.	-02
12. Fa's Ed. Asp.	-01
13. Mo's Ed. Asp.	-01
14. SEI (Duncan)	-01

1. Race	+
2. Age	+
3. IQ	+
4. DAT - VR	+
5. DAT - AR	+
6. DAT - NR	+
7. GPA	+
8. Ed Plans	+
9. Total CAS	+
10. Mo's Ed.	+
11. Fa's Ed.	+
12. Fa's Ed. Asp.	+
13. Mo's Ed. Asp.	+
14. SEI (Duncan)	+

	1	6	7
1. Race	+1000000000	059500	-0252951500
2. Age	-0388362600	397900	+0490047700
3. IQ	-0296444400	790500	+0435944400
4. DAT - VR	-0201100900	789100	+0340257900
5. DAT - AR	-0177353500	797800	+0493375200
6. DAT - NR	-0238059500	000000	+0459043000
7. GPA	-0252951500	043000	+1000000000
8. Ed Plans	-0235425400	649400	+0642778100
9. Total OAS	-0192912300	151000	+0298348100
10. Mo's Ed.	-0087748000	528400	+0289115000
11. Fa's Ed.	-0228111400	896300	+0461276600
12. Fa's Ed. Asp.	-0115931900	714100	+0425939700
13. Mo's Ed. Asp.	-0184617000	020500	+0271943300
14. SEI (Duncan)	-0423755500	990000	+0262492500

	8	13	14
1. Race	-0235425400	617000	-0423755500
2. Age	+0459032000	189100	+0185847100
3. IQ	+0456011500	555900	+0123046000
4. DAT - VR	+0328559200	850000	+0166108500
5. DAT - AR	+0465643500	879800	+0183550300
6. DAT - NR	+0464649400	020500	+0260990000
7. GPA	+0642778100	943300	+0262492500
8. Ed Plans	+1000000000	303500	+0191621900
9. Total OAS	+0204302200	854600	+0084724500
10. Mo's Ed.	+0279571300	296000	+0096170500
11. Fa's Ed.	+0364342900	589600	+0199160200
12. Fa's Ed. Asp.	+0272816500	123500	+0123853800
13. Mo's Ed. Asp.	+0314303500	000000	+0081460900
14. SEI (Duncan)	+0191621900	460900	+1000000000

1. Race
2. Age
3. IQ
4. DAT - VR
5. DAT - AR
6. DAT - NR
7. GPA
8. Ed Plans
9. Total CAS
10. Mo's Ed.
11. Fa's Ed.
12. Fa's Ed.
13. Mo's Ed.
14. SEI (Dunce

1. Race
2. Age
3. IQ
4. DAT - VR
5. DAT - AR
6. DAT - NR
7. GPA
8. Ed Plans
9. Total OAI
10. Mo's Ed.
11. Fa's Ed.
12. Fa's Ed.
13. Mo's Ed.
14. SEI (Dun

	1	6	7
1. Race	+1000000000	250300	-0145048900
2. Age	-0306246400	943200	+0387761400
3. IQ	-0141982200	647700	+0416971200
4. DAT - VR	-0228238000	943500	+0276627100
5. DAT - AR	-0207567600	283700	+0250687400
6. DAT - NR	-0269250300	0000000	+0495318200
7. GPA	-0145048900	318200	+1000000000
8. Ed Plans	-0103807700	038000	+0613518100
9. Total OAS	-0106867300	753600	+0266880200
10. Mo's Ed.	-0056241700	356100	+0285764000
11. Fa's Ed.	-0095321400	413700	+0520351200
12. Fa's Ed. Asp.	-0089025100	3710600	+0475731500
13. Mo's Ed. Asp.	-0078845300	2082200	+0392648100
14. SEI (Duncan)	-0254732200	014900	+0139630000

	8	13	14
1. Race	-0103807700	78845300	-0254732200
2. Age	+0324551400	8322400	+0176511700
3. IQ	+0361037700	2451900	+0183214100
4. DAT - VR	+0231018900	21968600	+0150886100
5. DAT - AR	+0188231700	6389500	+0150091300
6. DAT - NR	+0454038000	2082200	+0197014900
7. GPA	+0613518100	2648100	+0139630000
8. Ed Plans	+1000000000	28982500	+0279505700
9. Total OAS	+0214031000	25967800	+0209815200
10. Mo's Ed.	+0221471300	4435900	+0173171100
11. Fa's Ed.	+0366727800	7873400	+0136057300
12. Fa's Ed. Asp.	+0448413800	81845600	+0239532600
13. Mo's Ed. Asp.	+0298982500	00000000	+0141738900
14. SEI (Duncan)	+0279505700	41738900	+1000000000

1. Race
2. Age
3. IQ
4. DAT -
5. DAT -
6. DAT -
7. GPA
8. Ed Pl
9. Total
10. Mo's
11. Fa's
12. Fa's
13. Mo's
14. SEI (

1. Race
2. Age
3. IQ
4. DAT
5. DAT
6. DAT
7. GPA
8. Ed P
9. Tot
10. Mo's
11. Fa's
12. Fa's
13. Mo's
14. SEI

1

6

7

1. Race	-.000003054002081	-.000000155
2. Age	+.000002312164129	-.000032198
3. IQ	-.000003164154998	+.000029307
4. DAT - VR	-.000002732060956	+.000008318
5. DAT - AR	-.000011418094821	+.000018645
6. DAT - NR	-.000002081088168	+.000015896
7. GPA	-.000000155015896	+.000003393
8. Ed Plans	-.000002181015489	+.000002188
9. Total OAS	-.000004684129742	+.000020433
10. Mo's Ed.	-.000001219008620	+.000001326
11. Fa's Ed.	-.000001040008812	+.000001249
12. Fa's Ed. Asp.	-.000002020010054	+.000001737
13. Mo's Ed. Asp.	-.000002405191609	+.000001641
14. SEI (Duncan)	-.000004061116220	+.000019539

8

13

14

1. Race	-.000002181002405	-.000004061
2. Age	-.000027921017176	-.000191787
3. IQ	+.000026015017162	+.000198279
4. DAT - VR	+.000012869008077	+.000095391
5. DAT - AR	+.000014294010426	+.000125467
6. DAT - NR	+.000015489191609	+.000116220
7. GPA	+.000002188001641	+.000019539
8. Ed Plans	+.000002094000876	+.000019293
9. Total OAS	+.000024686016214	+.000192398
10. Mo's Ed.	+.000000618000119	+.000013538
11. Fa's Ed.	+.000000787000100	+.000013662
12. Fa's Ed. Asp.	+.000001255000386	+.000012728
13. Mo's Ed. Asp.	+.000000876000761	+.000014610
14. SEI (Duncan)	+.000019293014610	+.000183015

1. Race
2. Age
3. IQ
4. DAT - VR
5. DAT - AR
6. DAT - NR
7. GPA
8. Ed Plans
9. Total OAS
10. Mo's Ed.
11. Fa's Ed.
12. Fa's Ed. Asp.
13. Mo's Ed. Asp.
14. SEI (Duncan)

1. Race
2. Age
3. IQ
4. DAT - VR
5. DAT - AR
6. DAT - NR
7. GPA
8. Ed Plans
9. Total OAS
10. Mo's Ed.
11. Fa's Ed.
12. Fa's Ed. Asp.
13. Mo's Ed. Asp.
14. SEI (Duncan)

1

6

7

1. Race	+.000003799	
2. Age	+.000012197	
3. IQ	-.000034146	
4. DAT - VR	-.000017834	
5. DAT - AR	-.000015772	
6. DAT - NR	-.000020387	
7. GPA	-.000000991	+.000027109
8. Ed Plans	+.000000470	+.000020862
9. Total OAS	+.000006427	+.000169297
10. Mo's Ed.	-.000000164	+.000005124
11. Fa's Ed.	-.000000728	+.000004537
12. Fa's Ed. Asp.	+.000000827	+.000005948
13. Mo's Ed. Asp.	+.000001159	+.000005789
14. SEI (Duncan)	-.000047628	+.000142547

8

13

14

1. Race		
2. Age		
3. IQ		
4. DAT - VR		
5. DAT - AR		
6. DAT - NR		
7. GPA		
8. Ed Plans	+.000073432	
9. Total OAS	+.000361430	
10. Mo's Ed.	+.000016163	
11. Fa's Ed.	+.000018536	
12. Fa's Ed. Asp.	+.000022548	
13. Mo's Ed. Asp.	+.000021826	
14. SEI (Duncan)	+.000336389	+.016968743

033031  
4.7249



## TABLE

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Variable

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Race

Age

IQ

DAT - VR

- AR

- NR

GPA

Educ. Plan.

OAS Total

Mo's Educ.

Fa's Educ.

Fa's Ed. A

Mo's Ed. A

SEI

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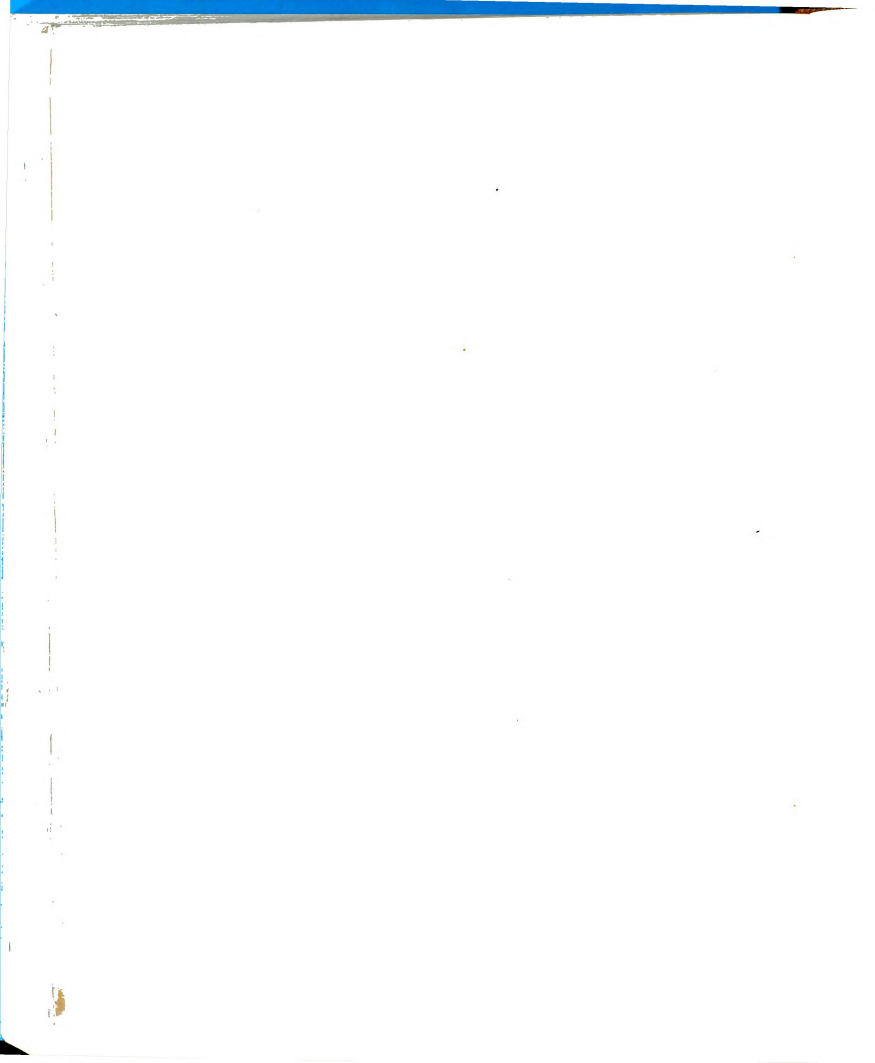
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TABLE OF STANDARD DEVIATIONS FOR SELECTED VARIABLES  
BY SEX AND TOTAL GROUP

Variable	Males	Females	Total Group
Race	.0235	.0373	.1449
Age	8.3362	6.0113	7.6148
IQ	12.7334	12.2965	12.6037
DAT - VR	8.8559	8.9860	8.9091
- AR	9.3277	9.7730	9.5338
- NR	8.3548	9.2785	8.7287
GPA	.9090	.9084	.9269
Educ. Plans	1.4751	1.4560	1.4586
OAS Total	12.4145	10.7287	11.7977
Mo's Educ.	1.1883	1.0911	1.1290
Fa's Educ.	1.3504	1.3033	1.3118
Fa's Ed. Asp.	1.0315	.9669	1.0012
Mo's Ed. Asp.	1.0107	.9126	.9756
SEI	22.2135	21.5878	21.9806









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ROOM USE ONLY

~~AUG 18 1966~~

~~AUG 8 1 1966~~

~~MAY 22 1966~~

~~MAY 15 1964~~

~~MAY 28 1966~~

~~OCT 1 1964~~

33

May 5/20

~~FEB 1 1964~~

~~DEC 1 1964~~

~~JUN 4 1966~~

~~FEB 5 1966~~

~~JUL 1 1966~~

~~MAR 5 1966~~

~~DEC 1 1966~~

~~DEC 1 1966~~

~~OFF 1 1966~~

~~MAY 1 1966~~

~~DEC 1 1966~~

ROOM USE ONLY.

~~MAY 1 1966~~

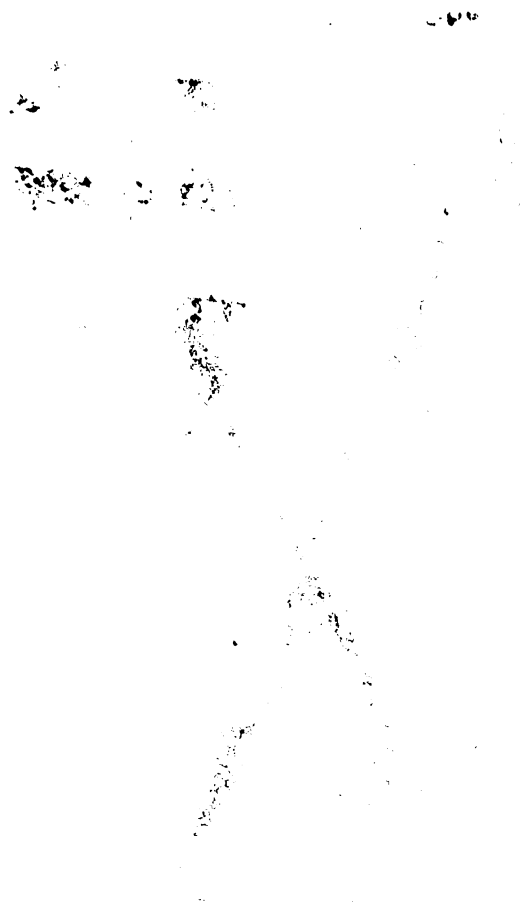
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