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ABSTRACT

Conducted as part of the Vocational Development Study project, this study utilized Path Analysis to develop, evaluate, and modify a model for predicting the stability of early expressed occupational choice of secondary students. Analysis of data from 550 students indicated that none of the 21 student characteristics investigated served as a denominator to separate those students who will express the same occupational choice throughout the secondary years from those who will not. The best indicator of stability of occupational choice throughout high school appeared to be stability of occupational choice from ninth to tenth grades. Of those students who chose the same occupation in both ninth and tenth grades, two thirds of them continued to choose the same occupation at twelfth grade. Several other student characteristics which increase the chances of stability of occupational choice include success in terms of grade point average, enrollment in a vocational curriculum, and vocational maturity. The student's socioeconomic background, sex, or level of occupational choice do not have an effect on stability of occupational choice. (Author/SB)

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THE
PENNSYLVANIA
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DEPARTMENT
OF
VOCATIONAL
EDUCATION



PREDICTING THE STABILITY
OF EXPRESSED OCCUPATIONAL CHOICES
OF SECONDARY STUDENTS

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Pennsylvania Department of Education
Bureau of Vocational, Technical and Continuing Education
Research Coordinating Unit
(Project No. 19-2007)

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✓ Predicting the Stability of Expressed
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May, 1973

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PREFACE

This report is the thirteenth in the series of monographs which have resulted from the Vocational Development Study (VDS) project. The project is designed as a ten-year longitudinal research effort which has as its beginning sample the entire ninth grade class of three large non-metropolitan Pennsylvania school systems. The study is being undertaken by the Department of Vocational Education at The Pennsylvania State University with the support of Pennsylvania's Research Coordinating Unit (RCU) in Vocational Education. The project's main goals are to conduct studies involving the evaluation of vocational programs, the validation of vocational guidance instruments, and the investigation of vocational development theories as they apply to today's youth.

The focus of this rather comprehensive study by O'Reilly is upon the last objective stated above. Specifically, the study attempts to make use of the most advanced statistical methodology available in gaining the maximum information from longitudinal data concerning the phenomena of stability of occupational choice. The main contributions of this study include the application of Path Analysis to longitudinal vocational development data, the findings concerning the degree of stability of occupational choice over the high school years, and the implication these findings have for program development in both Vocational Education and Career Education.

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VDS CAPSULE

~~It is the aim of this section to provide a relatively brief summary~~
of the findings and implications of this study without sacrificing accuracy. It is hoped that the discussion which follows will be of practical value to teachers, counselors, administrators, and other school personnel. It may well be that those school personnel in policy-making positions will find this discussion more helpful than other school personnel. In keeping with the objectives of this section, the following discussion will be as brief as possible.

Rationale for the Study

In order to provide meaningful relevant education for students during the secondary school years, education must be geared to enhance the student's plans for his future. Additionally, since the world we live in is changing at a rapid pace, education should seek to provide a flexible base from which each student can draw the capacities to adapt to the changes he will inevitably face during his lifetime. Especially notable are the continuing changes in the occupational structure.

Throughout their lifetimes, most individuals aspire to many and varied occupations. It would be helpful to educators if they were able to determine when an individual had reached a point in his vocational development that his occupational choice would remain stable. If it were possible to determine when each individual had arrived at this point in his development, we would be able to provide better education

which would be more relevant to the needs of the individual. The aim of this study was to investigate if such a determination is possible.

Findings

The results of this study indicate that no student characteristics, of those investigated, serve as a denominator to separate those students who will express the same occupational choice throughout the secondary years from those who will not. The best indicator of stability of occupational choice throughout high school appears to be stability of occupational choice from ninth to tenth grades. Of those students who chose the same occupation in both ninth and tenth grades, two thirds of them continued to choose the same occupation at twelfth grade. Several other student characteristics increase the chances of stability of occupational choice. Students who are successful in terms of GPA, are enrolled in the Vocational curriculum, and are vocationally mature, are most likely to choose the same occupation throughout high school than their counterparts. It is also important to note that the student's socioeconomic background, sex, or the level of the student's occupational choice do not effect stability of occupational choice.

Implications

1. It appears that stability of occupational choice is largely a product of the environment, circumstances, or personality of the student. It appears that most students are not psychologically prepared to make stable occupational choices during their ninth and tenth years of school. This may, in fact, point to a need for the educational system to provide

activities and experiences during the elementary and junior high school years that are of an exploratory nature. These exploratory activities should be structured so the student gains accurate information about himself as well as difficult occupations. The student should also participate in educational activities which will develop his decision-making capabilities. Armed with information about himself and the world of work and with some experience in making decisions, more students could probably be expected to make stable occupational choices. It is unrealistic to expect stable occupational choices from students if they have only limited information upon which to base their choices.

2. The findings of this study reemphasizes the individuality of students. We have always known that people develop at different rates, but we have not always allowed for individual differences. The findings of this study point to the need for the educational system to allow students to change programs. Inasmuch as is possible, these program changes must be facilitated in a manner which costs the student the least. Certain students may benefit from vocational programs based upon a family of occupations concept, especially those who are experiencing difficulty in narrowing their choice to a specific occupation within a family. Other students may derive the maximum benefit from a program such as Industrial Arts which will allow for further exploration during some portion of, or the entire high school experience. This should not be taken to mean that training for specific occupations should not be offered at the secondary level because some students apparently are ready for such training. The findings of this study merely emphasizes that the educational system must adapt to the needs of the individual not make the individual fit the system.

3. The educational system must develop in students the attitudes and competencies necessary to reenter the system. Those who graduate or otherwise leave the educational environment must be encouraged to return should upgrading or retaining become necessary because of changes in the occupational structure or changes in the individual's occupational choice. Furthermore, it is not enough to pay lip service to such a philosophy. Reeducation programs must be designed to cause the minimum of inconvenience to the returning student. Such programs will probably become increasingly important as technology continues to influence our society.

The findings of this study appear to support the need for an integrated system of education from the elementary school through high school. Such an educational system should make the world of work a central focus of its program. Whether such a system is called Career Education or Education for the World of Work or by any other name, it should prepare the student as well as possible for the day he leaves the rather controlled environment of the school and enters the real world. In order for the student to make the transition as smoothly as possible, his total educational program should be relevant to that real world.

4. The findings of this study cast serious doubts upon the traditional manner in which Vocational Education has been evaluated. If secondary students do not make stable occupational choices, it is unrealistic to judge the total success of Vocational Education upon the criterion of the number of students working in the occupation for which they were trained. This is not to say that this criterion does not have merit for certain applications; however, no other facet of education is

subject to such a narrow evaluation criteria. Granted that Vocational Educators have done much to foster such an evaluative criteria, but the fact remains it is unrealistic given the present educational system. It would not be unlike evaluating the academic education program by the number of academic graduates achieving baccalaureate degrees. Until it can be determined that the majority of students are making stable occupational choices during the early secondary school years, evaluation of Vocational Education's success must be based on other criteria.

ORIGIN AND IMPORTANCE OF THE STUDY

Introduction

It would be difficult, if not impossible, to overstate the effects that technological advances of the last several decades have had upon Western civilization. Especially notable is the dramatic effect of the industrial revolution and the era of technology upon the occupational structure of most societies. Nowhere has the effect of technology been as pronounced as in the United States.

Technology has affected almost all facets of American life, but none as dramatically as the occupational structure. For all practical purposes, occupations such as that of a cooper which were common several decades ago no longer exist. On the other hand, occupations such as those in micro-electronics, which did not exist a decade ago, are now common. Some occupations such as farrier, which declined as a result of technological advances, have recently come back as viable occupations as a result of increased leisure time. Technology has resulted in the fragmentation of tasks which, in turn, has resulted in the creation of more occupations. Thus, as technology eliminates many occupations, it creates others. As the occupational structure is constantly in a state of flux, there are more occupations from which to choose, and there is a good possibility that an individual will work at more than one occupation during his or her lifetime.

A unique characteristic of American society is the freedom of choice afforded to each individual. Although we have not achieved a utopia in which all individuals have complete freedom of choice, the average American probably has more freedom of choice than the average citizen of any other country. "Our intellectual tradition has always held freedom of choice to be a positive value. If there has been any traditional problem of freedom, it has been the problem of attaining the greatest possible freedom from social restraint" (Keniston, 1960, p. 260). A somewhat different point of view is represented by Tyler (1969). She states, "Determination is a fact of life; so is freedom of choice within limits" (p. 28).

The increasing number of occupations and the accompanying freedom of choice have been problematic for many. "Americans have come to experience this freedom [of choice] as at best a mixed blessing and at worst an acute problem; the demand that one choose and make commitments in the face of an enormous variety of socially available options is increasingly felt as a heavy demand" (Keniston, 1960, p. 261). True freedom in terms of occupational choice has really only existed for the average man in the last few decades. Prior to the 1940's, when the United States was still basically an agrarian society, there was limited freedom in choosing one's life work because of the limited number and types of occupations from which one could choose. Sons often followed their father's occupations or sought employment in one of a limited number of industries in the locale in which they were raised. Today, the effects of mobility, technology, urbanism, and more recent suburbanism, have tended to make such an occurrence the exception rather than the rule. A whole new world of occupational choices has been opened to the average person.

In addition to increasing the number of occupations from which to choose, technological advances have had the effect of increasing the educational requirements for most occupations. The majority of jobs which have been eliminated by technology are those which would be categorized as unskilled or semi-skilled. The majority of the occupations created by technology would be classified as at least skilled in nature. At least one overall effect has been an increase in the importance of educational preparation for employment.

Background

As a result of these changes in the occupational structure which have increased emphasis on preemployment education, vocational education has come to be seen by many as an important option in the high school curriculum. This interest in vocational education has been reflected by increasing amounts of federal aid to vocational education and manpower programs. Federal aid to vocational education was approximately 7.2 million dollars in 1917. It had increased to approximately 446 million dollars in 1971 (Burkett, 1971). With this incrementation of federal dollars available to secondary schools to establish vocational programs, more schools have added these types of programs to their curriculum.

The advent of vocational programs has been accompanied by a concomitant push for students to make occupational decisions at, or about, the ninth grade. It is known that these decisions influence the course of the student's life as a result of their practical, if not theoretical, irreversibility (Super, 1960). The knowledge that these decisions are to a large degree irreversible has fostered concern about the propriety

of requiring the student to make them. This point of view is illustrated by Super and Overstreet (1960). "Ninth graders tend to be psychologically ready for vocational exploration, but not for vocational choice; the identification of vocational potential in ninth graders should be designed to help with the making of decisions for vocational exploration rather than decisions of vocational preparation" (p. 109). An opposite viewpoint is represented by McDaniels (1968). He states, "Youth are not too young to choose, only too poorly prepared to make choices. . . . Youth are making choices. The concern is whether the choices are informed ones" (pp. 242 and 244). The importance of making early decisions is emphasized by Marr (1965). She found that early deciders were most likely and able to implement their most desired occupation. This fact is not surprising when one considers the practical irreversibility of most occupational decisions. As an example, it is hard to imagine that a boy who chose a general curriculum in high school, because he had not made an occupational decision, would have much chance to become a medical doctor should he so choose after high school. He would in most cases not have the prerequisites necessary to gain entrance into a pre-med program. In order to implement his post high school "most desired" occupational choice, he would have to be willing to pay the extra price in time and money for supplementary instruction.

All of these factors have combined to increase interest in learning how individuals develop vocationally and how they go about choosing occupations. The pioneering effort in this area was the work of Frank Parsons (1909). His book, Choosing a Vocation, became the basis for a philosophy of vocational guidance known as the trait-factor approach.

The basic premise of this philosophy is that a person's traits could be matched with job requirements, and this process would result in a match which would be beneficial to both the individual and society. This philosophy was the prominent approach to vocational guidance until approximately 1950.

As a result of the work of Ginzberg, Ginsburg, Axelrad and Herma (1950), the choosing of an occupation came to be viewed as a developmental process rather than a choice made at a single point in time. Ginzberg and associates proposed three periods of development, fantasy, tentative, and realistic. This work resulted in a major overhaul of the then current thinking with regard to occupational choice, and was one of the first works to question the validity and wisdom of requiring an occupational decision during early adolescence. These efforts substantiated the importance of an individual's interests, values, and abilities in the decision process.

Then, too, the Career Pattern Study (CPS) initiated by Super in 1951 further established that the choice of an occupation is a developmental process. Super and others (1957) defined two major constructs, self-concept and vocational maturity, as playing major roles in the choice process. A description of the study and its theoretical base was published as Vocational Development: A Framework for Research. Super and his associates also hypothesized developmental life stages somewhat similar to those of Ginzberg and associates. As a result of substudies conducted as a part of the CPS, the making of an occupational decision during early adolescence was again questioned.

As might be expected, there has been some difference of opinion regarding the process of occupational choice. Holland (1966), for example, views the process as one of matching personality type with a compatible occupational environment. His theory is based on the premise that all types of people and environments can be classified into one of six categories. Many other career decision models and theories have been proposed: Roe (1956) proposed a theory based upon early childhood experiences; Hilton (1962) has developed the Complex Information Processing Model based on Festinger's construct of cognitive dissonance; Tiedeman (1961) proposed a decision-making model and defined the various stages in terms of differentiation and integration. These are the main theories and models, and the point is established that only within the last quarter century has the investigation of occupational decision-making and vocational development come of age. None of these theories is perfect and most theorists would agree with Hilton (1962) that, "Career decision-making is an imperfect process at best" (p. 291).

Accompanying these developments within the educational community, there have been recent changes in the public's attitude toward education; these changes have stimulated the current interest in the occupational decision-making process. These changes in attitude are reflected in the public's demand that education be relevant and that educational institutions be accountable. It has become important that educational institutions be able to document benefits to society as a result of public monies spent. The National Advisory Council on Vocational Education in its fifth report (1971) has identified some of the concerns of the

public. In it the Council questions why the educational system is not providing for the needs of

the forty million elementary school children who need career orientation; the seven and one-half million young people who seek employment after graduation; and the seven hundred and fifty thousand high school and college students who drop out each year, virtually all without marketable skills (p. 1).

This increasing demand by the public that educational institutions provide meaningful and beneficial programs for every student and not just those continuing on to college, has spurred educators to develop new concepts for dealing with this problem. Foremost among these concepts is Career Education. The principles and philosophy of Career Education are well described by Hoyt and associates (1972). They state:

Career education is not something which precedes participating in the society but is an integration of learning and doing that merges the worlds of the home, the community, the school, and the work place into a challenging and productive whole. . . . Career education is a total concept which should permeate all education, giving a new centrality to the objective of successful preparation for and development of a life long, productive career (p. 3).

The concept of career education is based on tasks, experiences, and processes which help each individual move toward the formation and achievement of his personal goals. As soon as the individual enters the educational environment, he should be provided with information and experiences which will help him develop decision-making skills. One of the major reasons for developing these decision-making skills is to provide a sound base from which an occupational choice can be made. It is hoped that this process will result in realistic, stable occupational decisions.

All individuals do not develop in exactly the same manner, nor are they ready, willing or capable to make an occupational decision at the

same time. Also, the majority of secondary educational systems in this country do not allow for individual differences. Most schools require all students of a certain age to make an occupational choice and enroll in a corresponding high school curriculum whether they are ready to make that decision or not. The arguments given for continuing such a practice are usually based on economy and expediency. This is an example of false economy in educational practice. Furthermore, it is an example of an attempt to make the individual fit the system rather than making the system fit the individual. The American public is demanding that education be relevant and accountable as opposed to falsely economical or expedient, particularly when that false economy is to the detriment of the individual.

Educators cannot claim that it is economical to continue to educate individuals to enter the ranks of the unemployed. They could take pride in providing for individual differences and providing each individual with a salable skill. It is not economical to train students for an occupation when they will not choose to enter that occupation after completing their education. One of the main philosophical issues which educators need to consider is whether the educational system exists for the benefit of the system. These seem to be some of the questions being asked by the public and enumerated by the National Advisory Council for Vocational Education (1970 and 1971) in its third and fifth reports.

Hopefully, the implementation of the Career Education concept will encourage the educational system to meet the needs of all students and provide for individual differences. If the educational system is to be successful in preparing each student to enter an occupation of his or

her choice, while at the same time allowing for individual differences in terms of when the occupational choice is made, there must be some method for determining when each high school student has reached a point at which his occupational choice will remain stable. If such a system could be devised, not only could individual differences be accommodated, but maximum, realistic economy could be achieved. Then, too, students would no longer be prepared for occupations which they might not be expected to enter. Schmidt and Rothney (1955) state, "It appears that those students who are consistent in specific choices all the way through high school are the most likely to proceed to the chosen vocations" (p. 145).

If it were possible to determine when a student's occupational choice would most likely remain stable, that student could then be channeled into a program which would provide specific skill training for his chosen occupation. This skill training should not exclude the basic educational competencies which would allow for reentry into the educational system for retraining and upgrading should either become desirable or necessary. By providing specific skill training when the student is ready for it, as well as providing the basic education necessary to reenter the educational system, the number of dropouts might well be reduced. We might also reclaim some of those who do drop out. Basically, this is the same system found in most secondary school systems. The only modification required to accommodate those students who have developed stable occupational choices is the provision of a realistic means by which students can leave the educational system and return at a later date.

Major modifications of the educational system will be required to accommodate those students who are not ready to make occupational choices which could be expected to remain stable. These students should be provided with broad exploratory types of experiences rather than specific skill training. This concept would seem to argue for the development of a course which utilized Industrial Arts family shops. In fact, the ideal situation would be one which would allow the student to rotate between family shops as he saw fit. Thus, if a student thought he might be interested in welding as an occupation, his guidance counselor would encourage him to explore that possibility in the metal shop and through occupational information. If after a period of time he decided welding was not really what he thought it to be, he might decide to work in the wood shop and eventually decide that cabinet-making was the occupation which he was suited to and would be interested in pursuing. At this time, he would again consult with his counselor and if it appeared that this occupational choice was likely to remain consistent, he would enter the cabinet-making course. If it was determined that this occupational choice was of a tentative nature, he would be encouraged to either continue his exploratory experience or enroll in a shop in which the general skills of the construction trades, rather than the specific skills of a particular trade, were taught.

Such a system would allow for individual differences and could incorporate many of the current trends in education. Specifically, individualized instruction would be an integral part of such a program. Forms of cooperative education and work-study programs could be used for exploratory purposes as well as for training for specific occupations.

These programs seem to be extremely compatible with the Career Education concept. More importantly, however, these programs would provide relevant education, encourage the system to adjust to the needs of each individual, and be more economical in the long run. Individuals would be educated for employment rather than unemployment. Programs of this type exemplify a situation where a somewhat greater initial investment can prevent the need for costly remedial and supplementary training in the future. This procedure is true economy in practice.

From a conceptual and philosophical standpoint, the implementation of such a program would require a major overhaul of the present educational system. Many of these changes have already been enumerated by the advocates of Career Education. It is important to note that Career Education, and this system specifically, is proposed to benefit all students--not just those who are planning to terminate their formal education after high school. Many school systems have begun to initiate some of the curricular changes necessary to implement the Career Education concept. In order to integrate the procedure advocated in this discussion into the Career Education concept, a method would have to be devised which would provide some indication of the probability that an individual's occupational choice will remain consistent.

Statement of the Problem

One of the more recent efforts in career development research is the Vocational Development Study (VDS) which was initiated by members of the faculty and staff of the Department of Vocational Education at The Pennsylvania State University in 1968. The present study is part

of this continuing effort aimed at exploring the vocational development of individuals. Because of the longitudinal nature of the data, it has been possible to study the effects of various treatments over time.

While this study may be viewed as an extension of the work done by Cooley and Lohnes, it is thought to be an initial effort in terms of the specific methodology used. Super (1969b) points out that Lattice Theory, Markov Chain Theory, and Path Analysis are three new methodologies which may prove useful in developing career models. The present study proposed to utilize Path Analysis for the purpose of building a model for predicting the stability of an early expressed occupational choice of secondary school students. The period over which stability of occupational choice was studied was ninth grade to twelfth grade.

Specifically, the purpose of this study was to:

1. Develop a model for predicting the stability of expressed occupational choice from ninth grade to twelfth grade based upon a review of previous research.
2. Examine the validity and strength of the proposed model.
3. Modify the proposed model in an effort to obtain the best possible model in terms of the existing data.

Additionally, the inter-rater reliability of Roe's (1956) field and level occupational classification scheme was investigated. While this reliability investigation was not directly related to the purpose of the present study, it was deemed to be pertinent since occupational choices were classified according to Roe's classification scheme for the purposes of this study. The specific question to be answered was:

4. What was the degree of relationship between raters using Roe's occupational classification scheme to classify secondary student's expressed occupational choice?

Definition of Terms

To promote clarity, the following terms are defined in terms of their specific connotations applicable to this study.

Aptitudes: "A natural tendency, ability, or talent" (Webster, 1971, p. 27). "Specific capacities and abilities required of an individual in order to learn or perform adequately a task or job duty" (Dictionary of Occupational Titles, 1965, p. 653).

Direct Effect: The amount of deviation in the dependent variable which is directly attributable to fluctuation in the independent variable.

Educational Aspiration: The student's response to the question, "Do you think you will go to college?" during the ninth and tenth grade phase of the study.

Educational Level: "The amount of formal schooling an individual has completed" (Kapes, 1971, p. 17).

Endogenous Variables: The variables to be explained by the theory under consideration (Blalock, 1968). Variables which have predecessors in the model that may be used as both dependent and independent variables.

Exogenous Variables: The variables in the model without predecessors. "Givens in terms of the theory" (Blalock, 1968, p. 163). "Variables which are assumed to be predetermined, the total variation of which is assumed to be caused by variables outside the set under consideration" (Land, 1971, p. 6).

Expressed Occupational Choice: The student's response to the direction, "Print the occupation which you probably will enter," during the ninth and tenth grade phase of the study and the question, "In

reality, what occupation do you expect to enter after you complete all the education you have planned?" during the twelfth grade phase. Crites (1969a) states, "When an individual makes a vocational choice, he considers what his probable occupation will be, not what his possible (preference) or fantasy (aspiration) occupations might be" (p. 133).

Indirect Effect: The amount of variability in the dependent variable which is attributable to fluctuation in one independent variable causing fluctuation in a related independent variable (Land, 1971).

Intervening Variable: A variable which tempers or modifies the effect of one variable on another.

Job Title: The specific name of an occupation. For example: machinist, welder, housewife, or nurse.

Occupational Field: A dimension developed by Roe (1956) for classifying occupations. Eight interest categories are used to define occupational field.

Occupational Level: A dimension based on the amount of training required and degree of responsibility assumed by the worker developed by Roe (1956) for classifying occupations. Roe defines six occupational levels.

Occupational Values: The aspects of an occupation deemed important by an individual in evaluating that occupation. "A set of concepts which mediate between the person's affective orientation and classes of external objects offering similar satisfactions" (Zytowski, 1970, p. 176). Sometimes also referred to as Work Values (Kapes, 1971, p. 17).

Residual Variables: "A variable assumed to be uncorrelated with the set of variables immediately determining the variable under consideration and to have a mean value of zero, is introduced to account

for the variance of the endogenous variable not explained by measured variables" (Land, 1971, p. 6).

Stability of Occupational Choice: The consistency with which the student responds with the same job title to the occupational choice questions at all points in time. Also referred to as Stability of Job Title.

Stability of Occupational Field: The result of the student responding to the occupational choice questions at all points in time with different job titles, but with titles that can be categorized in the same field according to Roe's (1956) classification scheme.

Stability of Occupational Level: The result of the student responding with different job titles to the occupation choice question at all points in time, but with titles that can be categorized in the same level according to Roe's (1956) classification scheme.

Standardized Path Coefficient: The mathematical value which "measures the fraction of the standard deviation of the endogenous variable for which the designated variable is directly responsible in the sense of the fraction which would be found if this factor varies to the same extent as in the observed data while all other variables (including the residual variables) are constant" (Land, 1971, p. 9).

Total Effect: "The concept of the total effect is merely an indication of the aggregate effect of an exogenous variable on an endogenous variable through all possible direct and indirect paths" (Land, 1971, p. 17).

Total Indirect Effect: The sum of all the indirect effects of an exogenous variable through all of the other exogenous variables upon an

endogenous variable (Land, 1971). Mathematically, it is the difference between the total effect and the direct effect.

Vocational Maturity: "The place reached on the continuum of vocational development from exploration to decline" (Super, 1955, p. 152).
"Refers to the maturity of an individual's vocational behavior as indicated by the similarity between his behavior and that of the oldest individuals in his vocational life stage" (Crites, 1961, p. 256).

II

REVIEW OF RELATED LITERATURE

Introduction

In an effort to place this study in perspective and provide support for the general procedure under which this study was conducted, a review of the literature was undertaken. Pertinent literature was reviewed in five categories:

1. Research dealing with Super's theory of vocational development.
2. Literature reflecting different theories of vocational choice.
3. Studies directly investigating the stability of occupational choices of secondary school students.
4. Investigations supporting the validity of the variables and student characteristics used in this study.
5. Literature of an explanatory or supportive nature relating to the methodology used in this study.

A variety of pertinent sources such as books, periodicals, journals, dissertations, and unpublished materials were investigated. Some literature yielded contributions which were significant in more than one category. Rather than reviewing studies in total, only those portions relevant to this study will be discussed.

Research Dealing with Super's Theory of Vocational Development

Those who have investigated the process of vocational development have sometimes come to different conclusions about that process. There

are those who have concluded that it is not a process that is controllable by the individual. On the other hand, many have decided that it is not only a process which can be controlled but one which can be encouraged and enhanced. This study was based on the theory that vocational development is, in fact, a true developmental process. This study further subscribes to the theory that the stages in this developmental process are not constant; that is, that they vary to some degree with the individual in question and that this process can be advanced through proper guidance and experiences.

Probably the best known proponent of the developmental approach to vocational development is Donald Super. With the initiation of the Career Pattern Study (CPS) in 1951, Super began twenty-five years of study designed to trace the vocational development of males. Super proposed two major constructs in his explanation of the developmental process, vocational maturity and self-concept (Super and others, 1957). The importance and development of these constructs in each life stage is the major basis of Super's study.

Although Super proposed that vocational development could be thought of in terms of various life stages, his idea was not unique even at that time. Super drew from and adapted the earlier work of Buehler (1933) and Ginzberg and associates (1950) in delineating his life stages. Buehler (1933) proposed the stages of life as growth, exploration, establishment, and maintenance; Super also proposed these same stages. Of particular interest in this study were the growth and exploration stages although it might be argued that the establishment stage was also of interest. Super hypothesized that the growth stage could generally

be characterized as being from birth to approximately 14 years of age. The exploration stage was proposed to encompass the years from 15 to 24 years of age. Establishment was viewed as being the period from 25 to 44 (Super and others, 1957).

Super (1957) viewed the vocational development process as being an ongoing, continuous, and generally irreversible process which is predictable. These statements are compatible with those made by Ginzberg and associates (1951) in relating the findings of their earlier work. Of specific importance to this study was the concept of vocational development as a continuous and predictable process. When viewed in the light of the constructs of vocational maturity and self-concept, these concepts provided the major theoretical basis for the present study.

Super and Overstreet (1960) dealt with the concept of vocational maturity at length, specifically at the ninth grade level. The authors felt that since vocational maturity was a valid construct, it could provide valuable insight into the vocational development process. In support of this theory, they state, "When the individual is ready to begin vocational planning, he will presumably do so more effectively than when, in terms of his vocational development, he is not yet ready" (Super and Overstreet, 1960, p. 10). Vocational maturity was viewed as one indicator of "readiness" for such planning. Since many decisions must be made by the student at the ninth grade level and these decisions will have far-reaching effects, this seemed to be an important point at which to initially study the concept. Super (1969b) emphasized the apparent validity of the vocational maturity construct and pointed out

that it appears to become more valid as time progresses. Vocational maturity was found to be closely related to the concepts of vocational choice attitudes and competencies with the primary dimension at the ninth grade level being "orientation toward planning for the future." Secondary dimensions were: "anticipation of immediate, intermediate, and remote vocational development tasks" (Crites, 1969a, p. 575). Considerable other research has further substantiated the construct of vocational maturity.

In an effort to measure vocational maturity, Crites (1961) developed a model based on the life stages and developmental tasks as defined by Super and associates (1957). Crites (1961) said vocational maturity can be defined in terms of two "measurable constructs: (1) the degree of vocational development, and (2) the rate of vocational development" (p. 255). He further stated that an individual's absolute degree of vocational maturity can be found by (1) a comparison of his vocational behaviors with those which are typical of the different life stages, and (2) a statement about which life stage he most closely resembles (p. 256). Relative degree of vocational maturity can be defined by comparing an individual's vocational life stage to (1) "chronological age, (2) expected life stage, and (3) the behavior of others" (Crites, 1961, p. 256). On this basis the Vocational Development Inventory (VDI) was constructed to measure vocational maturity. Super (1969b) criticizes the VDI for its use of consistently negative responses which, he points out, "hardly satisfies a logical or psychological definition of maturity" (p. 12). Since Crites VDI was used during the conduct of this study, literature related to it will be reviewed in a later section.

The second major construct proposed by Super and others (1957) was that of the self-concept. They explained that as the individual matures vocationally, he passes through a series of life stages. During these stages his self-concept is continually developing and being clarified. The self-concept is defined as the answer to the question: "What kind of a person am I?" Especially during the adolescent years, a person will tend to describe himself in terms of his interests, aptitudes, aspirations, preferences, and work values. The process of clarifying the self-concept is a developmental process which continues throughout life and is promoted through the processes of modification and adjustment (Super, 1969a). The way an individual perceives himself will have a profound effect on the way he reacts to any given situation.

Super (1969a) emphasized the importance of the construct of self-concept: "Central to a theory of vocational development are the processes of the formation, translation into occupational terms, and implementation of self-concepts" (p. 7). He further stated that the construct of self-concept "may prove to be the overarching theory which will bind various other segments into a cohesive whole" (Super, 1969b, p. 12). The importance of the self-concept, and specifically the development of a correct perception of the self is at the heart of Super's theory.

In describing the development of the self-concept, Super and others (1963) referred to self-percepts as the initial stage of development. "Self-percepts are observed facts, the impression of raw materials of self which the individual received via the several senses" (p. 17). By itself no single self-percept has any meaning. As the individual begins to connect and compare isolated self-percepts they begin to take on

specific meaning. As these self-percepts become meaningful, they evolve into self-concepts. It is important to realize that a person cannot begin to attach meaning to self-percepts as isolates; they have to take on meaning as the individual pictures himself in different roles and situations, or as he interacts with others. After the development of self-concepts from self-percepts, the self-concepts can be categorized according to degree of complexity. Simple self-concepts are defined as "organized, related percepts with accrued meaning" (Super and others, 1963, p. 19). As development proceeds, complex self-concepts emerge. These are a result of the generalization or connection of simple self-concepts with one another. The individual can finally be described in terms of his self-concept system which is the organized network of all his self-concepts.

Of particular importance to this study was that portion of the self-concept system which Super and others (1963) called the vocational self-concept. This is a collection of the simple self-concepts the individual has about his interests, aptitudes, work values, and other attributes he deems to be vocationally relevant. More specifically of interest is the individual's occupational self-concept. The occupational self-concept differs from the vocational self-concept. Occupational self-concept is defined as an individual's statement of how he views himself by identifying with an occupation as he comprehends it. Vocational self-concept is defined as a collection of all the attributes the individual perceives as vocationally relevant. For example, when a person says, "I will be a psychologist," he may be saying, "I am intelligent, healthy, and broad-minded" (Super and others, 1963). From the later discussion, it will

become evident that the accuracy of an individual's perception of himself and of an occupation is very important in the occupational choice process.

Summary of Super's Theory

The developmental approach to vocational development as proposed by Super was based on previous work done by Buehler (1933) and Ginzberg and others (1950). These previous efforts provide the foundation upon which Super's theory was built. Specifically, Super's proposed stages of development, growth, exploration, establishment, maintenance and decline closely resembled those proposed by the previous works. Super's work in the early fifties resulted in the first major revisions in the thinking of vocational counselors since the work of Parsons at the turn of the century.

Super postulated that vocational development is, in fact, a true developmental process which begins at birth and continues through life. He also agreed with Ginzberg and associates that the process is largely irreversible. The theory is based on two major constructs, vocational maturity and self-concept, that provide the key for explaining why individuals develop and act as they do. These two constructs provide the major theoretical basis for the present study.

Literature Reflecting Different Theories of Vocational Choice

Since this study was primarily concerned with predicting the stability of expressed occupational choice, it was felt a review of theories concerning how individuals arrive at those choices would be beneficial. There has been considerable interest in the phenomenon of occupational

choice in recent years. This interest has not been without justification, for as Cribbon (1963) points out, "When one appreciates the fact that the average person is likely to work for approximately 40 hours a week, 50 weeks a year, 45 years of his life--a total of some 90,000 hours--the matter of vocational choice is crucial, indeed" (p. 207).

Roe's Theory

Roe developed a theory of vocational choice based on a study of research scientists. The theory is composed of three major constructs: (1) that early childhood experiences influence vocational choice, (2) that individuals have needs which they seek to satisfy through occupations, and (3) that an individual's genetic make-up influences both his occupational choice and the need hierarchy, or values orientation, he develops. Roe defined two levels of her theory. The first level consists of general statements that are very difficult to test. The second level has been described by Osipow (1968) in terms of three propositions: (1) satisfied needs do not become unconscious motivators, (2) higher-order needs, as classified by Maslow (1954), that are rarely satisfied will disappear, while lower-order needs will become dominant motivators if rarely satisfied, and (3) needs that are satisfied only after delay will become unconscious motivators in some instances.

Roe also proposed four basic patterns of parental attitude concerning child rearing. These are the overprotective parent, the overdemanding parent, the rejecting parent, and the accepting parent. The different patterns of child rearing are hypothesized as being related to different patterns of need gratification. Each style of child rearing will provide

complete, partial or delayed, or no gratification for different needs. Thus, children reared under different patterns will develop different need hierarchies. In choosing a specific type of occupation, the individual is attempting to satisfy the need hierarchy he has developed. Roe noted that while the need hierarchy determines the type of occupation chosen, genetic influences, such as mental ability and manual dexterity, determine the occupation level the individual will choose. It would follow that knowledge of an individual's early childhood and his or her abilities and aptitudes would make it possible to predict the general occupational class he will choose.

Roe's theory, even as revised and updated (Roe and Siegelman, 1964), has not fared well in terms of supportive research. Osipow (1968) concludes, "the evidence is very strong against the likelihood that Roe's theory as originally proposed is an adequate representation of the crucial features of vocational development" (p. 33). Likewise, Crites (1969a) points out that the studies of Roe's theory have had shortcomings and have provided very little support for her hypotheses.

Holland's Theory

Holland (1959) classified all personalities and work environments into six categories: realistic, intellectual, social, conventional, enterprising, and artistic. Holland did not elaborate on the developmental aspects related to these categories. This theory is almost exclusively concerned with the phenomenon of occupational choice. At some point in time, the individual develops an orientation toward one of the categories and this orientation has a direct effect upon his choice.

Holland viewed the matching of personality and environment type as the main factor in the occupational choice process. Occupational choice is best facilitated when one orientation is clearly dominant. The individual then attempts to match his personality orientation with a work environment of the same category through his occupational choice. Should factors such as economic conditions make it impossible to match his primary orientation with a work environment, he will revert to his second strongest orientation. In this manner, Holland allowed for the effects of the environment over which the individual has no control. Should environmental factors or lack of knowledge about the self or the occupation cause a mismatch between personality type and occupation, the individual will probably vacillate between different occupational choices until a match is achieved.

Once the individual has chosen a particular type of work environment as being correct for him, he must come to a decision about the level within that work environment at which he can operate competently. In order to arrive at the choice of a particular occupation, the individual must be able to identify both a work environment and an appropriate level within that environment. In keeping with most theories, the maximum level at which an individual can competently perform is largely dictated by his abilities, aptitudes, and other personal characteristics. Therefore, two key factors, knowledge of one's self and knowledge of occupations, play major roles in determining the proficiency of the matching process.

The majority of the major research efforts undertaken to substantiate Holland's theory have been done by Holland himself. Considerable evidence

has been found which lends validity to the theory. As a result of a longitudinal investigation, Holland (1962) concluded that not only was the primary and secondary personality orientation important, but the whole orientation pattern had an effect on occupational choice. Thus, two individuals with identical primary orientations but different orientation patterns could be expected to choose different occupations. This development makes Holland's theory infinitely more complicated when one considers the number of unique orientation patterns which can be generated from six personality categories. To further complicate matters, Holland gives no indications as to viable patterns or of the effects of specific patterns. Holland (1962) also added that the personality types and environments may tend to overlap. Finally, it is important to note that Holland has used an atypical population for his investigations, namely National Merit Scholars, and this fact should be considered when evaluating his theory.

Hilton's Theory

Several decision-making models have been proposed rather recently. They have attracted some attention but have failed to generate much research. One of the more prominent of these models is Hilton's (1962) Complex Information Processing Model. Crites (1969a) suggests that while Hilton's model has received little attention in theoretical research, it has considerable "promise for integrating field and laboratory research" (p. 592). He adds that one of the major reasons for this apparent lack of interest is Hilton's failure to quantify or provide an operational definition for conflict or dissonance in the decision-making process.

Hilton's decision-making model is based upon the concept of cognitive dissonance as defined by Festinger (1957). As stated by Hilton (1962), "A major premise of this model is that the individual is faced with multitudinous behavioral alternatives and that it is his limited capacity to handle information about them which limits the rationality of decision-making" (p. 292). Hilton proposed that the decision-making process is initiated in an effort to reduce cognitive dissonance which is produced by some occurrence in the environment. Cognitive dissonance occurs when an individual's premises, "his beliefs and expectations about his environment and himself" (Hilton, 1962, p. 296), are not compatible with the actual environment. When this situation occurs, the individual will examine his premises and attempt to alter them or to create new premises which will be compatible with the actual environment. If it becomes apparent that it is not possible to change these premises, the individual will search for an alternative environment compatible with his premises. In the case of occupational choice, he will choose an alternative occupation. Regardless of the approach taken, changing the premises or searching for an alternative, the process will continue until the level of dissonance is reduced to a tolerable level. It is at this point that the individual makes a decision. Hilton did not discount the role of unconscious factors in the decision-making process but hypothesized that their influence is indirect.

Hilton (1962) enumerates two problems or conditions which can occur during the decision-making process. First, the individual can encounter a condition of high difficulty, defined as "continued unsuccessful attempts to reduce cognitive dissonance. . . . Second, there is the

problem of identifying the short- and long-term effects of different strategies" (p. 296). For example, postponement may provide for an immediate reduction of dissonance, but will be unsuccessful in the long run. Likewise, a given strategy may be successful in reducing the dissonance of a particular situation, but create dissonance at a later date because of the constraints it imposes on the individual.

Hilton (1962) has hypothesized some factors which will raise cognitive dissonance to an intolerable level. Of particular interest in terms of the present study are the following factors:

1. Nearness in time to [a] culturally determined point at which [a] decision must be made
2. Exposure to malevolent environment
3. A high number of perceived occupational alternatives
4. High heterogeneity among perceived alternatives
5. Social pressure not to postpone decision-making (pp. 296 and 297).

It is recognized that some factors which create dissonance are more enduring than others. Dissonance caused by some factors can be eliminated merely by making any decision, that is, social pressure to not postpone decision-making. Other factors cause dissonance of a more enduring nature and require specific types of decisions for relief, that is, gross incongruence between an individual's premises about himself and the requirements of his occupational choice.

Hilton recognized three important factors which need further investigation in order to make the model more workable. These are the cumulative effects of postponing decisions, the emergence of premises and their relative stability over time, and the relative value placed on different

premises. Even in view of these problems, Hilton's Complex Information Processing Model seems to be a graphic description of the occupational choice problem as described by Keniston (1960).

Our society offers no package deals in which one choice takes care of most of the rest, no clear blueprints for life that an individual can take or leave as a whole. Each choice involves other choices; each commitment requires others; each decision is a preface to another new point of no return (p. 262).

Super's Theory

As it has been previously discussed, one of the major constructs proposed by Super and others (1957) in their developmental theory of vocational development was that of the self-concept. Super hypothesized that when making an occupational choice, the individual is attempting to implement his self-concept, that is, the individual is attempting to match his attributes with an occupation which will allow him to be the kind of person he believes himself to be. Super and others (1963) defined the success of this matching process as the level of incorporation.

Two types of knowledge are important if the individual is to achieve a satisfactory level of incorporation as defined by Super. First, the individual must have a complete and accurate understanding of himself--who he is, what he is, and what he wants to be. Second, he must have accurate information about the occupational alternatives--what the requirements of the occupation are and what the average member of the occupation looks like. Accurate information about himself and occupational information relevant to the individual's choice should aid in the achieving of a satisfactory level of incorporation.

It is important to note that Super views the choice of an occupation as a developmental and irreversible process and not as an event that occurs at a specific point in time. For this reason, it is difficult to separate the choice of occupation from vocational development when discussing Super's theory. The specification of an occupation is really what occurs at a specific point in time. The process leading to that specification is the choice process. As the individual has progressed through life he has continually been making judgments and decisions which have narrowed the alternatives open to him.

Once the individual has specified, or implemented, his occupational choice, several things can occur depending upon the congruence between his self-concept and the occupation. If he has had an accurate self- and occupational-concept, the level of incorporation will probably be high and the individual will be satisfied. If, on the other hand, either the self- or occupational-concept has not been accurate, dissatisfaction will occur (Super, 1969a). As a result of this dissatisfaction, the individual will attempt to make adjustments through modification of the self-concept to achieve a satisfactory level of incorporation. If this is not possible, the individual may decide to implement another occupational choice. Because Super's theory emphasizes the accurate matching of self and occupation, Osipow (1968) has suggested that it is basically a "trait-factor approach to vocational choice" (p. 143).

Some research evidence has been accumulated to support Super's theory of vocational choice and the self-concept. However, Osipow (1968) points out that many of these studies have utilized small samples with restricted career orientations. Therefore, he suggests that further

investigations are needed. Crites (1969a) attributes much of the lack of supportive research to the interview type of data collected in the CPS, but like Osipow, he seems to view the theory as viable. Super (1969b) admits that much remains to be done but sees self-concept theory as being very important in the future.

Summary of Choice Theories

Although the major theoretical framework for the present study is found in Super's development theory of vocational development and choice, other theories were reviewed for additional support and their implications. The theories of occupational choice specified by Roe, Holland, Hilton, and Super, all emphasize the importance of the self in the choice process. The major differences between these various theories are found in how they explain the development of the self when they concern themselves with self development at all. The major point of agreement among these theories is that in order to secure satisfaction, the self and the chosen occupation must be compatible.

Roe has emphasized the effects of early childhood experiences in the development of the self. Holland does not concern himself with the development of the self, but is mainly concerned with the matching of self and environment. Hilton does not refer to the development of the self nor is he concerned with categorizing environments. His major emphasis is defining the process that is initiated by conflict between the self and the environment. Super gives attention to all of these points. He is concerned with the development of the self, the process of matching the self and the occupational environment through the choice

of a specific occupation, and the processes that occur as a result of a poor match between the self and the occupational environment. Super's theory provides a broader, more comprehensive base from which to investigate occupational choice. It was for this reason that Super's theory was chosen as the theoretical basis from which the present study was initiated.

The final and most important aspect of these theories is their definition of the self. The theories all define the concept of the self as how the individual sees himself. The individual's definition of himself is hypothesized as being expressed in terms of his attributes, that is, his interests, values, abilities, backgrounds, and aptitudes as he sees them. Furthermore, the accuracy of the individual's perception of himself and the occupation are stressed to some degree.

Studies Directly Investigating the Stability of Occupational Choice of Secondary School Students

There have been few research efforts which have investigated stability of expressed occupational choice that have utilized specific occupational titles. In fact, there have been relatively few investigations of stability of occupational choice regardless of the stability criteria. This is due in part to the lack of longitudinal data upon which such studies must necessarily rely. For this reason, a comprehensive review of the studies dealing with stability of occupational choice regardless of the criteria used is presented.

Astin (1967) utilized the data collected in Project TALENT to study career choices over time. The sample consisted of students from ninth through twelfth grades with follow-up data collected one year after

graduation. Career choices were classified into seven major occupational groups. The major pattern of career changes over time was found to be one of migration from Engineering, Science, the Professions, Noncollege, and Unclassified careers to those in Business and Education. The percentage of students choosing an Engineering-type career declined more drastically one year after the completion of high school than during the high school years. Three alternatives were offered in an effort to explain the change pattern discovered. First, the changes could be due to "the maturational nature of career development. Perhaps some 'changers' are merely expressing their original choice in different terms: as they grow older they take into consideration the setting or the institution in which their career interest could be implemented" (p. 545). Second, "career changes occur as a result of personal development and education experiences" (p. 545). The student, as a result of his development and experiences, seems to be able to make a more realistic assessment of his abilities and aptitudes and, thus, a more realistic estimation of his chance of successfully meeting occupational requirements. This adjustment produces changes to more realistic choices. Lastly, the changes may be a result of environmental and cultural influences. Students may be encouraged to select pragmatic and applied careers rather than theoretical and research-oriented careers. However, the need for early commitment and specialized training may discourage students from careers in such applied areas as medicine, law, dentistry, and engineering.

A subsequent study by Astin (1968) investigated the stability and change of career plans of ninth grade girls. The sample was again drawn from the Project TALENT data bank. The period studied was ninth grade

to one year after high school. Career plans were categorized into five groups: Natural Sciences, the Professions, Teaching, Office Work, and Housewife. Based on choices stated at ninth grade and one year after high school, each girl was classified as stable, a defector, or a recruit. If the same choice was stated at both ninth grade and also at one year after high school, the girl was classified as stable. If a different choice was stated at each point in time, the girl was classified as a defector from her ninth grade choice and a recruit to her later choice. It was found that defectors from the three career-oriented groups (Natural Science, Teaching, and Professions) scored significantly lower on the four ability measures used by the study than those who remained stable in the career-oriented groups. Additionally, the recruits to these groups were more academically able than were the defectors. Moreover, recruits to a group tended to be different from the "stables" in that group. For the Housewife and Office Work groups, both the recruits and the defectors were more academically able than the "stables" of those two groups. It was further established that "the defectors [from any group] score lower than the stables on those measured interests that are characteristic of the group [which they left] as a whole" (p. 964). The recruits to any particular group were also found to differ from the stables of that group in terms of measured interests. The result of career shifts had the effect of increasing the homogeneity within the groups while at the same time increasing the differences among the groups with respect to general ability. The career-oriented groups increased their average level of ability while the average level of ability decreased in the Housewife and Office Work groups. The general conclusion reached was that as

girls mature, their plans become more realistic. Brighter girls tend to raise their aspirations, less capable girls tend to lower their aspirations.

The Project TALENT data bank produced still another study of stability of career plans. In reporting the findings of their one-year follow-up studies, Flanagan and Cooley (1966) included data about stability of career plans. The sample consisted of students in ninth through twelfth grades. Initial choices were collected with four resulting follow-ups, one after each group had been out of high school one year. This study is of particular interest because, while choices were categorized to some extent, the categories used were rather specific. For example, choices such as chemist, geologist, and physicist were classified as physical scientist. Another category was craftsman. Other choices were not categorized at all, for example, housewife, lawyer, elementary school teacher, or secondary school teacher. Part of the justification of this seemingly inconsistent pattern may be found in the statement:

There is really no concern if a boy changes his plans from physics to mathematics between grade 10 and grade 12 when there are no necessary differences in the high school behavior of future physicists and future mathematicians. On the other hand, if a tenth grade boy planning to go into business later decides at grade 12 to become an aeronautical engineer, he will be rather set back if he has not taken the necessary mathematics options during high school (p. 181).

Flanagan and Cooley made this observation about occupational plans:

"Obviously, the extent to which plans are considered stable depends upon how one classifies plans in the first place. For example, plans will appear to more stable if broader categories are used" (P. 182). Among

the major findings was that neither boys nor girls tended to have stable plans during high school as compared with one year later. Figures ranged from 17 percent stability for ninth grade boys to 41 percent for twelfth grade girls. Some choices tended to be more stable than others. For boys, choices of clergyman or physician showed the highest stability, and choices of teacher, writer, or farmer were more stable than average. For girls, choices of teacher or housewife were better than 50 percent stable while choices of office worker, nurse, beautician, artist, and entertainer were better than 40 percent stable. Flanagan and Cooley (1966) conclude that while the career plans of high school students tend to be both unrealistic and unstable, the plans of females are more realistic and stable than those of males.

Flores (1966) reported the findings of a non-longitudinal study that were relevant to the present study. Flores compared the level of occupational aspiration (LOA) of eighth grade males to the LOA of eleventh and twelfth grade males. The results of this study indicate that there is no significant difference between the LOA of eighth grade males and the LOA of eleventh and twelfth grade males. Additionally, the LOA of eighth grade males was more stable than the LOA of the older groups. It was hypothesized that this might be a result of the older groups being closer to high school graduation and thus to entering the world of work or the college environment. As a result of these findings, Flores concluded, "That LOA is probably formed in eighth grade males and is possibly one of the first stable and realistic occupational considerations formed in young people" (pp. 40-41). A longitudinal study of LOA, the variables influencing it, and how LOA changes during the

adolescent years was recommended. It is further hypothesized that LOA "is probably an important factor in adolescent behavior, and as such should be more intensively studied" (p. 42).

Gibbons and Lohnes (1968) analyzed career-aspiration patterns over time as part of the Career Development Study. A sample of 111 students was interviewed four times between the eighth grade and two years after high school. As a result of their study, they propose four Differential Career Processes (DCP):

1. Constant Maturity - Consistent, persistent, realistic pursuit of the first stated goal.
2. Emerging Maturity - Passage through the stages and tasks of Super's developmental model.
3. Degeneration - Progressive deterioration of aspirations and achievement, accompanied by frustration and loss of status.
4. Constant Immaturity - Persistent fixation of fantastic, unrealistic goals, with no advances in achieved level (p. 69).

They found, as might be expected, that students develop at different rates. Also a "sizable percentage" persists in making the same occupational choice throughout the secondary school experience and in later years. Furthermore, "career researchers need to locate the early signs from which youth may be sorted into explanatory and predictive categories" (p. 70). It was established that even as late as the tenth grade, many students were making decisions, and would probably continue to make decisions, based on irrelevant and inaccurate information. Conversely, there were many eighth grade students who were more advanced and ready to make vocational decisions than were some tenth grade students.

As a result of the findings of his investigation of the effect of the study of occupational information on stability and realism of

occupational choice, Hill (1965) concluded that the vocational choice expressed by ninth grade students is not always the final vocational decision, and that the choice of a vocation is an "ongoing, continuous, irreversible process." It was Hill's opinion that further studies of vocational development, with specific emphasis on the choice process, are needed and that such studies should be of a longitudinal nature.

Holden (1961) investigated the stability of vocational choice of students from eighth to eleventh grade using a sample of 109 students, all members of the same class. The students were interviewed at eighth and again at eleventh grade. Their expressed vocational choices were classified according to occupational level. It was found that students in the highest quartile (N = 25 with an IQ range of 115 to 138) of the class according to IQ had relatively stable levels of aspiration over the four year period. Those students in the lowest quartile (N = 25, IQ range of 88 to 100) were found to have relatively unstable levels of aspiration. The mean change in aspirational level for the highest group was computed to be +0.68 while for the lowest group the mean change in level for the same period was -2.92. Two major conclusions were reached as a result of the findings. First, "students at the lower range of the IQ continuum are more likely to change the level of occupational choice between grades eight and eleven than students in the upper range of the IQ continuum." Secondly, "as they progress through the grades from eight to eleven, students at the lower levels of scholastic ability . . . tend toward vocational choices that are more suitable to their scholastic abilities" (p. 37). Holden suggested that a study be conducted investigating the persistence of actual choices and that such a study should

extend beyond the eleventh grade. Another study suggested by Holden was one which would examine the relationship between persistence of vocational choice and selected aptitudes.

Kohout and Rothney (1964) reported on a study consisting of 321 males who graduated from high school in 1951. The study was initiated in 1948 when the subjects were high school sophomores. Occupational preferences for all subjects were obtained during tenth and twelfth grades as well as data on occupational status at six months, two and one-half years, five years, and ten years after high school graduation. Additionally, the subjects were asked to project themselves five and ten years into the future in the last three follow-ups. The study sample was divided into two groups, those who were intensively counseled during high school and those not intensively counseled. Based on their expressed occupational preferences during high school, their occupational status or preference at each follow-up, and their projections for five and ten years into the future, each student was classified as either specifically consistent, consistent by category, or inconsistent. Specifically consistent classifications were given to those subjects who preferred, were engaged in, and projected themselves into the same occupation for all points in time. Subjects classified as consistent by category could have changed their occupational choice at any point in time, but only to the extent that they remained in the same modified category according to the Dictionary of Occupational Titles (DOT) as specified by their original tenth grade preference. Inconsistent subjects were those who at some point in time preferred, were engaged in, or projected themselves into a category other than the one defined by their original preference.

For the total period of the study--twenty-three years counting projections--Kohout and Rothney (1964) found only 4.9 percent of the experimentals, intensively counseled, were consistent, while only 5.7 percent of controls were consistent. Thus, approximately 5.3 percent of the sample was consistent for the entire twenty-three year period. Disregarding the projections, thus reducing the time span to 13 years, approximately 6.6 percent of the sample (6.9% - experimentals, 6.3% - controls) could be classified as consistent. Of the categories (professional, managerial, agricultural, skilled, semiskilled, and unskilled), only two occupational categories, agricultural and professional, are represented in the choices of the consistent subjects. For the same time spans, 23 and 13 years, approximately 10 percent and 13.7 percent respectively were categorized as consistent by category. Kohout and Rothney conclude, "Generally speaking, the percentages of persistence were largest in the professional and agriculture categories and smallest in the semiskilled and unskilled categories" (p. 20). Furthermore, they hypothesized that greater stability in the professional and agriculture categories was a result of the greater investment required for entry into these categories. Finally, it was suggested "that there is no ordered set of influences on vocational preferences, but that the order varies as the individual develops and circumstances change . . . [and that] chance operates more frequently than the guidance literature suggests" (p. 20).

An investigation initiated in 1959 and reported by Rice (1962) utilized 282 "capable" tenth grade students and followed up those same students as twelfth graders in 1961. It was found "that well over 50

percent of these students remained constant in their levels of aspiration" (p. 133). Of those who were not consistent in terms of their level of aspiration, a greater number raised rather than lowered their aspirational levels. Most of the students, especially those who were consistent, expressed high level aspirations. Thus, it was concluded that the aspiration level of capable students is "relatively stable and high from Grade 10 to 12" (p. 134). Rice suggested that longitudinal studies of the aspirations of a more heterogeneous sample of high school students be conducted.

Schmidt and Rothney (1955) published the findings of an examination of the consistency of vocational choice during the high school years, grades 10 to 12, of 347 counseled students. This was one of the few studies which used the actual expressed job title as a basis for determining consistency of choice. A student was termed "consistent" if he chose the same occupation for at least two succeeding years. Conversely, a student who specified a different occupation each year was designated "inconsistent." It was found that 34.9 percent of the students specified the same occupation all three years. Two thirds of the students expressed the same occupational choice for at least two years, with 13.8 percent consistent for grades 11 and 12 only, and 17.7 percent consistent for grades 10 and 11 only. Thus, almost half of the students were categorized as consistent for grades 10 and 11. Upon follow-up, six months after graduation, almost half of the graduates entered occupations they had chosen one or more times during high school. Although grade 12 occupational choices were found to be the best predictors of post high school activity, including post high school course of study, grade 10 and 11 were almost equally predictive with grade 11 choices slightly better

predictors than those expressed in grade 10. Two thirds of the most consistent students entered the occupation, or training for the occupation, which they had indicated as their choice all three years of high school. Of those consistent during their junior and senior years, 41.7 percent entered the occupation chosen during those years. Of those who changed their choice in their senior year, those consistent during grades 10 and 11 as well as those inconsistent all through high school, almost half entered the occupation that was their senior year choice. The authors conclude "that planning cannot be a 'one-shot' process for all high school youth" (p. 146). They also allude to the desirability of developing a method of early identification of students who will remain consistent in terms of their occupational choice.

Summary of Studies of Occupational Choice Stability

Studies undertaken to investigate the stability of expressed occupational choice are not numerous. Generally, the findings seem to be somewhat in conflict, not only with each other, but also in conflict with some choice theory. A possible explanation for this conflict can be found in the study methodology. Investigators have not chosen to define consistency of occupational choice in a common manner. Additionally, these investigators have generally classified occupational choices rather than using specific job titles. These classification systems have varied from study to study. The most common classification seems to be by level of occupational aspiration. Kohout and Rothney (1964) did utilize the specified job title as the basis for determining stability of occupational choice. However, Kohout and Rothney's 23-year study may be more aptly

described as a career pattern study rather than a study of stability of choice. To expect stability of choice over such a long time span does not seem to be realistic because of changes in the occupational structure and the promotions one would expect. Thus, it would be more meaningful to classify studies of stability of choice as those covering the years of training and the first one or two years in the world of work.

The review of studies suggests several points of general agreement:

(1) the choice of an occupation is a developmental process, (2) individuals develop at different rates, and it is not realistic for all persons to state an occupational choice at a given point in time, (3) some students develop stable occupational choices as early as the ninth grade, although studies disagree as to the number of students, (4) those occupations which require relatively large investments of time and resources to enter, tend to be the most stable, and (5) more longitudinal investigations of stability of choice and the variables affecting it need to be conducted.

Findings directly relevant to the present study were: (1) Astin's (1968) finding that the students choosing a particular occupation tend to become more homogeneous over time while the groups become more heterogeneous, (2) Flores' (1966) explanation that the fact that eighth-grade occupational aspiration level is more stable than twelfth-grade occupational aspiration level may be a result of the nearness of entry into the world of work, and (3) Schmidt and Rothney's findings that approximately half of the students entered the occupation which was their expressed occupational choice during their senior year.

Investigations Supporting the Validity of
the Variables and Student Characteristics
Used in this Study

The variables and student characteristics used during the course of this study were: curriculum, General Aptitude Test Battery (GATB) scores, grade point average (GPA), level of occupational choice, occupational values, sex, socioeconomic status, stability of occupational choice, and vocational maturity. Literature abounds which reports the relative value of several of these variables or characteristics in different types of investigations. On the other hand, literature which supports the use of others of these variables is scarce. Numerous studies have used GATB scores, GPA, occupational values, sex, and socioeconomic status. Fewer studies have utilized curriculum, level of choice, stability of choice, and vocational maturity. The studies cited reflect upon the relative or general value of each variable or characteristic as was relevant to its utilization in this study. Two variables were categorized for the purposes of this review. They are occupational values and GATB scores. Rather than review literature pertinent to each value or score that was utilized in this study under a separate heading, they are treated under the general headings.

Curriculum--No investigations were found which have utilized the student's curriculum choice in the manner in which it was used during the course of this study. Conceptually, it is almost impossible to divorce curriculum choice from occupational choice. In effect, curriculum choice might be viewed as an occupational choice. This has been the case in several studies. The following studies were reviewed to establish the conceptual connection.

Two statements of Flanagan and Cooley (1966) address themselves to this issue: (1) no single high school curriculum is appropriate for all students, and (2) "the appropriateness of a curriculum depends in part upon the career plans of the students" (p. 181). Additionally, they point out that much of the concern about stability of occupational choice is curriculum related. For example, if a student changes his occupational choice from physicist to mathematician, he will not fare too badly in terms of curriculum prerequisites. On the other hand, if a student's occupational choice changes from plumber to mathematician, he will probably encounter rather severe difficulty in terms of curriculum prerequisites. Finally, the conclusion that occupational choices such as clergyman or physician tend to be more stable than the average would tend to indicate that if the student is enrolled in the curriculum appropriate to such a choice, curriculum may have some value in predicting stability of occupational choice.

In describing the eight domains of Readiness for Vocational Planning, Gibbons and Lohnes (1968) include as their first variable, "Factors in Curriculum Choice," and as their second variable, "Factors in Occupational Choice." They are defined as:

Factors in Curriculum Choice

Awareness of relevant factors, including one's abilities, interests and values and their relation to curriculum choice; curricula available; courses within curricula; the relation of curriculum choice to occupational choice.

Factors in Occupational Choice

Awareness of relevant factors, including abilities, interests, values; educational requirements for choice; relation of specific high school courses to choices; accuracy of description of occupation (p. 16).

Of major importance to the present study is the general similarity of the two definitions. Additionally, the mention of the importance of the relationship between curriculum and occupational choice in the first definition and the mention of educational requirements of the specified choice in the second, lend support to the conceptual relationship between curriculum and occupational choice.

Gribbons and Lohnes (1968) further investigated curriculum as a classification device and found that it was possible to discriminate between curriculums. That is, different curriculums attract different types of students. They further determined that Discriminant Career Processes (DCP) was to some degree contingent on high school curriculum. Specifically, "more seniors in the college preparatory curriculum have strong than weak DCP diagnoses, while more senior members of other curricula have weak diagnoses" (p. 73). The implication is that maturity may be curriculum-linked. They also state, "It should not be necessary to argue in detail that curriculum choice in high school is a most significant career development criterion in today's world" (p. 37).

Herr and Cramer (1968) point to the importance of interests, and particularly occupational interests, in a student's curriculum choice. They emphasize that "many men perceive field of study [curriculum] and occupational choice as one problem" (p. 106). The compatibility of the student, his interests, needs, and other attributes, and the educational environment (especially curricular demands and rewards) were proposed as major factors in achievement and stability of curriculum choice. They also assert that students select curriculums on the same basis as they select occupations. Thus, Super's self-concept construct or Holland's

matching of personality types and environments are as valid for curriculum decisions as they are for occupational decisions.

Several studies have found certain occupational choices or curriculum groups to be more stable than others. Therefore, the curriculum in which a student is enrolled might be useful in terms of predicting stability of occupational choice. Marr (1961) found those who enter a field such as medicine tend to make a firm commitment earlier than those making other choices. Not only may curriculum be useful in predicting stability of occupational choice; but specific course sequences may also be useful as predictors. Mierzwa (1963) discovered that while most boys of grades 11 to 13 remained stable in terms of their expressed choice, any migration that occurred was predominately out of science into nonscience areas. Somewhat in conflict with other studies is the finding of Mondart, Curtis, and Dobbins (1970) that firmer choices are made by those who expect to enter the labor force as wage earners. This fact would lead one to believe that if students enroll in curriculums which are appropriate in terms of their occupational choices, those in vocational curriculums would tend to be more stable in their occupational choices than those in academic curriculums.

Finally, Wallace and Leonard (1971) found that curriculum was related to level of occupation aspiration in their study of high school girls. It was found that those girls aspiring to low or intermediate level occupations were usually enrolled in either a general or vocational curriculum. The college preparatory curriculum enrolls the majority of girls who aspire to high level occupations. Those who expected to enter the labor market in semiskilled or unskilled occupations were generally not enrolled in the vocational curriculum.

General Aptitude Test Battery (GATB)--Considerable research has been done which investigated the validity of the GATB. Because of this fact, only several pertinent studies will be reviewed here, but further information can be found by referring to the General Aptitude Test Battery, Section III: Development, U.S. Department of Labor, October, 1967. Two specific aptitude scales, General Learning Ability (G) and Manual Dexterity (M), were used in the present study. It was felt that these two scales provided unique types of data because of their low correlation.

Impellitteri and Kapes (1969) explored the use of the GATB with vocational-technical students. Six GATB scales, General Learning Ability (G), Numerical Aptitude (N), Spatial Aptitude (S), Form Perception (P), Motor Coordination (K), and Manual Dexterity (M), were found to be useful in predicting shop achievement. They were found to be more efficient predictors of achievement in technical level vocational-technical course areas than in the craft level shops, however.

Ingersoll and Peters (1966) used a sample of high school freshmen and sophomores enrolled in academic and vocational curriculums to examine the relationship between GATB scores and achievement. The "G" scale was found to be the scale most highly correlated with achievement, $r = .60$. The resulting multiple correlation for all GATB scales and GPA was $.64$. It was found that each of the nine GATB scales was found to be a useful predictor of achievement for some specific academic or vocational area. The majority of the sample was composed of academic students, but the GATB was found to be useful for predicting achievement of those non-academic students included in the sample.

O'Reilly (1972) found GATB scale "M" to be useful in predicting achievement of vocational-technical students in terms of the shop or laboratory in which they were enrolled. It was found, however, that this scale was only useful in predicting achievement for the first year in which the student was enrolled in the vocational shop, the tenth grade in this case. After the sophomore year, the students became rather homogeneous in terms of manual dexterity, and GATB "M" failed to continue to be an effective predictor of shop achievement.

The United States Department of Labor (1967, pp. 177-191) reports the results of numerous studies conducted by local offices which investigated the relationship between the GATB and other tests. The results of several of these studies are included to show the relationship of the "G" scale to established IQ tests and the relationship between GATB scales "G" and "M." Using a sample of 64 high school juniors, GATB "G" was found to correlate with the Lorge-Thorndike Intelligence Test total .78 while GATB "M" correlated only .21 with the same measure. Using the Full Scale IQ from the Wechsler Adult Intelligence Scale, the obtained correlation coefficient with GATB "G" was .74, with GATB "M" it was .45. The GATB "M" was found to correlate .37 or above with all obtained scores on the Purdue Pegboard, while GATB "G" correlated .12 or below for all obtained scores.

Numerous studies have found relationships between scores on intelligence measures and level of occupational choice. Bradley (1943) found IQ to be one of the correlates of vocational preference. Clark and Gist (1938) determined that intelligence does affect the level of occupational choice, but that each occupational level seems to include a wide range

of abilities. Davis, Hagen, and Strouf (1962) investigated the occupational choices of twelve year olds, and they concluded that more mature choices correlated positively with IQ. Flanagan and Cooley (1966) reported the results of a one-year follow-up study, and noted that ability measures were found to be more related to future plans than current plans. Flores (1966) reported that "there was not a significant difference between the two groups [eighth grade and twelfth grade students] in the degree to which LOA [level of aspiration] was related to IQ, but the LOA was somewhat more highly related to IQ for the eighth grade than for the twelfth grade group" (p. 39). Forcese and Siemens (1965), as a result of their findings, concluded that generally the higher the IQ; the higher the aspiration. Gibbon and Lohnes (1968) expanded this theory and stated that while IQ is related to level of occupational aspiration, it is most realistically related to IQ's above 105. Mierzwa (1963) found ability to be a useful predictor when predicting science versus nonscience career choices for adolescent boys. Portes, Haller, and Sewell (1968) found IQ to differentiate between level of occupational choices more accurately than between specific occupational choices.

Rieger (1961) used a cross-sectional sample of 1,520 students in grades 5 to 12 and determined that students with higher IQ's exhibited greater crystallization of LOA's than those with lower IQ's. Finally, Schwarzweller (1959) found that a student's IQ level influences his value orientations.

On the other hand, few studies have addressed themselves to the relationship between IQ and the stability of occupational choice.

Astin (1968) used the Project TALENT data bank to study changes in the career plans of ninth grade girls. She concluded:

There is a tendency for the brighter girls to change from initial careers in Office Work and Housewife more frequently than the less able girls, whereas those who shift out of the career-oriented groups, Sciences, Professions, and Teaching, are scholastically less capable than those who maintain these same plans over time (p. 961).

Holden (1961) found "the aspirations of high IQ students are reasonably real, and that fairly stable programs of study can be planned at the eighth grade level" (p. 40). He also determined that students with lower range ability levels were more likely to express occupational choices which were unrealistic and unstable than students in the upper scholastic ability range. Finally, as the students with lower range IQ's move from eighth grade to eleventh grade, their occupational choices tend to become more realistic. Rice (1962) conducted a study using a sample of capable high school students, and found their level of aspiration to be constant for well over 50 percent of the sample. Although Wrenn's (1935) sample consisted of junior college males, he found students who were classified as high in terms of academic intelligence exhibited "greater consistency, permanence, and suitability [reality] in terms of vocational choice" (p. 219). Findings also tended to indicate that students of high academic intelligence decide on particular vocational choices earlier than those of low academic intelligence (pp. 218-219).

Grade Point Average (GPA)--It would seem logical that the student whose occupational choice is not reinforced by his achievement in the school environment will be more inclined to change his occupational

choice than a student whose achievement has reinforced his occupational choice. For this reason it was decided to investigate previous research which had utilized achievement records, GPA in particular, in a manner pertinent to the present study.

In an effort to establish the validity of GPA as a measure of achievement, O'Reilly (1972) conducted a study of a sample of vocational-technical students. It was determined that GPA was a valid measure of achievement in the total school environment. Additionally, it was found that a student's level of achievement in the specific shop in which he is enrolled will most likely be accurately reflected by his level of achievement in the total school experience.

Several studies have established the existence of a relationship between GPA and LOA. Kapes (1971) concluded that positive relationship exists between GPA and LOA. Furthermore, success in the academic curriculum tended to be more predictable than success in the vocational curriculum. Moncart, Curtis, and Dobbins (1970) conducted a study of the educational and occupational aspirations of high school youth. They found students' aspirations to be highly effected by several factors, one of which was GPA. Rice (1962) investigated the changes in aspiration levels of capable students and determined that the greatest difference between the three groups was in terms of each group's mean GPA. The groups were categorized in terms of consistency, rise, or fall of aspirational level over time. It appears that GPA is related to change in aspirational level. Rieger (1961) determined that students with higher GPA's tend to exhibit greater crystallization of LOA than did students of the same age group with lower GPA's. In

their investigation of the vocational maturity of ninth grade boys, Super and Overstreet (1960) found school grades to be highly related to "Concern with Choice," and "Acceptance of Responsibility for Choice and Planning." Lastly, Wallace and Leonard (1971) concluded that academic average was significantly related to occupational aspiration. They further state that information concerning the student's achievement record is useful to teachers and counselors because of the relationship between success in school and occupational aspirations.

Level of Occupational Choice--Constancy of occupational choice seems to be conceptually related to the level of the original choice. The interaction with environmental feedback which the student receives in terms of his or her achievement aids in clarification of his or her self-concept, and may result in a readjustment of his or her aspirational level. ~~This readjustment~~ is more likely to occur in those students who have high level aspirations and are met with negative environmental feedback. Stability of choice may also be a function of the level of original choice interacting with societal pressures. Burchinal (1962) points out that youth have a tendency to prefer professional level jobs and more of them aspire to professional level employment than can be accommodated in the labor market.

Flanagan and Cooley (1966) concluded that there was a slight downward trend in level of occupational choice from ninth to twelfth grade. It was found that more students in the higher grades expressed lower level occupational choices than did students in the lower grades. This trend was found to accelerate upon graduation from high school. Additionally, this downward trend was determined to be more drastic for males than for females.

As a result of a study of the stability and realism of occupational aspiration, Flores (1966) deduced that the inclusion of LOA in research involving students of at least eighth grade level is justified and valid since LOA was formed in males by that time. Hamburger (1958) also addresses himself to realism of LOA in the early high school years when he states:

Knowing that 80 percent of the population aspires to Level 1-3 occupations would be important if it were definitely true that only a limited number of Level 1-3 openings are available. But if all the individuals in the 80 percent who aspire to these levels possess the requisite ability for such occupations (and this is frequently found in select populations), then who is unrealistic?"

He further points out that "surface realism may hide self-underevaluation and underachievement" (p. 74).

Holden (1961) emphasized that while the LOA of high ability students is real and stable, LOA seems to interact with IQ for lower ability students and is likely to result in change of LOA for lower ability students. This might seem to be in conflict with the findings of Kohout and Rothney (1964) when they found persistence of occupational choice to be highest in the professional and agriculture categories and lowest in the semiskilled and unskilled categories.

Stephenson (1957) examined the realism of vocational choices expressed by youth. It was determined that the level of the expressed occupational choice had bearing on stability of choice. It was found that by shifting the emphasis of the question so as to obtain an occupational choice rather than an occupational aspiration, students tended to choose lower level occupations. Furthermore, the distribution of

expressed occupational choice tends to approximate the national and state distribution of occupations by level. "It appears clear that students approach occupational planning with considerably more realism than is sometimes assumed" (p. 488).

Sex--An extraordinary number of educational researchers have investigated the hypothesis that males and females are, in fact, different in terms of factors pertinent to occupational choice. The following studies were reviewed to obtain some perspective about the relative values of the inclusion of this variable in the present study.

While investigating the correlates of vocational preference, Bradley (1943) found sex to be related to level of occupational choice. Breton and McDonald (1967) determined from their study of career decisions made by Canadian youth that boys are more likely to have formed career intentions before entering a program of study in high school. Davis, Hagan, and Strouf (1962) found that for twelve-year olds more mature choices were positively correlated with the feminine sex.

The American High School Student, by Flanagan and others (1964), was based on the data bank of Project TALENT. Several important differences were found which were sex-related. For males, reading comprehensive and verbal aptitude were found to be useful in distinguishing between occupational groups. This fact was not necessarily true for females when jobs such as secretary, clerk, or typist were considered. Most sex differences seemed to be a result of differences in interests. Furthermore, while males and females were found to hold some values such as personal interest in work and security in common esteem, they seemed to differ in terms of other values. Most notable was the concern of males with future salary

and opportunity for promotion. In a later Project TALENT report by Flanagan and Cooley (1966) which was the result of a series of one-year follow-up studies, sex differences were once again noted. It was determined that the occupational choices of females did not shift as markedly as those of males. Sex was also found to be an important ability factor as well as an important factor in student appraisals.

Gribbons and Lohnes (1968) state that one of the specific objectives of their longitudinal study was, "To determine whether there are significant sex differences in career sequences" (p. 5). In terms of Readiness for Vocational Planning (RVP), no significant differences were found. However, it was pointed out that, with a larger sample, separation by sex would be required. They further indicate that, "Although theoreticians emphasize that career development differs for girls and boys and we have noted a degree of people-oriented versus career-oriented differentiation in our developed hierarchies, the similarities in our data outweigh the differences, and our boys and girls appear to be rather alike in their employment of vocational-value categories" (p. 87).

Hollender (1967) concluded that a significantly greater percentage of females in sixth through twelfth grade had made occupational choices than had males of the same age group. It was further concluded that this trend held constant for all ability quartiles. Due to the nature of the sample, however, it was impossible to determine whether inter-quartile trends existed. Mondart, Curtis, and Dobbins (1970) further substantiated the above conclusion when they stated, "Girls develop occupational interests earlier, more of them exercise choices and fewer are uncertain about their occupational outlook" (p. 38). It was found

that 20 percent of the boys and 25 percent of girls developed occupational interests at the eighth grade level or below.

Powell and Bloom (1962) found sex-related differences in the work values of high school adolescents. Boys tended to place more emphasis on the financial aspects of a vocation than girls. Moreover, salary became less important to girls as age increased while interest and satisfaction became more important.

Rieger (1961) concluded that girls seemed to be able to specify their immediate realistic and long-range idealistic occupational goals more precisely than boys. On the other hand, boys were able to identify their immediate idealistic and long-range realistic goals more precisely than girls. Overall crystallization of LOA was greater for girls than boys of the same age.

Rosenberg (1954) found sex differences to exist in terms of occupational value orientations. Schwarzweller (1960) supports this finding by stating that girls and boys seem to differ in terms of their occupational values.

Slocum and Bowles (1966), as a result of an investigation of the aspirations and expectations of high school juniors and seniors, addressed themselves to sex differences in a manner which may shed light on much of the controversy. "The finding that fewer girls than boys appeared uncertain about their occupational plans may reflect the fact that the choice of an occupation is less problematic for girls since nearly all will be homemakers (though many will have other jobs, too)" (p. 28).

Socioeconomic Status--There seems to be little question that an individual's socioeconomic background limits or expands the occupational

options from which he may choose. The following review provides information about the effects of socioeconomic background which are relevant to the present study. Of special interest were investigations of the effect of the father's occupational and educational level since these were the indicators of socioeconomic status selected for use in the present study.

Bennett and Gist (1964) investigated class and family influences on the aspirations of students. It was determined that social class is an important factor in occupational aspirations; furthermore, the mother seems to have a stronger influence than the father on the aspirational level of students from lower class levels. This finding is somewhat compatible with Bradley's (1943) determination that the parents' occupational level is related to the occupational choice of the pupil. Davis, Hagan, and Strouf (1962) studied the occupational choice of twelve-year-olds and found that although 60 percent of the sample had made tentative occupational choices, the maturity of the choice did correlate with socioeconomic environment.

Douvan (1958) investigated the relationship between social status and success strivings. It was determined that achievement motivation is related to social class. Additionally, the achievement motivation of middle class students seems to remain at the same level regardless of whether the rewards are of a material nature or not. Working class students' level of achievement motivation tended to decrease if the reward was limited to personal satisfaction. Finally, achievement motivation scores for working class students showed greater variation following failure than did the scores of middle class students.

Drabick (1963), in a study of vocational agriculture students, found that more than half of the students expected to enter an occupation equal or superior in prestige to their father's occupation. It was further determined that the parents' level of education influences the students' educational plans, and that the mother is the single most important outside influence in the decision to enter college or not. In a later work, Drabick (1967) expanded the findings of the influence of socioeconomic factors by determining that students with low IQ's tend to be more influenced by family factors when making occupational decisions than other students.

Empey (1956) probed the influence of social class on occupational aspirations of students and found that, "While the lower class youngsters aspired to get ahead, they aspired to occupations at different status levels than those from higher strata" (p. 709).

Gribbons and Lohnes (1968) found no significant relationship between socioeconomic status and their Readiness for Vocational Planning (RVP) Scales. Socioeconomic status was based on the level of the father's occupation. It was found that family socioeconomic status was related to the way in which a student was classified in terms of the Differential Career Patterns (DCP) proposed by the authors. Students were found to be unwilling "to settle for less education than their parents had and most were looking forward to more than their parents" (p. 93). Finally, it was concluded that although RVP responses were not related to the socioeconomic status of the student, educational-occupational aspirations were related to socioeconomic status particularly after the eighth grade. The data tended to indicate that students from lower socioeconomic

backgrounds may have a tendency to have educational aspirations which are not compatible with their abilities more often than their counterparts from higher socioeconomic backgrounds.

Hamburger (1958) studied the CPS sample at ninth grade. "The results showed that the vocational and vocationally-related plans were significantly related to socioeconomic status" (p. 2). Socioeconomic status was not found to be as important a factor as intelligence, however. Contrary to what is often hypothesized, socioeconomic status was not found to be related to difference between occupational aspirations and expectations.

Socioeconomic status, indicated by father's educational level, was found to be useful in predicting whether a student would choose to enter the vocational or academic curriculum by Kapes (1971). Additionally, socioeconomic level was found to be important in distinguishing among successful and unsuccessful vocational and academic students. It is also important to note that although the father's occupational level was included as a socioeconomic indicator by Kapes, it failed to be of significant importance to remain in the restricted predictive models. Kapes concluded that the high relationship between father's educational and occupational level may have been responsible for this result.

Mondart, Curtis, and Dobbins (1970) found high school students' aspirations to be highly affected by influences from the home such as number of siblings, father's education, occupation, and salary, and mother's education.

Nunalee and Drabick (1965) investigated the occupational desires and expectations of high school seniors. Level of father's occupation

and parents' educational level were determined to be useful in predicting differences between a student's desired and expected occupational level. Specifically, those students whose fathers were engaged in medium level occupations exhibited greater differences between desires and expectations than those whose fathers held either high or low level occupations. Additionally, as parents' educational level increased, differences between student's desires and expectations decreased.

Porter (1954) investigated the dependence of vocational plans and preferences of high school senior boys upon: (1) prestige level of father's occupation, (2) mental ability, and (3) emotional adjustment. While both mental ability and level of father's occupation were found to be related to vocational plans, level of father's occupation was most predictive. Porter determined that "as a group, planned occupations of high school senior boys are not on a higher level than those of their fathers" (p. 218). This finding seems to contradict much of the literature and may be a result of Porter's sample being predominately composed of upper-middle class boys.

Rehberg (1966) determined that a stronger relationship exists between realistic career goals and social status than idealistic career goals and social status for adolescents. Additionally, boys from homes with "marked maternal superiority" (a home where the mother is better educated than the father) tend to have higher goals than those from other types of homes.

Rice (1962) found the educational level and the occupational status of mothers to be related to changes in their sons' levels of educational and occupational aspiration, but only related to changes of the educational aspirations of their daughters. At the same time, the father's

educational and occupational level was found to be totally unrelated to changes in their son's or daughter's aspirational level. Those students whose aspirations remained constant from tenth to twelfth grade were generally from homes of higher socioeconomic status. Those students who lowered their aspirations over the same period tended to come from lower socioeconomic backgrounds. Those students who raised their aspirations tended to be from medium socioeconomic backgrounds.

Super (1969a) points out, "Parental socioeconomic status, is, as sociologists keep stressing, the starting point of the career pattern and one of its major determinants" (p. 4). Super and Overstreet (1960) found the father's occupational level and educational level to be significantly related. In addition, both levels were found to be related to the occupational aspiration level of the student. Parents' occupational level was also found to be significantly related to the student's Vocational Maturity Index total and to three indices of Orientation to Vocational Choice. It is interesting to note that Super and Overstreet report the average educational level of the subjects' mothers to be higher than that of their fathers, although the two were highly related.

Thompson (1966) found some occupational work values to be related to socioeconomic status as measured by the father's occupation. While students with high socioeconomic backgrounds placed importance on the "leadership" potential of a job, students from lower classes were more interested in the "security" and "high pay" aspects of a job. Finally, for those students who considered "security" and "high pay" to be important, "security" was extremely important but "high pay" was only moderately important.

Stability of Choice--Few studies have investigated the stability of occupational choices of secondary school students. Much of what has been done has been of a cross-sectional rather than a longitudinal nature. The following studies were felt to be pertinent to the present study and thus were included in this review since stability of occupational choice was used as both an independent and dependent variable.

Astin (1968) points out:

that students' career plans during the high school and college years tend to be unstable and often unrealistic, there are certain consistent patterns that seem to emerge from these changes. . . . There is evidence that those students who deviate most from the majority of students choosing certain careers are the ones most likely to change to a different career plan with time (p. 961).

Astin's study lent support to the validity of the concept of stability of occupational choice. Three hypotheses were proposed and supported. First, girls who change from an initial choice will tend to score lower on measures of aptitude and achievement than girls who maintain initial choice in the same area. Second, girls who change their initial career plans will score lower on measures of those interests most characteristic of girls maintaining initial choices in that particular career field. Third, as a result of career plan changes, career groups become more heterogeneous (p. 962). In addition to supporting these hypotheses, Astin concluded that vocational plans tend to become more realistic as a result of maturity. Furthermore, highly capable girls tend to raise their occupational aspirations while less capable girls tend to lower their aspirations as a result of time.

Flanagan and Cooley (1966) emphasize the importance of studying the stability of occupational choice: "We saw the great number of career plan changes that took place during and immediately following high school. This is an unfortunate phenomenon, insofar as educational decisions made during and immediately following high school are based upon these unrealistic (or at least unstable) plans" (p. 181). They further emphasize that the study of stability of choice and the choice patterns resulting from instability are extremely important if we are to understand the career development process. If personal characteristics related to instability of choice can be identified, we can anticipate choice changes and build a "convincing theoretical model of the career choice process" (p. 182). The predictability of stability of occupational choice was supported by the Project TALENT data in that Flanagan and Cooley were able to identify some characteristics which were related to stability of choice. These characteristics were categorized under the two major headings of ability measures and motive measures. It was found that ability measures were more related to future plans, while motive measures were more related to current plans. Additionally, interest profiles of those who changed their occupational plans tended to "explain the type of change which occurred" (p. 194). They further discovered that those who were unstable, in terms of their occupational plans, more closely resembled the occupational group they changed to than the occupational group they changed from.

The need to study stability of choice and career patterns is reiterated by Gribbons and Lohnes (1968). They point out that current career psychology suggests all youth follow a single developmental process.

From the findings of their investigation it was hypothesized that while some youth follow the process as it is now proposed, others are following different routes. Gibbons and Lohnes propose four processes called "Differential Career Patterns (DCP)," (Constant Maturity, Emerging Maturity, Degeneration, and Constant Immaturity). "What emerges is a complex view of careers in progress, for which the fundamental element is career aspiration . . . [over several] years" (p. 74).

Kohout and Rothney (1964) used stability of occupational choice as the criterion in a study of the effectiveness of intensive counseling. Students were classified as being consistent in terms of the specific occupation originally named, consistent in terms of the DOT category of the originally named occupation, or inconsistent. Stability of occupational choice was determined to be a useful variable in judging the effectiveness of intensive counseling. It was emphasized that choices that appear to be a good "fit on paper" often change. Stability of occupational choice should be included in investigations to determine the characteristics which negate the "fit" and cause change in occupational choice.

Schmidt (1953) found stability of occupational choice to be useful in predicting post-high school vocational activity. Furthermore, choice consistency during the first two years of high school was somewhat predictive of stability of choice over the three year high school period studied. It is suggested that stability of occupational choice be included in other investigations. By exploring the characteristics related to stability of occupational choice, a method for early identification of students whose choices are likely to remain stable can be developed.

Values--That occupational values play an important role in the choice of an occupation is a foregone conclusion to many. The role of occupational values in stability or change of occupational choice is less established. A review of the literature was conducted to establish the role of occupational values in the choice process, the pattern of change of values over time, and the role of values in change of occupational choice.

Dipboye and Anderson (1959) conducted a study of high school freshmen and seniors to determine if there was a difference in their rankings of occupational values. While the rankings were found to be extremely similar overall regardless of sex, there were differences in terms of the individual values. Two values, Interesting Work and Security, were ranked first and second respectively by all groups. Thus, these two values would seem to play an important role in any occupational choice process. It was further concluded that the values of ninth graders were extremely similar to those of twelfth graders. Occupational values seem to be well formed by the ninth grade and seem to remain relatively stable throughout the secondary school years.

Similarly, Gibbons and Lohnes (1965) concluded that, overall, there was little difference between the sexes in terms of occupational values. Satisfaction and Interest were found to be the most popular types of values. Boys gave high ranks to Salary and Prestige values, while girls felt Personal Contact and Social Service more important. The shifts in values that occurred from eighth to twelfth grade were seen as a shift from "idealism" to "realism" but not necessarily of a drastic nature. Gibbons and Lohnes point out that the value hierarchies

of adolescents "reveal aspects of their self-concept systems which are crucial in determining occupational preferences" (p. 251).

In a later work, Emerging Careers, Gribbons and Lohnes (1968) defined "awareness of values and their relationship to occupational choices" as one variable in Readiness for Vocational Planning (RVP) (p. 16). It was found that awareness of values increased with time for secondary students. While the findings tended to contradict Dipboye and Anderson's (1959) finding that values remain stable during high school, important consistencies were observed over the seven-year time period (eighth grade to two years following high school). Satisfaction and Interest were most important throughout high school and decreased in importance only slightly after high school. Some sex differences were found: while boys ranked career-type values high and girls ranked social-type values high, the overall pattern was predominantly similar. The eighth grade value statements were determined to be relatively free of "fantasy" elements although somewhat idealistic.

The value of Prestige was found to be useful by Kapes (1971) in distinguishing between students who would enroll in a vocational curriculum as opposed to an academic program. Furthermore, the importance that the value Prestige had for the student was found to be useful in differentiating among successful and unsuccessful vocational students and successful and unsuccessful academic students. The unsuccessful academic students were found to closely resemble successful vocational students in the cognitive-socioeconomic domain, but the unsuccessful academic students held a higher value for Prestige.

Miller (1956) found values to be important in distinguishing between those students who had made vocational choices and those who had not. Specifically, the importance the student placed on the value of Security was significantly different between these groups. Additionally, the importance of social rewards such as helping people, congenial working associates, and contact with varied and stimulating people may be useful in distinguishing between choice versus no choice.

One of the most extensive studies of values to date was conducted by Rosenberg (1954). It was found that, contrary to what has often been believed, the values of Security and Salary are closely related, not mutually exclusive. Three major value-complexes were developed: the self-expressive value complex, the external-reward value complex, and the interpersonal value complex. Different types of occupations were found to be representative of each value complex. Thus, people who were classified in a given complex could be expected to choose a particular type of occupation. It was observed that those who were compatible with the major value orientation of their occupational choice were less likely to change their choice than those who did not accept such a value hierarchy. Furthermore, "people tended to switch to occupations which were consistent with their value systems" (p. 237). Finally, it was determined that those individuals concerned primarily with monetary success almost invariably chose occupations which provided possibilities for large earnings.

Rosenberg (1955) addressed herself entirely to the factors influencing change of occupational choice. Two major statements about the role of occupational values in the change process reemphasize and synthesize

her earlier position. First, "occupational values do influence change of occupational choice but this influence is exercised in terms of the norms of the group, not in terms of specific values" (p. 253). Secondly, people tend to become more psychologically consistent, that is, their values tend to become more consistent with the norms of their occupational group over time. This is a result of either a change of occupational choice or a change in values.

Two publications by Schwarzweller (1959 and 1960) stated the major findings of his investigation of values. He stated, "the status position of a young person in society and school, and his IQ level, influence his value orientations" (p. 254). Values do play an important part in the process of making a vocational choice. Furthermore, "the influence of values on choice decreases as freedom of opportunity is restricted by the bonds of the social structure" (p. 246). He further hypothesized that the value orientations of girls and boys are different.

The only work which exclusively treated the relationship between values and stability of occupational choice was done by Searle (1962). It was found that new entrants to some occupations did exhibit change in terms of some value, while new entrants to other occupations did not. With only one exception, values held by those who changed their occupational choice versus those who maintained their choice did not differentiate between dropouts, graduates, and students. Additionally, stability of values did not differentiate between the groups. Searle's study was based upon two major assumptions: first, that entering the world of work will provide a "reality shock" which will affect value systems, and second, that dropouts will sustain a different shock upon

entering the world of work than graduates, and students will not have sustained such a "reality shock." The data failed to support these assumptions; therefore, Searle concluded that values may be more stable than originally perceived. Since the sample used in this study consisted of college-age subjects, the findings may not be directly applicable to the present investigation.

Singer and Steffle (1954) found the value Self-Expression to be more important to those with high level aspirations than those with low level aspirations. In comparing the values selected by the adolescent and adult groups it was determined that age differences do exist. Thus, values change over time. Specifically, the adult group selected the values Self-Expression and Independence most often while the adolescent group chose Self-Expression and Interest most often. Moreover, the values Power and Fame were selected least often by adults while the values Leadership and Esteem were chosen least often by adolescents.

Thompson (1966) found the values expressed by students as sophomores to be consistent with their value expressions as freshmen. It was surmised that value orientations are relatively well formed before the ninth grade. "Judged important by over 80 percent of the students were the occupational characteristics of an interesting job, the opportunity for self-expression, a secure position, and the opportunity to help others" (p. 850). Of moderate importance were the opportunity to gain esteem, to obtain prominence and recognition, to be independent, and to receive high pay. Of little importance were the opportunity to be a leader and an opportunity to be the boss (p. 851). Students of this sample felt security to be extremely important, but high pay only moderately important.

Vocational Maturity--Vocational Maturity was first proposed by Super (1955) as a major construct in his theory of vocational development. The review of the literature revealed no studies dealing with the relationship between vocational maturity and stability of occupational choice. Therefore, the following review will emphasize the validity of vocational maturity and its measurement. Of particular interest were studies which dealt with or used the Vocational Development Inventory (VDI) by Crites since that was the particular instrument used by the present study.

Crites (1965) discussed the measurement of vocational maturity and the development of the VDI. Crites stated that there is "fairly conclusive evidence that the vocational attitudes measured by the inventory are general in nature, not being affected by either sex or school differences, and that they are more closely related to grade than age" (p. 27). Although eleventh grade scores on the VDI did not follow the basic trend established by the obtained scores of fifth to twelfth graders, the variations in the means of eleventh grade items were not found to be significantly different from those of the tenth and twelfth graders in the sample. Based on this finding, Crites concluded that verbal vocational behaviors were monotonically related to grade. The VDI is, and has been criticized for being, negatively coded; that is, a "false" response is a more mature response for most items. It was reported that, "the most notable trend in the item means for the Attitude test was from true responses in the lower grades to false responses in the upper grades". (p. 28). Later studies reported by Crites (1969b) have led to conclusions which are pertinent to the present study. First, vocational students tend to score lower on the VDI than do academic

students at the same grade level. Second, socioeconomic background and intelligence tend to correlate with maturity as measured by the VDI. Finally, it is important to note that sex differences in maturity as measured by the VDI were rare.

Gribbons and Lohnes (1968) investigated vocational maturity measured by the Readiness for Vocational Planning (RVP) traits they defined. They point out the seemingly contradictory aspects of the theory regarding the measurement of vocational maturity over time. On one hand, for the measured elements of vocational maturity to qualify as personality traits, they should remain relatively stable over time. On the other hand, if vocational maturity is developmental in nature, the measured traits must change over time. According to their theory, this contradiction does not exist since there is no radical change in individual trait patterns over time, and individuals also display a pattern of increasing vocational maturity. As a result of their investigation, Gribbons and Lohnes concluded that vocational maturity was, according to their measurements, both developmental and stable in nature. Additionally, the RVP Scales were found to be related to curriculum, IQ, and socioeconomic level of occupational choice but not to sex or Differential Career Processes.

Kapes (1971) found vocational maturity as measured by the VDI to be useful in distinguishing between successful vocational students, unsuccessful vocational students, successful academic students and unsuccessful academic students. Vocational maturity was not found to be useful in determining whether the student would choose the vocational or the academic curriculum. It was concluded, however, that the vocational maturity construct was valid.

Pucel and others (1970) studied the change in vocational maturity, as measured by the VDI, resulting from post-secondary vocational training. Scores on the VDI were found to correlate positively with GATB Scores, IQ, and feminine sex. Additionally, interest in health service, office, and sales office work were found to be positively correlated with VDI score but VDI score was negatively correlated with mechanical electronics and outdoor interests.

Summary of Studies Supporting the Variables

Some of the student characteristics and variables selected for inclusion in this study are the subject of considerable controversy, while the remainder are rather universally accepted as useful, valid, and as having given effects. Previous research does seem to point to several relevant connections between curriculum and stability of occupational choice. First, curriculum choice appears to be highly related to occupational choice. Second, vocational development seems to be somewhat curriculum related. Finally, curriculum appears to be related to level of occupational aspiration.

The GATB has been the subject of considerable research. Of particular interest to this study were aptitude scales "G" and "M." The GATB has been shown to be a useful test battery with considerable validity. The General Learning Ability (G) scale is closely related to many accepted IQ measures. The GATB "G" is useful in predicting achievement. On the other hand, the Manual Dexterity (M) scale is almost totally unrelated to the "G" scale. The "M" scale appears to be at least initially useful in predicting success in the vocational curriculum.

GPA appears to be a valid measure of achievement. Additionally, GPA was found to be related to occupational aspiration. Stability of aspiration was determined to be highly related to GPA. Finally, GPA was found to be related to vocational maturity indices and the crystallization of LOA.

Level of occupational choice (LOA) has been the subject of considerable inquiry. The level of the student's occupational choice does seem to be related to stability of choice. There does, however, seem to be some disagreement as to whether higher level aspirations are more stable than lower level aspirations or vice versa. LOA appears to interact with IQ and affect stability of occupational choice.

Whether, in fact, sex is a factor in achievement, the development of an occupational values hierarchy, and occupational choice is quite controversial. The literature does, however, seem to support the theory of the existence of sex differences more adequately than the absence of such differences. Furthermore, the literature provides evidence that sex differences do exist in at least two important areas relevant to the present study: crystallization of LOA and stability of occupational choice.

Super (1969a) pointed out that the student's background as gauged by family socioeconomic level constitutes an important starting point for all students' aspirations. Previous research has established that a student's occupational choice, vocational development, achievement, and stability of occupational choice are affected by his socioeconomic background, even if it only operates to the extent that the scope of occupational alternatives is limited or expanded. Furthermore, the

father's occupational education level are supported in the literature as valid indices of family socioeconomic status.

Stability of occupational choice is a rather unique variable in the present study in that it operates as both an independent and dependent variable. There were investigations which tended to support stability of choice as a valid measurement variable as well as those which supported stability of choice as a desirable outcome. Stability of choice was found to be related to student characteristics on one hand, while on the other hand was useful in predicting post-high school activity. The need for further study of those characteristics related to stability of choice, and specifically to develop methods for early identification of students whose choice would remain stable, was viewed as important by many investigators.

While the literature provided an abundance of data supporting the importance of occupational values in the occupational choice process, the role of values in stability of occupational choice is not as well understood. The existing literature did, however, suggest that a relationship does exist between values and stability of occupational choice. Whether this relationship is a result of change in values or incompatibility of values and occupational choice is not clear. Nevertheless, there seems to be sufficient support to include occupational values in a study of stability of occupational choice.

Vocational maturity as measured by the VDI was generally supported by the literature to be both a valid construct and a valid measurement of that construct. No investigations were found which investigated the relationship between vocational maturity and stability of occupational

choice. Vocational maturity has been found to be useful in distinguishing between students in different curriculums and their achievement in those curriculums. The major argument for including an index of vocational maturity in the present study must be based on the logic that more mature students will make vocational choices which are more realistic and, therefore, will tend to be stable. Since no literature was found which confirmed or denied this relationship, inclusion was based on this theoretical assumption.

Literature of an Explanatory or
Supportive Nature Relating to the
Methodology Used in this Study

Path analysis, the statistical methodology used during the conduct of the present study, is not a new approach. It was developed by Sewall Wright beginning about 1921 and applied to the study of genetics. Application of path analysis to social science data is at an embryonic stage. This author is unaware of any previous applications comparable to the present study. For the purpose of supporting the validity of path analysis, two studies of occupational attainment using longitudinal data were included in this literature review.

A study by Featherman (1972) most closely resembles the present study in terms of methodological approach. Data were gathered on a sample of 715 males at three points in time: 1957, 1960, and 1963-67. Data included father's occupation, family size, educational attainment, occupation at each point in time, and income at each point in time. In addition, three indices of achievement-related motivations were constructed from attitude data collected at the first point, 1957. A causal

model was developed to investigate the effects of the variables upon one criterion, income at the third point in time. This model was then tested using path analysis techniques. It is emphasized that path analysis allows the researcher to adjust the data and the model for measurement validity and reliability as well as to determine both the magnitude and pattern of the effects of the independent variables on the criterion. Of particular interest in this study was whether achievement-related motivations operate as intervening variables "potentially capable of explaining how socioeconomic origins and/or early achievements influence later socioeconomic attainments" (p. 131). While little support was found for the hypothesis, the validity and reliability of the motivational indices were examined. It was found that the negative results may have been a consequence of invalid measurement rather than invalid or unreliable constructs. Thus, it was arbitrarily judged that the model was acceptable but should be investigated further.

Howell (1970) attempted to verify and extend causal models of the occupational achievement process which had been previously proposed. A sample of approximately 800 males was utilized. It was found that early measured intelligence had an indirect effect on adult occupational attainment through GPA, level of education, status of first full-time job, and additional education. Father's education had an indirect effect on occupational attainment through level of education and status of first full-time job. Furthermore, GPA worked through level of education before and after the first full-time job to have an indirect effect on adult occupational attainment. "In each case the indirect effect was greater than the direct effect of each of these variables. This implies a

cumulative effect of early influences functioning in conjunction with intervening influences to effect the occupational achievement process over time" (p. 101). Finally, the author emphasized the advantages of path analysis when he states:

Not only did the hypothesized direct effects have an influence on adult occupational attainment, but because of the feature in path analysis that permits the investigator to examine indirect effects, implied cumulative indirect effects of causal antecedents working through intervening variables were discernible" (p. 101).

Werts (1968) demonstrated the advantages of path analysis by reconstructing a study by Davis (1966). Davis theorized that: (a) School Quality is negatively related to GPA and that (b) GPA is positively related to level of Career Choice. Finally, a student does not allow for School Quality when developing his self-judgments upon which his career aspirations are based. Werts points out that "the construction of a path diagram . . . brings to light previously overlooked relationships that might well be brought explicitly into the theoretical discussion" (p. 512).

Summary of Studies Supporting the Methodology

Super (1969b) has stated that path analysis may prove to be useful in investigating career patterns. The application of this methodology in the social sciences is in the early stages. No studies were found which examined stability of occupational choice and used path analysis to construct and verify models pertinent to stability of occupational choice. The literature points out several advantages of path analysis over conventional statistical methods. Path analysis allows the

investigator to examine the validity and reliability of constructs and measures. Most important, however, are the features of path analysis which allow the investigator to determine the indirect effects variables have upon the criterion through their direct effect upon other variables. Path analysis appears to be a useful and valid methodology in the social sciences.

III

PROCEDURE

This chapter will discuss the sample, essential data, and statistical methodology pertinent to the present study.

Population and Sample

It would be difficult to formulate a description of an average American high school student which would be satisfactory to everyone.

It was felt, however, that the parent population used in this study was an acceptable approximation of the average high school population.

Therefore, this study could provide information useful as guidelines for further investigation outside the parent population. Caution should be exercised in generalizing the results of this study to students outside the actual parent population without some effort to confirm that the groups are similar.

The parent population of the sample used in this study was comprised of all students enrolled in the ninth grade of the Altoona, Pennsylvania, public junior high schools in 1968. The ninth grade population during that year was approximately 1,100 students. The Altoona Public School System served about 15,000 students at all levels that year. The district relies upon one public high school which offers a comprehensive educational curriculum. The Altoona per pupil expenditure for the 1968-69 school year was approximately \$620, while the average expenditure state-wide was approximately \$680 for that year.

Altoona is one of the major cities in the west central Pennsylvania area. It has a population of approximately 67,000. The decline of the railroad, in recent years, has all but eliminated the traditional major employer, the Pennsylvania Railroad Shops. Traditionally, the majority of workers were employed by the railroad, now few are. Consequently, the city has been forced to actively recruit new industry and now has a rather diverse employment structure. The school system serves students from many ethnic and socioeconomic backgrounds.

All data for this study were collected as part of a continuing longitudinal study of career development being conducted by the Department of Vocational Education at The Pennsylvania State University in cooperation with the Research Coordinating Unit of the Pennsylvania Department of Education. The study was initiated in 1968 with the initial collection of data on the subjects as ninth graders. The sample is specifically composed of those students who continued in the Altoona School System through the twelfth grade. Additionally, only those students for whom complete data were available were included in the sample. Thus, of an approximate original population of 1,100 students, it was possible to obtain a sample of 500 boys and girls with complete data. Although every effort was made to obtain complete data on each student, it was found to be economically impracticable to schedule more than one retesting period. Another reason for sample shrinkage was normal student attrition. Many students either transferred to other schools or withdrew for various reasons.

Essential Data

To maximize the efficiency of the proposed model, the following variables were selected for inclusion in the present study, based on previous research. In addition, some of these variables are discussed in terms of the method of measurement used or the rationale for their creation.

Curriculum--Since the review of previous research indicated that the curriculum which the student pursued might affect stability of occupational choice, it was included in this study. Students were classified as being enrolled in either the academic or vocational curriculum at the middle of their tenth grade year. It was decided to combine those enrolled in the academic and the academic business curriculums and classify them as academic students. Those students enrolled in the vocational-technical, home economics, and secretarial curriculums were classified as vocational students. Kapes (1971) utilized a similar method of classification in a study of males. Kapes found such a system valid and useful for establishing curriculum as a dichotomy.

GATB "G" and "M"--Abilities and aptitudes have been extensively investigated. The role of IQ or intelligence in almost all phases of life has been examined while the effects of other abilities and aptitudes are not well known. The GATB was developed for employment-type counseling. Extensive validity and reliability studies have been done on it. The GATB measures nine aptitudes, and it has been shown to be a reasonably valid and reliable measure. Two of the nine aptitudes were chosen for inclusion in the present study.

GATB "G" is defined as a measure of general learning ability. It is very similar to well known intelligence measures, and it has been shown to be highly correlated with such measures. The relationship between IQ and occupational choice is well established. IQ has also been shown to be related to realism and stability of occupational choice. For these reasons, it was decided to include the GATB "G" as a measure of intelligence.

One's manual dexterity is known to affect the degree of success one has in a manual trade. Little is known about the role manual dexterity may play in the choice of an occupation. But, it is assumed that for those who choose occupations of a manual nature, the stability of that choice will be affected by one's ability to successfully perform manual tasks. Thus, it was decided to include a measure of manual dexterity, GATB "M," in the present study. The "M" scale has been found to be reasonably valid and reliable as well as having a small relationship with the "G" scale.

GPA--The success a student enjoys in the school environment will influence both his occupational choice and the stability of that choice. For this study a student's GPA was computed based on the grades he received in major subjects. The Altoona School System uses a weighted formula for computing GPA. Those subjects at each grade level which are designated as advanced courses are given an additional 20 percent weight. Thus, although the Altoona School System uses a five point system for grades A to F (5 = A, 4 = B, etc.), it is possible for a student to achieve a GPA higher than 5.0 by taking advanced courses.

For the purposes of this study, it was decided that the grade a vocational student received in shop should be weighted as 50 percent of his GPA. The reason for this weighting is that except for two areas, computer technology and engineering technology, the student spends 50 percent of his school day in the shop. These two exceptions require that the student spend 40 percent of his day in the vocational laboratory. This method of weighting vocational shop grades when computing GPA for vocational students was initially suggested and found to be valid by Kapes (1971) and has been used successfully by O'Reilly (1972) as well.

Occupational Choice--Each student's response to the direction, "Print the occupation which you probably will enter," was recorded at both ninth and tenth grade. At the twelfth grade the student was asked, "In reality, what occupation do you expect to enter after you complete all the education you have planned?" Each response was coded according to Roe's (1956) field and level classification scheme. Roe's scheme outlines six occupational levels and eight occupational fields. The levels are defined as:

- 1 = Professional and Managerial I
- 2 = Professional and Managerial II
- 3 = Semi-Professional and Small Business
- 4 = Skilled
- 5 = Semi-Skilled
- 6 = Unskilled

The eight occupational fields were designated:

- 1 = Service
- 2 = Business Contact
- 3 = Organization
- 4 = Technology
- 5 = Outdoor
- 6 = The Sciences
- 7 = General Cultural
- 8 = Arts and Entertainment

Each occupational choice was assigned a two digit number, the first designated the field and the second the level of the choice. This classification scheme was found to be useful by Gribbons and Lohnes (1968) in categorizing the occupational choices of their subjects. In studying the construct of vocational maturity, Super and Overstreet (1960) utilized Roe's classification scheme to classify occupational choices.

Sex--Although there is some controversy as to whether sex differences exist or not, the bulk of the literature appears to support the existence of differences. In addition to this fact, investigators who found no significant differences according to sex, recommend that the sexes be segregated in future studies (Gribbons and Lohnes, 1968). For these reasons, it was decided to include sex as a variable in the present study.

Socioeconomic Status--Studies of vocational development have traditionally included some measure of the socioeconomic status of the subject's family. Among the most commonly used indicators of socioeconomic status are: father's occupational level and father's educational level. The occupational and educational level of the mother have sometimes been used, but they have been shown to correlate highly with the same measures for the father (Super and Overstreet, 1960). Some researchers have utilized information about residency as indicators, but information of this nature is generally difficult and time-consuming to obtain. For this reason the following formula was used to compute a socioeconomic index: "Index of Social Position = 7 X Father's Occupational Level + 4 X Father's Educational Level" (Bonjean, Hill, and McLemore, 1968, p. 385). This index and its formula "was developed to meet the need

for an objective, easily applicable procedure to estimate positions which individuals occupy in the status structure of the community" (Hollingshead and Redlich, 1958, p. 387). Extensive studies of the reliability of scoring and the validity of the Index have been conducted by Hollingshead and others (Bonjean, Hill, and McLemore, 1968).

Stability of Occupational Choice--The students' responses to the direction, "Print the occupation which you probably will enter" at the ninth and tenth grade, and the question, "In reality, what occupation do you expect to enter after you complete all the education you have planned?" at twelfth grade were coded according to Roe's field and level classification scheme. By comparing the actual verbal student responses for each point in time, it was possible to determine whether the student had chosen the same occupation at any two points in time. The codings of the student's occupational choice in terms of field and level were examined in the same manner. In this way, a student could be classified into one of four categories in terms of the title, field, and level of his expressed occupational choice at all points in time. These categories are:

1. Stable from ninth to twelfth grade.
2. Stable from ninth to tenth grade, but unstable from tenth to twelfth grade.
3. Unstable from ninth to tenth grade, but stable from tenth to twelfth grade.
4. Unstable from ninth to twelfth grade.

In addition, it was possible to determine the direction and degree of change in level for any student whose expressed occupational choice was not stable in terms of level for any two points in time. This was

computed by subtracting the level of the occupational choice at the latest point in time from the level of the earlier choice. For the purposes of this study stability of choice was viewed as a dichotomy, that is, those who were stable in their choice for a given period of time versus those who were unstable.

Values--Occupational values appear to be extremely important in the occupational choice process and in the stability of that choice (Rosenberg, 1954 and 1955). Occupational values have been extensively studied by numerous researchers. Many instruments have been developed to assess value hierarchies. The particular instrument selected for use in the present study was the Occupational Values Inventory (OVI) developed by Impellitteri and Kapes. The development of the instrument is described in a monograph, The Study of Occupational Values (Impellitteri and Kapes, 1971). The instrument is constructed on an ipsative format and assesses seven occupational values. For the purpose of this study, four of the seven were selected for inclusion. They are defined by Impellitteri and Kapes (1971) as:

Interest and Satisfaction--One likes the work; enjoys it; is happy at it; fulfills oneself by doing it.

Salary--One perceives the financial return resulting from the work; can make a good living at it; sees it as an opportunity for a satisfactory income.

Prestige--One is impressed by the respectability attached to the work; can earn recognition from it; desires the feeling of importance that goes with it.

Security--One can obtain employment in this work; perceives that workers are needed in it; there will always be openings in it (p. 13).

Kapes (1971) found the OVI to be a valid and useful instrument for assessing occupational values. It is important to note that Kapes used

the same four values based on the rationale that, "because this instrument is ipsative it is necessary to include fewer than all of the values. . . . In order to allow the values to vary independently, . . ." (p. 72).

Vocational Maturity--Super and Overstreet (1960) concluded that ninth grade boys were not ready to make vocational decisions. This conclusion was based primarily on the finding that, as a group, ninth grade boys were not vocationally mature. Present theory relating to the construct of vocational maturity tends to follow the hypothesis that students who are more vocationally mature will make more realistic occupational choices, and these occupational choices will be more stable than those of less mature students.

The particular measure of vocational maturity selected for use in the present study was the Vocational Development Inventory (VDI). A major advantage of VDI is that it yields a single score based on a 50-item attitude scale. The validity of the VDI has been investigated extensively by Pucel and others (1970), Kapes (1971), and O'Reilly (1972), as well as by Crites. Norton (1970), in examining the development of the VDI as described by Crites (1965), has determined that "all of Crites' . . . criteria fit with Super's [construct]" (p. 169). However, he also stated the measurement of vocational maturity is still in the early stages.

Analysis

The major statistical method utilized by the present study was path analysis. In an effort to make the explanation of path analysis more understandable, a model will be used as an example:

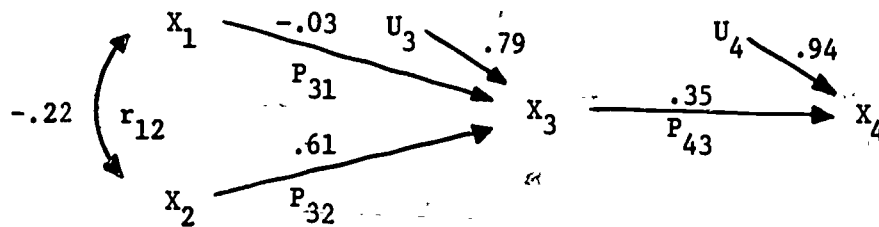


Figure 1: Example Model

X_1 = Father's Occupational Level

X_2 = IQ as measured by GATB "G"

X_3 = Grade Point Average

X_4 = Educational Aspiration

(The above model is previously unpublished and was developed by Enderlein, Kapes, O'Reilly, and Warland, 1972):

In Figure 1, variables X_1 and X_2 are exogenous variables, X_3 and X_4 are endogenous variables. When examining the effect X_1 on X_4 through X_3 , X_3 is an intervening variable. The residual variables are designated as U_3 and U_4 . The direct effect of X_1 upon X_3 is the standardized path coefficient designated P_{31} and is computed at the same time as P_{32} , the direct effect of X_2 upon X_3 , using Multiple Regression Analysis. Since only one variable, X_3 , leads to X_4 , the path coefficient P_{43} is equal to the correlation between X_3 and X_4 . The relationship, r_{12} , between the exogenous variables is also equal to their zero-order correlation coefficient.

The total effect of any variable upon another is equal to the zero-order correlation between those variables. Thus since X_1 and X_3 were found to have a correlation of $-.17$, the total effect of X_1 upon X_3 ,

r_{31} , equals $-.17$. Additionally, the sum of the direct and total indirect effects of any variable upon another must equal the total effect obtained for that relationship. Thus, it is possible to compute the indirect effect of one variable upon another. When no sensible indirect effects are possible, the direct effect equals the total effect, such is the case of the effect of X_3 upon X_4 in Figure 1.

An example of how indirect effects are computed is offered here.

Land (1971) gives the following formula:

$$r_{31} = P_{31} + P_{32} r_{12}$$

That is, the total effect, r_{31} , equals the direct effect of X_1 upon X_3 , P_{31} , plus the sum of all the indirect routes from X_3 to X_1 , times the correlation of X_1 and the variable that leads to X_1 . In this example only one route, through X_2 , is possible. By substituting figures obtained in the earlier investigation the following is obtained.

$$\begin{aligned} r_{31} &= P_{31} + P_{32} r_{12} \\ -.17 &= -.03 + (.61) (-.22) \\ -.17 &= -.03 - .1342 \\ -.17 &= -.17 \end{aligned}$$

Thus, the total indirect effect of X_1 upon X_3 , $P_{32} r_{12}$, computed to be $-.13$. In this case the indirect effect $P_{32} r_{12} = -.13$, is greater than the direct effect, $P_{31} = -.03$. It should be noted that this is not always the case.

In order to complete the system, it is necessary to introduce a residual variable into the model. The residual variable is a composite of all things not considered in the model which effect an endogenous

variable. Residual variables are only introduced when the variance of an endogenous variable is not completely explained by variables preceding it in the model. Thus, since X_1 and X_2 did not explain the total variance in X_3 the residual U_3 is introduced. To compute the path coefficient for the residual, Land (1971) offers the following formula:

$$P_{3u_3}^2 = 1 - (P_{31} r_{31} + P_{32} r_{32})$$

Since r_{31} and r_{32} were found to be $-.17$ and $.62$ respectively during the previous investigation, substitution results in the following:

$$P_{3u_3}^2 = 1 - (-.03 (-.17) + .61 (.62))$$

$$P_{3u_3}^2 = 1 - (-.0051 + .3782)$$

$$P_{3u_3}^2 = 1 - .3731$$

$$P_{3u_3}^2 = .6269$$

$$P_{3u_3}^2 = .63$$

$$P_{3u} = \sqrt{.63}$$

$$P_{3u3} = .79$$

By utilizing these formulas all the indirect effects and residual path coefficients can be computed.

The path coefficients and zero-order correlations used in the formulas previously discussed were obtained through Multiple Regression Analysis (MRA). By using the standardized regression coefficients (Beta coefficients), comparisons between path coefficients can be made. Through MRA, it is possible to determine the unique contribution made

by any given variable by partialing out (holding constant) the effects of all other variables. The meaning of the regression coefficients is dependent upon the theoretical basis which resulted in the formation of a given set of independent variables. Thus, the set of independent variables must be of a selected nature.

The theoretical assumptions which must be met to insure the validity of path analysis are the same as those pertaining to MRA. Li (1967) has stated the assumptions relevant to MRA:

1. The distribution of the dependent variable must be normal.
2. The relationship between the independent variables and the dependent variable must be linear.
3. Homogeneity of variance.
4. Samples must have been drawn randomly.
5. The independent variable values remain constant for all samples (p. 95).

Σ The specific model proposed and investigated by the present study is shown in Figure 2.

Figure 2 utilizes the following variables:

- X_1 = Value of Interest and Satisfaction (Ninth Grade)
- X_2 = Value of Salary (Ninth Grade)
- X_3 = Value of Prestige (Ninth Grade)
- X_4 = Value of Security (Ninth Grade)
- X_5 = GATB "G" Score (Ninth Grade)
- X_6 = GATB "M" Score (Ninth Grade)
- X_7 = Sex
- X_8 = Socioeconomic Status
- X_9 = Vocational Maturity (Ninth Grade)

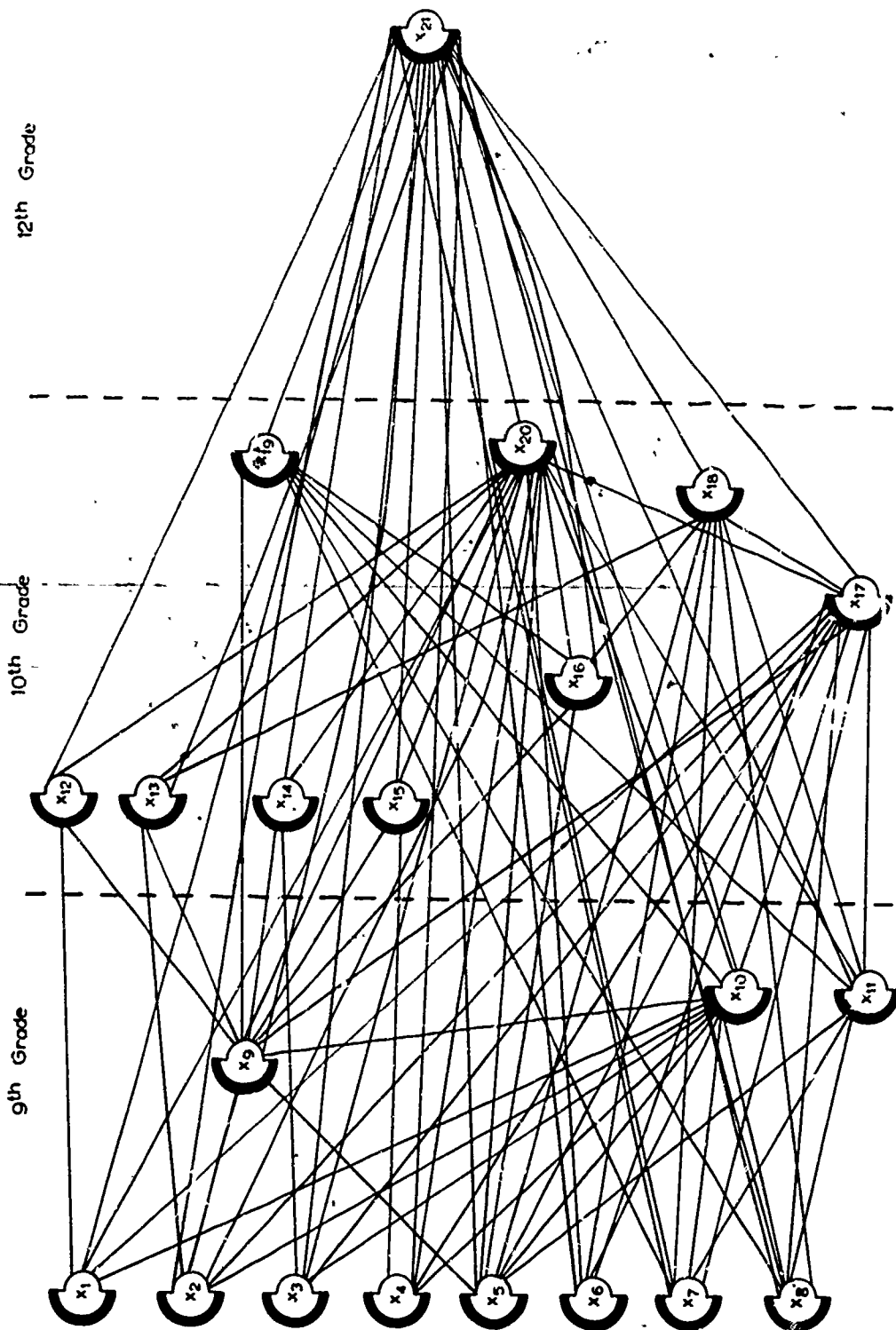


Figure 2. Proposed Model

- X_{10} = Level of Occupational Choice (Ninth Grade)
 X_{11} = GPA (Ninth Grade)
 X_{12} = Value of Interest and Satisfaction (Tenth Grade)
 X_{13} = Value of Salary (Tenth Grade)
 X_{14} = Value of Prestige (Tenth Grade)
 X_{15} = Value of Security (Tenth Grade)
 X_{16} = Vocational Maturity (Tenth Grade)
 X_{17} = Curriculum (Mid-Term Tenth Grade)
 X_{18} = GPA (Tenth Grade)
 X_{19} = Stability of Expressed Occupational Choice (Ninth to Tenth Grade)
 X_{20} = Level of Occupational Choice (Tenth Grade)
 X_{21} = Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

The residual variables are not shown in Figure 2, but a residual variable is associated with variables X_9 through X_{21} . Thus, a total of 13 residual variables are proposed.

- X_{9u} = The residual associated with X_9
 X_{10u} = The residual associated with X_{10}
 X_{11u} = The residual associated with X_{11}
 X_{12u} = The residual associated with X_{12}
 X_{13u} = The residual associated with X_{13}
 ~~X_{14u} = The residual associated with X_{14}~~
 X_{15u} = The residual associated with X_{15}
 X_{16u} = The residual associated with X_{16}
 X_{17u} = The residual associated with X_{17}
 ~~X_{18u} = The residual associated with X_{18}~~

X_{19u} = The residual associated with X_{19}

X_{20u} = The residual associated with X_{20}

X_{21u} = The residual associated with X_{21}

Each of the vectors in Figure 2 represents a proposed relationship which was included in the regression equations. Only those relationships pertinent to the stability of expressed occupational choice were investigated by the present study. It was finally proposed that should any variable or variables in Figure 2 not be found useful in predicting stability of expressed occupational choice, a modified model would be developed after eliminating that variable or variables.

Finally, it should be noted that the vectors representing the correlations among the exogenous variables (X_1 to X_8) are not shown in Figure 2. Although these relationships will be expressed in table form, they were not included in Figure 2 in an effort to keep the model as simple as possible. All possible combinations of exogenous variables were investigated to determine the degree of their relationship.

Summary

The sample used in this study was composed of 550 male and female students from the Altoona Area High School Senior Class of 1972. To be included in the sample the student had to have a complete set of data in terms of the student characteristic variables used in this study. The 22 student characteristic variables utilized during the course of this study included ability, aptitude and achievement measures, occupational values, student descriptors, and information pertinent to the student's expressed occupational choice. Two statistical methodologies,

Pearson Product Moment Correlation and Path Analysis, were used during the course of this study. Path Analysis, based upon Multiple Regression Analysis, was the major methodology employed.

FINDINGSIntroduction

Because of the vast number of casual relationships which could be reported when investigating a model such as the one used during the course of this study, the following discussion will be limited to those findings directly pertinent to this study. Although all the direct effect path coefficients are reported, the only indirect effects computed were those related to the final criterion. No casual explanation will be offered in this chapter but such explanations will be included in the following chapter.

The Inter-rater Reliability of Roe's Classification Scheme

An effort was made to determine the inter-rater reliability of the occupational categorization scheme proposed by Roe (1956). Two different raters, both graduate students in Vocational Education, categorized the expressed occupational aspirations and choices of the same students at ninth and tenth grades. These two coding operations were conducted one year apart and were based on the same data. The inter-rater reliability correlation coefficient was determined using the Pearson Product Moment Correlation. Eight correlation coefficients were computed based on the field and level classifications of four occupational choices per student. The resulting coefficients ranged from .84 to .91. The median obtained correlation coefficient was .87.

The Proposed Model

In order to provide a common basis from which to view the findings, Tables 1 and 2 furnish descriptive statistics pertinent to the variables used in this study. Table 1 displays the means and standard deviations for the variables and student characteristics used. The obtained means and standard deviations for those variables collected during the ninth grade year closely resemble those obtained by Kapes (1971) on the same measures. While the actual means and standard deviations will not be examined during the discussion of the model, they are presented here in an effort to describe the sample. Several obtained means were of particular interest. The obtained mean for the variable sex was 1.49. Since males were coded "1" while females were coded "2," the sample was composed of slightly more males than females (283 males, 267 females). The obtained mean for curriculum was .53 indicating the sample is approximately equally divided in terms of vocational versus nonvocational students, 258 and 292 students respectively. The mean values for Stability of Expressed Occupational Choice Ninth to Tenth Grade and Ninth to Twelfth Grade were 1.52 and 1.34 respectively. Thus, 52 percent (286) of the sample expressed the same occupational choice in both ninth and tenth grades while 34 percent (185) remained stable in their occupational choice from ninth to twelfth grade.

Table 2 presents the zero-order correlations among all of the variables excluding the final criterion variable, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). It should be noted that these correlation coefficients also represent the total effect any variable has upon another. The coefficients express the strength of the

Table 1: Means and Standard Deviations for All Variables

Variable No.	Variable Name	\bar{X}	SD
1.	Value-Interest and Satisfaction (Ninth Grade)	19.52	4.90
2.	Value-Salary (Ninth Grade)	12.67	7.18
3.	Value-Prestige (Ninth Grade)	11.50	5.09
4.	Value-Security (Ninth Grade)	12.13	5.68
5.	GATB-"G" (Intelligence)	95.98	12.99
6.	GATB-"M" (Manual Dexterity)	89.38	18.22
7.	Sex	1.49	.50
8.	Socioeconomic Status	36.62	10.42
9.	Vocational Maturity (Ninth Grade)	35.40	4.76
10.	Level of Occupational Choice (Ninth Grade)	3.89	1.01
11.	GPA (Ninth Grade)	3.43	.64
12.	Value-Interest and Satisfaction (Tenth Grade)	20.37	4.75
13.	Value-Salary (Tenth Grade)	13.67	7.74
14.	Value-Prestige (Tenth Grade)	9.83	5.35
15.	Value-Security (Tenth Grade)	10.23	5.45
16.	Vocational Maturity (Tenth Grade)	36.14	4.69
17.	Curriculum (Mid-Term Tenth Grade)	.53	.50
18.	GPA (Tenth Grade)	3.20	.78
19.	Stability of Expressed Occupational Choice (Ninth to Tenth Grade)	1.52	.50
20.	Level of Occupational Choice (Tenth Grade)	3.82	.99
21.	Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)	1.34	.53
22.	Stability of Expressed Occupational Choice (Tenth to Twelfth Grade)	1.45	.51

Table 2. Zero-order Correlations Among All Variables Except the Final Criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Interest and Satisfaction ^a	-.46	-.13	-.16	.29	.04	.22	.14	.30	.16	.24	.51	-.25	-.08	-.04	.28	.13	.30	-.02	.18
2. Salary ^a		-.14	-.24	-.11	.02	-.24	-.02	-.20	-.22	-.18	-.33	.47	.01	-.08	-.16	-.12	-.19	-.08	-.16
3. Prestige ^a			-.17	.00	-.04	.08	.04	-.10	.09	.02	-.10	-.05	.43	-.08	-.15	.09	-.01	-.02	.05
4. Security ^a				-.15	-.09	-.01	-.03	-.09	-.01	-.11	-.02	-.19	-.13	.45	-.08	-.05	-.10	.05	-.06
5. GATB "G" ^a					.20	-.10	.19	.43	.39	.56	.22	-.01	-.08	-.16	.37	.10	.58	.07	.41
6. GATB "M" ^a						-.03	.04	.15	.11	.20	-.03	.05	-.02	-.08	.09	.04	.16	.02	.08
7. Sex							-.02	.05	-.07	.10	.20	-.24	.07	.03	.07	.19	.00	.06	-.05
8. Socioeconomic Status								.14	.19	.13	.10	.01	.00	.00	.11	.18	.18	.00	.22
9. Vocational Maturity ^a									.22	.41	.27	-.07	-.10	-.11	.61	.03	.45	.17	.19
10. Level of Occupational Choice ^a										.35	.14	-.06	.00	-.06	.17	.35	.30	-.03	.66
11. GPA ^a											.16	-.01	-.04	-.13	.32	.16	.68	.09	.36
12. Interest and Satisfaction ^b												-.50	-.15	-.05	.28	.12	.22	.02	.18
13. Salary ^b													-.10	-.28	-.14	-.08	-.02	-.02	-.10
14. Prestige ^b														-.20	-.15	.03	-.08	-.01	.02
15. Security ^b															-.09	-.01	-.10	.05	-.05
16. Vocational Maturity ^b																.00	.38	.20	.16
17. Curriculum ^b																	.11	-.08	.34
18. GPA ^b																		.17	.36
19. Stability of Expressed Choice ^c																			.04
20. Level of Occupational Choice ^b																			

^aNinth grade data

^bTenth grade data

^cNinth to tenth grade

total effect but not whether that effect is of a direct or indirect nature.

Table 3 displays the zero-order correlations between the final criterion variable, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), and all other variables used in the model. Seven of these relationships were found to be significant at the .05 level. It should be pointed out that significance is not necessarily an important prerequisite for including or retaining a variable in a path analysis model.

Table 4 provides the first data directly pertinent to the proposed model. The obtained correlation coefficient indicates the degree of relationships among the exogenous variables. The strength of these relationships indicates the independence of the exogenous variables. These correlation coefficients are also necessary to compute the indirect effects of these variables. Table 5 presents the computed path coefficients of the residual variables associated with each endogenous variable in the proposed model. They represent the effects of variables outside the model upon each endogenous variable. The data contained in Tables 4 and 5 would normally be included in the graphic description of the proposed model, but because of the complexity of the present model, were included in table form only.

The first path coefficients computed relevant to the proposed model are those in Table 6. Of the two variables, Salary and GATB "G," hypothesized to be predictors of Vocational Maturity (Ninth Grade), GATB "G" was found to be more directly related to Vocational Maturity (Ninth Grade). The obtained path coefficient relating

Table 3: Zero-Order Correlations of the Twenty Exogenous and Endogenous Variables with the Final Criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade)^a

Variable	r
1. Interest and Satisfaction ^b	-.01
2. Salary ^b	-.04
3. Prestige ^b	-.02
4. Security ^b	-.02
5. GATB "G" ^b	.11*
6. GATB "M" ^b	.09*
7. Sex ^b	-.02
8. Socioeconomic Status ^b	.04
9. Vocational Maturity ^b	.15
10. Level of Occupational Choice ^b	-.03
11. GPA ^b	.07
12. Interest and Satisfaction ^c	.03
13. Salary ^c	.01
14. Prestige ^c	-.01
15. Security ^c	-.02
16. Vocational Maturity ^c	.15*
17. Curriculum ^c	-.14*
18. GPA ^c	.19*
19. Stability of Expressed Choice ^d	.49*
20. Level of Occupational Choice ^c	.03

^aThe zero-order correlation is equal to the total effect of the variable upon the criterion

^bNinth grade data

^cTenth grade data

^dNinth to tenth grade

*Significant at .05

Table 4: Zero-Order Correlations Among the Exogenous Variables of the Proposed Model

Variable	2	3	4	5	6	7	8
1. Interest and Satisfaction ^a	-.46	-.13	-.16	.29	.04	.22	.14
2. Salary ^a		-.14	-.24	-.11	.02	-.24	-.02
3. Prestige ^a			-.17	.00	-.04	.08	.04
4. Security ^a				-.15	-.09	-.01	-.03
5. GATB "G" ^a					.20	-.10	.19
6. GATB "M" ^a						-.03	.04
7. Sex ^a							-.02
8. Socioeconomic Status ^a							

^aNinth grade data

Table 5: The Residual Variable Path Coefficients

Variable	Path Designation	Path Coefficient
9. Vocational Maturity ^a	P ₉ 9 _a	.89
10. Level of Occupational Choice ^a	P ₁₀ 10 _a	.89
11. GPA ^a	P ₁₁ 11 _a	.81
12. Interest and Satisfaction ^b	P ₁₂ 12 _a	.85
13. Salary ^b	P ₁₃ 13 _a	.88
14. Prestige ^b	P ₁₄ 14 _a	.90
15. Security ^b	P ₁₅ 15 _a	.89
16. Vocational Maturity ^b	P ₁₆ 16 _a	.78
17. Curriculum ^b	P ₁₇ 17 _a	.90
18. GPA ^b	P ₁₈ 18 _a	.68
19. Stability of Occupational Choice ^c	P ₁₉ 19 _a	.97
20. Level of Occupational Choice ^b	P ₂₀ 20 _a	.71
21. Stability of Occupational Choice ^d	P ₂₁ 21 _a	.85

^aNinth grade data

^bTenth grade data

^cNinth to tenth grade

^dNinth to twelfth grade

GATB "G" to Vocational Maturity (Ninth Grade) was .41. The direct effect of Salary was found to be -.15. The residual path coefficient was computed to be .89. Thus, while intelligence as measured by GATB "G" was positively related to Vocational Maturity, value of Salary was determined to be negatively related to Vocational Maturity. The direct effect of GATB "G" yielded a coefficient of .41 which comprises the major part of the total effect .43. Likewise, the direct effect of Salary -.15 comprises the major portion of the total effect for that variable, found to be -.20.

Table 6: Effects Upon the Variable Vocational Maturity (Ninth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
2. Salary ^a	-.20	-.15	-.05
5. GATB "G" ^a	.43	.41	.02
Residual	.89		

^aNinth grade data

Table 7 displays the path coefficients associated with the nine variables used to predict Level of Occupational Choice (Ninth Grade). GATB "G" was found to have the strongest path coefficient: .32. Value for Salary was determined to be negatively related to Level of Occupational Choice (Ninth Grade) with a computed path coefficient of -.19. Socioeconomic status is associated with a path coefficient of .12. The remaining path coefficients were computed to be less than .10, however,

several variables were found to have either total or indirect effects greater than .10. It is important to note that the total indirect effect can be computed by subtracting the path coefficient from the zero-order correlation of the relationship between the predictor and the criterion variable. Vocational Maturity (Ninth Grade) had an indirect effect of .18. Interest and Satisfaction was associated with a total effect of .16 and an indirect effect of .18. Finally, GATB "M" was determined to have a total effect of .11. It is also important to note that while the direct effect of Interest and Satisfaction is negative, the indirect effects are positive. On the other hand, while the direct effect of Security is positive, the indirect effect is negative.

Table 7: Effects Upon the Variable Level of Occupational Choice (Ninth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.16	-.02	.18
2. Salary ^a	-.22	-.19	-.03
3. Prestige ^a	.09	.07	.02
4. Security ^a	-.01	.01	-.02
5. GATB "G" ^a	.39	.32	.07
6. GATB "M" ^a	.11	.04	.07
7. Sex	-.07	-.09	.02
8. Socioeconomic Status	.19	.12	.07
9. Vocational Maturity ^a	.22	.04	.18
Residual	.89		

^aNinth grade data

The computed effects upon GPA (Ninth Grade) are shown in Table 8. GATB "G" was found to be the strongest predictor with a path coefficient of .57. Thus, the total effect of GATB "G" was found to operate upon GPA (Ninth Grade) almost entirely in a direct manner. The two other predictors in the model, Sex and Socioeconomic Status, were determined to effect GPA (Ninth Grade) to a lesser degree. Socioeconomic Status was associated with a total effect of .13 and effected the criterion largely through indirect paths as evidenced by the obtained indirect effect of .11. Sex was found to have a stronger direct than total effect which is indicated by a path coefficient of .15 while the computed total effect was equal to .10.

Table 8: Effects Upon the Variable GPA (Ninth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
5. GATB "G" ^a	.56	.57	-.01
7. Sex	.10	.15	-.05
8. Socioeconomic Status	.13	.02	.11
Residual	.81		

^aNinth grade data.

Table 9 displays the path coefficients resulting from the prediction of Interest and Satisfaction (Tenth Grade) using Interest and Satisfaction (Ninth Grade) and Vocational Maturity (Ninth Grade) as predictors. As would be expected, the previous value measure predicts the later value measure better than does Vocational Maturity, total effects equal .51

and .27 respectively. While the total effect of Vocational Maturity is almost equally divided between direct and indirect effects, the effect of the earlier value measure is almost entirely direct in nature.

Table 9: Effects Upon the Variable Interest and Satisfaction (Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.51	.48	.03
9. Vocational Maturity ^a	.27	.13	.14
Residual	.85		

^aNinth grade data

Table 10 presents the effects of Salary (Ninth Grade) and Vocational Maturity (Ninth Grade) upon Salary (Tenth Grade). The earlier measure of the same value is again the stronger predictor of the two. The entire effect of Salary (.47) operates upon the later measure directly. However, Vocational Maturity (Ninth Grade) effects Salary (Tenth Grade) largely via an indirect route. Moreover, the direct effect, while small, (.03), is positive while the stronger total indirect effect (-.10) is negative.

The effects of Prestige (Ninth Grade) and Vocational Maturity (Ninth Grade) upon Prestige (Tenth Grade) are found in Table 11. The direct effect of .43 computed for the relationship between the first and second measurement of the value is equal to the total effect. The total effect of Vocational Maturity (Ninth Grade) was found to be -.10.

Table 10: Effects Upon the Variable Salary (Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
2. Salary ^a	.47	.47	.00
9. Vocational Maturity ^a	-.07	.03	-.10
Residual	.88		

^aNinth grade data

Table 11: Effects Upon the Variable Prestige (Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
3. Prestige ^a	.43	.43	.00
9. Vocational Maturity ^a	-.10	-.06	-.04
Residual	.90		

^aNinth grade data

The total effect of Vocational Maturity was fairly evenly distributed between direct and indirect routes and both direct and indirect effects are negative.

The final value of interest in this study was Security. Table 12 exhibits the computed relationships between Security (Tenth Grade) and Security (Ninth Grade) and Vocational Maturity (Ninth Grade). As would be expected, the computed effect of Security (Ninth Grade) was found to be larger than that of Vocational Maturity (Ninth Grade), .45 and -.11 respectively. The effect of the previous measurement of the value was again entirely direct in nature. Vocational Maturity was found to have a negative direct and indirect effect: -.07 and -.04 respectively.

Table 12: Effects Upon the Variable Security (Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
4. Security ^a	.45	.45	.00
9. Vocational Maturity ^a	-.11	-.07	-.04
Residual	.89		

^aNinth grade data

Table 13 presents the effects of Vocational Maturity (Ninth Grade) and GATB "G" (Ninth Grade) upon Vocational Maturity (Tenth Grade). The obtained path coefficient of .55 corresponding to the direct effect of Vocational Maturity (Ninth Grade) upon Vocational Maturity (Tenth Grade) accounts for the major portion of the total effect, which was .61. While GATB "G" (Ninth Grade) was found to have a total effect of .37 upon the

tenth grade measure of Vocational Maturity, the indirect effect dominates the direct effect, .23 and .14. Such was not the case when the effects of GATB "G" (Ninth Grade) upon Vocational Maturity (Ninth Grade) were investigated, as can be determined by referring to Table 6.

Table 13: Effects Upon the Variable Vocational Maturity (Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
5. GATB "G" ^a	.37	.14	.23
9. Vocational Maturity ^a	.61	.55	.06
Residual	.78		

^aNinth grade data

Eleven variables and student characteristics were used to predict Curriculum enrolled in at mid-term of the tenth grade. The computed effects are found in Table 14. The most powerful predictor was found to be Level of Occupational Choice (Ninth Grade) with a direct effect of .35 which was equal to the computed total effect. Sex was found to be the second most predictive variable with a total effect of .19 and a direct effect of .20. The relative strength of sex as a predictor may have been slightly inflated since few vocational programs were offered for girls at the time this data was collected. Socioeconomic Status was the third strongest predictor with direct and indirect effects of .12 and .06. Ninth grade GPA was found to have a stronger indirect than direct effect, .10 as compared to .06. Interest and Satisfaction was

Table 14: Effects Upon the Variable Curriculum
(Mid-Term Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.13	.04	.09
2. Salary ^a	-.12	.01	-.13
3. Prestige ^a	.09	.03	.06
4. Security ^a	-.05	-.03	-.02
5. GATB "G" ^a	.10	-.05	.15
6. GATB "M" ^a	.04	.01	.03
7. Sex	.19	.20	-.01
8. Socioeconomic Status	.18	.12	.06
9. Vocational Maturity ^a	.03	-.10	.13
10. Level of Occupational Choice ^a	.35	.35	.00
11. GPA ^a	.16	.06	.10
Residual	.90		

^aNinth grade data

determined to effect Curriculum more indirectly than directly. Salary was found to have a stronger indirect than total effect, $-.13$ and $-.12$ respectively. Thus, while the direct effects of Salary were positive in nature, the indirect and total effects were negative. GATB "G" operated upon Curriculum in the opposite manner associated with Salary. The total and indirect effect was computed to be positive while the direct effect was found to be negative. The remaining four predictors, Prestige, Security, GATB "M," and Vocational Maturity, were found to have total effects of less than $.10$. Prestige and GATB "M" were determined to have operated upon the criterion in a basically positive manner. Security and Vocational Maturity operated upon the criterion in both a negative and a positive manner. The former having shown all negative effects and the latter being associated with a direct effect of $-.10$ and total and indirect effects of $.03$ and $.13$.

Only two variables, Sex and Salary (Tenth Grade), of the eight used to predict GPA (Tenth Grade) were found to have effects of less than $.10$ as displayed by Table 15. GPA (Ninth Grade) had the strongest effect and this effect was largely of a direct nature (total effect = $.68$, direct effect = $.51$). GATB "G" also had a strong effect upon the criterion and was found to have a direct effect of $.24$, smaller than the indirect effect of $.34$. Vocational Maturity (Tenth Grade) was determined to operate upon the criterion in a positive manner but largely through indirect routes, direct and indirect effects being $.12$ and $.26$ respectively. GATB "M" was associated with a larger indirect than total effect, $.17$ and $.16$, since a very small negative direct effect was found, $-.01$. Curriculum was found to be positively

Table 15: Effects Upon the Variable GPA
(Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
5. GATB "G" ^a	.58	.24	.34
6. GATB "M" ^a	.16	-.01	.17
7. Sex	.00	-.03	.03
8. Socioeconomic Status	.18	.05	.13
11. GPA ^a	.68	.51	.17
13. Salary ^b	-.02	.00	-.02
16. Vocational Maturity ^b	.38	.12	.26
17. Curriculum ^b	.11	.00	.11
Residual	.68		

^aNinth grade data

^bTenth grade data

related to GPA (Tenth Grade) and to operate entirely through indirect paths since the indirect effect of .11 equaled the computed total effect.

Finally, Socioeconomic Status was determined to be associated with positive total and indirect effects of .18 and .13 respectively.

Table 16 presents the effects relevant to the six variables used to predict Stability of Occupational Choice (Ninth to Tenth Grade). Vocational Maturity (Tenth Grade) was the strongest predictor of the criterion with a direct effect of .15 and operated mainly upon the criterion through a direct path. Vocational Maturity (Ninth Grade) was found to be affiliated with a total effect of .17 which was almost equally divided between direct and indirect effects, .08 and .09 respectively. Ninth grade GPA had a computed total effect of .09 which was comprised of a direct effect of .03 and an indirect effect of .06. Level of Occupational Choice (Ninth Grade) was determined to effect the criterion negatively overall and directly (total effect = $-.03$, direct effect = $-.08$) while having a positive indirect effect of .05. Sex was associated with a total effect of .06 which was comprised of a direct effect of .04 and an indirect effect of .02. Socioeconomic Status had no total effect since the direct and indirect effects were computed to be $-.01$ and $.01$ respectively.

The effects associated with the 17 variables and student characteristics used to predict Level of Occupational Choice (Tenth Grade) are shown in Table 17. Level of Occupational Choice (Ninth Grade) was found to have a direct effect of .53 and an indirect effect of .13. Therefore, the total effect of Level of Occupational Choice (Ninth Grade) was found to be .66. The second strongest predictor of the

Table 16: Effects Upon the Variable Stability
of Expressed Occupational Choice
(Ninth to Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
7. Sex	.06	.04	.02
8. Socioeconomic Status	.00	-.01	.01
9. Vocational Maturity ^a	.17	.09	.08
10. Level of Occupational Choice ^a	-.03	-.08	.05
11. GPA ^a	.09	.03	.06
16. Vocational Maturity ^b	.20	.15	.05
Residual	.97		

^aNinth grade data

^bTenth grade data

Table 17: Effects Upon the Variable Level
of Occupational Choice (Tenth
Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.18	.00	.18
2. Salary ^a	-.16	.01	-.17
3. Prestige ^a	.05	-.03	.08
4. Security ^a	-.06	-.03	-.03
5. GATB "G" ^a	.41	.14	.27
6. GATB "M" ^a	.08	-.03	.11
7. Sex	-.05	-.04	-.01
8. Socioeconomic Status	.22	.06	.16
9. Vocational Maturity ^a	.19	-.04	.23
10. Level of Occupational Choice ^a	.66	.53	.13
11. GPA ^a	.36	.10	.26
12. Interest and Satisfaction ^b	.18	.04	.14
13. Salary ^b	-.10	-.04	-.06
14. Prestige ^b	.02	.05	-.03
15. Security ^b	-.05	.02	-.07
16. Vocational Maturity ^b	.16	.00	.16
17. Curriculum ^b	.34	.12	.22
Residual	.71		

^a Ninth grade data

^b Tenth grade data

criterion was GATB "G" with a total effect of .41. GATB "G" was found to operate to a greater degree through indirect than direct effects with an indirect effect of .27 and a direct effect of .14. Ninth grade GPA was also found to have a stronger indirect than direct effect upon the criterion. The direct and indirect effects associated with GPA (Ninth Grade) were .10 and .26, respectively. Curriculum also exhibited a stronger indirect than direct effect since the total effect of .34 was divided into a direct effect of .12 and total indirect effect of .22. Vocational Maturity (Ninth Grade) was found to have an indirect effect of .23 which exceeded the total effect of .19. This was attributable to a direct effect of -.04. Socioeconomic Status also operated upon the criterion largely through indirect paths. The total effect computed for Socioeconomic Status was .22, the major portion of which was an indirect effect of .16. Interest and Satisfaction was found to be the value most associated with the criterion. For both the ninth and tenth grade measure of this value, the total effect was computed to be .18. While Interest and Satisfaction for both years operated upon the Level of Occupational Choice through indirect means, the ninth grade measure did so exclusively. Ninth grade value of Salary was found to operate negatively and indirectly upon the criterion with a computed total effect of -.16 and indirect effect of -.17. Vocational Maturity (Tenth Grade) was measured to have a total effect of .16 which was entirely indirect in nature. Value of Salary (Tenth Grade) like the ninth grade measure of this value was found to be negatively related to Level of Occupational Choice (Tenth Grade). The total effect of Salary (Tenth Grade) was computed to be -.10 with direct and indirect

effects of $-.04$ and $-.06$ respectively. The remaining six predictors were found to have total effects of less than $.10$ although GATB "M" was associated with an indirect effect of $.11$.

Table 18 presents the effects computed for the twenty variables used in the proposed model to predict Stability of Occupational Choice (Ninth to Twelfth Grade). Stability of Occupational Choice (Ninth to Tenth Grade) was found to be the best predictor of the consistency of the student's occupational choice throughout the secondary school years. The computed total effect was $.49$. Furthermore, Stability of Occupational Choice (Ninth to Tenth Grade) was found to operate upon the criterion almost entirely in a direct manner since the direct effect equaled $.45$. GPA (Tenth Grade) was the second most effective predictor. GPA (Tenth Grade) was found to have a total effect of $.19$, of which the largest proportion was the direct effect of $.13$. GPA (Ninth Grade) was found to have a small total effect, $.07$, but the total indirect effect equaled $.16$. Vocational Maturity (Ninth Grade) was found to have exactly the same total effect as Vocational Maturity (Tenth Grade), $.15$. It is interesting to note, however, that the ninth grade measure was associated with a small direct effect, $.02$, while the entire effect of the same variable measured at tenth grade operates indirectly. The total effect of Curriculum, $-.14$, was divided between a direct effect of $-.12$ and an indirect effect of $-.02$. GATB "G" was found to have a total effect of $.11$ which was determined to be a result of a direct effect of $.03$ and a total indirect effect of $.08$.

While the remaining variables in the model were associated with small total effects, several findings are worth noting. First, there

Table 18: Effects Upon the Variable Stability
of Expressed Occupational Choice
(Ninth to Twelfth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	-.01	-.07	.06
2. Salary ^a	-.04	-.05	.01
3. Prestige ^a	-.02	-.02	.00
4. Security ^a	-.02	-.04	.02
5. GATB "G" ^a	.11	.03	.08
6. GATB "M" ^a	.09	.07	.02
7. Sex	-.02	-.01	-.01
8. Socioeconomic Status	.04	.03	.01
9. Vocational Maturity ^a	.15	.02	.13
10. Level of Occupational Choice ^a	-.03	-.05	.02
11. GPA ^a	.07	-.09	.16
12. Interest and Satisfaction ^b	.03	.05	-.02
13. Salary ^b	.01	.03	-.02
14. Prestige ^b	-.01	.02	-.03
15. Security ^b	-.02	-.01	-.01
16. Vocational Maturity ^b	.15	.00	.15
17. Curriculum ^b	-.14	-.12	-.02
18. GPA ^b	.19	.13	.06
19. Stability of Expressed Occupational Choice ^c	.49	.45	.04
20. Level of Expressed Occupational Choice ^c	.03	.03	.00
Residual	.85		

^aNinth grade data

^bTenth grade data

^cNinth to tenth grade

was a small association between any of the four values (Interest and Satisfaction, Salary, Prestige, and Security) and the criterion for either the ninth or tenth year measures of these values. Of the four values, Interest and Satisfaction had the strongest effect if the total effect for ninth grade was disregarded. Second, while Level of Occupational Choice (Ninth Grade) is associated with a negative total effect, Level of Occupational Choice (Tenth Grade) is associated with an equal positive effect. Lastly, Socioeconomic Status has a relatively small effect upon the criterion, most of which operates in a direct manner. The final point of interest is the residual, which was computed to be .85, indicated that the model predicted approximately 28 percent of the variance in the criterion Stability of Expressed Occupational Choice (Ninth to Twelfth Grade).

One of the most important advantages of path analysis is that it allows specific indirect effects to be determined. Since relatively strong indirect effects were indicated for the variables Interest and Satisfaction (Ninth Grade), GATB "G," Vocational Maturity (Ninth Grade), GPA (Ninth Grade), Vocational Maturity (Tenth Grade), the paths of indirect effects for these variables were computed from the data presented in Tables 2 and 18. Table 19 depicts the major indirect paths for these five variables and the indirect effect associated with each path. Although the sum of the specific indirect effects for any given variable should equal the total indirect effect found in Table 18, the sum of the specific indirect effects given in Table 19 do so for GPA (Ninth Grade) only by chance since only the major paths were investigated.

Table 19: Paths of Major Indirect Effects Upon the Variable
Stability of Expressed Occupational Choice
(Ninth to Twelfth Grade)

Variable	Through	Variable	Indirect Effect
1. Interest and Satisfaction ^a	2. Salary ^a		.02
1. Interest and Satisfaction ^a	11. GPA ^a		-.02
1. Interest and Satisfaction ^a	12. Interest and Satisfaction ^b		.03
1. Interest and Satisfaction ^a	17. Curriculum ^b		-.02
1. Interest and Satisfaction ^a	18. GPA ^b		.04
5. GATB "G" ^a	11. GPA ^a		-.05
5. GATB "G" ^a	18. GPA ^b		.08
9. Vocational Maturity ^a	18. GPA ^b		.06
9. Vocational Maturity ^a	19. Stability of Expressed Occupational Choice ^c		.08
11. GPA ^a	18. GPA ^b		.09
11. GPA ^a	19. Stability of Expressed Occupational Choice ^c		.04
16. Vocational Maturity ^b	18. GPA ^b		.05
16. Vocational Maturity ^b	19. Stability of Expressed Occupational Choice ^c		.09

^aNinth grade data

^bTenth grade data

^cNinth to tenth grade

Five major indirect paths were determined to be relevant to Interest and Satisfaction (Ninth Grade). The indirect path coefficient for Interest and Satisfaction (Ninth Grade) through Salary (Ninth Grade) was computed to be .02. An indirect path coefficient of the same variable through GPA (Ninth Grade) was found to equal $-.02$. The indirect effect of Interest and Satisfaction (Ninth Grade) upon the criterion through the tenth grade measure of the same value was .03. A value of $-.02$ was found to be associated with the indirect effect of Interest and Satisfaction (Ninth Grade) through Curriculum. Finally, Interest and Satisfaction was determined to operate upon the Stability of Expressed Occupational Choice (Ninth to Tenth Grade) through GPA (Tenth Grade), resulting in a computed indirect effect of .04. All major indirect paths were associated with values smaller than the direct effect of Interest and Satisfaction (Ninth Grade).

Two major indirect paths were identified to be associated with GATB "G." Both of these indirect paths were found to have a stronger effect upon the criterion than did the direct path from GATB "G" to Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). GATB "G" was found to operate through GPA (Ninth Grade) and GPA (Tenth Grade), the effects computed for these paths were $-.05$ and $.08$ respectively.

Likewise, Vocational Maturity (Ninth Grade) was found to effect the criterion indirectly through two major paths. The coefficient associated with the effect of Vocational Maturity (Ninth Grade) through GPA (Tenth Grade) was computed to be .06. The coefficient associated with the effect of Vocational Maturity (Ninth Grade) through Stability

of Expressed Occupational Choice (Ninth to Tenth Grade) upon the criterion was computed as .08. Both of these major paths are associated with larger path coefficients than was the direct path from Vocational Maturity (Ninth Grade) to Stability of Expressed Occupational Choice (Ninth to Twelfth Grade).

Ninth Grade GPA was discovered to have major indirect paths through the variables GPA (Tenth Grade), and Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). The effects computed for each of these paths were .09, and .04 respectively. None of these indirect routes were found to have a stronger effect than the direct route from GPA (Ninth Grade) to Stability of Expressed Occupational Choice (Ninth to Twelfth Grade).

The entire effect of Vocational Maturity (Tenth Grade) was determined to operate upon the criterion in an indirect way. Vocational Maturity (Tenth Grade) was found to operate through the same two variables as did the ninth grade measure of Vocational Maturity. The effect computed for the path through GPA (Tenth Grade) was .05. A coefficient of .09 was obtained for the path through Stability of Expressed Occupational Choice (Ninth to Tenth Grade).

The Revised Model

A revised model was developed in light of the small relationship which occurred between several of the variables and the final criterion. This model is depicted in Figure 3. The summary information provided in Tables 1, 2 and 4 is still applicable to the revised model for those variables included in the revised model. The same variable designations

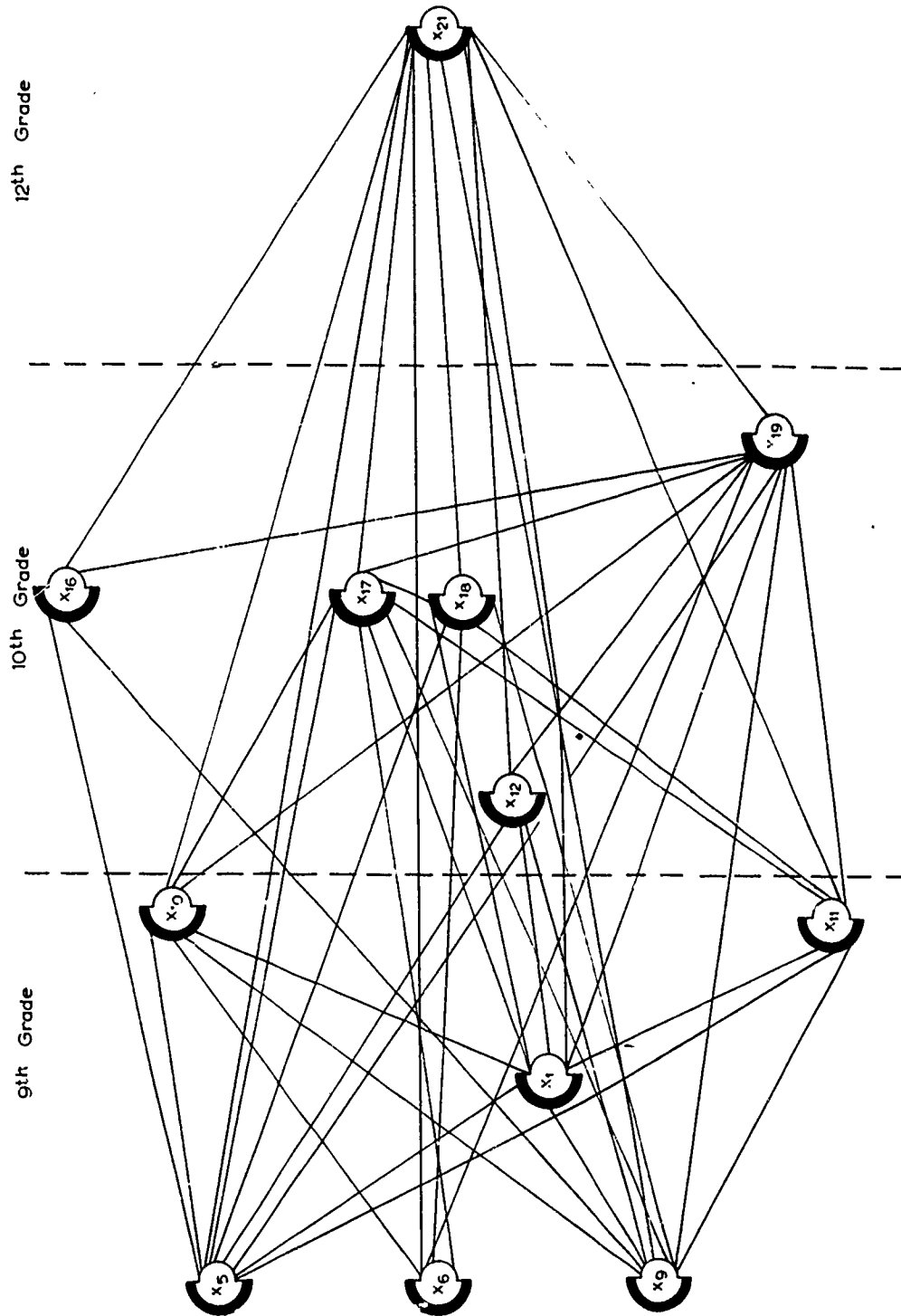


Figure 3. Revised Model

were used in the revised model as were used in the original model to eliminate the need to redefine the variables.

The effects of GATB "G" and Vocational Maturity (Ninth Grade) upon Interest and Satisfaction (Ninth Grade) are shown in Table 20. Both variables were found to operate upon the criterion largely through direct routes. The computed total effect associated with GATB "G" was .29. Approximately two thirds of the total effect, .19, was computed to be direct effect. The same condition held for the variable, Vocational Maturity, which had a total effect of .30 and a direct effect of .21.

Table 20: Effects Upon the Variable
Interest and Satisfaction
(Ninth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
5. GATB "G" ^a	.29	.19	.10
9. Vocational Maturity ^a	.30	.21	.09
Residual	.93		

^aNinth grade data

Level of Occupational Choice (Ninth Grade) was predicted by four variables in the revised model as indicated in Table 21, as opposed to nine variables in the original model. Three variables, Interest and Satisfaction (Ninth Grade), GATB "M," and Vocational Maturity (Ninth Grade) were found to have effects of an indirect nature upon the criterion. GATB "G" was found to operate upon the criterion largely through a direct path. The total effects associated with Interest

and Satisfaction (Ninth Grade), GATB "M," and Vocational Maturity (Ninth Grade) were .16, .11, and .22 respectively. Corresponding indirect effects of .12, .08, and .16 were computed. GATB "G" was found to be the strongest predictor of Level of Occupational Choice (Ninth Grade) as evidenced by a total effect of .39. The direct effect computed for GATB "G" was .35.

Table 21: Effects Upon the Variable Level of Occupational Choice (Ninth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.16	.04	.12
5. GATB "G" ^a	.39	.35	.04
6. GATB "M" ^a	.11	.03	.08
9. Vocational Maturity ^a	.22	.06	.16
Residual	.92		

^aNinth grade data

Table 22 displays the effects of Interest and Satisfaction (Ninth Grade), GATB "G," and Vocational Maturity (Ninth Grade) upon the variable GPA (Ninth Grade). GATB "G" was found to be the strongest predictor of GPA (Ninth Grade) with a total effect of .56, most of which was found to be direct effect, .46. Vocational Maturity (Ninth Grade), the second best predictor, had a total effect of .41 which was evenly divided between a direct effect of .20 and an indirect effect of .21. Interest and

Satisfaction (Ninth Grade) was computed to have a total effect of .24 and an indirect effect of .19.

Table 22: Effects Upon the Variable GPA
(Ninth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.24	.05	.19
5. GATB "G" ^a	.56	.46	.10
9. Vocational Maturity ^a	.41	.20	.21
Residual	.81		

^aNinth grade data

Three ninth grade variables, Interest and Satisfaction, GATB "G," and Vocational Maturity, were utilized as predictors of Interest and Satisfaction (Tenth Grade). Table 23 shows that, as would be expected, the ninth grade measure of Interest and Satisfaction was the best predictor of the tenth grade measure of the same value. The total effect associated with the ninth grade measure of Interest and Satisfaction was computed to be .51 and the direct effect was found to be .47. Vocational Maturity (Ninth Grade) was the second best predictor of the criterion. The total effect of Vocational Maturity (Ninth Grade) was determined to be .27 which was partitioned into a direct effect of .14 and an indirect effect of .13. GATB "G" was found to operate upon the criterion more strongly in an indirect than direct manner. The total effect of GATB "G," .22, was comprised of a direct effect of .04 and an indirect effect of .18.

Table 23: Effects Upon the Variable
Interest and Satisfaction
(Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.51	.47	.04
5. GATB "G" ^a	.22	.04	.18
9. Vocational Maturity ^a	.27	.14	.13
Residual	.84		

^aNinth grade data

Table 24 exhibits the effects of GATB "G" and Vocational Maturity (Ninth Grade) upon Vocational Maturity (Tenth Grade). Since this table is identical to Table 13, no recapitulation of the results will be offered here.

Table 24: Effects Upon the Variable
Vocational Maturity
(Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
5. GATB "G" ^a	.37	.14	.23
9. Vocational Maturity ^a	.61	.55	.06
Residual	.78		

^aNinth grade data

Six variables, all ninth grade measures, were used to predict Curriculum (Mid-Term Tenth Grade) and the results are depicted by Table 25. Level of Occupational Choice (Ninth Grade) was determined to be the strongest predictor of the criterion and operated exclusively in a direct manner. The total effect of .35 computed for Level of Occupational Choice (Ninth Grade) was found to equal the direct effect. GPA (Ninth Grade) had a total effect of .16 upon the criterion which was divided into a direct effect of .10 and an indirect effect of .06. Interest and Satisfaction (Ninth Grade) operated upon Curriculum through a direct effect of .10 and an indirect effect of .03. While GATB "G" was found to be affiliated with a direct effect of .10, an indirect effect of .18 was computed. Vocational Maturity (Ninth Grade) also had a larger indirect than total effect, .12 as compared with .03. GATB "M" was found to have a total effect upon Curriculum of only .04, all of which was indirect in nature.

Table 26 indicates that the revised model used six variables to predict Tenth grade GPA as opposed to eight in the original with no decrease in the amount of variance explained (Residual = .68 for both models). GPA (Ninth Grade) was the variable most related to GPA (Tenth Grade) as indicated by the total effect of .68 associated with the earlier success measure. The direct effect computed for GPA (Ninth Grade) was .48 with a corresponding indirect effect of .20. GATB "G" was found to have a direct effect of .24 upon the criterion which when combined with the obtained indirect effect of .34 yielded a total effect of .58. Vocational Maturity (Ninth Grade) was determined to have a stronger indirect than direct effect upon the criterion. The total

Table 25: Effects Upon the Variable Curriculum
(Mid-Term Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.13	.10	.03
5. GATB "G" ^a	.10	-.08	.18
6. GATB "M" ^a	.04	.00	.04
9. Vocational Maturity ^a	.03	-.09	.12
10. Level of Occupational Choice ^a	.35	.35	.00
11. GPA ^a	.16	.10	.06
Residual	.93		

^aNinth grade data

Table 26: Effects Upon the Variable GPA
(Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	.30	.08	.22
5. GATB "G" ^a	.58	.24	.34
6. GATB "M" ^a	.16	-.01	.17
9. Vocational Maturity ^a	.45	.12	.33
11. GPA ^a	.68	.48	.20
17. Curriculum ^b	.11	-.01	.12
Residual	.68		

^aNinth grade data

^bTenth grade data

effect of .45 computed for Vocational Maturity (Ninth Grade) was composed of an indirect effect of .33 and a direct effect of .12. Interest and Satisfaction (Ninth Grade) also operated upon the criterion largely through indirect paths as can be demonstrated by comparing the indirect effect of .22 to the direct effect of .08. GATB "M" was found to have a larger indirect than total effect, .17 as opposed to .16. This was also the case with Curriculum: computed indirect effect was .12 while the total effect was .11.

Of the nine variables used to predict Stability of Expressed Occupational Choice (Ninth to Tenth Grade), only two were found to have total effects greater than .10 (see Table 27). Vocational Maturity (Tenth Grade) was found to be most strongly related to the criterion with a total effect of .20 and a direct effect of .16. The ninth grade measure of Vocational Maturity was determined to have a total effect upon the criterion of .17 which was partitioned into a direct effect of .10 and an indirect effect of .07. The remaining variables were associated with total effects of less than .10. Interest and Satisfaction (Ninth Grade) was found to have a total effect of $-.02$ while the tenth grade measure of the same value had a total effect of .02. Additionally, the ninth grade measure of Interest and Satisfaction had a direct effect of $-.09$ and an indirect effect of .07, while Interest and Satisfaction (Tenth Grade) operated entirely through indirect paths as evidenced by the obtained indirect effect of .02. Of the remaining five variables, two operated upon the criterion largely through indirect paths. GATB "G" and GATB "M" were found to have indirect effects of .08 and .03 respectively. Level of Occupational Choice (Ninth Grade), GPA (Ninth Grade),

Table 27: Effects Upon the Variable Stability
of Expressed Occupational Choice
(Ninth to Tenth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	-.02	-.09	.07
5. GATB "G" ^a	.07	-.01	.08
6. GATB "M" ^a	.02	-.01	.03
9. Vocational Maturity ^a	.17	.10	.07
10. Level of Occupational Choice ^a	-.03	-.06	.03
11. GPA ^a	.09	.06	.03
12. Interest and Satisfaction ^b	.02	.00	.02
16. Vocational Maturity ^b	.20	.16	.04
17. Curriculum ^b	-.08	-.05	-.03
Residual	.97		

^aNinth grade data

^bTenth grade data

and Curriculum had larger direct than indirect effects and were associated with direct effects of $-.06$, $.06$, and $-.05$ respectively. The model explained only five percent of the variance in Stability of Expressed Occupational Choice (Ninth to Tenth Grade).

The revised model explained 28 percent of the variance in the final criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), as did the original model. Eleven variables were used to predict the criterion in the revised model as opposed to 20 in the original model. Table 28 contains the computed effects associated with each of the eleven variables used in the revised model to predict Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was most related to the criterion and operated upon Stability of Expressed Occupational Choice (Ninth to Twelfth Grade) basically through the direct path. The total effect of the earlier stability measure upon the later measure was computed to be $.49$ with a direct effect of $.45$. GPA (Tenth Grade) also effected the criterion largely through the direct path and was associated with a total effect of $.19$ and a direct effect of $.15$. As in the original model, Vocational Maturity measured at both ninth and tenth grades had equal total effects of $.15$ upon the criterion and both operated through indirect paths, the earlier measure having an indirect effect of $.12$ and the later measure an indirect effect of $.15$. Curriculum was found to have a direct effect of $-.11$ and an indirect effect of $-.03$ which combined to equal a total effect of $-.14$. A total effect of $.11$ was computed for GATB "G." GATB "G" was associated with an indirect effect upon Stability of Expressed Occupational Choice (Ninth to Twelfth

Table 28: Effects Upon the Variable Stability
of Expressed Occupational Choice
(Ninth to Twelfth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	-.01	-.05	.04
5. GATB "G" ^a	.11	.04	.07
6. GATB "M" ^a	.09	.07	.02
8. Vocational Maturity ^a	.15	.03	.12
10. Level of Occupational Choice ^a	-.03	-.02	-.01
11. GPA ^a	.07	-.09	.16
12. Interest and Satisfaction ^b	.03	.03	.00
16. Vocational Maturity ^b	.15	.00	.15
17. Curriculum ^b	-.14	-.11	-.03
18. GPA ^b	.19	.15	.04
19. Stability of Expressed Occupational Choice ^c	.49	.45	.04
Residual	.72		

^aNinth grade data

^bTenth grade data

^cNinth to tenth grade

Grade) of .07 as compared to a direct effect of .04. The remaining five variables in the model were determined to have total effects of less than .10. GPA (Ninth Grade) was found to have a larger indirect than total effect, .16 as opposed to .07. The remaining four variables, Interest and Satisfaction (Ninth Grade), GATB "M," Level of Occupational Choice (Tenth Grade), and Interest and Satisfaction (Tenth Grade), were found to have direct effects of $-.05$, $.07$, $-.02$, and $.03$ respectively.

Table 29 depicts the major indirect paths and their computed effects for the variables Interest and Satisfaction (Ninth Grade), GATB "G," Vocational Maturity (Ninth Grade), GPA (Ninth Grade), and Vocational Maturity (Tenth Grade). Two major paths were investigated which were relevant to the variable Interest and Satisfaction (Ninth Grade). The path through GPA (Ninth Grade) was found to have an indirect effect of $-.02$. The effect of Interest and Satisfaction through GPA (Tenth Grade) was computed to be $.05$. Thus, the effect of Interest and Satisfaction through GPA (Tenth Grade) is equal to the direct effect of Interest and Satisfaction (Ninth Grade) upon the final criterion.

Three major indirect paths were identified with GATB "G." Two of these paths, through GPA (Ninth Grade) and GPA (Tenth Grade), were found to be larger than the direct effect of GATB "G" upon Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). The computed indirect effect of GATB "G" through GPA (Ninth Grade) was $-.05$. The indirect effect of GATB "G" through GPA (Tenth Grade) was found to be $.09$. The only major indirect path not found to be larger than the direct effect of GATB "G" upon the criterion was the path through Stability of Expressed Occupational Choice (Ninth to Tenth Grade) which was computed to be $.03$.

Table 29: Paths of Major Indirect Effects Upon the Variable
Stability of Expressed Occupational Choice (Ninth
to Twelfth Grade)

Variable	Through	Variable	Indirect Effect
1. Interest and Satisfaction ^a	11. GPA ^a	Stability of Expressed Occupational Choice ^c	-.02
1. Interest and Satisfaction ^a	18. GPA ^b		.05
5. GATB "G" ^a	11. GPA ^a		-.05
5. GATB "G" ^a	18. GPA ^b		.09
5. GATB "G" ^a	19. Stability of Expressed Occupational Choice ^c		.03
9. Vocational Maturity ^a	11. GPA ^a		-.04
9. Vocational Maturity ^a	18. GPA ^b		.07
9. Vocational Maturity ^a	19. Stability of Expressed Occupational Choice ^c		.08
11. GPA ^a	18. GPA ^b		.10
11. GPA ^a	19. Stability of Expressed Occupational Choice ^c		.04
16. Vocational Maturity ^b	18. GPA ^b		.06
16. Vocational Maturity ^b	19. Stability of Expressed Occupational Choice ^c		.09

^aNinth grade data

^bTenth grade data

^cNinth to tenth grade

Vocational Maturity (Ninth Grade) was affiliated with three major indirect paths. All three paths yielded effects that were greater than the direct effect of Vocational Maturity (Ninth Grade) upon Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). The effect of Vocational Maturity (Ninth Grade) through ninth grade GPA was determined to be $-.04$. The path through tenth grade GPA was computed to have an effect of $.07$. Finally, the computed effect for the path through Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was $.08$.

Two major indirect paths were determined to be relevant to GPA (Ninth Grade). The effect of GPA (Ninth Grade) through GPA (Tenth Grade) was found to be $.10$. GPA (Ninth Grade) had an indirect effect equal to $.04$ through Stability of Expressed Occupational Choice (Ninth to Tenth Grade) upon the criterion Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). Both of these indirect paths yielded effects stronger than the direct effect of GPA (Ninth Grade) upon the final criterion.

Two major indirect paths were identified with Vocational Maturity (Tenth Grade). The path through GPA (Tenth Grade) yielded an effect of $.06$. The indirect path through Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was determined to have an effect of $.09$ upon the criterion. As has been previously found, Vocational Maturity (Tenth Grade) had no direct effect upon Stability of Expressed Occupational Choice (Ninth to Twelfth Grade).

Figure 4 displays the revised model with the path from Stability of Expressed Occupational Choice (Ninth to Tenth Grade) to the final

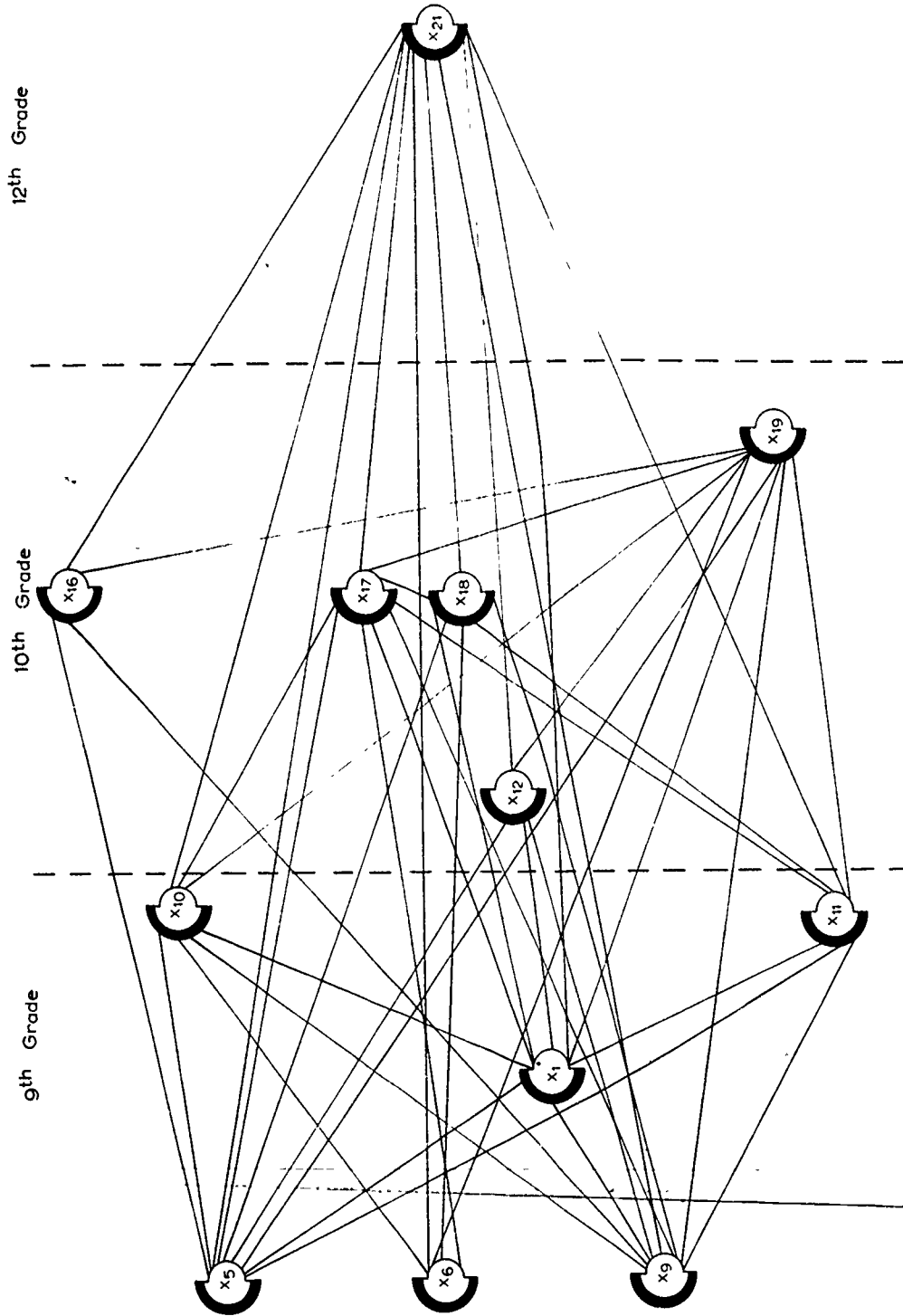


Figure 4. Revised Model Without Stability of Expressed Occupational Choice (9th to 10th Grade) Included as a Predictor.

criterion deleted. Table 30 contains the results of the analysis of the revised model without Stability of Expressed Occupational Choice (Ninth to Tenth Grade) included as a predictor of the final criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). GPA (Tenth Grade) was identified as the strongest predictor of the criterion with a path coefficient of .23 and an indirect effect of $-.04$. GPA (Ninth Grade) was found to have a direct effect of $-.10$ and an indirect effect of $.17$ upon the final criterion. Curriculum was associated with a direct effect of $-.13$ and an indirect effect of $-.01$. Interest and Satisfaction (Ninth Grade) was determined to have a direct effect of $-.09$ and an indirect effect of $.08$ upon Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). GATB "M" and Vocational Maturity (Ninth Grade) both had direct effects computed to be $.07$ though the former was associated with an indirect effect of $.02$, and the latter with an indirect effect of $.08$. Vocational Maturity (Tenth Grade) had a total effect upon the criterion of $.15$ which was divided into a direct effect of $.06$ and an indirect effect of $.09$. GATB "G" was found to have a direct effect of $.02$, but operated upon the criterion through an indirect effect of $.09$. Level of Occupational Choice (Ninth Grade) had a direct effect of $-.05$ which was larger than the total effect of $-.03$. Finally, the effects of Interest and Satisfaction (Tenth Grade) remained unchanged from the previous table which showed a direct effect of $.03$ and no indirect effect. The residual, $.95$, indicates that without including Stability of Expressed Occupational Choice (Ninth to Tenth Grade) as a predictor, only nine percent of the variance of Stability of Expressed Occupational Choice (Ninth to Twelfth Grade) can be predicted.

Table 30: Effects Upon the Variable Stability
of Expressed Occupational Choice
(Ninth to Twelfth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	-.01	-.09	.08
5. GATB "G" ^a	.11	.02	.09
6. GATB "M" ^a	.09	.07	.02
9. Vocational Maturity ^a	.15	.07	.08
10. Level of Occupational Choice ^a	-.03	-.05	.02
11. GPA ^a	.07	-.10	.17
12. Interest and Satisfaction ^b	.03	.03	.00
16. Vocational Maturity ^b	.15	.06	.09
17. Curriculum ^b	-.14	-.13	-.01
18. GPA ^b	.19	.23	-.04
Residual	.95		

^aNinth grade data

^bTenth grade data

It was decided to investigate the model with one additional modification. Figure 5 displays a model identical to that in Figure 3, except that the final criterion has been changed to Stability of Expressed Occupational Choice (Tenth to Twelfth Grade), X_{22} . At the outset, it should be noted that Table 31 shows that the residual equals .95, again indicating that only nine percent of the variance in the criterion was explained by the model. All but one of the relationships between the predictors and the criterion decreased or remained unchanged from previous models. The exception was Curriculum which became a stronger predictor. Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was the strongest predictor and was associated with a total effect of .22, most of which operated directly upon Stability of Expressed Occupational Choice (Tenth to Twelfth Grade) since the direct effect was computed to be .19. Curriculum was determined to have a larger direct than total effect, -.21 as compared to -.20. The total effect of GPA (Tenth Grade) upon the criterion was computed to be .12 which was divided into a direct effect of .11 and an indirect effect of .01. The remaining variables in the model were found to be associated with total effects less than .10. Two variables, GATB "G" and Vocational Maturity (Ninth Grade) were determined to have larger indirect than total effects, .07 compared to .05 and .09 compared to .06 respectively. Interest and Satisfaction measured at both ninth and tenth grades exhibited a stronger direct than total effect upon Stability of Expressed Occupational Choice (Tenth to Twelfth Grade). Finally, Level of Occupational Choice (Ninth Grade) was determined to have direct and indirect effects which were larger than the total effect. The direct

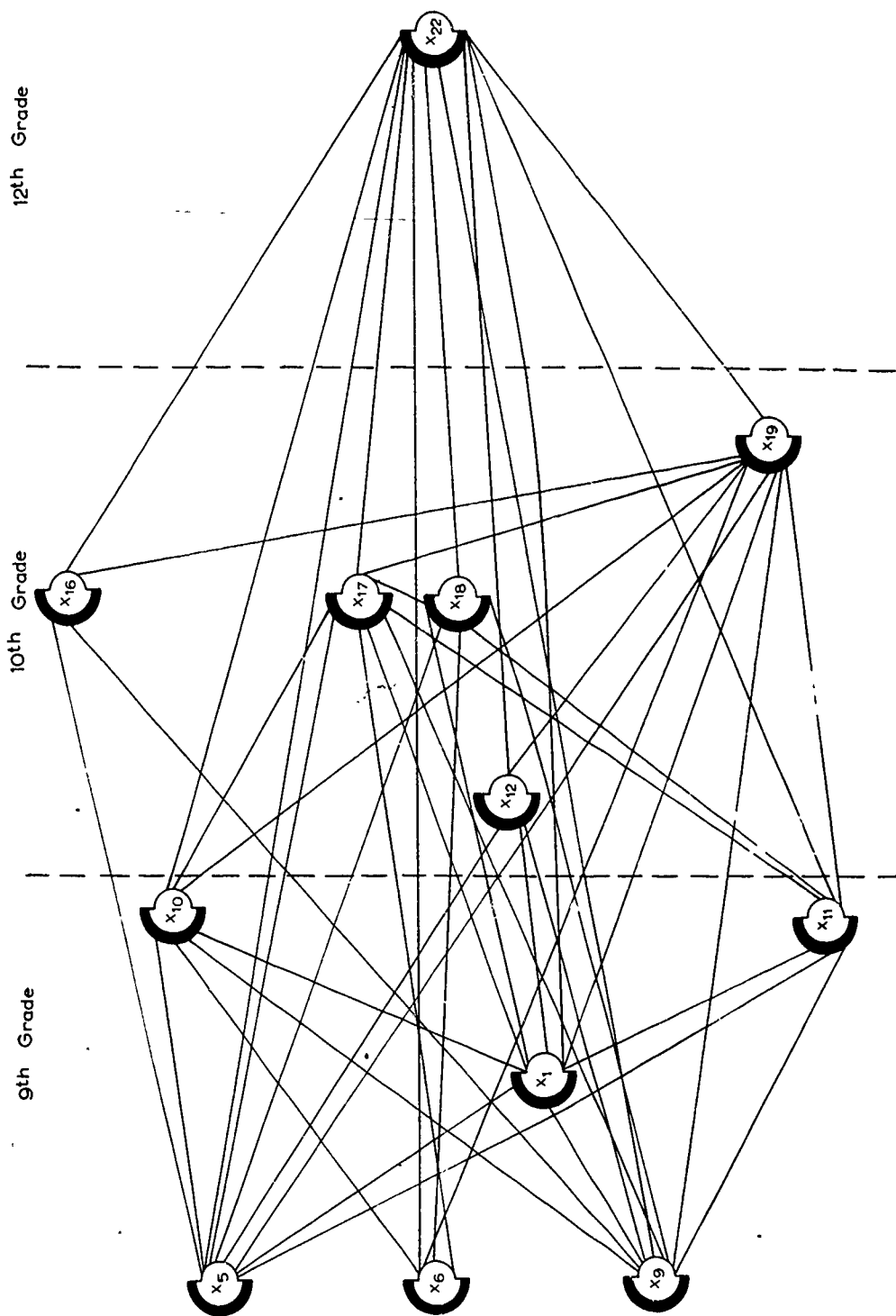


Figure 5. Revised Model Using Stability of Expressed Occupational Choice (10th to 12th Grade)
Included as the Final Criterion.

Table 31: Effects Upon the Variable Stability
of Expressed Occupational Choice
(Tenth to Twelfth Grade)

Variable	Total Effect	Direct Effect	Total Indirect Effect
1. Interest and Satisfaction ^a	-.01	-.03	.02
5. GATB "G" ^a	.05	-.02	.07
6. GATB "M" ^a	.01	.00	.01
9. Vocational Maturity ^a	.06	-.03	.09
10. Level of Occupational Choice ^a	-.01	.05	-.06
11. GPA ^a	.06	.00	.06
12. Interest and Satisfaction ^b	.01	.02	-.01
16. Vocational Maturity ^b	.07	.01	.06
17. Curriculum ^b	-.20	-.21	.01
18. GPA ^b	.12	.11	.01
19. Stability of Expressed Occupational Choice ^c	.22	.19	.03
Residual	.95		

^aNinth grade data

^bTenth grade data

^cNinth to tenth grade

effect computed for Level of Occupational Choice (Ninth Grade) was .05 while the indirect effect was found to be $-.06$; they combined to determine a total effect of $-.01$.

Summary

This chapter reported the findings pertinent to the present study. The investigation of the inter-rater reliability of Roe's (1956) occupational classification scheme yielded a median correlation coefficient of .87. Eight correlation coefficients were computed using Pearson Product Moment Correlation. Three models relevant to the Stability of Expressed Occupational Choice were investigated. It was determined that Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was the best predictor of Stability of Expressed Occupational Choice (Ninth to Twelfth Grade) and Stability of Expressed Occupational Choice (Tenth to Twelfth Grade). In terms of predicting the stability of occupational choice throughout the secondary school years, both the original and the revised model predicted 28 percent of the variance associated with Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). When Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was eliminated from the revised model, the revised model explained only nine percent of the variance associated with Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). Likewise, when Stability of Expressed Occupational Choice (Tenth to Twelfth Grade) was utilized as the final criterion in the revised model in lieu of Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), the revised model explained only ten percent of the variance associated with the new final criterion.

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

This chapter will provide a summary of this study, as well as a discussion, conclusions and recommendations based upon the findings of this study.

SummaryIntroduction

The Industrial revolution, and more specifically the era of technology, have drastically altered the occupational structure of the United States. Change in the occupational structure has resulted in changes in society and education. Manual labor is being de-emphasized while technical skills are becoming increasingly more important. The change from a manual labor, agrarian based society to a technical, suburban based society has resulted in numerous changes pertinent to education. Pre-employment education has continually become more important as the number of unskilled occupations has decreased and the number of skilled and technical occupations has increased. The schools have been viewed as the logical institution to conduct pre-employment education. Thus, an increasing emphasis has been placed upon vocational education since the beginning of this century.

The addition of vocational education to the secondary school curriculum has necessitated that youth make occupational choices. The

requirement that each youth make an occupational choice of some type during his secondary school experience has fostered considerable interest in the decision-making or choice process among educational researchers. While preliminary work in this area was done by Parsons during the first decade of this century, a more concerted effort to explain choice phenomena has been made in the last twenty-five years. Although no two theorists seem to agree completely, most theories are found to contain several common elements. For example, most theories have pointed out that the way an individual views himself, plays an important role in the decision-making process. One of the more widely accepted theories is Super's theory of Vocational Development.

Another concern is that society has recently begun to view the educational system in a different manner. The American public has begun to demand that education, as an institution, be more accountable. Furthermore, the public is currently demanding that education as a process be relevant. Much of this public concern with education is at least indirectly attributable to the effects of our technological age and the resultant changes in society in general.

The pressures of the era of technology, whether exerted through public opinion or as a result of the changing occupational structure, have brought about changes in educational philosophy. Educators have begun to search for instructional methods which will accommodate the needs of each individual as well as reflect the continually changing world of work. Momentum seems to be gathering in favor of those educators who believe the system should adapt to the needs of each individual rather than those who would maintain a system which demands that the

individual change to fit the system. Thus, in recent years we have heard considerable discussion of individualized instruction, individually prescribed instruction, computer-assisted instruction, and other similar systems.

Most recently, Career Education has captured the limelight. This concept is founded upon the principle that all education should be relevant to the world of work. This concept also contends that no student should leave the educational environment without a salable skill. Career Education emphasizes the value and necessity of providing educational programs to retrain and upgrade individuals as necessary. Career Education supports the philosophy that all individuals should be given the academic skills and attitudes which would allow them to reenter the educational environment should it become necessary or should they so desire. Much of the theoretical basis for the concept of Career Education can be found in the Developmental Theories of Career Development.

Career Development theory supported by casual observation indicates that individuals develop at different rates. Thus, it would seem logical to assume that all individuals are not ready to make occupational decisions at the same point in time. If some method could be developed which would identify those students whose occupational choices were likely to remain stable, those students could then be given training directly pertinent to their occupational choices. Those students who had not yet developed to the point at which their occupational choices were likely to remain stable, could be given further exploratory and developmental experiences. Thus, all students would be encouraged to make occupational decisions when they were ready to do so and to make

occupational decisions which would not prematurely narrow their occupational alternatives.

Statement of the Problem

A ten-year study of vocational development, the Vocational Development Study (VDS), was initiated in 1968 by the Department of Vocational Education at The Pennsylvania State University in conjunction with the Pennsylvania Research Coordinating Unit (RCU) of the Department of Education. This study is part of that continuing research effort to examine the vocational development of individuals.

The research conducted and reported here may be viewed as an extension of the work of Cooley and Lohnes as well as the theory proposed by Super. This study is thought to be a pioneering effort in applying Path Analysis to longitudinal data concerning the stability of occupational choice. The present study attempted to build a model for predicting the stability of the early expressed occupational choices of secondary students. Additionally, it was proposed that the stability of occupational choice for the period from ninth grade to twelfth grade be investigated.

Specifically, the purpose of this study was to:

1. Develop a model for predicting the stability of expressed occupational choice from ninth grade to twelfth grade based upon a review of previous research.
2. Examine the validity and strength of the proposed model.
3. Modify the proposed model in an effort to obtain the best possible model in terms of the existing data.

Additionally, the inter-rater reliability of Roe's (1956) field and level occupational classification scheme was investigated. The specific question to be answered was:

4. What was the degree of relationship between raters using Roe's occupational classification scheme to classify secondary students' expressed occupational choices?

Procedure

The research sample consisted of 550 students from the Altoona Area High School System. To be included in the sample a student must have been enrolled in the Altoona Area Schools for the period from ninth to twelfth grade and have a complete set of data in terms of those variables of interest in the present study.

Two statistical methodologies were used to analyze the data pertinent to this study: Pearson Product Moment Correlation (PPMC) and Path Analysis. PPMC was used to determine the inter-rater reliability of Roe's occupational classification scheme. Path Analysis was used to develop, evaluate and modify the proposed model for predicting Stability of Expressed Occupational Choice. A total of 21 student characteristic variables, including the final criterion, were used in the proposed model. The revised model utilized 12 of the 21 variables, including final criterion, utilized in the originally proposed model. Finally, two modifications of the revised model were investigated in order to evaluate the strength of the revised model.

Findings

The inter-rater reliability for Roe's occupational classification scheme was determined by computing the PPMC between two raters. The occupational choices of 1,175 students were classified according to both field and level at two points in time. Eight coefficients were

computed and they ranged from .84 to .91. The obtained median correlation coefficient was .87 based on the field and level classifications of four occupational choices per student.

Using Path Analysis, it was determined that 28 percent of the variance associated with the final criterion, Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), could be explained by the proposed model. The proposed model utilized 20 variables to predict the final criterion. Based upon the strength of the relationship between each variable and the final criterion, nine variables were deleted from the proposed model to form the revised model.

It was found that the revised model, which utilized 11 predictor variables, also explained 28 percent of the variance associated with the final criterion. Two modifications of the revised model were investigated to evaluate the strength of the revised model. First, since most of the variance in the revised, as well as the originally proposed, model was explained by the variable Stability of Expressed Occupational Choice (Ninth to Tenth Grade), it was deleted from the model as a predictor variable. The remaining ten variables were found to explain only nine percent of the variance associated with Stability of Expressed Occupational Choice (Ninth to Twelfth Grade). Secondly, the final criterion was changed to Stability of Expressed Occupational Choice (Tenth to Twelfth Grade). The revised model, including Stability of Expressed Occupational Choice (Ninth to Tenth Grade), was used to predict this new final criterion. It was determined that the revised model explained ten percent of the variance related to Stability of Expressed Occupational Choice (Tenth to Twelfth Grade).

Discussion

Conclusions related to Question 4 are offered initially. Roe's occupational classification scheme was found to have a reasonably high inter-rater reliability coefficient. It appears that Roe's classification scheme is a useful and reliable method of classifying occupations. Furthermore, this classification scheme has sufficient inter-rater reliability to make comparisons of classified occupations between samples valid when such comparisons are useful.

The major conclusion of this study is that the stability of the expressed occupational choices of secondary students cannot be predicted to any great extent except by previous stability. At least, such a criterion cannot be predicted using the model composed of the variables utilized in this study. This conclusion was supported by the observation that only a small amount of the variance (nine percent) associated with the criterion was explained by the model when Stability of Expressed Occupational Choice (Ninth to Tenth Grade) was not included as a predictor. Further indication that the stability of the expressed occupational choice was not predictable was obtained when the model was utilized to predict Stability of Expressed Occupational Choice (Tenth to Twelfth Grade). The model, including Stability of Expressed Occupational Choice (Ninth to Tenth Grade) as a predictor, explained only ten percent of the variance in the modified criterion.

The best predictor of Stability of Expressed Occupational Choice (Ninth to Twelfth Grade) is Stability of Expressed Occupational Choice (Ninth to Tenth Grade). Of the 286 students who expressed the same occupational choice at tenth grade as they had expressed at ninth

grade, 185 continued to choose that same occupation at twelfth grade. Thus, 65 percent, or approximately two out of every three, of the students who were consistent in their occupational choice from ninth to tenth grade were also consistent in their occupational choice from ninth to twelfth grade. This particular variable, Stability of Expressed Occupational Choice (Ninth to Tenth Grade), explained more of the variance in the criterion than did the remaining variables combined.

Among the many student characteristics which were related to Stability of Expressed Occupational Choice (Ninth to Twelfth Grade), several should be noted. The degree of academic success the student experiences, as measured by CPA, affects the stability of his occupational choice. The successful student more often exhibits stability of occupational choice than his or her academically unsuccessful counterpart. The more vocationally mature student is also slightly more likely to remain stable in terms of occupational choice than the less vocationally mature individual. The student enrolled in the Vocational curriculum is also slightly more likely to continue to express the same occupational choice throughout the secondary school years than the academic student. In fact, in terms of Stability of Expressed Occupational Choice (Tenth to Twelfth Grade), whether or not the student is enrolled in the Vocational curriculum is almost as good a predictor of stability of an occupational choice as is Stability of Expressed Occupational Choice (Ninth to Tenth Grade). On the whole, however, the stability of an occupational choice is not predictable using the above mentioned variables. It may be that the student's knowledge of himself and knowledge of various occupations are the main factors influencing the stability of his occupational choice.

This study did not concern itself with measuring these types of student knowledge. The findings of this study seem to indicate that the stability of an occupational choice is an idiosyncratic occurrence during these years. The stability of an occupational choice may be a result of environment, personality or circumstances. There appears to be no common denominator among those variables considered by this study which distinguishes between those who will remain stable in terms of their expressed occupational choice and those who will not.

Perhaps among the more important findings of this study was the fact that certain variables are not related to the stability of an occupational choice. No overall sex differences were found. Whether the student is male or female has no effect upon stability of choice. Although sex differences were found in early measures of GPA and in level of occupational choice, these differences decreased in later measures of the same variables.

Socioeconomic status was found to affect achievement and level of occupational choice, but had no affect upon the stability of an occupational choice. That is, students from higher socioeconomic backgrounds tend to have better school achievement records and choose higher level occupations. However, their occupational choices, once expressed, are no more or no less stable than are the choices of students from lower socioeconomic backgrounds.

A student's occupational values affect the level of occupation he chooses as well as the curriculum he enters. But, occupational values have a minimal effect upon the stability of an occupational choice. Although the values, Interest and Satisfaction, and Salary, appear to be

the most important, the value structure of most students appears to be in a state of flux during this period in life.

The findings of this study tend to support Super's (1960) contention that ninth graders are not psychologically ready to make occupational choices. This may, however, be a result of the present educational system which does not adequately prepare students to make occupational decisions. Thus, McDaniels' (1963) statement that youth are not too young to choose but rather too poorly informed to choose, may, in fact, not be in disagreement with Super's contention. Once the world of work and career development become the focus of educational programs, stability of expressed occupational choice may become a viable criterion for determining when students are ready for specific occupational instruction.

~~Ginzberg and associates proposed that the tentative choice period~~ occurs between ages 11 and 18. The findings of this study seem to support this hypothesis. Especially notable is the Value Stage occurring at age 15 to 16 during which students' value hierarchies undergo considerable change. This may explain the minor influence occupational values had upon the stability of occupational choice during the time period covered by this study.

In general, the findings of this study seem to imply that three major deficiencies exist in today's educational system. First, students need more planned activities throughout their educational years which will provide them with opportunities to gain knowledge about occupations and their personal capabilities. This seems to support the implementation of a philosophy such as Career Education or at the very least a strong exploratory program such as Industrial Arts in the middle school years.

Second, provisions must be in the present educational system which will allow students to reenter the educational system and to allow students to change programs. Since the majority of students are not making stable occupational choices during this period, adequate program alternatives must be provided for those changing their occupational choices.

Lastly, if a program such as Career Education is not implemented or if no program can be developed which will prepare the majority of students to make stable occupational choices during the beginning of the secondary school years, the current method of evaluating Vocational Education must be viewed as being unrealistic. If students do not make stable occupational choices during high school, they cannot necessarily be expected to enter occupations for which they were trained during that period. Thus, under the existing educational system, it is completely unrealistic to evaluate Vocational Education on the basis of how many students enter occupations for which they were trained during high school.

Recommendations

Recommendations Pertinent to Education

The following recommendations are based on the findings of this study and focus on suggested changes in the present educational system which seem to be indicated.

It appears that the majority of secondary school students are not ready to make occupational choices which would be stable. Because of this fact, the schools should provide programs which will help each individual arrive at a stable occupational choice. Three basic programs are suggested:

1. For those students who are ready to make stable occupational choices or who want specific job skill training, curriculums should be provided to teach the specific skills needed for entry into their occupational choice.
2. For those students who have come to a rather stable decision about the general occupational area they wish to enter (such as the construction industry), curriculums should be developed which will provide instruction in the general skills necessary for entry into a broad occupational area.
3. For those students who are not ready to make any type of occupational decision, broad exploratory programs should be available. These programs could include family type Industrial Arts shops, work-study programs, and work practicum programs.

In addition, all programs should have provisions for students to exit and reenter the educational program for periods of work experience. Furthermore, provisions ought to be made to enable students to transfer between curriculums with the minimum of inconvenience. In order to provide flexibility and coordination in such a diverse educational system, schools will have to develop larger, more effective guidance programs.

All secondary school curriculums should incorporate instruction in employability skills, including how to: (1) look for a job; (2) apply for a job; and (3) get along with other people on the job. In addition, the acquisition of skills and development of attitudes necessary to obtain, maintain, and advance in any occupation should be provided in all curriculums of the proposed approach. Schools should also establish and maintain an active office of Student Placement and Follow-up. The responsibilities of this office should include helping graduates and dropouts obtain employment, and following up ex-students. The placement office should also be instrumental in encouraging and aiding individuals in reentering the educational system as necessary.

Finally, it is evident that all education must become education for change. That is, the educational system must develop in the students the attitudes and competencies necessary to live in a rapidly changing occupational and social environment. Students must be provided with the academic skills and the attitudes which will allow for reentry into the educational system as retraining and upgrading becomes necessary or desirable. Because of the pace at which the occupational structure is changing, it is unrealistic to view any educational program as terminal. It is not enough that educators understand this fact; the community at large, and students in particular, must be made knowledgeable of the effects of technological advances upon the American occupational structure. It seems inevitable that retraining and upgrading programs will become an integral part of the educational system in the future. Therefore, programs must be designed to permit easy entry into and exit from the educational system with the minimum possible inconvenience to the individual.

The findings of this study have served to reemphasize that the educational system should begin to meet the needs of each individual in a more effective manner. If the educational system is to adequately accomplish such a task, the schools must become a more flexible, responsive, and vibrant part of the total community.

Recommendations for Future Research

Based on the findings of the present study the following recommendations for further study are offered.

1. The stability of expressed occupational choice should be investigated utilizing variables which measure the student's self and occupational knowledge.
2. The relationship between stability of expressed occupational choice and various personality types, such as those outlined by Holland, should be investigated.
3. Should a philosophy such as Career Education be implemented, this study should be replicated to investigate the effects of that new educational treatment upon the stability of the occupational choices of secondary school students.
4. Path Analysis should be further investigated as a potentially useful methodology to explore causation in social science problems, particularly when longitudinal data is used.
5. An investigation should be undertaken to determine the age at which stability of expressed occupational choice becomes a useful and predictable phenomenon under the present educational system.

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