

71-2157

ROBERTSON, John Marvin, 1932-

THE EFFECT OF AN OCCUPATIONAL INFORMATION
UNIT OF INSTRUCTION ON THE EXPRESSED AND
INVENTORIED INTERESTS OF VOCATIONAL AGRICUL-
TURE STUDENTS IN SELECTED MICHIGAN HIGH
SCHOOLS.

Michigan State University, Ph.D., 1970
Education, vocational

University Microfilms, A XEROX Company , Ann Arbor, Michigan

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HIGH SCHOOLS

By

John Marvin Robertson

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Secondary Education and Curriculum

1970

ABSTRACT

THE EFFECT OF AN OCCUPATIONAL INFORMATION UNIT OF INSTRUCTION ON THE EXPRESSED AND INVENTORIED INTERESTS OF VOCATIONAL AGRICULTURE STUDENTS IN SELECTED MICHIGAN HIGH SCHOOLS

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Statement of the Problem

The study was an attempt to provide additional information so that teachers of vocational agriculture could better assist rural youth with the tasks involved in the vocational development process.

The objective of the study was to determine the effect which a unit of instruction regarding agriculture occupations might have on the occupational interests of students.

Conducting the Study

The unit was taught in two Michigan high schools by teachers of vocational agriculture. The treatment population included tenth grade students enrolled in vocational agriculture at Stockbridge Community Schools and eleventh and twelfth grade students enrolled in horticulture at Mason High School. The control group at Stockbridge was comprised of other tenth grade students matched with

students in the treatment group on interest variables. The control group at Mason High School included classes of eleventh and twelfth grade students in production agriculture and vocational mechanics.

Outcomes were assessed in terms of the change in the direction, intensity, and clarity of student interests in agricultural occupations and the congruence of the interests with educational and occupational plans.

Three hypotheses were tested:

1. The students' inventoried interests in agriculture will increase more in treatment groups than in control groups.
2. The students' inventoried interests in agriculture will be more consistent in treatment groups than in control groups.
3. The students' in treatment groups will have inventoried interests more consistent with occupational choice than will control groups.

Situational data were gathered regarding the occupation of participants' fathers, years of vocational agriculture taken, and place of residence of participants. Descriptive data concerning the communities, the schools, and the vocational agriculture programs were included.

Major Findings

The eleventh and twelfth grade participants at Mason tended to have interests generally congruent with their educational and occupational plans. The tenth grade participants at Stockbridge tended to have interests that were not generally congruent with their educational and

occupational plans. The majority of the tenth grade students at Stockbridge with inventoried interests in and plans for occupations in agriculture were not enrolled in vocational agriculture.

No significant differences were found and each of the three hypotheses was rejected.

The study did not present any data to support the teaching of information regarding occupations in agriculture to the participants in the manner taught or for the purpose of changing interests as measured by an interest inventory. The study did point to the need for some kind of educational or occupational experiences to aid high school vocational agriculture students in the vocational development process.

DEDICATION

This work is dedicated to my wife, Becky Robertson, and our God. A wife could sacrifice no more to fulfill the dreams of her husband. God has been patient with this sometimes foolish and unwilling servant.

John Marvin Robertson

ACKNOWLEDGMENTS

The author is deeply grateful to Dr. O. Donald Meaders, Chairman of his Guidance Committee, for his constant encouragement, continued guidance, and his many hours of assistance in planning the graduate program and conducting this study.

Appreciation is also expressed to Dr. H. Paul Sweany, Dr. Edgar Schuler, and Dr. John Suehr who served on the author's Guidance Committee.

Sincere thanks are also extended Mr. Robert Slocum and Dr. Howard Splete of the Ingham Intermediate School District for providing the tests and allowing the author to make this study a part of the ISD testing program.

Mr. Dave Winefordner provided invaluable advice in use of the Ohio Vocational Interest Inventory.

Sincere thanks are extended to Mr. Don Cronkite and Mr. Michael O'Malley, vocational agriculture teachers at Stockbridge and Mason respectively, who taught the unit in their classes. The administrators, counselors, and students in Stockbridge and Mason were also essential to the study.

Finally, deep and lasting gratitude is expressed to the author's family. Encouragement and assistance from the

author's wife, and his and her parents were essential to the completion of this study. The author's three children, Susan, Cheryl, and John, exhibited patience and understanding beyond their years.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Statement of the Problem	1
Basis for the study	5
Need for the Study	8
Objective of the Study	10
Hypotheses	11
Definitions	11
Scope and Limitations of the Study	13
Summary	15
II. REVIEW OF LITERATURE	16
Vocational Development Theory	16
The Nature of Interest	30
Origin and Development of Interests	36
Measurement of Specific Occupational Interest	40
Reasons Given for Occupational Choices	44
Interests and Teaching About Agricultural Occupations	49
Summary	54
III. DESIGN OF THE STUDY	56
Collection of Situational Data	56
Selection of Participants	57
Selection of the Unit	61
Selection of the Measurement Instrument	62
Conducting the Study	64
Testing the Hypotheses	68
IV. REPORT OF THE FINDINGS	71
The Community	71
The Schools	76
Enrollments	76
The Vocational Agriculture Programs	78
Counseling Programs	80
Vocational Offerings	80

Chapter	Page
The Participants	81
Years Enrolled in Agriculture	81
Place of Residence	82
Fathers' Occupations	84
Status of Inventoried Interest Prior to Treatment	87
Stockbridge Matched Pairs	88
Mason Groups	90
Testing Hypothesis One	91
Testing Hypothesis Two	94
Testing Hypothesis Three	95
Summary of Hypothesis Testing	97
Additional Findings	98
V. FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS	101
Summary of Findings	101
Status of Students Prior to the Study	101
Status of Occupational Interests Prior to Instruction	102
Measures of Change in Interests	103
Congruence of Occupational Plans and Interests	104
Results of the Instructional Program	105
Conclusions	105
Implications of the Study	106
Recommendations for Further Study	109
SELECTED BIBLIOGRAPHY	111
APPENDICES	
A	119
B	122
C	123

LIST OF TABLES

Table	Page
1. Participant Groups Included at Mason High School by Size and Factors on Which Matched	60
2. Test Reliability and Validity Data From OVIS for Scale 15--Agriculture	64
3. Enrollment Data for Mason and Stockbridge Schools for Grades Nine Through Twelve as Reported on Fourth Friday Count, September, 1969	77
4. Enrollment in Vocational Agriculture By School and Class (1969-1970)	78
5. Years Enrolled in Vocational Agriculture by Participants at Stockbridge	82
6. Years Enrolled in Vocational Agriculture by Group at Mason	83
7. Place of Residence of Participants at Stockbridge	83
8. Place of Residence of Participants by Group at Mason	84
9. Father's Occupation Classified by OVIS Interest Scales for Stockbridge Participants	85
10. Father's Occupation Classified by OVIS Interest Scales for Mason Participants	86
11. Pre-test Scores on Selected OVIS Measures for Participants at Stockbridge	90
12. Pre-test Scores on Selected OVIS Measures by Groups at Mason	90

Table		Page
13.	Differences on Agriculture Scale Data at Stockbridge	91
14.	Pre- and Post-Comparisons of OVIS Agriculture Scale Scores for Treatment and Control Groups at Mason	92
15.	Differences on Normative Rank of the Agriculture Scale at Stockbridge	93
16.	Pre- and Post-Comparison of the Normative Rank of the OVIS Scale Identified by the Participant's Occupational Plans for Mason Data	94
17.	Differences on OVIS Scale Clarity Index for Agriculture at Stockbridge	95
18.	Pre- and Post-Comparisons of the OVIS Clarity Index for the Agriculture Scale for Mason Data	95
19.	Differences on Normative Rank of Interest Scale Matching Occupational Plans at Stockbridge	96
20.	Pre- and Post-Comparisons of the Normative Rank of the OVIS Agriculture Scale Score for Mason Data	97
21.	Summary of Selected Interest Scales and Occupational Choice Data for Groups at Mason	99
22.	Summary of OVIS Variables Relevant to Vocational Agriculture for Stockbridge Sophomore Males	100

LIST OF FIGURES

Figure	Page
1. Map of Mason School District and Stockbridge School District in Relation to the Urban Centers of Ingham County, Michigan	73
2. Comparison of Pre-Test Scores on the Agriculture Scale of the Ohio Vocational Interest Inventory for Paired Treatment and Control Students at Stockbridge	89

CHAPTER I

INTRODUCTION

"Tell me, Sir, which direction shall I go?"
--Lewis Carroll

The question was directed to the Cheshire Cat by Alice in the story Alice in Wonderland. The reply was "this depends a great deal upon where you want to get to." Teachers of vocational agriculture are faced with a similar question when attempting to assist rural youth with activities such as development of career plans, preparation of educational plans, and participation in work experiences. The responsibility of the teacher of vocational agriculture extends beyond the kind of assistance Alice received from the Cheshire Cat.

Statement of the Problem

This study was an attempt to provide additional information so that teachers of vocational agriculture can better assist rural youth with the tasks involved in the vocational development process.

In the first half of this century the world of work was essentially the every day world of experience and reality for most youngsters. Thus a student, especially a rural boy,

was able to observe examples of many occupational opportunities in his immediate community and obtain considerable first-hand work experience. The boy would likely begin to assist his father with daily chores around the farm at an early age. He would progress from simple chores through the common activities performed on the farm. A young boy not only saw his father and other role models at daily work, he received occupational experience and much vocational education in the rural setting.

The boy would grow to be a young man in that same rural setting and could look forward to the traditional career ladder in agriculture. He might begin as a farm-hand, progress to more responsibility as a crew foreman and eventually become a tenant farmer. From tenant farmer he could move to a partnership or become the owner of a mortgage and operate on his own. The top rung of the career ladder was reached when he could burn the mortgage and become owner and operator of his farm. Farming was a way of life.

Today farming in the United States is a business. Farmers no longer live in a self-sufficient status. The era of "horse" power gave way to an era of much more "horse-power"--mechanization. Instead of growing his own power source and fuel--horses and oats--the farmer purchases a tractor and gasoline. The activities once performed entirely on the farm have been continually specialized, divided, and moved off the farm. Agriculture has come to mean more than farming.

As American agriculture has mechanized, output per man has increased and many of the occupational opportunities in agriculture have moved from the farm. The number of farmers and farm managers has decreased by 1,413,000 from 1900 to 1950.¹ At the same time opportunities in careers requiring skills, knowledge, and interest in agriculture located off the farm have multiplied. During the same period of 1900 to 1950, for example, workers in dairy products increased 368 per cent, in grain mill products 674 per cent, and workers in food preparation increased 2,024 per cent.²

Increasing role differentiation in our society and wider geographical distribution of work sites makes it more difficult for rural and rural farm youth to gain reliable and relevant experiences to develop and test interests and make realistic educational and career plans. In addition, as Kaufman and Lewis³ state, the opportunities for exploration in the labor market have been increasingly restricted by legislation and by technological changes that have made it difficult for young people to obtain meaningful employment.

¹Donald J. Bogue, The Population of the United States (New York: The Free Press of Glencoe, 1961), p. 486.

²Ibid., p. 485.

³Jacob J. Kaufman and Morgan V. Lewis, "The Potential of Vocational Education," The Bulletin of the National Association of Secondary School Principals (February, 1969), 21.

The increasing complexity of agriculture and the changing role of educational institutions in helping students bridge the gap between school and the world of work have been recently recognized.

Legislation enacted by Congress since the early sixties has provided the basis for major changes in policies affecting the expenditure of federal funds for vocational education. Both the Vocational Act of 1963 (P.L. 88-210) and the Vocational Amendments of 1968 (P.L. 90-576) have provided the basis for expanding instruction in vocational agriculture from a primary focus on preparation for farming to include preparation for occupations in farming, other production agriculture, and in fact, to include any occupation which requires skills and knowledge in agriculture.

A joint committee of the United States Office of Education and the American Vocational Association re-defined the objectives of vocational agriculture in relation to the expanded mandate of the new legislation. Six objectives were written. Objective three states:

To develop an understanding of and appreciation for career opportunities in agriculture and the preparation needed to enter and progress in agricultural occupations.⁴

The committee drafted six contributory objectives as aspects of objective three:

⁴U.S., Department of Health, Education, and Welfare, Objectives for Vocational and Technical Education in Agriculture (Washington, D.C.: Government Printing Office, 1965), p. 7.

1. Understand and appreciate the importance of agriculture to the Nation's economy and its impact upon the daily lives of all citizens;
2. Determine the types and numbers of occupational opportunities in agriculture;
3. Evaluate information concerning agricultural occupations;
4. Study pertinent occupational information in relation to personal characteristics, aptitudes, and interests;
5. Obtain exploratory work experiences in selected occupations under proper supervision;
6. Appreciate the need for pursuing a program of continuing education to keep abreast of and advance in the occupation.⁵

The main objective and the six contributory objectives allude to the problem facing many rural youth. An unstated assumption is that if the students possess the understandings and appreciations regarding career opportunities in agriculture and requirements for entry and success in agricultural occupations, the students will be more able to bridge the gap between school and work.

Basis for the Study

Several authors have suggested that teachers and counselors not only can, but should, attempt to influence the career planning of rural youth. The career planning and subsequent occupational and educational attainments of rural youth have been reported to be at lower levels than for their urban counterparts.

Ziesel states that rural youth have been:

. . . less successful occupationally than urban-reared persons. Moreover, studies have shown, to an alarming

⁵Ibid.

degree, unrealism in the occupational expectations of rural youth which undoubtedly reflects inadequate or complete lack of competent vocational guidance.⁶

Byram suggests that the role perceptions of counselors and teachers have changed:

Leaders in guidance are stressing more and more the role of the school counselor in the total vocational development of the individual. As a result, school counselors are becoming more career-oriented in their counseling of youth as contrasted to being occupation-oriented. Teachers, too, need to become career-oriented in their guidance role if they are going to work effectively with counselors in the guidance of youth.⁷

The role of the teacher of vocational agriculture in guidance is outlined in detail by Byram⁸ in his latest book on the subject.

Hoover emphasizes the need to teach about occupations in agriculture:

Another aspect of agricultural occupation information is--it must be taught. This may sound like a trite statement; but, how often in recent years have we heard something like this, 'What's new about off-farm agricultural occupations? We've always had vo-ag graduates enter these occupations.' Yes, by chance or by accident but with little or no guidance, some have found satisfying and satisfactory employment. The challenge is--

⁶Joseph S. Zeisel, "The Job Outlook for Rural Youth," Rural Youth in Crisis: Fact, Myth, and Social Change. Edited by Lee G. Burchinal (Washington, D.C.: Government Printing Office, 1963), p. 270.

⁷Harold M. Byram, "The Modern Guidance Role of the Teacher of Agriculture," The Agricultural Education Magazine, XXXVI (April, 1964), 219.

⁸Harold My Byram, Guidance in Agricultural Education, (Danville, Illinois: The Interstate Printers and Publishers, Inc.; 2nd Edition; 1966), p. 297.

'What will happen if we have a planned program of occupational guidance in agriculture?'⁹

The statements by Byram and Hoover emphasize the role of the teacher in vocational agriculture in assisting students in career planning.

Studies by Judge,¹⁰ Bittner,¹¹ and Freeh,¹² have shown that vocational agriculture teachers influence the occupational choice of students enrolled in high school vocational agriculture.

Conflicting results have been reported regarding the usefulness of occupational information to students. Impellitteri¹³ reported that career information gains in a computer-assisted program were not reflected in the student's choice of a tenth-grade course of study. On the

⁹Norman K. Hoover, "Teaching for Occupational Guidance in Agriculture," The Agricultural Education Magazine, XXXVI (April, 1964), 227.

¹⁰Homer V. Judge, "Work Experiences of Michigan High School Students of Vocational Agriculture and Their Relation to Occupational and Educational Plans" (unpublished Ph. D. dissertation, Michigan State University, 1962).

¹¹Richard H. Bittner, "Identification of Selected Characteristics Associated with Continued Enrollment in Vocational Agriculture" (unpublished Ph.D. dissertation, Michigan State University, 1962).

¹²Lavern A. Freeh, "Characteristics and Influence Patterns of Students Enrolling in Agricultural Curricula at Michigan State University" (unpublished Ph.D. dissertation, Michigan State University, 1962).

¹³Joseph T. Impellitteri, The Development and Evaluation of a Pilot Computer-Assisted Occupational Guidance Program: Final Report, Microfiche Ed 029 095 (Harrisburg, Penn.: Penn. Department of Public Instruction, July 30, 1968).

other hand, Goff¹⁴ and Jeffs¹⁵ report positive results from two experimental programs designed to improve the realism of occupational choice.

In summary, rural youth need more effective assistance in making the adjustment from the educational environment to the world of work. Indicators point to guidance activities organized by the school as a potential contributor to this adjustment. Teachers of vocational agriculture have influenced the educational, occupational, and work decisions of students. Teachers of vocational agriculture should continue to have a role in providing some of the guidance activities to assist students. However, teaching information about occupations has obtained changes in student behavior under some, but not all conditions.

Need for the Study

The teachers of agriculture who attempt to provide some of the guidance activities for the youth in their classes are faced with many problems. They must choose from a multitude of possible instructional units, decide when the instruction should be given, allocate a certain amount of

¹⁴William Goff, Project Director, Project P.A.C.E. (Preparing, Aspiring, Career Exploration), Microfiche Ed 012 934 (Dayton, Ohio: Dayton City School District, June 30, 1967).

¹⁵George A. Jeffs, The Influence of Occupational Information Counseling on the Realism of Occupational Aspirations of Mentally Retarded High School Boys, Microfiche Ed 025 078 (Reno, Nevada: University of Nevada, 1964).

time for the instruction, and make many other decisions regarding the instructional program. They must make these decisions within the usual constraints such as time, materials, finances and student abilities.

Activities to assist the student to make educational and occupational plans and adjustments represent one of many important concerns. Any additional information that will assist the vocational agriculture teacher to select the most efficient instructional unit will enable him to do a better job. Additional research may provide such information.

The objective relating to occupational information constructed by the joint committee of the United States Office of Education and representatives from the American Vocational Association is not stated in behavioral terms. The vocational agriculture teacher needs to know what behavioral changes in students are implied by such terms as understand, appreciate, determine, evaluate, and study. The teacher also needs to know how specific instructional units contribute to the attainment of the behavioral objectives.

An additional concern of teachers is the most appropriate time to conduct the instruction. Students commonly enroll in vocational agriculture at grade nine or ten and continue the courses through grade twelve. Important decisions concerning careers are made throughout that time; but key ones are made at entry to grade nine or ten and upon completion of grade twelve. Teachers need to know the best time during this period to present occupational information.

Kaufman and Lewis¹⁶ indicate the need for additional research in a statement regarding the difficulty of determining the effectiveness of guidance and the unique potential of guidance to have important influences on young people.

Occupational information appears throughout the school curricula, including vocational agriculture. To become more effective and efficient, each unit needs to be evaluated in terms of its contribution to vocational development of students.

Objective of the Study

The objective of this study was to determine the effect which a unit of instruction dealing with agriculture occupations might have on the occupational interests of students.

The specific unit of instruction selected for use in this study was developed at Michigan State University in a curriculum project under the direction of Dr. Raymond Clark.¹⁷ The unit was designed for use by teachers of vocational agriculture in Michigan high schools.

Outcomes from the unit were assessed in terms of the change in direction, intensity, and clarity of students' interests in agricultural occupations and the congruence of the interests with occupational and educational plans.

¹⁶Kaufman and Lewis, "The Potential of Vocational Education," p. 17.

¹⁷Raymond C. Clark, et al., Career Opportunities (East Lansing: Michigan State University, Department of Secondary Education and Curriculum, 1969). (Mimeographed.)

Hypotheses

The general hypothesis of the study was that the intensity, clarity, pattern, and differentiation of the student's interests may be changed by formal instruction.

The specific hypotheses tested were:

1. The student's inventoried interests in agriculture will increase more in treatment groups than in control groups as measured by the Ohio Vocational Interest Survey scale score for the agriculture cluster and by the normative rank of the same scale.
2. The student's inventoried interests in agriculture will become more consistent in treatment groups than in control groups as measured by the Scale Clarity Index of OVIS.
3. The students in treatment groups will have inventoried interests more consistent with occupational choice than will control groups as measured by the normative rank of the OVIS scale identified by the student's occupational choice on the pre-test.

Definitions

Interests are an aspect of personality--not a separate entity. The concept of interests is part of such factors of personality as attitudes, aspirations, motivation, and satisfaction. Interests are treated separately because as yet,

no way has been found to look at the whole of personality. Specific kinds of interests influence the behavior of selecting and performing in an occupation. These aspects are applicable to this study.

In this study the following terms were used as defined (further definition is given in Chapter II):

Interests.--A tendency to make consistent choices in a certain direction without external pressure and in the face of alternatives.

Vocational Interests.--A tendency to make consistent choices specific to present or future work role(s) portions of an individual's life in a certain direction without external pressure and in the face of alternatives.

Manifest Interest.--Is implied by the behavioral activity or choice that has been made. When an individual has selected a course or a job, he has exhibited a manifest interest.

Expressed Interest.--An interest as stated by the individual.

Inventoried Interest.--That aspect of vocational interests quantified by common interest inventories. The inventory portion of the Ohio Vocational Interest Inventory was used in this study.

Some additional terms in general use were given specific limitations in the context of this study:

1. The consistency and clarity of the interest pattern is limited to the degree to which the individual answers all inventory questions within a job cluster in the same way. Measurement was by the Scale Clarity Index of OVIS.
2. Occupational choice is limited to the stated occupational plans as elicited by Item number one of the Student Questionnaire portion of OVIS.

Scope and Limitations of the Study

The study included two high schools in Ingham County, Michigan with programs of vocational agriculture. Junior and senior boys from one school and sophomore boys from a second school were included. One teacher in each school handled all vocational agriculture in that school. Some students in each school were dually enrolled in additional shop classes related to the instruction in agriculture and taught by a different teacher. The one-teacher program with shop taught by another teacher in the school is the most common pattern of instruction in vocational agriculture in Michigan high schools.

Schools located in Ingham County were chosen because the Intermediate Education District¹⁸ sponsored the administration of the Ohio Vocational Interest Inventory during 1969-1970 to all sophomore students in the county except those in the Lansing Public School District. The OVIS forms used in this study were provided by the Ingham Intermediate District.

Generalizability of the study is limited to other populations and conditions that are similar to those found in this study. The research was limited by the availability of the measurement instrument, implications of the county-wide nature of the basic testing program, and by the availability of teachers and students in actual programs of vocational agriculture.

The study employed some case study techniques in the nature of an in-depth look at two current situations with somewhat similar characteristics. Findings may be usable in other situations to the degree that characteristics are similar. The findings do describe two situations as they exist and point to implications for those situations and for additional research.

¹⁸An Intermediate District is an administrative unit consisting of one or more counties. It generally does not operate schools, but provides services and performs clerical and regulatory functions for the local districts.

Synopsis

In this chapter the problem was stated, the basis of the study developed, the need for additional research outlined, the objective of the study stated, the hypotheses presented, terms defined, and the scope and limitations of the study indicated. The next chapter contains a review of the research and literature. Chapter III describes how the study was conducted. Findings are reported in Chapter IV. The conclusions, recommendations, and implications of the findings are presented in Chapter V.

CHAPTER II

REVIEW OF LITERATURE

In this chapter is a review of the literature relative to the study. The review begins with vocational development theory and moves to the nature of interests, origin and development of interests, measurement of interests, reasons given for occupational choice, and interests in relation to teaching about occupations in agriculture.

Vocational Development Theory

In the early years of vocational counseling the central focus was on the matching of people with specific jobs. The two requirements were a knowledge of the traits of the individual and a knowledge of the essential job factors. With this information matching the individual and the job did not seem very complex. One exhibiting dissatisfaction with a particular job might have been described as a "square peg in a round hole." The term used to describe the basis of the system was "trait and factor theory."

Several things point to shortcomings of the trait and factor theory. The increasing complexity of the occupations and the occupational structure in our society has

vastly increased the number of jobs that need to be "factored" to implement the theory. The rapidly changing nature of many occupations, including those in agriculture--partly through technological change--render descriptions obsolete before the occupation can be properly researched. Individuals have exhibited increased job mobility with the average person changing jobs several times in a lifetime. Social and geographical mobility of the work force, especially the change from rural to urban residence, have added further complications.

Since 1950 research in the field has centered around the study of career choice as a developmental process. Several separate theories have been advanced, none complete in itself, but all building on the developmental concept. Probably central to the newer vocational development theory is the work of Donald Super and his associates.

Super's theory of vocational development is based on three psychological areas--differential, developmental, and self-concept. He built on the trait and factor theory of differential psychology and suggests that interests and abilities are likely to fall into patterns more like some occupations than others. He assumes that a person possesses the potential for success and satisfaction in a variety of occupational settings.

Vocational behavior as a developmental process related to developmental psychology led Super to the concept of vocational maturity. The vocational maturity of the

individual can be assessed by either of two methods. The behavior of the individual can be compared with the behavior to be expected from one in his life stage as determined by his age. The individual can also be compared with others dealing with the same developmental tasks. Normative data are required with either comparison. Vocational maturity is an operational normative concept and as such does not involve value judgements.

Dimensions and indices of vocational maturity used by Super in the Career Pattern Study are orientation to vocational choice, information and planning about the preferred occupation, consistency of vocational preferences, crystallization of traits, and wisdom of vocational preferences.¹ To use the vocational maturity concept effectively, educators need reliable and valid measures plus explicit life stages and appropriate vocational development tasks for each stage of development.

Super has extended the analysis of life stages with reference to vocational behavior. The vocational life stages as outlined by Super are:

1. Growth Stage (Birth-14)

Self concept develops through identification with key figures in family and in school; needs and fantasy are dominant early in this stage; interest and capacity become important in this stage with increasing social participation and reality testing.

¹Donald E. Super and Phoebe L. Overstreet, The Vocational Maturity of Ninth Grade Boys (New York: Teachers College, Columbia University, 1960), pp. 33-34.

Sub-stages of the growth stage are:

Fantasy (4-10). Needs are dominant; role-playing in fantasy is important.

Interest (11-12). Likes are the major determinant of aspirations and activities.

2. Exploration Stage (age 15-24)

Self-examination, role tryouts, and occupational exploration take place in school, leisure activities, and part-time work.

Sub-stages of the exploration stage are:

Tentative (15-17). Needs, interests, capacities, values, and opportunities are all considered. Tentative choices are made and tried out in fantasy, discussion, courses, work, etc.

Transition (18-21). Reality considerations are given more weight as the youth enters labor market or professional training and attempts to implement a self concept.

Trial (22-24). A seemingly appropriate field having been located, a beginning job in it is found and is tried out as a life work.

3. Establishment Stage (Age 25-44)

Having found an appropriate field, effort is put forth to make a permanent place in it. There may be some trial early in this stage, with consequent shifting, but establishment may begin without trial, especially in the professions.

Sub-stages of the establishment stage are:

Trial (25-30). The field of work presumed to be suitable may prove unsatisfactory, resulting in one or two changes before it becomes clear that the life work will be a succession of unrelated jobs.

Stabilization (31-44). As the career pattern becomes clear, effort is put forth to stabilize, to make a secure place in the world of work. For most persons these are the creative years.

4. Maintenance Stage (Age 45-64)

Having made a place in the world of work, the concern now is to hold it. Little new ground is broken, but there is continuation along established lines.

5. Decline Stage (Age 65 on)

As physical and mental powers decline, work activity changes and in due course ceases. New roles must be developed; first that of selective participant and then that of observer rather than participant.

Sub-stages are:

Deceleration (65-70). Sometimes at the time of official retirement, sometimes late in the maintenance stage, the pace of work slackens, duties are shifted, or the nature of the work is changed to suit declining capacities. Many men find part-time jobs to replace their full-time occupations.

Retirement (71 on). As with all the specified age limits, there are great variations from person to person. But, complete cessation of occupation comes for all in due course, to some easily and pleasantly, to others with difficulty and disappointment, and to some only with death.²

The life stages take the individual through a sequence of vocational development tasks. The vocational development task as used by Super is taken from Havighurst.

The definition is given as:

A developmental task is a task which arises at or about a certain period in the life of the individual, successful achievement of which leads to his happiness and to success with later tasks, while failure leads to

²Donald E. Super, et al., Vocational Development (New York: Teachers College, Columbia University, 1957), pp. 40-41.

unhappiness in the individual, disapproval by the society, and difficulty with later tasks.³

Osipow describes the first vocational task in his book regarding the major theories of career choice:

The first of these tasks, crystallization of a vocational preference, requires the individual to formulate ideas about work appropriate for himself. It also requires him to develop occupational and self concepts that will help him to mediate his tentative vocational developmental tasks, it most typically occurs during the 14-to 18-year age range . . . the necessary attitudes and behaviors for the successful negotiation of the crystallization of a career pattern are summarized. These prerequisites reflect the necessity for an individual to make his plans explicit, to learn to identify cogent variables and their manner of implementation, to accumulate data appropriate to those important variables, and to translate the data and interpret them so that a plan to reach the next stage of the process can be made, implemented, and evaluated.⁴

Super outlines the vocational developmental tasks through life stages and attendant attitudes and behaviors in a 1963 publication for the College Entrance Examination Board. That outline is as follows:

Attitudes and Behaviors Relevant
to
Vocational Developmental Tasks

1. Crystallization (14-18)
 - a. awareness of the need to crystallize
 - b. use of resources
 - c. awareness of factors to consider
 - d. awareness of contingencies which may affect goals
 - e. differentiation of interests and attitudes
 - f. awareness of present-future relationships
 - g. formulation of a generalized preference

³R. J. Havighurst, Human Development and Education (New York: Longmans, Green and Company, 1953), p. 2.

⁴Samual H. Osipow, Theories of Career Development (New York: Appleton-Century-Crofts, 1968), p. 124.

- h. consistency of preference
- i. possession of information concerning the preferred occupation
- j. planning for the preferred occupation
- k. wisdom of the vocational preference
- 2. Specification (18-21)
 - a. awareness of the need to specify
 - b. use of resources in specification
 - c. awareness of factors to consider
 - d. awareness of contingencies which may affect goals
 - e. differentiation of interests and values
 - f. awareness of present-future relationships
 - g. specification of a vocational preference
 - h. consistency of preference
 - i. possession of information concerning the preferred occupation
 - j. planning for the preferred occupation
 - k. wisdom of vocational preference
 - l. confidence in a specific preference
- 3. Implementation (21-24)
 - a. awareness of the need to implement preference
 - b. planning to implement preference
 - c. executing plans to qualify for entry
 - d. obtaining an entry job
- 4. Stabilization (25-35)
 - a. awareness of the need to stabilize
 - b. planning for stabilization
 - c. becoming qualified for a stable regular job or accepting the inevitability of instability
 - d. obtaining a stable regular job or acting on resignation to instability
- 5. Consolidation (35 plus)
 - a. awareness of the need to consolidate and advance
 - b. possession of information as to how to consolidate and advance
 - c. planning for consolidation and advancement
 - d. executing consolidation and advancement plans⁵

The concept of life stages led to the idea of career patterns which may be recognized as regular and predictable after study of the individual.

Osipow gives examples of four career patterns from Super's theory as:

⁵ Donald E. Super, Reuben Starishesky, Norman Matlin, and Jean Pierre Jordaan, Career Development: Self Concept Theory (New York: C. E. E. B., 1963), pp. 19-20.

. . . the stable pattern, where a career such as medicine is entered into relatively early and permanently; the conventional pattern, where several jobs are tried, one of which leads to a stable job; the unstable pattern, characterized by a series of trial jobs which lead to temporary stability which is soon disrupted; and finally the multiple trial pattern, in which an individual moves from one stable entry job to another such as may be observed in domestic service careers.⁶

The other basic feature of Super's vocational development framework--self concept theory--has its roots in self concept psychology. Self concept formation requires a person to recognize himself as a distinctive individual, yet be aware of his similarity to others. The well integrated individual's self concept is continually developing and shifting through experiences to reflect reality. Vocational self concept develops in a similar way.

Super proposes that an individual strives to implement his self concept by entering the occupation he sees as most likely to permit self expression. Super proposes that vocational self concepts develop on the basis of children's observations of and identifications with adults involved in work.

Super defines the following terms relating to self concept:

1. Self is what the person is. It is sometimes the ego of the perceiver and sometimes what is perceived. The latter is more useful for measurement purposes.
2. Self percepts are observed facts, the impressions of the raw materials of self which the individual receives via the several senses.

⁶Osipow, Theories of Career Development, pp. 119-20.

3. Primary self percepts are unmodified or raw impressions of one aspect of the self.
4. A secondary self percept is a simple self concept which has come to function as a percept.
5. A simple self concept consists of organized, related percepts with accrued meaning.
6. A complex self concept is an abstraction from and generalization of simple self concepts, generally organized in a role framework.
7. A self concept system is the constellation, more or less well organized, of all of the self concepts.
8. The vocational self concept is the constellation of self attributes considered by the individual to be vocationally relevant, whether or not they have been translated into a vocational preference.⁷

The elements of a self concept theory of vocational development are outlined by Super as:

1. Exploration seems to be the first phase. The self is an object of exploration as it develops and changes; so, too, is the environment.
2. Self differentiation--"This is I" and "What am I like."
3. Identification occurs more or less simultaneous with differentiation. Man-child identifies with father and strives in many ways to be like him. This channels much of the boy's identification along occupational lines. He sees his father and other men in occupational roles and hears them talking of work and finds he can choose masculine roles (his identification) on the basis of what appeals to him most. The girl-child identifies with mother at home; women talk less of work at home and seem less involved in occupations. Small boys interests are more likely to agree with their measured aptitudes than those of girls.
4. Role playing accompanies or follows identification. The person will try the role on for size and see how valid the concept of oneself in that role actually is.
5. Reality testing stems readily from role playing. It takes place in play, school courses, extracurricular activity, and part-time and temporary employment. Reality testing experiences strengthen or modify

⁷Super, et al., Career Development: Self Concept Theory, pp. 84, 88, 90-91.

self concepts, and confirm or contradict the way in which they have tentatively translated into occupational roles.⁸

Osipow critiques the process of the development of vocational self concepts in Super's theory:

The various processes in the development of vocational self-concepts are likely to occur in more complex ways than the examples given suggest. While it is possible for an adolescent's identification with a person to lead him directly to an educational-vocational decision, it is more likely that the identification will stimulate a chain of events having vocational implications that might not have occurred otherwise. Similarly, the adoption of a role may lead directly to a career, but it is more likely that role playing will have immediate consequences which may eventually influence vocational decisions. Talents explored will often lead to talents in new fields that have not been acknowledged previously. Thus in playing the role of journalist, a student may join the school newspaper staff and meet a teacher who inspires him to become a writer. This decision, in turn, may lead him to join a literary club, read Sinclair Lewis' Arrowsmith, and eventually become a research scientist.⁹

More recent work by Super and his associates tie together the differential psychology of trait and factor theory; the developmental aspects of life stage, vocational maturity, vocational development tasks, career patterns; and the realization of self concept in the occupational role. Jordaan has attempted to state the elements in a format that can be empirically tested.

Jordaan, a student and colleague of Super, identifies two crises in the ego development of a child. The

⁸Ibid., pp. 11-13.

⁹Osipow, Theories of Career Development, p. 123.

first occurs in childhood and the second in adolescence. It is the second that is of most concern in vocational development. Jordaan says:

The adolescent must exchange derived status for primary status, become a person in his own right, and acquire intrinsic feelings of adequacy and worth. In this process the choice of vocation plays a crucial role. The chief agent in promoting these developments is exploration which furnishes the adolescent with opportunities to make choices and independent decisions, to play different kinds of adult roles, and to establish his own identity.¹⁰

Jordaan brings together the development of self concept and relevant vocational developmental tasks in the adolescent years in the life stage of exploration. Emphasis is given to exploratory activity in self concept formulation with vocational development a central focus. The high school program that would aid the individual at this critical period would need exploratory activities that include vocationally relevant tasks. Exploratory behavior is characterized by "search, experimentation, investigation, trial, and hypothesis (reality) testing."¹¹

The school can aid the student in exploratory activity if the process is understood and programs designed to engage the individual in appropriate experience. Sixteen

¹⁰Jean Pierre Jordaan, "Exploratory behavior: the formation of self and occupational concepts," in Career Development: Self Theory, by Super, et al. (New York: College Entrance Examination Board, 1963), p. 47.

¹¹Ibid.

factors, identified by Jordaan, facilitate, impede, or inhibit exploration by an individual:

1. Ability to tolerate tension, uncertainty, and ambiguity.
2. Ability to tolerate frustration.
3. Objectivity concerning needs, biases, motives and frame of reference.
4. Urgency.
5. Ability to make judgements or inferences.
6. Confidence and feelings of adequacy.
7. Independence.
8. Knowing when exploration has served its purpose.
9. Outcome of previous explorations.
10. Conflicting societal demands.
11. Psychological support and encouragement.
12. Identification with the peer group.
13. Availability of roles and opportunities to explore.
14. Maturity and the appearance of maturity.
15. Defensiveness.
16. Self concept.¹²

Specific outcomes of exploratory behavior are expected. These have been outlined and specified in detail by Jordaan in attempts to make empirical testing through research more feasible. The outcomes he outlines for exploratory behavior are:

1. Increased self-knowledge
 - a. more realistic appraisal of his interests, abilities, values and personality traits.
 - b. more realistic appraisal of his strengths and shortcomings.
 - c. increased understanding of why he behaves, feels, and thinks as he does.
 - d. greater awareness of how he resembles, or differs from others.
2. Increased ability to relate this new knowledge to future objectives.
3. a. occupational possibilities: their availability, character, requirements.

¹²Ibid., pp. 73-76.

- b. expectations of persons who occupy a significant place in his life: parents, friends, peer group, teachers, employer, and so forth.
- c. adult mores and expectations.
- d. obstacles he may have to overcome to achieve his objectives.
- e. his preferred occupation.
- 4. Changes in the way he perceives himself.
 - a. a more realistic self concept.
 - b. a clearer and better differentiated self concept.
 - c. a more integrated self concept.
 - d. an expanded self concept.
 - e. greater confidence in his self concept.
 - f. a clearer sense of identity.
- 5. Changes in his interests, values, goals, concept of success.
- 6. Decisions to continue with or abandon a course of study, preference, occupation, or course of action.
- 7. Changes in the way in which he handles his problems or relationships with people.
- 8. Greater awareness of the ways in which people and occupations resemble or differ from one another.
- 9. Greater differentiation of interests and abilities.
- 10. Seeing significance in something which previously had little or no meaning to him.
- 11. Change to a vocational or educational objective which is more in line with his interests, abilities, values, personality, self concept, and financial means.
- 12. Clearer understanding of the basis on which certain decisions which are confronting him should be made.
- 13. Confirmation or rejection of a previously held belief: about himself, others, or some aspect of his environment.
- 14. Increased awareness of the choices and decisions which are, or will shortly be, confronting him.
- 15. Formulation, implementation, or both, of plans for attaining his objectives, or for self-development.
- 16. Formulation and implementation of plans for further exploration.
- 17. Clearer formulation of objectives.
- 18. Increased confidence in, or commitment to, his objectives.
- 19. More realistic plans for achieving the goals he has set for himself.
- 20. More specific plans for achieving his objectives.¹³

¹³Ibid., pp. 59-60.

Super's theory of vocational development seems to be the most advanced of the several theories. The theory is explicit, has a high degree of empirical support, and has substantial application to human affairs. It has considerable utility for practice and research. The more recent writings by Super and others seem detailed and explicit enough to provide the basis of an explanation for the career development process.

Vocational development theory, outlined by Super and others, is a well ordered, highly systematic representation of the process of vocational maturation. It builds on the mainstream of developmental psychology and personality theory and demonstrates how these two streams can come together to clarify behavior in one major realm of human activity.

Osipow evaluates the theory as follows:

A considerable proportion of research based on Super's theory has resulted in empirical confirmation of the fundamental aspects of his theory: that career choice is seen by the chooser as a way in which to implement his self concept and that throughout life one is confronted with a series of career developmental tasks which specify the particular vocational decisions that must be made.¹⁴

This study focused on the vocational development tasks relating to interests in agricultural occupations. The subjects of the study were primarily in the tentative sub-stage of the exploration stage as defined by Super. Several developmental tasks related to the study but the

¹⁴Osipow, Theories of Career Development, p. 222.

focus was on "differentiation of interests and attitudes." Jordaan's outcomes of exploratory behavior most relevant to the study were "more realistic appraisal of his interests, changes in his interests; greater differentiation of interests; change to a vocational or educational objective which is more in line with his interests; and confirmation or rejection of a previously held belief: about himself, others or some aspect of his environment"--particularly in relation to vocational interest.

The Nature of Interest

Interests are an aspect of personality and a part of motivational theory. Human behavior involves various needs, wants, desires that may be satisfied by achieving some goal or end and a means of achieving that goal or end. The former refers chiefly to motivation and the latter to efficiency. Interests are one means of motivation--usually an intrinsic one.

Probably the nearest synonym to "interests" found in the literature is "preferences." Mursell's definition is preference oriented:

An interest may be described as a tendency to make consistent choices in a certain direction without external pressures and in the face of alternatives.¹⁵

¹⁵James L. Mursell, Psychological Testing (New York: Longmans, Green and Co., 1949), p. 272.

Strong defines interest experimentally as "a response of liking; an aversion is a response of disliking."¹⁶ He differentiates interest from some other aspects of behavior with an example:

. . . when a person salutes a flag as it is carried by, he exhibits perception in sensing the flag, a habit in moving his arm, a memory in remembering the flag and the custom of salutation, an interest in liking to engage in military ceremony, an attitude in that he has a tendency to act in a patriotic manner, and a sentiment in that he feels a thrill at seeing the flag.¹⁷

The Dictionary of Education contains the following definition of interest:

interest: (1) a subjective-objective attitude, concern, or condition involving a percept or an idea in attention and a combination of intellectual and feeling consciousness; may be temporary or permanent; based on native curiosity, conditioned by experience; (2) any preference displayed when choices are available.¹⁸

Carter states that when "studying interests, one is concerned specifically with enjoyment, or satisfaction."¹⁹

The major concern in this review is with vocational interests. This, obviously, is a selection of a part of the whole concept of interests. It is the area most studied and

¹⁶Edward K. Strong, Jr., Vocational Interests of Men and Women (Stanford, California: Stanford University Press, 1943), p. 6.

¹⁷Ibid., p. 8.

¹⁸Carter V. Good, ed., Dictionary of Education (New York: McGraw-Hill Book Company, Inc., 1959), p. 295.

¹⁹Harold D. Carter, Vocational Interests and Job Orientation (Stanford, California: Stanford University Press, 1944), p. 9.

and most pertinent to vocational guidance and to vocational education in agriculture.

Vocational interests are variously defined. The more specific definitions are used to describe what is measured with interest inventories. The following definitions are from the Dictionary of Education:

Vocational interests: (1) measured patterns of likes and dislikes that have been found experimentally to differentiate successful adults in one occupation from those in other occupations; (2) the students' expressed interest in or his choice of an occupation.

Interest patterns: a characteristic group of likes and dislikes for persons in the same occupation or class, typically revealed by an interest test.²⁰

The Dictionary of Occupational Titles defines vocational interests in terms of preference for work activities and limits the term to an "either or" choice of five pairs of situations:

III. INTERESTS

Preferences for certain types of work activities or experiences. Five pairs of interest factors are provided so that a positive preference for one factor of a pair also implies rejection of the other factor of that pair.

Situations involving a preference for activities dealing with things and objects.	vs.	Situations involving a preference for activities concerned with people and the communication of ideas.
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Situations involving a preference for activities involving business contact with people.	vs.	Situations involving a preference for activities of a scientific and technical nature.
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²⁰Good, Dictionary of Education, pp. 603 and 296.

Situations involving a preference for activities of a routine, concrete, organized nature. vs. Situations involving a preference for activities of an abstract and creative nature.

Situations involving a preference for working for people for their presumed good, as in the social welfare sense, or for dealing with people and language in social situations. vs. Situations involving a preference for activities that are nonsocial in nature, and are carried on in relation to processes, machines, and techniques.

Situations involving a preference for activities resulting in prestige or the esteem of others. vs. Situations involving a preference for activities resulting in tangible, productive satisfaction.²¹

Dolliver²² expands vocational interest to encompass what is measured by the inventory method plus expressed and manifest interests. The inventoried interest is derived indirectly and limited to what is measured by a written "test." Expressed interest is the direct verbal profession of interest in an occupation and is derived from answers to direct questions. Manifest interest is implied from one's actions such as the occupation in which engaged or the course of instruction in which enrolled.

²¹U.S. Department of Labor, Dictionary of Occupational Titles (Washington, D.C.: Government Printing Office, 1965), II, 654.

²²Robert H. Dolliver, "Strong Vocational Interest Blank Versus Expressed Vocational Interest: A Review," Psychological Bulletin, LII (August, 1969), 95-107.

Interests in general and vocational interests, more specifically, are variously defined in the literature. The concept is described, on the one hand, as some aspect of personality and/or motivational psychology. On the other hand, some definitions are limited to narrowly defined research uses. In general, interests are a source of intrinsic motivation and are an explanation of choices or preferences in the face of alternatives when specific rewards are not discernable.

Some recent attempts to correlate vocational interest and personality factors are encouraging. Kunce and Callis found that interest scores on the Strong Vocational Interest Blank correlate with personality factors. They concluded:

In light of the findings that interest scores and personality profiles tend to cluster together in meaningful ways, one can make tentative inferences about global personality characteristics from vocational interest scores. However, it does not appear feasible to infer occupational choice from personality, since individuals with grossly similar structures can have quite different vocational interests. Further research studying the interaction of occupational scales with each other and personality characteristics may eventually enable one to make more specific interpretations.²³

Siess and Jackson conducted a study in London, Ontario, Canada to identify common dimensions in personality and interest measures. The results should contribute to the

²³ Joseph T. Kunce and Robert Callis, "Vocational Interest and Personality," Vocational Guidance Quarterly, XVIII (September, 1969), 39.

development of a theory of vocational interests. Such a gap in theory is recognized by them:

The need for data that will link these two domains results from the fact that much of what is known about the nature of vocational interests is based on research using instruments developed to meet the practical demands of a counseling situation, rather than the demands of the interest theorist or research worker . . .²⁴

Progress is indicated in the following statement from a discussion of their study implications:

. . . Certainly, however, our interpretation of the data from the present investigation illustrates how findings concerning vocational interests have begun to converge on a small number of meaningful motivational constructs . . . The data on basic dimensions of occupational motivation should be combined with this increased methodological sophistication in the development of measures which more adequately meet the needs of the practitioner, the researcher, and the theorist interested in occupational motivation and behavior.²⁵

The two studies cited indicate the increasing emphasis on bridging the gap between research regarding interests by practitioners of vocational guidance and by psychologists regarding relationships between interests, motivation, occupational choice, and personality. Hopefully, an adequate theory of interests will evolve and result in more productive research constructs.

²⁴Thomas F. Siess and Douglas N. Jackson, "Vocational Interest and Personality: An Empirical Integration," Occupational Psychology, XXIII (January, 1969), 27.

²⁵Ibid., p. 35.

Origin and Development of Interests

The literature reports much research dealing with vocational choices, vocational interests, and vocational adjustment. It is difficult to find research regarding the origin and development of interests. Vocational interests are dealt with as a concept primarily in vocational guidance or vocational education literature. Psychology has concentrated on more general concepts of affective, cognitive, and psychomotor development.

Some sources of this research gap probably stem from the artificial separation of occupational life from total life and life style. Complications also arise from inadequate operational definitions of concept, inadequate knowledge of the specific variables, and differing criteria for measuring occupational success.

Research on vocational interests was reviewed by Carter in 1944. He begins with a statement reflecting the fragmentation of research:

The problems of vocational choice have long been considered piecemeal. In a multitude of uncoordinated research projects, vocational choice has been studied from the point of view of industry, employment, classification, selection, training, personnel management, mental hygiene, and social planning.²⁶

Carter summarizes research on vocational interests prior to 1944:

²⁶Carter, Vocational Interests and Job Orientation, p. 7.

It has been commonly assumed that "vocational interests" are acquired; actually, little is known concerning the origins of the traits measured by vocational interest inventories. Carter's study of twin-resemblances suggests that there may be some hereditary influences in the development of interests, although of course such resemblance studies do not conclusively prove an inherited basis. Earlier studies by Kitson, and more recent studies by Remmers have indicated means of creating interests, or of altering the degree of interests, or of altering the degree of interest in a particular activity by means of controlled experiences. Further studies of the effects of specific experiences upon the vocational interests of young people are much needed.

It is known that interests as measured by the inventory method have surprising stability. This topic will be discussed more fully later. The writings of Strong indicate that successful men in a given occupation-group have a characteristic pattern of likes and dislikes different from that of men in other groups. There is little scientific evidence to indicate why these patterns of interests should have such remarkable stability, or under what conditions the interest patterns are changeable. The assumption that minor environmental influences easily alter vocational interests has been current for twenty years; the evidence of stability is more recent. It is also frequently assumed, implicitly, rather than explicitly, that if interests are acquired they will not be stable. However, it is common knowledge that acquired modes of behavior, such as habits, are often surprisingly fixed. One may also add that habits are not entirely accidental in origin. A general view of the studies of the past ten years does not support the idea that experience in a given occupation is necessary to the development of the patterns of interest characteristic of that occupation. All these odds and ends of evidence lead on to desire a comprehensive theory which is in accord with the facts.²⁷

Roe has developed a theory of the origin of interests in relation to the determination of vocational choice based on early childhood experiences. The importance of such a theory is reflected by the following quote from Roe's writings:

²⁷Ibid., p. 11.

In the modern view that occupational choice is not a matter of one or two specific decisions, but that the occupational history is a lifelong development, thoroughly interwoven with the life as a whole, the origin and development of interests becomes a matter of more than theoretical importance. Interests, as an aspect of personality, have a place in any significant personality theory and must be subject to the same developmental principles as any other aspect of personality. Any general consensus on personality theory is, however, lacking, and there is no general personality theory that deals with interests in a way meaningful for the study of occupations.²⁸

The Roe theory is built around interpersonal interaction in relation to occupations and the "person orientation" of individuals. Focus has been on early childhood experiences with parents and later occupational choice. Roe states:

It is our thesis that one of the earliest and greatest differentiations in interests develops from the degree to which attention is focused on persons and that this difference in focus of attention develops very early in life and primarily as a result of early experiences. Further differentiation follows throughout life. The person-oriented individual may be nurturant, exploitative, succorant, demanding, submissive, etc., with regard to others, or his attention may be primarily directed toward himself. The non-person-oriented individual may be oriented toward objects, toward living things other than persons, toward ideas.²⁹

Research, according to Roe's own review, has been distressingly inconclusive. Categorization of the family atmosphere has been difficult. Interest scores generally do not have a clear person or non-person reference. Research

²⁸ Anne Roe and Marvin Siegelman, The Origin of Interests (Washington, D.C.: American Personnel and Guidance Association, 1964), p. 4.

²⁹ Ibid.

relies on how subjects remember an event rather than on direct observation. Hopefully, the slow progress and limited success will not discourage development of research on the origin of interests. Regardless of how interests originate, several researchers have concluded that interests are learned. Strong states:

Interests are learned.--Since interests involve reactions to specific things, they must be learned. Accordingly they can be modified later on by re-education.³⁰

Thorndike concludes:

The results of our experiments support the conclusion that a person can be taught new attitudes and tastes as surely, though not as easily, as he can be taught facts or skills. The basic principles of learning by repetition and reward seem to operate with wants, interests, and attitudes as they do with ideas and movements.³¹

Mager states that "People influence people. Since you are people, then you influence people. That's clear enough."³²

Educational experiences likely exert some influence on attitudes and, therefore, vocational interests of students. Current research has not explained the phenomena specifically enough to assist teachers to structure curricula and instruction to assure specific behavioral changes in a predictable pattern.

³⁰Strong, Vocational Interests of Men and Women, p. 10.

³¹Edward L. Thorndike, The Psychology of Wants, Interests, and Attitudes (New York: D. Appleton-Century Company, Inc., 1935), p. 189.

³²Robert F. Mager, Developing Attitude Toward Learning (Palo Alto, California: Fearon Publishers, 1968), p. 3.

Measurement of Specific Occupational Interest

Measurement of specific occupational interest can be approached by three general methods. The first revolves around what an individual is doing--the activities in which he engages (referred to as manifest interest). The second stems from asking the individual. The assumption is that he knows what his interests are and both can and will express that interest accurately (referred to as expressed interest). The third involves breaking general areas of interest into specific, easily identified activities and constructing formal instruments that force choices between activities or elicit a like-dislike response to each item (referred to as inventoried interest).

Manifest interest is usually accepted as the basic criterion. Expressed and inventoried interests are evaluated and/or validated by comparison with a group exhibiting manifest interest by engaging in a particular occupation. Some selection and limitation is usually placed on the criterion group by a means of selecting only those who are "successful in and satisfied with" the occupation.

One basic assumption underlying counseling use of inventory measures of interest is that groups of people successful in an occupation have similar interests that differ from those of persons in other occupations. Darley and Hagenhah state:

The specific occupational interest scores on the present Strong Vocational Interest Blank grew out of a series of

group difference studies in which selected members of certain occupational groups indicated their own degree of liking for a wide sample of activities cast in the form of test items and drawn from a supposedly common part of experience.³³

Clark and Campbell support the assumption in the following statement from their manual for the Minnesota Vocational Interest Inventory:

The use of vocational interest measures assumes that workers in a given occupation have in common certain likes and dislikes, and that these differ from those of workers in other occupations. This assumption has been verified for professional civilian occupational groups time and time again. One of the first tasks in the development of the MVII was to discover whether or not skilled trades groups and Navy ratings could likewise be differentiated. Results obtained from the analysis of responses of men in such trades as electrician, plumber, baker, truck driver, and in diverse Navy ratings indicate clearly that the interest patterns of men in different trades and ratings differ in stable, meaningful ways.³⁴

A somewhat different approach was used in the Kuder Preference Record. This inventory is built around the idea that one can measure preferences for types of activities and that these preferences have vocational significance. The inventory does not measure the interests of specific occupational groups. Rather, it measures the preferences that are presumed to be characteristic of general types of work and

³³John G. Darley and Theda Hagenah, Vocational Interest Measurement (Minneapolis, Minnesota: The University of Minnesota Press, 1955), p. 19.

³⁴Kenneth E. Clark and David P. Campbell, Minnesota Vocational Interest Inventory Manual (New York: The Psychological Corporation, 1965), p. 7.

each score indicates a preference for a particular group of occupations.

The Ohio Vocational Interest Inventory utilizes the data, people, things concept from the Dictionary of Occupational Titles. Winefordner, co-author of the inventory, explains the "cubistic model" concept on which OVIS is based:

WORLD-OF-WORK CUBE. If data, people, and things are the basic dimensions of work, the world of work can be considered as a three-dimensional space or, roughly, a cube. Jobs which are described in terms of their data-people-and-things values can be plotted so as to occupy a meaningful spot in the cube. Since data-people-and-things values have become discernable through functional job analysis, and since they are recorded in the DOT for all jobs, it is possible to plot all jobs in this cube.

When the 114 worker-trait groups (which represent the entire world of work) were plotted in the data-people-things cube, they formed clusters which were found to be homogeneous not only in terms of their data-people-things values but also in terms of other characteristics such as interests, temperaments, aptitudes, and general educational level.

It was hypothesized that these clusters represent the world of work and could be used to measure vocational interests. Each major cluster was used to define an interest scale for the Ohio Vocational Interest Survey (OVIS), which is now finalized after three years of research.³⁵

Although the Kuder Preference Record and Ohio Vocational Interest Inventory seem to rely on different theory than the Strong Vocational Interest Inventory, and the Minnesota Vocational Interest Inventory, much of the difference is illusory. The latter two have gone to the expense and

³⁵David W. Winefordner, "Interest Measurement in Vocational Decision Making: The Use of the Ohio Vocational Interest Survey," American Vocational Journal, XXII (February, 1969), 56-57.

time of gathering data directly from the criterion occupational group(s). The method is costly by any measure and always limited by the number of criterion groups involved. The other two inventories use a more indirect and less costly inferential technique.

The Ohio Vocational Interest Survey has an added advantage as a guidance tool. The interest inventory is seen as part of a total system that aids students in the various tasks of vocational development. Winefordner emphasizes the point:

It is characteristic of youth that they work best when they are pursuing something which concerns them personally. Thus, self exploration through the use of an interest survey such as OVIS, which is tied to a developmental program that includes a system for learning about the world of work, can serve as a natural exploration and course selection.

School programs must be based upon sound vocational development theory and built around a conceptional frame work appropriate for student involvement. There is a definite need to establish systems that will tie occupational information and job opportunities to student interests, aptitudes, educational course selection and curricular planning. . . . ³⁶

The measurement of vocational interests with inventories has evolved from the belief that persons engaged in an occupation have similar patterns of interest that can be differentiated from the patterns of persons in other occupations. The concept has been demonstrated in practice. More recent inventories have attempted to incorporate concepts of vocational development and tie the inventory to a

³⁶ Ibid.

system of occupational information and exploratory experiences that will aid the student in performing vocational development tasks.

Reasons Given for Occupational Choice

Accurate assessment of the motivation of specific human behavior is a difficult endeavor. However, the need to know why is basic to development of experiential and/or educational programs that will assist young people to make realistic decisions or to influence such decisions. Even though limited in validity, the individual's perceived reasons and his verbalized reasons provide a starting point.

Shill, in a Mississippi study of rural youth, found interests as the prime reason students gave for selection of an occupation. Shill reports interest as the reason for occupational selection by 61 per cent of the non-vocational agriculture rural students and by 68 per cent of the vocational agriculture students.³⁷

Mathews and Drabick surveyed 985 seniors in North Carolina high schools concerning interests. Students were asked to name the job he or she expected to enter and the most important reason for expecting to enter the job.

Mathews and Drabrick reported:

³⁷James F. Shill, Careers of Rural Male High School Seniors in Mississippi: A Study of Occupational Interests, Aspirations, and Expectations (Mississippi: Social Science Research Center, Mississippi State University, Report 26, October, 1968), p. 45.

Responses indicated that almost three-fourths of the sample gave reasons of general interest for entering expected occupations. This was expected as other studies have indicated the majority of people give reasons of general interest for entering an occupation. Almost identical proportions of the white male and female students gave reasons of general interest for the expected occupation, but for the Negro students this was not the case--a larger proportion of Negro males gave reasons of general interest than did Negro females. A little over three-fourths of the white students gave reasons of general interest compared with only a little over two-thirds of the Negro students.³⁸

Other researchers have attempted to go beyond the simple expression of interest as a measure. A method commonly utilized is based on two assumptions: (a) interest in an occupation and satisfaction with the work in the occupation are positively correlated; and (b) workers in jobs congruent with interests will be more satisfied.

The manual for Minnesota Vocational Interest Inventory summarizes the relationship between interest and satisfaction:

Young people who enter an occupation for which the evidence indicates they have a high level of interest may be expected to find satisfaction in their work, and to persist in that field, through their adult years. There is evidence to support this generalization based on the Strong Vocational Interest Blank, on which follow-up studies have been made over long periods of time. The same may be presumed to be true for the MVII. There is, however, a qualification: measures of satisfaction in a field are not precisely the same as satisfaction in a given job. Perhaps this is the reason that many studies

³⁸R. G. Mathews and L. W. Drabrick, Reasons for Selection of Expected Occupations: By Race and Sex (Raleigh, North Carolina: North Carolina State University, Department of Agricultural Education and Rural Sociology, Educational Research Series No. 7, 1965), p. 9.

of work satisfaction have not shown as close relationships as might have been expected.³⁹

Status or prestige provided by the occupation is a third motivation or reason often perceived as influential in occupational choice. The extent of literature regarding aspirational levels reflects the emphasis. The subject most extensively treated in the literature concerning occupational orientations and choices of rural youth centers on occupational status and level of aspiration. Researchers in Texas have compiled extensive bibliographies on the subject. Kuvlesky and Pelham⁴⁰ reported forty-seven different empirical research studies in a 1966 publication limited to occupational status orientation of rural youth.

The most often reported element of aspirational studies of rural youth is that rural youth do not aspire to occupations of as high a status level as do urban youth. Rural youth that leave for urban areas are often reported as having higher aspiration levels than rural youth choosing to farm.

Super proposes another motivation--that youth choose an occupation to implement a self-concept in a

³⁹Clark and Campbell, Minnesota Vocational Interest Inventory Manual, p. 25.

⁴⁰William P. Kuvleskey and John Pelham, Occupational Status Orientations of Rural Youth: Structural Annotations and Evaluations of the Research Literature (College Station, Texas: Department of Agricultural Economics and Sociology, Department Technical Report 66-3, September, 1966), 78 pp.

perceived occupational role. Studies by Ziegler,⁴¹ Englander,⁴² and Warren⁴³ lend empirical support to Super's theory.

Blocher and Schutz⁴⁴ hypothesized that the similarity of self and occupational concepts of boys is greater for occupations in which they express interest than for those in which they have little or no interest. Self and ideal self concepts were examined with preferences for forty-five occupations and significant differences found in the direction predicted.

Wheeler and Carnes⁴⁵ explored the congruence of self and ideal self concept with the individual's stereotype of his probable occupation and ideal occupation. They reported

⁴¹Daniel J. Ziegler, "Self-Concept, Occupational Member Concept, and Occupational Interest Area Relationships in Male College Students," Journal of Counseling Psychology, XVII (March, 1970), 133-136.

⁴²Meryl E. Englander, "A Psychological Analysis of Vocational Choice: Teaching," Journal of Counseling Psychology, VII (Winter, 1960), 257-264.

⁴³Jonathan R. Warren, "Self Concept, Occupational Role Expectations and Change in College Major," Journal of Counseling Psychology, VIII (Summer, 1961), 164-169.

⁴⁴Donald H. Blocker and Richard A. Schutz, "Relationships Among Self-Descriptions, Occupational Stereotypes and Vocational References," Journal of Counseling Psychology, VIII (Winter, 1961), 314-317.

⁴⁵Charles L. Wheeler and Earl F. Carnes, "Relationships Among Self-Concepts, Ideal Self-Concepts, and Stereotypes of Probable and Ideal Vocational Choices," Journal of Counseling Psychology, XV (November, 1968), 530-535.

congruence between ideal self concept and either of the occupational stereotypes to be greater than congruence between self concept and occupational stereotype. The accuracy of the occupational stereotypes was ignored.

Some of the literature raises doubt as to the extent of choice of occupation open to rural youth. Economic, geographic, educational and experiential limitations are cited as restrictions to occupational choice for rural youth.

This opinion is expressed by Hubert H. Humphrey:

The material disadvantages which affect many young people in rural areas literally conspire to deprive them of choice--the choice of where to live, the choice of job, the choice of a future.⁴⁶

Grant Venn expresses a similar point of view that led to the following statement concerning rural youth's need for better vocational guidance:

No system of public school education will be pronounced complete until all youth are given a knowledge of the occupations which support the economic structure of their society, and a chance to make decisions about their future contribution to that structure.⁴⁷

In his Mississippi study Shill⁴⁸ concluded that students from relatively large rural communities were more

⁴⁶Hubert H. Humphrey, "New Prospects for Rural Youth," Speech presented in National Outlook Conference on Rural Youth October 23-26, 1967 (Washington, D.C.: Microfiche Ed 015 077).

⁴⁷Grant Venn, "Vocational Education and Rural Youth," Speech presented at National Outlook Conference on Rural Youth October 23-26, 1967 (Washington, D.C.: Microfiche Ed 015 064).

⁴⁸Shill, Careers of Rural Male High School Seniors in Mississippi.

occupationally limited than students from small rural communities. The small rural communities either desired or forced geographical mobility.

Four groups of factors that influence occupational choice were identified through the review of literature: interest, status, self-concept, and environment. These are perceived to be illustrative of reasons for occupational choice--not exhaustive of the possibilities. Students perceive interest in the work as a major determinant of choice. Status orientation has received much study as a determinant. Super has precipitated considerable research centering on the implementation of self concept as a determinant. The fourth determinant proposed was the environment--social, economic, and geographical. The four determinants are not mutually exclusive. Considerable interaction would be expected. A better understanding of the reasons for occupational choice will enable all educators, including teachers of vocational agriculture, to improve services for students.

Interests and Teaching About Agricultural Occupations

The importance of teaching about occupations in agriculture is reflected by the frequency of articles in professional journals and research studies reported. Stevens comments in his report of studies in progress in 1964:

This year almost half of the new titles represent efforts to survey career opportunities and educational

needs in positions other than farming and ranching that involve knowledge in agriculture . . . ⁴⁹

Stevens⁵⁰ has classified the 148 research studies completed by agricultural educators during 1964 in four categories, including the category "guidance." A special subdivision was made in the guidance category to call attention to the large number of studies dealing with opportunities and needs in off-farm agriculture.

The importance of teaching for guidance and about agriculture occupations is stressed by Hoover.⁵¹ He contends that an occupational guidance program in agriculture should include an orientation program and materials for students, parents, guidance counselors, school administrators, and school board members; the use of tests to determine interests; and organized and planned study of occupations in agri-industry.

Much research has focused on the characteristics of students in vocational agriculture and on the kinds of occupations entered. Thompson summarizes his findings:

⁴⁹Glenn Z. Stevens, "Studies in Progress in Agricultural Education," The Agricultural Education Magazine, XXXVII (September, 1964), 73.

⁵⁰Glenn Z. Stevens, "Research Studies Completed in 1964," The Agricultural Education Magazine, XXXVII (June, 1965), 318-322.

⁵¹Hoover, "Teaching for Occupational Guidance in Agriculture," pp. 226-227 and 232.

Actually, contrary to the beliefs of many, there does not appear to be a stereotype of the "ag student." He isn't necessarily a farm boy--in fact, almost half live in town. His father isn't necessarily a farmer for only one-third had fathers who were full time farmers. He doesn't usually plan to terminate his education with high school and return to the farm. Actually, four times as many plan to enroll in college upon graduation as plan to go into farming directly.⁵²

In reporting on his study of the occupational values of 837 students of agriculture in California high schools Thompson concluded that students place high value on a vocation that is interesting, which offers security, and offers opportunity for self-expression and to help others. Nearly 94 per cent of the students ranked "a very interesting job" as an important occupational characteristic. He suggests how teachers can be more effective in helping students reach realistic vocational decisions by:

First, determine what the student identifies as important characteristics of the vocational area he wishes to enter. Second, help the youth find a vocation within the area of interest which will help him fulfill his personal needs which he identified.⁵³

Shill⁵⁴ surveyed 517 male seniors in rural areas of Mississippi in 1967 to ascertain aspirations, expectations,

⁵²Orville E. Thompson, "Characteristics of California Vo-Ag Students," The Agricultural Education Magazine (January, 1963), 145.

⁵³Orville E. Thompson, "How Important Are Occupational Values of Students of Agriculture," The Agricultural Education Magazine (May, 1963), 240.

⁵⁴Shill, Careers of Rural Male High School Seniors in Mississippi.

and interests. The restricted random sample contained students who had and had not taken vocational agriculture classes. Factors relating to and/or influencing the occupational choices were also investigated.

Family influence varied with families in higher socio-economic levels exerting the most influence. Community influence was related to the variety of occupations present that could provide a person for the student to react with. A strong implication of the research was that most rural high schools fall far short of the desired degree of influence the school should exert upon students in the occupational choice process.

Studies to determine the effect of various educational activities in agriculture on the occupational choice or the interests of students are not numerous. Judge⁵⁵ reports correlations between work experience of vocational agriculture students and the choice between agricultural and non-agricultural occupations, the choice between farming and non-farm agricultural occupations, certainty of occupational choice, and level of aspiration. Possible relationships among several variables were studied but no cause-effect relationships were implied. In addition, Judge did not

⁵⁵Homer V. Judge, "Work Experience of Michigan High School Students of Vocational Agriculture and Their Relation to Occupational and Educational Plans" (unpublished Ph.D. dissertation, Michigan State University, 1963).

indicate whether or not the work experience changed students' interests.

Buie⁵⁶ conducted a study to identify critical factors involved in the evaluation and use of occupational information in agriculture by students and teachers. The publications reviewed were limited by the use of two criteria: the publication should be adapted to the region and the publication should cost less than one dollar. No attempt was made to determine the use of the materials by teachers or students or to measure effectiveness.

One experimental study involving the teaching of information about agricultural occupations was reviewed. Shontz⁵⁷ used change of interests as one criterion in evaluating the effectiveness of three methods of teaching about agricultural occupations associated with land use and conservation. Increases in scores on expressed interests of students were obtained by all three methods. However, Shontz did not find generally consistent increases of inventoried interests pertaining to occupations closely related to land use and conservation.

⁵⁶Tollie Raymond Buie, "Critical Factors Involved in the Evaluation and Use of Occupational Information in Agriculture in the North-Central Region" (unpublished Ph.D. dissertation, Michigan State University, 1953).

⁵⁷David F. Shontz, "An Experiment in Teaching Agricultural Occupations Information to High School Students" (unpublished D.Ed. dissertation, The Pennsylvania State University, 1962).

Scores on a test of information about occupations related to land use and conservation showed significantly more achievement by either the integrated or separate unit method than by the teacher's own method.

The emphasis in the literature on the need to teach about occupations and on the characteristics of rural youth and on the characteristics of vocational agriculture students provides background for the study. Such literature and related studies only suggest methods of attacking the problem. Research to determine how best to structure the school environment to influence interests of students is urgently needed.

Summary

Vocational choice was reviewed as a developmental process involving a series of developmental tasks. The task most relevant to this study was "differentiation of interests and attitudes" and usually occurs during the exploratory stage of development.

Interests were described as a "tendency to make consistent choices in a certain direction without external pressures and in the face of alternatives." Vocational interests are specific to one's work role. The need for an adequate theory of vocational interests as a part of total personality theory was cited.

No adequate theory of the origin and development of interests was found or reviewed. Several authors agreed

that interests at least in part, are learned and that educational experiences planned by the school can and do influence interests.

Vocational interests were found to be measured by observing what the individual does (manifest interest), by asking the individual what his interests are (expressed interest), and by constructing formal instruments that elicit preferences (inventoried interests).

Factors that probably influence student occupational decisions were reported to include interest, status, self-concept, and the social, economic, and geographical environment.

Educators in vocational agriculture have recommended teaching about occupations in agriculture. Emphasis in the literature during the past decade has focused on the description of methods of instruction. The focus has not yet turned to the evaluations of outcomes of the recommended practice.

CHAPTER III

DESIGN OF THE STUDY

This chapter contains a description of the procedures for the collection of information to provide situational data, selection of schools and participants in the study, selection of the instructional unit and the measurement instrument, how the experimental task was conducted, and methods used to analyze data.

Collection of Situational Data

Data were collected regarding the workforce in relation to occupations in agriculture, characteristics of the communities, characteristics of the schools and the vocational agriculture programs, and other factors perceived to sometimes influence occupational choice and interests.

Published sources of data included the decennial Reports of the United States Bureau of the Census and the Agriculture Census.

The following agencies or individuals were contacted for data:

1. Tri-County Regional Planning Commission
535 North Clippert Street
Lansing, Michigan 48912

2. Ingham Intermediate Education District
Howell Road
Mason, Michigan
3. Program Development Unit
Michigan Department of Education
Division of Vocational Education
Bauch Building
Lansing, Michigan
4. State Supervisor of Vocational Agriculture
Education
Michigan Department of Education
Bauch Building
Lansing, Michigan

Additional data were collected from students through the use of a "local survey instrument" administered with the Ohio Vocational Interest Inventory (OVIS). The instrument was constructed in cooperation with professional educators in the office of the Ingham Intermediate District.¹

Selection of Participants

The selection of schools with programs of vocational agriculture was limited to such schools within the Ingham Intermediate Education District (IIED). The selection was confined to the IIED because of the proposed testing program which would include the administration of OVIS to all tenth grade students during the 1969-1970 school year.

The following four criteria were used to select two schools from the seven in the IIED which were conducting programs of vocational agriculture during the year 1969-1970:

¹See Appendix A.

1. All agriculture in the school taught by one teacher;
2. An experienced teacher of vocational agriculture;
3. Teacher had been in the school at least four years;
4. Vocational agriculture classes of fifteen to twenty-five students with twenty students preferred.

Both schools selected, Mason and Stockbridge, followed the pattern of one teacher for all classes of vocational agriculture. The two teachers have thirteen and twenty-three years of experience teaching vocational agriculture. One teacher has been in the present school seven years and the second for twenty-three years. Classes of adequate size were available in each school for statistical purposes.

In addition to the general criteria, Mason and Stockbridge had some unique features that the researcher felt would contribute to the value of the study.

Mason High School had available for the study a group of junior and senior boys enrolled in a horticulture class. Objective of the class was to prepare graduates for entry occupations in sales and service occupations related to the horticultural aspects of agriculture. The class was the type for which the unit was designed. Students in the class were selected partially, according to the teacher,

because they had little or no opportunity to enter occupations in production agriculture. This class was selected to receive the instruction about opportunities in agri-business sales and service occupations.

A second class of boys in grades eleven and twelve were included at Mason High School. This class contained about the same number of students, was taught by the same teacher, and expressed an interest in agriculture by enrolling in the class. The course title, "Production Agriculture," indicated the prime objective was preparation for occupations in farming. The class of students receiving instruction in production agriculture provided a non-equivalent control group matched on the factors of school, teacher, and enrollment in agriculture.

A third group at Mason High School was taken from junior and senior boys enrolled in a mechanics class. This group provided a second non-equivalent control group matched on factors of grade level, school and vocational enrollment. The group differed from the treatment group and the production agriculture group on factors of teacher and expression of interest in agricultural occupations as evidenced by enrollment in a non-agricultural class.

Stockbridge Community Schools offered the opportunity to include a teacher of vocational agriculture experienced in the use of the instructional unit selected. The teacher participated in the development of the unit and had taught the unit to junior and senior boys enrolled in

Table 1.--Participant groups included at Mason High School by size and factors on which matched.

	Horticulture	Production Agriculture	Mechanical- Vocational
Number of Students	21	17	24
Number Included in Study	17	12	17
Vo-Ag Teacher	Yes	Yes	No
School	Mason	Mason	Mason
Grade Level	11-12	11-12	11-12
Enrolled in Agri- culture	Yes	Yes	No
Received Instruction	Yes	No	No

vocational agriculture the previous year (1968-69). In discussions with the vocational agriculture teacher the researcher determined that the inclusion of a group of sophomore students would add participants to the study at an earlier stage of development. Therefore, the sophomore (grade ten) vocational agriculture class was selected to receive the instruction.

The control group at Stockbridge was selected from sophomore males who were not enrolled in vocational agriculture. Individuals from treatment and control groups were matched on the basis of inventoried interest in agriculture.

No attempt was made by the researcher to gain experimental control between schools. The objective was to gain exploratory data from two different school situations to provide case study information. The variations in the two situations preclude any statistical comparisons of results in the two schools.

Selection of the Unit

During 1968-1969 a series of instructional units in agricultural business were developed at Michigan State University under the direction of Dr. Raymond Clark. Unit I in the series, Career Opportunities, has as the major teaching objective: "To develop an understanding of the career opportunities in agricultural sales and service occupations and the preparation needed to advance in these occupations."²

The instructional format of the unit allowed each student to determine, to some extent, occupations he studied and concentrate on occupations of most interest to him. The activities suggested were designed to acquaint the student with the available occupations in agriculture in the community and the requirements for entry and success in each occupation. The activities allowed students to obtain occupational information on field trips and directly from people engaged in the occupation. Buie³ found students prefer

²Clark, et al., Career Opportunities, p. 1.

³Buie, "Critical Factors Involved . . . ," pp. 110-111.

these methods rather than to gain information from counselors.

Use of the Clark unit had the advantage of using an existing unit developed by an expert in curriculum materials, of concentrating in the area of agricultural occupations that show more expansion of employment opportunity than production agriculture, and of using a unit not generally taught by Michigan agriculture teachers previous to the study.

Selection of the Measurement Instrument

For the purposes of the study an instrument was needed to inventory interests that would obtain three aspects of interests--intensity, clarity and rank. The Ohio Vocational Interest Survey (OVIS) provides intensity through the scale score for each of twenty-four clusters of occupations. A clarity score is obtained within each cluster from the consistency of the students' answers. Rank is obtained directly from a listing of the twenty-four scale scores.

A second criterion for selection of the instrument was its appropriateness for the age group of the students to be studied. The OVIS was developed for use with students in junior and senior high schools. The reference group was "successful" high school vocational students. Winefordner describes the validation:

OVIS scales are valid to the extent that the DOT is valid in terms of its job descriptions and functional analysis. OVIS was also subjected to a validation study in which OVIS scores of "successful and satisfied" students from the six major vocational education groups

(agriculture, home economics, health, business and office, trade and industrial, and distributive education) were subjected to multiple discriminant analysis. It was found that the six vocational education groups were significantly successful in classifying an independent sample of students.⁴

Winefordner states one of the basic design objectives of OVIS was to "provide indices of strength and clarity of interests in the area of the world of work as defined by the interest scales of the Ohio Vocational Interest Survey."⁵

Following tentative selection of OVIS as the measurement instrument, the researcher conferred with Mr. Dave Winefordner, a co-author of the instrument, and explained the research problem. Mr. Winefordner stated that in his opinion OVIS was designed to fit the instrumentation needs of the research problem as presented to him.⁶

The OVIS provided measurements by a validated and reliable instrument. Table 2 contains the test-retest reliability coefficients and related data for the reliability sample for the agriculture scale by grade and sex. The data were collected and interpreted by the test publisher.

⁴Winefordner, "Interest Measurement in Vocational Decision Making . . . ," pp. 56-57.

⁵Ibid., p. 56.

⁶The research was reviewed with Dave Winefordner while he and this writer were attending the National Seminar on Patterns of Career Development as Applied to Vocational Education, conducted by the University of Missouri in Columbia, Missouri, August 3-8, 1969.

Table 2.--Test reliability and validity data from OVIS for scale 15--agriculture.^a

	N	First Administra- tion		Second Administra- tion		r	SE _m
		Mean	S.D.	Mean	S.D.		
Total--Grade 8							
Males	646	30.8	10.1	31.2	10.5	.81	4.4
Females	597	21.4	8.7	21.0	9.1	.79	4.0
School A--Grade 8							
Males	125	30.8	11.2	31.7	11.6	.88	3.9
Females	119	21.5	9.5	20.7	9.8	.84	3.8
Total--Grade 10							
Males	569	32.0	10.0	32.0	10.4	.87	3.7
Females	536	19.7	7.9	19.9	8.4	.85	3.0

^aSource: Michael Schaeffer, Harcourt, Brace and World, prepared the data for the OVIS test manual to be published late in 1970.

Conducting the Study

Vocational agriculture teachers at Stockbridge and Mason committed themselves to participation in the study. The teachers of vocational agriculture assisted the researcher in obtaining approval and cooperation from the school administrators. The assistance and cooperation of the school counselors were obtained through the vocational agriculture teacher and through the Ingham Intermediate

Education District consultants for counseling and vocational education.

The teacher of vocational agriculture at Mason was visited by the researcher in October, 1969 to discuss the unit to be taught. The director of the Michigan State University project "Individualizing Instruction"⁷ met with the teacher at the same time. The content of the unit, the philosophy of the teaching method, and the lesson plans were discussed. The list of references, audio visual materials and other teaching aids were reviewed. The teacher obtained the items recommended for the unit. The researcher supplied the teacher with a copy of the instructional unit for each student receiving instruction.

The teacher at Stockbridge was visited by the researcher to discuss the instruction. The teacher had been involved during the previous year in the curriculum project in which the unit was written and tried out. He had taught the unit the previous year to junior and senior students of vocational agriculture and assisted in developing some of the slide sets and other teaching aids. The activities to be included in the instruction were discussed and the teacher was given a copy of the unit for each student in the treatment group.

⁷The project was a follow-up of the one in which the careers unit was developed.

The Mason counselor scheduled the testing for that school for November 6, 1969. The Ohio Vocational Interest Survey was administered at the same time to sixty-two students comprising the treatment and control groups. The test was administered to the students as a part of the school's testing program and they were not made aware of the research uses of the results. The teachers of the classes in which the students were enrolled helped monitor the test administration. Instruction began for the treatment group the following Monday, November 10, 1969.

The teacher was contacted at intervals. No instructional problems developed. The instructional period was extended beyond the six weeks originally planned to avoid testing during the week prior to Christmas vacation. The time period covered was November 10, 1969 to February 3, 1970 including nine (9) weeks of school. One week was used for semester exams. A second week was lost by vacation time at Thanksgiving and other time losses, leaving a total of seven (7) weeks for instruction.

Instruction was completed on Tuesday, February 3, 1970. The next day was used for teacher attendance at a professional workshop with the post-test administered on Wednesday, February 5, 1970. The test was administered to the full group by the researcher under similar conditions to the pre-test administration. The second test administration was explained to the students as an opportunity for

them to find out how their interests compared at two time intervals. Instructions were to answer questions on the second administration as they reacted at that time.

It was necessary to post-test some students at a later date due to a high rate of absenteeism caused by various virus infections. The researcher attempted to include into the post-test group all participants who took the test the first time it was administered.

The Ohio Vocational Interest Survey was administered to all sophomore students at Stockbridge on December 11, 1969 by the Ingham Intermediate Education District counselor consultant. The researcher and the Stockbridge counselor helped monitor the testing. Instruction began for the treatment group on January 5, 1970 following the Christmas vacation.

The early administration of OVIS to the Stockbridge students allowed the researcher to select a control group by matching the pre-test scores on the OVIS scale for agriculture. It was assumed that any influences during the three (3) weeks between the pre-test and beginning of instruction would be randomly distributed between treatment and control groups.

The elapsed time of six weeks included a week of semester exams limiting instructional time to not more than five (5) weeks. It was planned to allow about one-half the instructional time for the grade ten group in Stockbridge as was allowed for the grade eleven and twelve group at Mason.

The elapsed time was twelve (12) weeks at Mason versus six (6) weeks at Stockbridge. The instructional time was seven (7) weeks at Mason and five (5) weeks at Stockbridge.

Testing the Hypotheses

The three hypotheses established for the study were the same for the two schools included in the study. The approaches to the problem were different in the two schools because of the exploratory nature of the study. The use of matched groups at Stockbridge and of non-equivalent control groups at Mason made it necessary to use separate statistical tests.

Hypothesis one was tested with the Mason data by subtracting the agriculture scale score obtained on the pre-test from the score obtained on the post-test. The statistical test consisted of a 1 x 3 analysis of variance.

The same hypothesis was tested for the matched pairs at Stockbridge by subtracting the post-test score on the agriculture scale obtained by the control from the score obtained by the treatment for each pair. A t test for differences was run on the difference scores.

In addition, the hypothesis was also tested for the Mason participants by using the normative rank of the agriculture scale score in relation to the other twenty-three (23) occupational cluster scales. The normative rank of the scale for agriculture on the pre-test was subtracted

from the normative rank on the post-test and tested by use of a 1 x 3 analysis of variance.

To test the same hypothesis for the matched pairs at Stockbridge, the post-test normative rank of the scale for agriculture of the student in the control group was subtracted from the post-test normative rank of the student in the treatment group for each pair and a t test for differences computed.

The data relative to hypothesis two required that the Scale Clarity Index scores be quantified. The pre-test scores were subtracted from post-test scores for participants at Mason and a 1 x 3 analysis of variance computed.

The Stockbridge data was quantified in the same manner. The control post-test scores were subtracted from treatment post-test scores, and a t test of difference computed.

The Mason data relative to hypothesis three was analyzed by first, identifying the appropriate cluster and determining the normative rank for the pre-test; and second, repeating the operation for the post-test, then subtracting the pre-test rank from the post-test rank. A 1 x 3 analysis of variance was computed from the score obtained.

The matched group normative rank scores at Stockbridge were obtained in a similar manner. An additional step was required. The increase by the control student was subtracted from the increase by the treatment student for each pair and then the t test for differences was computed.

The Research Consultant Service, for the College of Education at Michigan State University advised on statistical analysis. The Michigan State University Computer Service was utilized for some computations.

CHAPTER IV

REPORT OF THE FINDINGS

This chapter contains descriptive information about the communities and the schools included in the study. Data are presented concerning the vocational agriculture programs in the schools, the students participating in the study, and information about the Ohio Vocational Interest Survey. Analyses of data for testing hypotheses and additional data are presented.

The Community

The schools included in this study are located in Ingham County in the central Michigan area. Lansing, a city of 120,034 and the capital of Michigan, is located in the northwest corner of the county. Michigan State University is located in East Lansing, a city of 30,208 near Lansing in the same portion of the county. Major employers in the Lansing metropolitan area include Oldsmobile, Fisher Body, state, city, and local government and the schools.

Mason High School is located in the city of Mason about ten (10) miles from Lansing. Mason has a population

of 4,522 and is on the fringe of the Lansing metropolitan area. Mason is the county seat.

Stockbridge Community Schools are located in Stockbridge, a rural town with 1,097 residents. Stockbridge is thirty (30) miles from Lansing in the southeast corner of Ingham County. A portion of the school district, approaching one-half, is located in Washtenaw and Jackson Counties. The city of Jackson is about twenty-five miles from Stockbridge. Ann Arbor and the University of Michigan are about thirty miles southeast of Stockbridge. The school district's boundaries are shown on the county map in Figure 1.

The Mason area can be described as rural with strong influences from the nearby urban complexes. Residents include those commuting to employment in the urban area. The Tri-County Regional Planning Commission (Ingham, Clinton, Eaton Counties) classifies Mason as a "type 3" community. The description of such a community is as follows:

This community type has a population range of from 2,300 - 5,999. Industry in this community includes some fabrication and manufacturing of hard-line items, yet it still maintains some agricultural-oriented industry. Rail has, in the past, been important to this community and still plays a significant part in movement of goods. Community services are quite extensive and provide a full range of health and safety facilities. The commercial center provides community shopping facilities for

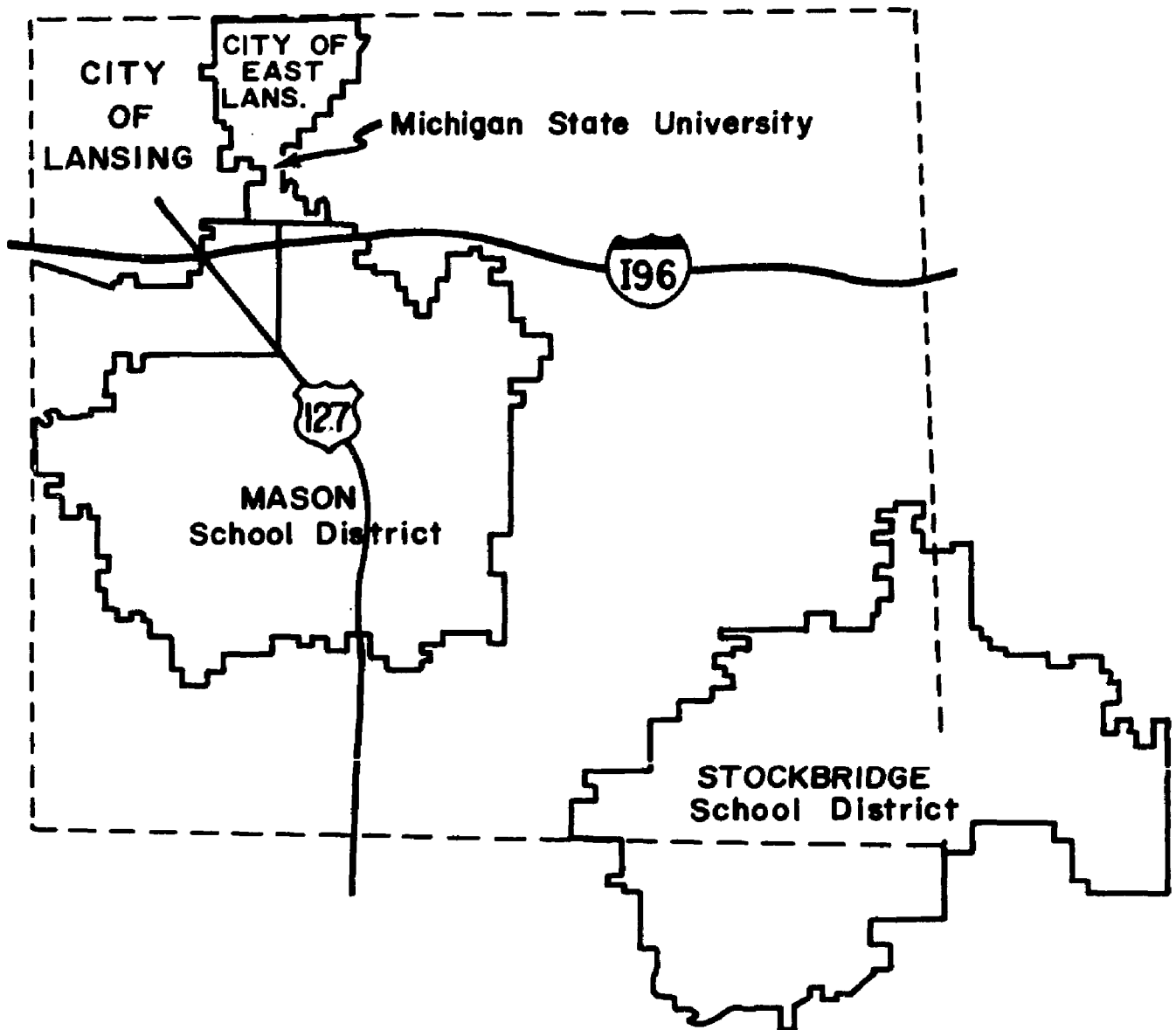


Figure 1.--Map of Mason School District and Stockbridge School District in Relation to the Urban Centers of Ingham County, Michigan.

an extensive area. In this type of community will be found the county seat of each of the three counties.¹

In contrast, Stockbridge has remained somewhat isolated in a rural status. It is classified by the Commission as a "type 2" community. The Tri-County Regional Planning Commission describes such communities as follows:

This is the smallest formal community type in the Region with a population of up to 2,299 persons. The limited amount of industry found in the community is primarily agriculturally oriented. The community type is quite informal and somewhat unhurried.²

Employment data collected by the same agency tend to support the community description. The Commission reports 1,924 persons employed in the area approximating the Mason school district. The figures were collected on township and village or town boundaries rather than by school district boundaries. Agriculture, meaning farming or production agriculture in Commission data, employs 425 or 22 per cent of the total. These data represent persons employed in the area--not the status of persons residing in the area who may or may not be employed in the area of residence.

In the Stockbridge area, according to Commission data, 588 persons are employed in the village and township. Of these, 254 or 43 per cent are employed in production

¹Tri-County Regional Planning Commission for the Counties of Clinton, Eaton, and Ingham, The 1975-1990 Tri-County Regional Comprehensive Development Plan (Lansing, Michigan, 535 North Clippert Street: September, 1968), p. 49.

²Ibid., p. 48.

agriculture. The data do not include portions of the Stockbridge school district located in Washtenaw and Jackson Counties. The employment data do not identify agriculturally related occupations other than farming.

Historically, Mason and Stockbridge are part of an area that drew settlers to till the soil. Since the forest had to be cleared for farming, lumbering was also an early economic factor. Several settlements were established by 1840. Census figures for Ingham County since 1900 point to the development of farming in most of the first half of the century. Since 1940 farms and farmers have declined in numbers if not in importance. In 1900 there were 3,815 farmers and/or farm managers in the county. The number decreased to 2,249 by 1940 and dropped to 1,920 by 1950. By 1960 the number had declined to 1,043. During the same time span the population of the county increased from less than 50,000 to 211,296 in 1960.³

Employment data usually identify occupations in production agriculture as farmer, farm manager, and farm laborer. The non-farm occupations requiring skills and knowledge in agriculture tend to be categorized by other criteria and usually are not identified in employment data as agricultural occupations. The IIED conducted a special survey that identified such occupations. The survey was conducted in 1968 in the three counties of Eaton, Clinton, and Ingham.

³Data based on U.S. Bureau of Census figures.

Seventy-three business firms were surveyed that dealt in agricultural services. Examples include farm equipment dealers, feed suppliers, fertilizer companies and nursery outlets.

The data indicated a significant increase in total employees reported for 1960 and 1964. Most employers expected the annual rate of employment to continue at the same level or to increase. Two projected a decrease. Qualified employees were reported as in short supply by the major portion of the employers. A surplus manpower supply was not reported by any of the firms replying to the survey.⁴

The Schools

Enrollments

Mason High School enrollment for the 1969-70 school year was 700 in grades ten, eleven, and twelve according to the records of the Michigan Department of Education. Grade nine, located in the Mason Junior High School, had 249 students enrolled. Stockbridge reported to the State Department of Education a grade nine through twelve enrollment of 528 for the school year 1969-70. Enrollment data are summarized in Table 3.

⁴Tri-County Occupational Survey as reported in Report on Excellence in Vocational Education (Okemos Citizens Vocational Advisory Committee, September 9, 1969). (Mimeographed.)

Table 3.--Enrollment data for Mason and Stockbridge Schools for grades nine through twelve as reported on fourth Friday count, September 1969.^a

Grade	Mason	Stockbridge
9	249 ^b	132
10	246	136
11	233	129
12	<u>221</u>	<u>131</u>
Total (9-12)	949	528

^aMichigan Department of Education, Division of Vocational Education (Unpublished computer printouts, January 30, 1970).

^bGrade 9 is part of the Mason Junior High School enrollment.

Enrollment in vocational agriculture is larger in both schools than the state average of approximately 65-70 agricultural students per school. The teacher of vocational agriculture at Mason has eighty-nine students in his agricultural classes plus a class of conservation biology; and the teacher of vocational agriculture at Stockbridge has eighty-five students in his agricultural classes. Forty-six students at Stockbridge are dually enrolled in agriculture mechanics classes taught by an industrial education teacher. Both schools are above the recommended maximum of sixty students per teacher of agriculture. The enrollments are shown by grade and course title in Table 4.

Table 4.--Enrollment in vocational agriculture by school and class (1969-1970).

Mason		Stockbridge	
Course Title	Enrollment	Course Title	Enrollment
Ag I	27	Ag I	20
Ag II	23	Ag II	22
Prod. Ag. 11-12	14	AG III	27
Horticulture 11-12	<u>25</u>	Ag IV	<u>16</u>
Totals	89		85

The Vocational Agriculture Programs

The courses in vocational agriculture at Stockbridge are organized primarily on a semester basis with a natural science orientation in the classroom portion. For example the sophomore year includes one semester of soil science and one semester of plant science.

Recent changes in the Mason program resulted in the formation of two classes for grade eleven and twelve students in agriculture with the division made on the basis of the student's opportunity to farm as perceived by the teacher of vocational agriculture. All other students were enrolled in a course with emphasis on preparing for occupations requiring skills and competencies related to horticulture.

A summary of the supervised experience programs of the vocational agriculture students in the two schools was obtained from the consultants in agriculture at the Michigan Department of Education. Data from the reports for two school years, 1967-68 and 1968-69, were used to review the work experiences of students in agriculture.

Stockbridge reported twenty-seven of eighty-nine students received off-farm agricultural experiences in 1967-68. Eleven individuals were placed in off-farm agricultural occupations. During 1968-1969 thirty-six students were placed in off-farm agricultural occupations, thirty-six had production agriculture programs, and six had off-farm agricultural experience programs that were not classified as placement.

Mason reported forty-seven students completing production agriculture programs in 1967-1968. Only two students completed off-farm agricultural work experience programs that year. The report for 1968-1969 was not available at the time the data for this study were collected.

Group projects were conducted in both schools that contributed to the work experiences of students. Mason vocational agriculture students raised and marketed cooperatively twenty-seven market hogs. The project included formation of a cooperative, selling shares, and dividing the profits among shareholders. In addition, a maple syrup project was conducted at Mason during the time of the study (1969-1970). Students rented a maple grove, gathered sap,

built and equipped a building for processing the sap, and marketed the syrup.

Group projects at Stockbridge included raising broiler chickens for a state contest and the sale of pine trees, bulbs, and seeds.

Neither the Mason nor the Stockbridge teacher of agriculture had access to a land laboratory, school farm, greenhouse, or landscape facilities assigned for educational use.

Counseling Programs

Counseling programs at both schools have been somewhat traditional with emphasis on educational planning and college enrollment according to observations and impressions of the researcher and the guidance consultant employed by the Ingham Intermediate School District. Counselors from both schools attended the workshop conducted during 1969-1970 by the IIED. Emphasis of the workshop program was on vocational development counseling in relation to the area vocational center program.

Stockbridge employs two part-time counselors with additional assistance from teachers. Mason employs two full-time counselors and the assistant principal is assigned some guidance and counseling responsibilities.

Vocational Offerings

Vocational education offerings for male students are less than comprehensive in both schools. Data for

1967-1968, the latest available from the Michigan State Department of Education, revealed Stockbridge had two reimbursed vocational programs: vocational agriculture and home economics. Mason reported reimbursed vocational education programs in office, distribution, and cooperative trade and industry in addition to agriculture. The male enrollments at grades nine and ten were limited to those enrolled in agriculture.

An interim program was operated in 1969-1970 under the shared-time concept by purchasing services from the Lansing Public Schools. Participation was limited by the capacity of the Lansing program. Twenty Mason students and three Stockbridge students participated in the interim area program during 1969-1970.

The Participants

Data were collected relative to some variables that have been shown to influence the interests of youth. The data reported relate to enrollment of students in vocational agriculture, the place of residence of participants, and the occupations of fathers of participants.

Years Enrolled in Agriculture

The sophomore students in the treatment group at Stockbridge were all enrolled in the second year of vocational agriculture. Some had not taken the freshman year, however. The average years enrolled, including the current year, was 1.70 years out of a possible 2.0 years.

Table 5.--Years enrolled in vocational agriculture by participants at Stockbridge.

	Treatment n=13	Control n=13
Average Years Enrolled	1.70	0.0

The control group was selected to include only sophomore boys who had never been enrolled in vocational agriculture classes.

The Mason participants were classroom units of eleven and twelfth grade males. The treatment group of juniors and seniors in a horticulture class had a mean enrollment in vocational agriculture of 2.70 years. The production agriculture control group was quite similar with 2.67 mean years of enrollment. The mechanical-vocational control group included only one student that had ever been enrolled in a vocational agriculture class. The mean years enrolled for the group was .06. Data on years of enrollment in vocational agriculture at Mason are found in Table 6.

Place of Residence

Tables 7 and 8 summarize data on the place of residence of participants. The sophomores at Stockbridge were all residing in rural areas. The city population total is well below the level used by the United States Bureau of Census to be classified as rural. However, the control group was rather evenly divided among the farm, rural

Table 6.--Years enrolled in vocational agriculture by group at Mason.

Years Enrolled:	Treatment		Control A (PA) ^a		Control B (M-V) ^b	
	No.	%	No.	%	No.	%
0	0	0.0	0	0.0	16	94.1
1	2	11.8	2	16.7	1	5.9
2	4	23.6	3	25.0	0	0.0
3	8	47.1	4	33.3	0	0.0
4	<u>3</u>	<u>17.5</u>	<u>3</u>	<u>25.0</u>	<u>0</u>	<u>0.0</u>
Total Students	17	100.0	12	100.0	17	100.0
Mean Years Enrolled	2.70		2.67		0.06	

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

Table 7.--Place of residence of participants at Stockbridge.

Place of Residence	Treatment		Control	
	Number	%	Number	%
Farm	7	53.8	4	30.75
Rural, Non-farm	5	38.5	4	30.75
Rural, Town	<u>1</u>	<u>7.7</u>	<u>5</u>	<u>38.5</u>
Total	13	100.0	13	100.0

non-farm, and rural-town categories as defined for the participants. The rural-town category includes only those living in Stockbridge. The treatment group of vocational

Table 8.--Place of residence of participants by group at Mason.

Place of Residence	Treatment		Control A (PA)		Control B (M-V)	
	No.	%	No.	%	No.	%
Farm	6	35.3	10	83.3	3	17.5
Rural, Non-farm	7	41.2	2	16.7	5	29.5
Urban	<u>4</u>	<u>23.5</u>	<u>0</u>	<u>0.0</u>	<u>9</u>	<u>53.0</u>
Total	17	100.0	12	100.0	17	100.0

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

agriculture students are mainly rural residents with 53.8 per cent on farms.

Mason participants follow a somewhat similar pattern. The production agriculture group reflects the selection for the class on the basis of opportunity to farm as perceived by the teacher. Some 83.3 per cent resided on farms. The treatment group was about evenly divided among the three place of residence categories. The mechanical-vocational control group had 53 per cent with urban residence and only 17.5 per cent residing on farms.

Fathers' Occupations

Some research has pointed to the father's occupation as a major determinant of vocational choice. Data were collected to compare the various groups on this variable.

The data are presented in Tables 9 and 10. The occupation of the father was classified according to the clusters (or vocational interest scales) as defined for use with the OVIS.⁵ No attempt was made to correlate the father's occupation with the participant's choice or his interest pattern. The data were used to elicit a pattern for the various groups in the study.

Table 9.--Father's occupation classified by OVIS interest scales for Stockbridge participants.

Interest Scale	Treatment		Control	
	Number	%	Number	%
Manual Work (1) ^a	1	7.7	1	7.7
Machine Work (2)	2	15.3	2	15.3
Personal Services (3)	1	7.7	1	7.7
Inspecting (6)	1	7.7	0	0.0
Crafts (7)	3	23.1	2	15.3
Agriculture (15)	3	23.1	3	23.1
Applied Tech (16)	1	7.7	2	15.3
Management (18)	1	7.7	1	7.7
Medical (24)	<u>0</u>	<u>0.0</u>	<u>1</u>	<u>7.7</u>
Total	13	100.0	13	99.8 ^b

^aNumbers refer to the identifying scale number from OVIS. See Appendix C.

^bTotals may not total 100.0 per cent due to rounding.

⁵See Appendix C for a description of the OVIS interest scales.

Table 10.--Father's occupation classified by OVIS interest scales for Mason participants.

Interest Scale	Treatment		Control A (PA) ^a		Control B (M-V) ^b	
	No.	%	No.	%	No.	%
Not Employed					2	11.8
Manual work (1) ^c	1	5.9	1	8.3		
Machine work (2)	1	35.3	2	16.7	3	17.5
Personal Services (3)	1	5.9				
Crafts (7)	3	17.5	3	25.0	6	35.3
Promotion-Comm. (10)	1	5.9				
Appraisal (14)			1	8.3		
Agriculture (15)			5	41.7	1	5.9
Clerical Work (16)	2	11.8				
Management (18)	2	11.8			2	11.8
Artistic (19)					1	5.9
Sales Rep. (20)					1	5.9
Entertainment (22)	<u>1</u>	<u>5.9</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Total	17	100.0	12	100.0	17	100.0

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

^cNumbers refer to the identifying scale number from OVIS. See Appendix C.

The sophomore groups compared at Stockbridge were quite similar, however, the participants were not paired on this variable. Thus the groups are similar but the matched pairs did not include the same degree of similarity.

At Mason, fathers who were farmers were reported most often by students in the production agriculture group. It should be noted that while 41.7 per cent of the fathers were farmers, 83.3 per cent lived on farms. The treatment group included no participants with fathers who farmed. The selection criteria of the teacher placed all such participants in the production agriculture group.

Thirteen of the twenty-four OVIS interest scales were used for the data presented in Table 10. No fathers were engaged in occupations that would fall into the remaining eleven scales. The crafts and machine work scales contain the most frequently mentioned occupations of the fathers. These two scales contain the occupations of 52.8 per cent of the treatment group, 41.7 per cent of the production agriculture control group, and 52.8 per cent of the mechanical control group. Only the 41.7 per cent in the agriculture scale of the production agriculture group is at a comparable level with craft or machine work within any of the three groups, and that represents a selection based on teacher-perceived opportunity to farm rather than student interest in farming.

Status of Inventoried Interest Prior to Treatment

Data obtained from the OVIS administered prior to the beginning of instruction are descriptive of the participant's inventoried interest in agriculture prior to

treatment. The data provide some description of the inventoried interests before change was attempted.

Stockbridge Matched Pairs

The Stockbridge pairs were matched on pre-test OVIS scores. Therefore, the differences in the treatment and control groups were as minimal as the population available for matching permitted. The scores of a single pair did not differ more than 3.0 points, which is less than one standard error of measurement for the scale. The students enrolled in vocational agriculture, the base group used for matching, had pretest scores in agriculture which ranged from a high of forty-six out of a possible fifty-five to a low of twenty-two. The minimum possible score on an OVIS scale was eleven. The pretest agriculture scale scores are graphically illustrated on Figure 2.

The normative rank of the agriculture scale and the clarity index for the same scale may have varied within pairs because of the limitations of the size of population available for matching. However, the mean scores of the two groups were quite similar based on a comparison of data contained in Table 11. The normative rank of the agriculture scale for the treatment group was 8.8 compared to a normative rank of 8.7 on the same scale for the control group. The clarity index on the agriculture scale for the treatment group was 2.4 compared to 2.8 for the control group. The clarity index range for each scale is based on

Paired Students

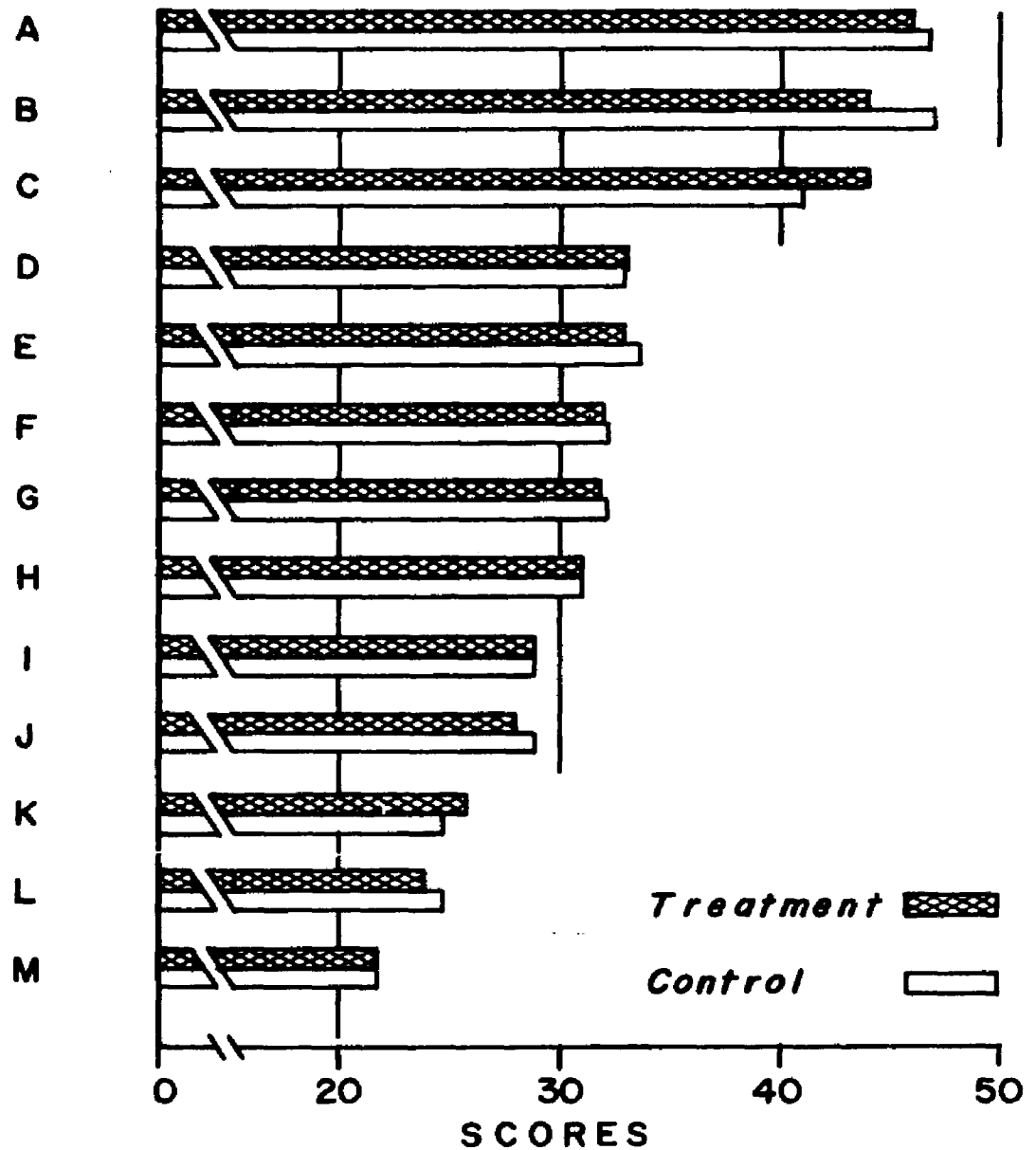


Figure 2.--Comparison of pre-test scores on the agriculture scale of the Ohio Vocational Interest Inventory for paired treatment and control students at Stockbridge.

Table 11.--Pre-test scores on selected OVIS measures for participants at Stockbridge.

	National Norm	Treatment (n=13)	Control (n=13)
Scale Score	32.0	32.6	32.8
Rank	--	8.8	8.7
Clarity	--	2.4	2.8

3.0 for "highly consistent," 2.0 for "fairly consistent," and 1.0 for "inconsistent."

Mason Groups

The three study groups at Mason were expected to exhibit variance because classroom groups were included in a non-equivalent group design. A comparison based on data from Table 12 supports the assumption. The treatment group mean scores were somewhat similar to the production

Table 12.--Pre-test scores on selected OVIS measures by groups at Mason.

	National Norms	Treatment	Control (PA) ^a	Control (M-V) ^b
Ag Scale Score	32.0	37.6	38.1	27.0
Ag Scale Rank	--	2.8	2.3	9.3
Ag Clarity	--	2.5	2.7	2.5

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

agriculture control means but the mechanical-vocational control group mean for the agriculture scale of 27.0 was well below the treatment group mean of 37.6, the production agriculture control group mean of 38.9, and the national norm of 32.0. The mean normative rank of 9.3 for the agriculture scale for the mechanical-vocational control group reflects lower scale scores. The clarity index mean for each of the three groups were all high. The inventoried interest measures for the three groups are congruent with the manifest interest shown by the decision to, or not to, enroll in agriculture. The homogeneity within each group introduced a bias to the study that was not anticipated.

Testing Hypothesis One

The first hypothesis stated that interest in agriculture would increase more for the treatment group than for the control group(s). This was first tested by a t test for difference for Stockbridge data and by a 1 x 3 analysis of variance for Mason data, using agriculture scale scores from OVIS.

A summary of the four Stockbridge matched pairs statistical data is contained in Table 13. The differences

Table 13.--Differences on agriculture scale data at Stockbridge (N = 13 pairs).

d	d ²	$\bar{d}$	s_d	t
-13	1365	-1.0	10.66	-.35 ^a

^aNot significant at .05 level.

were in the opposite direction from that predicted and not statistically significant. The hypothesis was rejected based on Stockbridge data.

A preliminary analysis of the Mason data was made to determine if any increase was indicated. Table 14 contains

Table 14.--Pre- and post-comparisons of OVIS agriculture scale scores for treatment and control groups at Mason.

	<u>Treatment</u> N=17	<u>Control (PA)^a</u> N=12	<u>Control (M-V)^b</u> N=17
Pre	37.6	38.1	27.0
Post	33.2	40.6	25.2

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

the data summary on the OVIS agriculture scale scores. The post-test mean of 33.2 for the treatment group reflects a loss from the pre-test mean of 37.6. The loss was beyond the standard error of measurement of 3.7 for the scale reported in the OVIS validation data. The differences in pre- and post- mean scores for both control groups was less than the measurement error. Therefore, the means were considered to be the same. With no gain evident for the treatment group, hypothesis one was rejected for the Mason data and the 1 x 3 analysis of variance on the gain score was not computed.

Hypothesis one was then tested using normative rank of the agriculture scale score from OVIS. The scale could rank from a high of one to a low of twenty-four. Rank was determined by the raw scale score with the highest raw score given the top rank.

The Stockbridge data are summarized in Table 15. The t test for differences indicated the gain was not statistically significant. The normative rank data for the agriculture scale at Stockbridge was the only data indicating any

Table 15.--Differences on normative rank of the agriculture scale at Stockbridge (N = 13 pairs).

d	d ²	$\bar{d}$	s d	t
16	928	1.23	8.78	.42 ^a

^aNot significant at .05 level.

raw score gain in the direction predicted for any of the measures for either treatment group. The hypothesis was rejected on the basis of these data.

The treatment group data from Mason was given a preliminary analysis to check for an increase in normative rank. Data indicated that any change was in the opposite direction predicted and the hypothesis was rejected. A summary of pre- and post- mean rank of the agriculture scale for treatment and control groups is contained in Table 16.

Hypothesis one was rejected. No significant increase in agriculture interests as measured by the OVIS

Table 16.--Pre- and post-comparison of the normative rank of the OVIS scale identified by the participant's occupational plans for Mason data.

	<u>Treatment</u> N=17	<u>Control (PA)^a</u> N=12	<u>Control (M-V)^b</u> N=17
Pre	2.0	4.4	3.7
Post	2.2	4.4	5.5

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

agriculture scale score or the normative rank of the agriculture scale score was recorded for either treatment group. In fact, three of the four sets of data include raw score changes in a direction opposite to that predicted. No statistically significant differences were found in either direction.

Testing Hypothesis Two

The second hypothesis states that the treatment groups will increase in consistency of interests more than control groups as measured by the OVIS scale clarity index for the agriculture scale score. The OVIS scale clarity index measures of highly consistent, fairly consistent, and inconsistent were given quantitative values of three, two, and one respectively.

Stockbridge data related to hypothesis two is summarized in Table 17. No difference was found; therefore the second hypothesis was rejected.

Group means for the scale clarity index from Mason data are recorded in Table 18. The treatment group post-test mean from raw scores is less than the pre-test mean. No gain from the instructional unit was recorded. Hypothesis two was rejected.

Table 17.--Differences on OVIS scale clarity index for agriculture at Stockbridge.

d	d^2	$\bar{d}$	s_d	t
0	6	0	0	0 ^a

^aNot significant at .05 level.

Table 18.--Pre- and post-comparisons of the OVIS clarity index for the agriculture scale for Mason data.

	<u>Treatment</u> N=17	<u>Control (PA)^a</u> N=12	<u>Control (M-V)^b</u> N=17
Pre	2.5	2.6	2.5
Post	2.3	2.7	2.6

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

Testing Hypothesis Three

The third hypothesis states that the normative rank of the OVIS interest scale representing the occupational cluster identified by the student's occupational plans will increase more in the treatment groups than in the control

groups. The t test for differences was used with data from Stockbridge. Data from Mason was analyzed for gain to ascertain the need for calculating the 1 x 3 analysis of variance.

Table 19 contains the summary data for the t test for differences for the Stockbridge matched pairs. No gain in normative rank was found. The change was in the opposite direction predicted but not statistically significant. Hypothesis three was rejected.

Table 19.--Differences on normative rank of interest scale matching occupational plans at Stockbridge.

d	d ²	$\bar{d}$	$\hat{s} d$	t
-36	998	-2.77	9.13	-1.09 ^a

^aNot significant at .05 level.

Table 20 contains pre-test and post-test mean rank for the Mason groups. The treatment group showed no gain with the post-test mean rank higher than the pre-test mean. The 2.8 pre-test mean rank placed the interest scale closer to the level predicted by the occupational plans than did the 3.8 post-test mean rank. No analysis of variance was run because no gain was recorded to analyze. Hypothesis three was rejected for Mason data.

Table 20.--Pre- and post-comparisons of the normative rank of the OVIS agriculture scale score for Mason data.

	<u>Treatment</u> N=17	<u>Control (PA)^a</u> N=12	<u>Control (M-V)^b</u> N=17
Pre	2.8	2.3	9.3
Post	3.8	2.3	11.3

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

Summary of Hypothesis Testing

No statistically significant increase in interest scores were obtained in support of any of the three hypotheses for the treatment group in either school. A gain in raw scores of any kind, significant or otherwise, was obtained in only one of the six test situations. In four of the six situations raw score decreases were recorded. The changes were not statistically significant in either direction as summarized for Stockbridge data.

The Mason data were analyzed to find the significance of observed differences when the restriction of predicted direction was removed. A 1 x 3 analysis of variance was run on the data with no prediction of the direction of change. None of the differences were statistically significant.

Additional Findings

One of the unexpected findings was the rather close relationship between manifest choice as measured by enrollment, the expressed occupational choice and the inventoried interests of the eleventh and twelfth grade students at Mason. The production agriculture control group had a mean rank on the inventory scale for agriculture of 2.3. Seventy-five per cent of the participants in this group listed agriculture as first occupational choice and 67 per cent received an interest inventory score placing agriculture first. For the majority of these students the units about occupations in agriculture could be redundant.

Data from Table 21 can be interpreted to indicate a similar homogeneity in the mechanical-vocational control group with emphasis on the OVIS scales of crafts, machine work, and applied technology. This group showed little manifest, expressed, or inventoried interest in agriculture. One student ranked agriculture at the top. Only one student in this group had ever enrolled in any vocational agriculture class.

Data from the same table indicate that the choices of the treatment group students in horticulture appear to have some things in common with each control group. Forty-seven per cent of the students in horticulture rated agriculture as first choice while 29.4 per cent ranked crafts, machine work, or applied technology first. The agriculture scale on OVIS, an inventory of interests, had a mean rank

Table 21.--Summary of selected interest scales and occupational choice data for groups at Mason.

	Treatment N=17		Control (PA) ^a N=12		Control (MV) ^b N=17	
	No.	%	No.	%	No.	%
Agric. 1st. Occ. Choice	8	47.0	9	75.0	1	5.9
Agric. Scale Ranked 1	6	35.3	8	76.0	1	5.9
Mean Rank of Ag Scale	2.8	--	2.3	--	9.3	--
Mech-Voc. Choice Ranked 1 ^c	5	29.4	1	8.3	12	70.0

^aPA refers to Production Agriculture.

^bM-V refers to Mechanical-Vocational.

^cIncludes crafts, machine work, applied tech.

of 2.8--not far below the 2.3 mean rank for the production agriculture control. A common pattern of inventoried interests, as measured by OVIS, for the horticulture treatment group was to find the agriculture, crafts, machine work, and manual work scales clustered near the top. The configuration fits the combination of job tasks often found in the landscape and horticulture occupations.

Data from the total sophomore male population from Stockbridge relative to interest in agriculture is summarized in Table 22. The homogeneity found with Mason upper-classmen is not evident in the Stockbridge data. Fifteen of the fifty-four students received a scale score on the agriculture portion of the interest inventory ranking first or

Table 22.--Summary of OVIS variables relevant to vocational agriculture for Stockbridge sophomore males (N = 54).

	Total	Enrolled in Vo-ag	Not in Vo-ag
Agric. Scale Score Ranked 1 or 2	15	4	11
Agric. Ranked 1 or 2 as Occupational Choice	14	6	8
Agric. Ranked 1 or 2 on Both Measures	10	3	7

second. Four of the fifteen were enrolled in vocational agriculture while eleven were not. The first and second occupational choices in agriculture exhibited a similar pattern. Ten of these sophomores expressed a first or second occupational choice in agriculture and had inventoried interest in agriculture that ranked first or second. Of the students with these congruent interests, three were enrolled in agriculture and seven were not.

CHAPTER V

FINDINGS, CONCLUSIONS, IMPLICATIONS
AND RECOMMENDATIONS

The major items considered in this chapter are a summary of the findings, conclusions, and recommendations for further study and implications of the study.

Summary of Findings

Status of Students Prior
to the Study

The participants were compared on the variables of previous enrollment in vocational agriculture, place of residence, and father's occupation. The findings on these variables are summarized as follows:

1. The treatment group at Stockbridge has been enrolled in vocational agriculture for a mean of 1.7 years and the control group had a mean enrollment of 0.0 years.
2. The students enrolled in horticulture (treatment group) at Mason had been enrolled in agriculture for a mean of 2.7 years; the students in the production agriculture class

(control group) for a mean of 2.67 years; and the students in the mechanical-vocational class (control group) had been enrolled in agriculture a mean of 0.06 years.

3. Participants enrolled in vocational agriculture resided on farms more often than not while other participants more often resided within incorporated units or in rural areas not part of farms.
4. The students enrolled in production agriculture (control group) at Mason most often reported farming as the father's occupation, at least partially because of the selection criteria employed by the instructor.
5. The remaining groups were essentially similar on the variable of father's occupation.

Status of Occupational
Interests Prior to
Instruction

The findings relevant to the status of occupational interests prior to teaching the instructional unit were as follows:

1. The sophomore class of students enrolled in vocational agriculture (treatment group) at Stockbridge had a mean score of 32.7 on the agriculture scale of OVIS--virtually the same

as the national norm (32.0) obtained by a random sample of sophomores.

2. The eleventh and twelfth grade participants at Mason had scores on the agriculture scale of OVIS congruent with manifest interest exhibited by current vocational enrollment.
3. The normative rank on the agriculture scale of OVIS for eleventh and twelfth grade participants at Mason was congruent with the manifest interest exhibited by current vocational enrollment.
4. The tenth grade students in vocational agriculture at Stockbridge scored the same on the agriculture scale of OVIS as did the group of tenth grade students in the sample on which national norms were established.

Measures of Change in Interests

Following the treatment, OVIS was used to measure changes in interest. The findings were:

1. No increase of inventoried interests as measured by either the OVIS agriculture scale or the normative rank of the same scale were obtained for either treatment group.
2. No significant increase in the consistency of interests as measured by the OVIS Scale

Clarity Index for the agriculture scale was obtained for either treatment group.

3. No significant increase in the OVIS scale score identified by the participants' occupational plans were obtained for either treatment group.
4. Participants' scores on pre- and post-measures had no consistent pattern. Scores remained the same for some, increased for some, and decreased for some. For many students changes were minimal and, for a few, changes were extreme.

Congruence of Occupational Plans and Interests

The findings regarding congruence of enrollment, plans, and interests were as follows:

1. The eleventh and twelfth grade students at Mason enrolled in vocational agriculture had occupational plans and inventoried interests consistent with enrollment status.
2. Occupational plans of the participants at Mason were generally congruent with manifest, expressed, and inventoried interests.
3. More tenth grade males at Stockbridge not enrolled in vocational agriculture had occupational plans and inventoried interests in

agriculture than did students enrolled in vocational agriculture.

4. Occupational plans of the tenth grade students at Stockbridge were not generally congruent with manifest, expressed, and inventoried interests.

Results of the Instructional Program

Evidence regarding the teaching of occupational information within the limitations of this study are summarized as:

1. No evidence was reported that teaching of information about occupations in agriculture to the study groups for the purpose of increasing interests in agriculture did in fact increase interests in agriculture as measured by the OVIS scale score for agriculture.

Conclusions

The following conclusions are drawn from interpretations of the findings and observations:

1. The manifest, expressed, and inventoried interests of the sophomore males at Stockbridge were not generally congruent with enrollment in agriculture and occupational plans.
2. Congruence of manifest, expressed, and inventoried interests with present enrollment and

occupational plans were evident in the eleventh and twelfth grade groups at Mason.

3. All hypotheses were rejected. The data failed to provide support for the practice of teaching information about agricultural occupations to sophomores, juniors, or seniors for the purposes of increasing inventoried interest in agriculture, increasing the rank of the inventoried interest in agriculture, increasing the clarity of inventoried interest patterns, or increasing the frequency of choosing an occupation in agriculture. This conclusion refers to the sophomore, junior, and senior groups within this study. (The teaching of such units for other purposes was not explored in this study.)

Implications of the Study

This study did not find significant changes in interest as a result of teaching information about occupations in agriculture. Two major implications appear to be indicated: first, there may have been some changes which were not measured by the particular instruments; second, a higher degree of participation by the students in real (as opposed to vicarious and simulated) experiences might have produced change.

In the Stockbridge situation several students with occupational interests and plans in agriculture were not

enrolled in vocational agriculture. The implication to expose students not presently enrolled in agriculture to information about occupations in agriculture seems clear. A second implication stems from the presence of students in vocational agriculture without pertinent inventoried occupational interests and without expressed plans for an occupation in agriculture. The instruction tended to not change the occupational plans of such students to occupations in agriculture. The responsibility for educators cuts both ways--to help students to enroll in or drop out of vocational agriculture as the best judgment of the student, teacher, and counselor might suggest.

The above situation may also imply a need for expanded vocational education opportunities. The school in question had few vocational offerings for boys. Until such offerings exist, it would be difficult to counsel students into programs more congruent with occupational interests and plans. It is possible that other characteristics of the instruction and instructor were major factors used when the students were enrolled in vocational agriculture classes.

Another implication of the study revolves around the basic assumptions that underlie the objective as stated by the United States Office of Education. The main objective and the contributing objectives use such words as "understand," "appreciate," "study," "evaluate," and "determine." One would assume that some behavioral

outcome is desired; that the individual's behavior would be influenced by "understanding," "appreciation," "information," or "evaluation." This study did not find a statistically significant change in verbally stated plans or various measures of interests. The expected behavioral changes need to be specified so that outcomes of present and recommended practice can be effectively measured.

The eleventh and twelfth grade boys, as a group, exhibited rather stable and congruent interests and plans. More emphasis on exploratory work and/or educational experiences that would assist students in testing tentative occupational choices appears warranted. Vocational development tasks related to obtaining initial employment and trying out the realism of choices seems to be a focal need.

The congruence of interests and occupational plans in the situation cited could imply that students rationalize interests to coincide with the investment of time and effort implied by three to four years of experience in a vocational program. It is also possible that this group had been selected to include only those with interests in agricultural occupations. A third alternative is that the interests changed, as a result of educational experiences, to become congruent with the occupations emphasized in the particular vocational program. Additional research might explore the three alternatives.

The unpredicted change leads one to consider a more individualized approach. Pre-vocational and occupational experiences built around the stage of vocational development of each individual could tend to be more effective and more efficient than group approaches.

Recommendations for Further Study

The following research is recommended on the basic problems identified by this study or encountered during the study:

1. A study to determine the present congruence of enrollment in vocational agriculture and occupational plans and/or interests of students by grade level. Such a study might add to the generalizability of this study.
2. A replication of the study involving additional populations and utilizing the same instructional unit and OVIS would help generalize the conclusions now limited to this study population.
3. Research built around the concept of utilizing vocational agriculture teachers to present occupational information about agriculture to a variety of school populations should yield valuable results. Such research should involve a wide range of grade levels. In

addition, it should involve students in one or more of three kinds of experiences regarding occupations: vicarious, simulated, and real.

4. Longitudinal study of changes in occupational interests of individuals with emphasis on variables believed to influence changes might fill a portion of an existing gap in knowledge.

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APPENDICES

APPENDIX A

OVIS ITEM #7--LOCAL SURVEY INFORMATION

In this section, you will read the question silently while I read it aloud. You will mark one answer for each question as you have done before.

- A. Do you think taking occupational or vocational courses would keep you from going on to more training after high school graduation?
1. Yes _____
 2. No _____
- B. Have you talked with a teacher, counselor, or principal in your school about attending occupational or vocational skills courses?
1. Yes _____
 2. No _____
- C. If you would like to talk about attending occupational or vocational skills courses, it would be with:
1. A Teacher
 2. A Counselor
 3. A Principal

- D. If you could attend an occupational skills course of your choice which met for 1/2 day of the school day in another school, would you?
1. Yes _____
 2. No _____
- E. Where do you plan on beginning your employment after you have completed your education?
1. In the Lansing area.
 2. In the Detroit area.
 3. In the Jackson area.
 4. In the Ann Arbor area.
 5. Out of state.
 6. In the Armed Forces.
 7. None of these.
- F. Have you received most of your information about occupational and vocational training programs and employment opportunities from:
1. Parents.
 2. Counselors.
 3. Teachers.
 4. Classmates.
 5. Adult friends and neighbors.
 6. A worker in that occupation.
 7. T.V. Programs.
 8. Books, magazines, etc.

G. The second most important source of information about occupational and vocational training programs and employment opportunities came from:

1. Parents.
2. Counselors.
3. Teachers.
4. Classmates.
5. Adult friends and neighbors.
6. A worker in that occupation.
7. T.V. Programs.
8. Books, magazines, etc.

H. What type of education or training do your parents expect you to take after leaving high school?

1. Vocational or technical school.
2. Business school (non-college).
3. Nursing school (non-college).
4. Junior college or community college (two-year).
5. College or university (four-year).
6. Military training.
7. Apprenticeship or other on-the-job training.
8. No further training after leaving high school.
9. Undecided.

APPENDIX B

STUDENT SURVEY INFORMATION

Name _____ School _____

1. How many years have you enrolled in high school vocational agriculture?

_____ None

_____ One

_____ Two

_____ Three

_____ Four

2. Where do you live?

_____ On a farm

a. farm size is _____ acres.

b. Major farm product is _____

_____ In the country but not on a farm.

_____ In the city or urban area.

3. What is your father's occupation? _____

Kind of business? _____

APPENDIX C

Orienting Youth to the World of Work: *The Data-People-Things Approach*

HAROLD F. BLIGH, AYRES D'COSTA, DAVID W. WINEFORDNER*

Today, career exploration and training may be seen as a continuous developmental process in which concepts of the world of work are introduced at an early age. The school then must provide meaningful experiences throughout the entire developmental process so that children will be motivated to learn about themselves and their relationships to the world of work. The role that guidance must play in this total educational process has been reemphasized by passage of the Vocational Education Amendments Act of 1968.

Many guidance programs now in effect are centered at the high school level and are limited in the emphasis given to vocational counseling. Where recognition is given, career exploration tends to be short-term in approach and lacking in coordination and continuity. To be effective, a career-exploration program must be grounded in a sound conceptual framework, a framework sufficiently simple to permit implementation during the early school years, and yet comprehensive enough to provide meaningful experiences at successive levels of the curriculum. This article describes one approach to developing such a program and shows how the program can be implemented at the junior and senior high school levels.

Understanding the World of Work

Building an understanding of the world of work is contingent upon the availability of sound occupational information. Since the individual must eventually interpret what he knows about himself in terms of his understanding of jobs for which he might qualify, it is important that the world of work be described in ways that make this interpretation easy. An effective approach is to describe jobs in terms of the activities performed and the worker traits associated with these activities.

The *Dictionary of Occupational Titles* (DOT)¹ was designed with this goal in mind.² The six-digit codes, which are used to classify jobs in person-related terms, specify the activities performed and the psychological characteristics implied by these activities. As illustrated in Figure 1, the six-digit code for the job "automobile service mechanic" is 620.381.

Figure 1. The Six-Digit DOT Code

OCCUPATIONAL CODE					
Occupational Group Arrangement			Data, People, Things Hierarchies		
CATEGORY	DIVISION	GROUP	DATA	PEOPLE	THINGS
6	2	0	• 3	8	1
6 - MACHINE TRADES OCCUPATION					
62 - MECHANICAL REPAIRING					
620 - MOTORIZED VEHICLE AND ENGINEERING EQUIPMENT REPAIRING					

The three digits to the left of the decimal point, 620, denote that the job involves the repair of motorized vehicles. Automobile service mechanics as a group belong to the division of work classified as mechanical repairing which is more broadly classified as a machine trades occupation.

In the DOT system, jobs are further described in terms of nine levels of involvement with data, people, and things as shown in Table 1 on page 2. The highest possible levels of involvement are denoted by the three digits to the right of the decimal point, in this case, 381. According to this scheme, automobile service work may have as high as a level 3 involvement with data (compiling), a level 8 involvement with people (no significant relationship), and as high as a level 1 involvement with things (precision-working).

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Table I. The Data, People, Things Levels

DATA (4th digit)	PEOPLE (5th digit)	THINGS (6th digit)
0. Synthesizing	0. Mentoring	0. Setting-Up
1. Coordinating	1. Negotiating	1. Precision Working
2. Analyzing	2. Instructing	2. Operating-Controlling
3. Compiling	3. Supervising	3. Driving-Operating
4. Computing	4. Diverting	4. Manipulating
5. Copying	5. Persuading	5. Tending
6. Comparing	6. Speaking-Signalling	6. Feeding-Offbearing
7. No significant relationship	7. Serving	7. Handling
8. No significant relationship	8. No significant relationship	8. No significant relationship

How useful is this system of occupational classification for school guidance and counseling programs? Perrone,³ in reporting the results of a national study on the use of occupational information by school personnel, considered the job cluster format and the basic data-people-things concept of the DOT to be an effective approach. However, Reilly,⁴ in a study on the availability and usefulness of occupational information, reported that few of the counselors in his survey found the DOT useful although the majority had access to it. These reports seem to indicate that counselors may recognize the value of the DOT as a reference tool, but that they have not found ways to use the classification system effectively in their daily work with students.

Recognizing the need for a practical approach, D'Costa, Winefordner, Odgers, and Koons undertook the development of the *Ohio Vocational Interest Survey (OVIS)*⁵ as a link between the individual seeking information about jobs and the occupational classification system provided in the DOT. Much of the information in the DOT is based on the premise that every job involves interaction in varying degrees with data, people, and things. These varying patterns of involvement provide a basis for grouping jobs into clusters which readily lend themselves to career exploration.

The World of Work in a Data-People-Things Space

When data, people, and things are considered to be the basic dimensions of work, the entire world of work can be graphically represented by a three-dimensional space or cube. Each job can be plotted in terms of its data, people, and things values so as to occupy an identifiable position in the cube. The DOT has classified 21,714 jobs according to their data-people-things involvements and has grouped them into 114 homogeneous areas or "worker-trait groups." Thus, the task of representing the world of work within this theoretical cube is simplified by plotting the 114 worker-trait groups instead of the individual jobs.

When the 114 worker-trait groups are plotted in the data-people-things cube, the groups in turn form clusters which appear to be homogeneous not only with respect to their data, people, and things values but also in terms of other worker characteristics such as interests, temperaments, aptitudes, and general educational levels. Since the homogeneous clusters represent the 114 worker-trait groups and the 21,714 separate jobs in the world of work, these new clusters can be used to define the entire domain of vocational interests. This conceptualization, entitled, "A Cubistic Model of Vocational Interests"⁶ provides the framework for developing the 24 interest scales of the *Ohio Vocational Interest Survey (OVIS)*.

The OVIS-DOT Relationship

The 24 OVIS interest scales are briefly described and related to the cubistic model in Figure 2 which appears on page 3. To facilitate the actual plotting of the worker-trait groups within the cubistic model, the OVIS authors condensed and inverted the nine-level DOT ratings as described in Table I to form the three-level ratings as shown in Table II. The job "automobile service mechanic" discussed earlier has the DOT data-people-things code 381. When converted to the OVIS system, the new code is 102, indicating average involvement with data, low involvement with people, and high involvement with things.

Table II. OVIS-DOT Relationships

Level of Involvement	OVIS Rating	DOT Rating	DATA Functions	DOT Rating	PEOPLE Functions	DOT Rating	THINGS Functions
High	2	0 1 2	Synthesizing Coordinating Analyzing	0 1 2 3 4	Mentoring Negotiating Instructing Supervising Diverting	0 1 2 3	Setting-Up Precision Working Operating-Controlling Driving-Operating
Average	1	3 4 5 6	Compiling Computing Copying Comparing	5 6 7	Persuading Speaking-Signalling Serving	4 5 6 7	Manipulating Tending Feeding-Offbearing Handling
Low	0	7 8	No Significant Relationship	8	No Significant Relationship	8	No Significant Relationship

When the three OVIS levels are utilized, the cube, a graphically portrayed on page 3, becomes a 3x3x3 matrix with 27 cells. The three-digit number within the parentheses in each cell expresses the OVIS levels of data-people-things involvement for the jobs which fall in that cell. The numbers below the three-digit numbers identify the 24 interest scales.

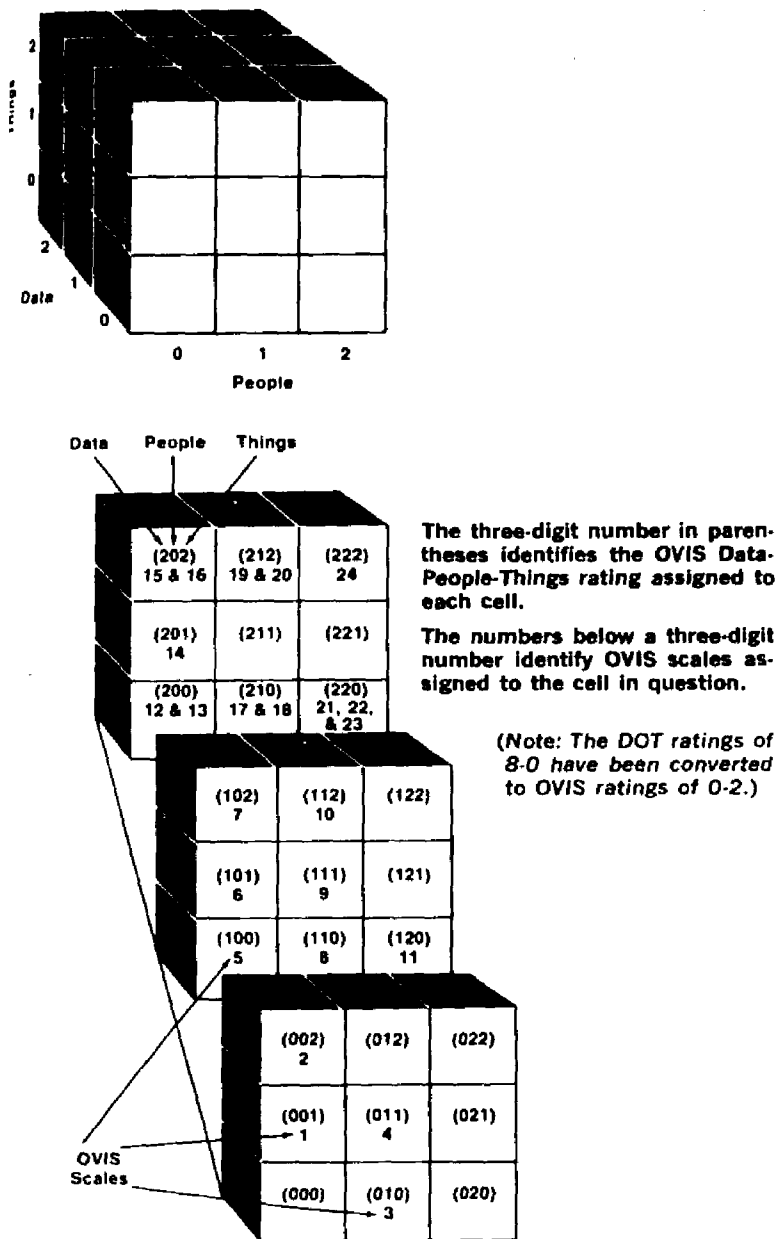
The 24 interest scales are further described in Figure 2. The three-digit number in parentheses following a scale title represents the OVIS data-people-things code for the job falling within that scale. For example, Scale 1, *Manual Work*, has a data-people-things code of 001, signifying job with low data and people involvement and an average involvement with things. OVIS scales 1, 2, 3, and 4 all fall into the lowest data-level slab of the cube since the job making up these scales call for little or no involvement with data. Note that there are no OVIS scales assigned to five of the cells in this slab. This is because there are no clusters of worker-trait groups within these cells.

The middle data slab contains technical-type jobs with average data involvement. The top data slab contains professional type jobs with high data involvement. Some of the cells in the top data slab contain more than one OVIS scale since there are more than one homogeneous cluster of worker-trait groups for each of those cells.

It is interesting to observe the relationships among the OVIS scales as one moves along each of the three axes of the cube. For example, the people and things involvement for Scale 2 (002), Scale 7 (102), and Scale 16 (202) remain at the same level as one moves along the data-axis, while there is a progressive rise in data involvement. As indicated in the scale descriptions, these three scales involve work with machines progressing from simple operation in Scale 2, *Machine Work*, through technical design and development in Scale 16, *Applied Technology*. A similar rise in people

(continued on page 4)

Figure 2. The Cubistic Model of Vocational Interests.



THE 24 INTEREST SCALES

After identifying the 24 interest scales, items representing the 114 worker trait groups were drawn from job definitions as presented in the *Dictionary of Occupational Titles*. The 24 scales are briefly defined below:

1. **Manual Work (001)** Unskilled use of tools and routine work usually done by hand.
2. **Machine Work (002)** Operating and adjusting machines used in processing or manufacturing.
3. **Personal Services (010)** Providing routine services for people as a waiter, waitress, usher, household worker, etc.
4. **Caring for People or Animals (011)** Routine work related to the day-to-day needs of people or animals.
5. **Clerical Work (100)** Typing, recording, filing, IBM key punching, and other clerical or stenographic work.
6. **Inspecting and Testing (101)** Sorting, measuring, or checking products and materials; inspecting public facilities.
7. **Crafts and Precise Operations (102)** Skilled use of tools or other equipment as in the building trades, machine installation and repair, or the operation of trains, planes, or ships.
8. **Customer Services (110)** Conducting business relations with people as in retail selling, accepting reservations, receiving payments, or providing information.
9. **Nursing and Related Technical Services (111)** Providing services as a nurse, physical therapist, X-ray or medical laboratory technician, or dental hygienist.
10. **Skilled Personal Services (112)** Providing skilled services to people such as tailoring, cooking, barbering, or hairdressing.
11. **Training (120)** Instructing people in employment or leisure-time activities. Also includes animal training.
12. **Literary (200)** Writing novels, poetry, reviews, speeches or technical reports; editing, or translating.
13. **Numerical (200)** Using mathematics as in accounting, finance, data processing, or statistics.
14. **Appraisal (201)** Determining the efficiency of industrial plants and businesses, evaluating real estate, surveying land, or conducting chemical or other laboratory tests.
15. **Agriculture (202)** Farming, forestry, landscaping, or the related fields of botany and zoology.
16. **Applied Technology (202)** Application of engineering principles and scientific knowledge to the design of structures and machines.
17. **Promotion and Communication (210)** Advertising, publicity, radio announcing, journalism, news information service, interviewing, recruiting; also providing legal services as a judge or lawyer.
18. **Management and Supervision (210)** Administrative or supervisory positions, such as a shop foreman, supervisor, school administrator, police or fire chief, head librarian, executive, hotel manager or union official. Includes owning or managing a store or business.
19. **Artistic (212)** Interior decorating, display work, photography, commercial and creative art work, or artistic restoration.
20. **Sales Representative (212)** Demonstrating and providing technical explanations of products or services to customers, selling and installing such products or services, and providing related technical assistance.
21. **Music (220)** Composing, arranging, conducting, singing, or playing instruments.
22. **Entertainment and Performing Arts (220)** Entertaining others by participating in dramatics, dancing, comedy routines, or acrobatics.
23. **Teaching, Counseling, and Social Work (220)** Providing instruction or other services to schools, colleges, churches, clinics, or welfare agencies. Includes instruction in art, music, ballet, or athletics.
24. **Medical (222)** Providing medical surgical, or related services for the treatment of people or animals.

involvement can be noted for Scales 5, 8, and 11, as one moves from left to right in the middle slab.

Through this cubistic model, the OVIS scales constitute a functional system for relating an individual's interests to broad homogeneous clusters of jobs. A student obtaining a high score on an OVIS scale has expressed a strong liking for the activities associated with the jobs making up that scale. From the profile of his OVIS interest scores, the individual is led into exploring the world of work. High scores represent likings for certain job activities, while low scores indicate types of job activities that were distasteful to the student.

CONCLUSION

An effective career exploration program recognizes that wise decisions are grounded in understanding—understanding by the individual of himself and his relation to others and to the world of work which he will eventually enter. The process of developing this understanding must begin at an early age and continue throughout the educational process. In the primary and elementary grades, children should develop not only an awareness of jobs in their immediate environment, but also positive attitudes toward work and an understanding of the school's role in preparing them for earning a living.

The early adolescent years then become a period for broad exploration of educational and vocational opportunities. By the time students reach the third year of high school, they are faced with making a fairly definite commitment to the future. They must plan to continue their education and training beyond high school, or seek a job upon leaving school.

In planning for the future, students must take into account their abilities, interests, and past accomplishments

both in and out of school. In this respect, an interest measure such as the *Ohio Vocational Interest Survey* has great value, not as a predictive instrument, but as a way of helping the student gain an understanding of his interests and how they relate to the world of work.

In grades 8, 9, and 10, the information provided by OVIS can be used in exploring broad educational and vocational areas. At the senior high school level, the student should begin to take a realistic look at specific jobs, the education and training involved, and the economic implications of a job. At both of these levels, the worker-trait groupings and the data-people-things concept of the *Dictionary of Occupational Titles* provide a particularly meaningful route to job exploration.*

¹ *Dictionary of Occupational Titles, Third Edition*. U.S. Department of Labor, Bureau of Employment Security, Washington, D.C.: U.S. Government Printing Office, 1965.

² For a concise appraisal of the DOT, see Fine, Sidney A. "The 1965 Edition of the *Dictionary of Occupational Titles*: Content, Contrasts, and Critique." *Vocational Guidance Quarterly*, 1969, 17, No. 3, 162-172.

³ Perrone, Philip A. "A National School Counselor Evaluation of Occupational Information." Center for Studies in Vocational and Technical Education, Industrial Relations Research Institute, University of Wisconsin, April, 1968. (Mimeographed.)

⁴ Reilly, Robert A. "Availability and Use of Occupational Materials." *Clearing House*, 1969, 43: 439-441.

⁵ D'Costa, Ayres G., Winefordner, David W., Odgers, John G., and Koons, Paul B., Jr. *Ohio Vocational Interest Survey*. New York: Harcourt, Brace & World, Inc., 1969.

⁶ D'Costa, Ayres and Winefordner, David W. "A Cubistic Model of Vocational Interests." *Vocational Guidance Quarterly*, 1969, 17, No. 4, 242-249.

* This article has been adapted from Chapter 1, *Ohio Vocational Interest Survey: Manual for Interpreting*, New York: Harcourt, Brace & World, Inc., 1970.