VOCATIONAL INTERESTS OF AGRICULTURAL EXTENSION

WORKERS AS RELATED TO SELECTED ASPECTS

OF WORK ADJUSTMENT

By

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A DISSERTATION

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CHAPTER I

INTRODUCTION AND STATEMENT OF PROBLEM

Overview of the Study

The general problem. In 1950 the Michigan Cooperative Extension Service initiated a research project for the purpose of attempting to obtain information that will be useful in improving the selection of its County Extension workers.[1] The goal of the Extension Service is to be able to select workers who not only will be more successful in the performance of their jobs, but who will also be more satisfied in their work.

As a starting point in this endeavor the project design calls for an analysis of the present County Agents and 4 H Club Agents in Michigan with respect to the relationship between certain of their personal characteristics and at least two criteria of their work adjustment. If some significant

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[1] P. A. Miller and J. T. Stone, "The Selection of Effective Extension Workers," Review of Extension Studies. U. S. Department of Agriculture, Extension Service Circular 470, July, 1950, p. 27.

relationships are found in the present Agents, and if these relationships can be validated in studies with additional Agents, this information should be useful in improving the selection procedures.

Over-all effectiveness on the job is considered to be the primary criterion of work adjustment in this general research project.. The work effectiveness of the present Agents is to be determined by ratings by their superiors. In keeping with the Extension Service's ultimate goal, job satisfaction is considered to be an additional criterion of work adjustment and the job satisfaction of the present Agents is to be measured by an adaptation and extension of the Hoppock Job Satisfaction Blank.[2] An analysis is to be made of the relationship between each of these criteria and the following measurable personal factors which are believed to be inherent in the work adjustment of these people: (a) biographical data, including an analysis of the worker's self-concept and his concept of his job, (b) vocational interests, (c) personality traits, and (d) various training factors.

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[2] Robert Hoppock, Job Satisfaction, New York: Harper and Brothers, 1935, 303 pp.

The problem of this study. This particular study is concerned with one phase of this General Research Project,[3] namely, the relationship between the vocational interests of the present Michigan Agents and the two criteria of work adjustment. For this purpose, their vocational interests were determined by the Strong Vocational Interest Blank.[4] The problem of this study may then be stated specifically as, "What is the relationship between the Strong Vocational Interest Blank scores of the present County Agents and 4 H Club Agents in Michigan and their rated job effectiveness, and self-rated job satisfaction?" In keeping with the objectives of the General Research Project, the purpose in studying these relationships was twofold. It was to provide a description of the vocational interests of Michigan Agents, and to attempt to determine the Strong Vocational Interest Blank scales, if any, that might be useful guides in the selection of more effective and more

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[3] The term "General Research Project" will hereinafter refer to the over-all project now being conducted by the Michigan Extension Service.

[4] Edward K. Strong, Jr., Vocational Interests of Men and Women, Stanford, California: Stanford University Press, 1943, 746 pp.

satisfied County Agents and 4 H Club Agents. It is implicit

in this study that the final predictive validity of any such re-

lationships found must rest upon future cross-validation studies.

The approach to the second objective was essentially that of

testing the significance of the difference between the Strong Vo-

cational Interest Blank mean scores of the "high" and "low"

groups of Agents in respect to their ratings on the two work

adjustment criteria, determining the intensity of these relation-

ships, and checking the extent to which accurate predictions

could be made by analysis of interest profiles. These methods

will be described in detail in Chapters IV and V.

Rationale for the study. It appears that attempts to

discover more effective techniques for improving the selection

of teachers have been rather disappointing. For example, in

reviewing 675 studies of factors related to success in teaching,

Sanford concludes that "research studies do not point to a

scientific basis for preservice selection of teachers. A valid

and reliable criterion of teacher success has not been found,

and factors conditioning success in teaching are not definitely

known, and a satisfactory technique of investigation for applying

the criterion and the factors has not been formulated."[5] Also,

Torgeson after an earlier review of 500 studies arrived at

substantially the same conclusion.[6] Since the Extension Ser-

vice is essentially an educational organization,[7] teaching is

implicit as one of its functions.   The findings of previous

studies would therefore tend to question the value of further

research in this area.

However, the setting in which the Extension Service

worker operates and the methods by which he achieves his

goals are somewhat different from those of the classroom

teacher.   By virtue of the basic cooperative organization of

the Service, the worker is responsible simultaneously to federal,

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[5] Charles W. Sanford and J. Lloyd Trump, Section on Pre-Service Teacher Selection, p. 1394.   Walter S. Monroe, editor, Encyclopedia of Educational Research, New York: The MacMillan Company, 1950.

[6] T. L. Torgeson, "The Measurement and Prediction of Teaching Ability," Review of Educational Research, 7: 242-247, 1937.

[7] Edmund deS. Brunner and E. Hsin Pao Yang, Rural America and The Extension Service, New York: Bureau of Publications, Teachers College, Columbia University, 1949, p. 163.

state, and county agencies.[8] Also, in Michigan he seldom con-

ducts classes in organized courses of study. Instead, he works

with individuals and organized and informal groups by playing a

variety of occupational roles. A recent analysis of the way in

which Michigan County Agents spend their time indicates that

approximately one-third of the time is spent in working directly

with individuals, one-third in working directly with groups, and

one-third in other activities such as writing, studying, and

planning.[9] Another analysis further indicates the following ap-

proximate distribution of time spent in the major roles played

by Michigan Agents in their work:[10]

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[8] Lincoln David Kelsey and Cannon Chiles Hearne, Coop-
erative Extension Work, Ithaca, New York: Comstock Publishing
Company, 1949, Chapter VII.

[9] John T. Stone, "The Way Michigan County Agricultural
Agents Estimate They Spend Their Working Time." (Unpublished
mimeographed report on file in the office of the Michigan Exten-
sion Service, July, 1951.)

[10] _____, "A Classification of the Different Occupa-
tional Roles Performed by County Agricultural Agents, The
Various Tasks Associated With Each and the Relative Amount
of Time a Model Agent Spends Performing Them." (Unpublished
mimeographed report on file in the office of the Michigan Exten-
sion Service, July, 1951.)

Consultant	24. 32%
Public Administrator	23. 52%
Salesman of information and ideas. (Including writing, radio broadcasting, lecturing demonstrating.)	17. 40%
Organizer and supervisor of events	15. 71%
Organizer of groups	7. 22%
Student	6. 78%
Facilitator-expeditor	5. 05%

Although the objectives of the Extension Service are educational in nature, the work situation and job activities peculiar to County Extension work therefore points to the possibility that negative research findings in the selection of teachers do not necessarily indicate that some useful results could not be determined for improving the selection of Extension Service workers.

Vocational interests have been studied extensively and the low relationships, indicated in some reviews of research[11] between vocational interests and work success might challenge

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[11] Harold O. Carter, "Vocational Interests and Job Orientation," Applied Psychology Monographs No. 2, Stanford, California: Stanford University Press, 1944, 85 pp.

Ralph F. Berdie, "Factors Related to Vocational Interests," Psychological Bulletin, 41:· 137-155, 1944.

Donald E. Super, Appraising Vocational Fitness, New York: Harper and Brothers, 1949, 727 pp.

the usefulness of further experimentation with the relationship

of these two variables. However, in summarizing studies by

Strong, Bills, Ghiselli, Otis, and Ryan and Johnson, Super

states that the relationship between interest inventory results

and work success "is significant in the case of several quite

different types of sales jobs."[12] With life insurance salesmen,

for example, "there is a rather clear tendency for those who

made high scores [on the Life Insurance Salesman scale of the

Strong Vocational Interest Blank] to be those who sold the most

insurance."[13]

In many of the roles demanded of the Extension worker

the concept of selling is inherent. It is, to be sure, that of

selling ideas and services, but still selling. In addition, the

fact that the success of the organization rests in no small

measure upon its voluntary acceptance by the public calls for

discrete persuasive characteristics on the part of Extension

workers. Consequently, in selecting new workers Michigan

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[12] Donald E. Super, _Appraising Vocational Fitness_, New
York: Harper and Brothers, 1949, pp. 431-432.

[13] _Loc. cit._

Extension Service administrators attempt to make a subjective

evaluation of an applicant's persuasive interests and aptitudes

because they feel that this trait is essential for his success

in Extension work.

Since there is subjective evidence that a positive re-

lationship exists between an Extension worker's persuasive

interests and his success on the job, and since sales interests

have been found to correlate positively with success in various

types of sales work, it is possible that this relationship is

objectively defensible in the case of Extension workers. Be-

cause of this possibility, there is also justification for investi-

gating the relationship between Extension workers' other

interests and their work adjustment.

Need for the Study

Recognition of the need for more valid selection tech-

niques is not peculiar to the Michigan Extension Service. The

United States Department of Agriculture and the Office of

Naval Research of the United States Navy are concerned over

this problem to the extent that they have granted several thou-

sand dollars to the Extension Services in the States of Missouri

and New York in addition to Michigan to aid in conducting research pertinent to it.[14] Each of these state Extension Services has planned a five-year study.

These federal agencies are assisting in this research because, among other reasons, Extension administrators are concerned about the rate of turnover and indications of dissatisfaction among County Extension workers, yet satisfactory means of coping with this problem have not been found. This reason for the need of this study is closely related to a second reason, namely, that the Extension worker's job has expanded rapidly in scope in recent years, but efforts to refine the process of selecting these workers apparently have not kept pace with the increasing complexities of the job.

<u>Rate of turnover and indications of dissatisfaction.</u> Rate of turnover and indications of dissatisfaction are among the reasons listed for the need for better selection techniques in

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[14] United States Department of Agriculture, "Periodic Status Report, Project Nr 154-041, December 15, 1950-June 15, 1951," (unpublished mimeographed report on file in the office of the Michigan Extension Service).

Missouri. For example, the Missouri State Agents Annual Report for 1949 includes the following statement:[15]

"In the Missouri Agricultural Extension Service in 1949, there was a turnover of fifteen percent. This represents a very considerable loss both to the Extension Service and to some of the individuals involved. Besides those who quit voluntarily or under pressure, there are others who are not very happy in their present work or not doing a very effective job, even though they are still in the Extension Service."

Representatives of the United States Department of Agriculture[16] indicated in meetings in 1950 and 1951 with the Planning Committee for the Michigan study[17] that similar reasons existed in the New York Extension Service.

These reasons for the need for the study are also evident in the Michigan Extension Service. Specifically, in

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[15] Missouri Cooperative Extension Service, "State Agents Annual Report," 1949, p. 78. (Quoted by written permission of Mr. Ivan F. Nye, Assistant Professor, Department of Rural Sociology, College of Agriculture, University of Missouri, Columbia, Missouri, and Coordinator of the present Extension Personnel Study in that state.)

[16] Dr. John P. Shea, Psychologist, Cooperative Extension Service, United States Department of Agriculture and Mr. Cannon C. Hearne, In Charge, Personnel Training Section, Division of Field Studies and Training Cooperative Extension Service, United States Department of Agriculture.

[17] The Planning Committee is described on page 19.

1948, 1949, and 1950 the rate of turnover in County Agents and

4 H Club Agents alone averaged about fifteen percent.[18] The

fact that many of these workers leave the Service for other

kinds of employment is an indication that some type of dissat-

isfaction exists among them. A larger proportion of 4 H Club

Agents than County Agents is found in this group.[19] This is

particularly significant because in Michigan, 4 H Club Work is

considered to be valuable experience for County Agent work and

4 H Club Agents have consequently been the main source from

which County Agents are selected.

In addition, there is subjective evidence of other unsatis-

factory features in the present Michigan Extension Service per-

sonnel program. Mr. John T. Stone, Extension Training

Specialist and a member of the administrative staff of the

Michigan Extension Service has reported that a number of Agents

are not performing satisfactorily in their jobs.[20] This same

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[18] From the personnel files of the Michigan Extension
Service.

[19] Loc. cit.

[20] John T. Stone, "Michigan State College Prospectus
and Program Report of the Cooperative Research Project 'A

report also points out that a number of the students who

select the Agricultural Extension major at Michigan State

College do not appear to have the personal qualifications be-

lieved necessary for success in that type of work. In dis-

cussing these two points in early meetings of the Planning

Committee, Mr. Stone emphasized that his report was based

upon a concensus of opinion of the Extension administrative

staff and the Extension training staff.

Increased complexity of the Extension Worker's job: The

changes that have taken place in Extension Work may be real-

ized more vividly by a brief reference to the original Extension

Service functions. The roots of the Extension Service can be

traced to the earliest years of our nation[21] but it came into

existence officially with the passage of the Smith-Lever Act

in 1914 and was designated as the "Cooperative Agricultural

Study of the Cooperative Extension Worker, His Job, Selection
and Training' ", June, 1950 (unpublished mimeographed report
on file in the office of the Michigan Extension Service).

[21] Edmund Des. Brunner and E. Hsin Pao Yang, Rural
American and the Extension Work in the United States, Washing-
ton: United States Government Printing Office, 1928, p. 100.

and Home Economics Extension Service."[22] From the begin-

ning of this organization the County Agricultural Agent has

been one of the key persons responsible for carrying out its

work. There were 1136 County Agricultural Agents in the

forty-eight states in 1915.[23] Baker describes the County

Agent of that time as "an itinerant teacher, going on foot or

horseback from one farm to another to spread the gospel of

good farming."[24] The essence of this gospel, due in no small

measure to the advent of World War I, was how to increase

food production. It was a time when "men of science brought

to the farmers what seemed most needed from the scientific

viewpoint."[25]

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[22] Alfred Charles True, A History of Agricultural Extension Work in the United States, Washington: United States Government Printing Office, 1928, p. 100. The Smith-Lever Act states that "cooperative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending said [Land Grant] colleges in the several communities and imparting to such persons information on said subjects through field demonstrations and otherwise," ibid., p. 195.

[23] Ibid., p. 129.

[24] Gladys Baker, The County Agent, Chicago: The University of Chicago Press, 1939, p. 207.

[25] Kelsey and Hearne, op. cit., p. 115.

Present scope. From its rather humble beginnings with

its vocational emphasis[26] the Extension Service has expanded

in size and scope to the extent that in 1949 it was described

as "the largest rural adult educational agency in the world"[27]

and its objectives as stated in 1946 were "more fruitful lives

and better living for all people."[28] Various statistics are

available to substantiate the importance of the educational ac-

complishments of the Service. For example, Brunner and Yang

wrote in 1949 that "In 1947 the latest year for which data were

available, over 3.8 million farms changed one or more agri-

cultural practises as result of Extension teaching. This rep-

resents just about two out of every three farms, as reported by

the 1945 Census of Agriculture."[29]

The present scope of the program is indicated more ex-

plicitly in the 1948 report of the joint committee of the U. S.

Department of Agriculture and the Association of Land-Grant

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[26] Brunner and Yang, op. cit., p. 113.

[27] Ibid., p. vii.

[28] Kelsey and Hearne, op. cit., p. 117.

[29] Brunner and Yang, op. cit., pp. 145, 149.

Colleges and Universities on Extension Programs Policies and

Goals.[30]   This report points out that the Extension Service

today serves not only farm people, but (a) part-time farmers,

(b) urban workers maintaining homes in rural areas, (c) in-

dustrial groups, such as miners, living and working in rural

communities, (d) the residents of small towns and villages,

and (e) residents of cities.   City residents, according to this

report, are making increasing demands on the Service not only

for help with agricultural problems, such as those dealing with

commercial floriculture and horticulture as well as home and

community gardening, but also in areas such as home manage-

ment and furnishing, clothing, nutrition, health, efficient pur-

chasing and wise use of food and other agricultural products.

The report further emphasizes that the subject-matter covered

by the Extension Service is also expanding.   This is indicated

in the following statement of problems with which the Service

is concerned:[31]

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[30] U. S. Department of Agriculture and Association of
Land Grant Colleges and Universities, Joint Committee Report
on Extension Programs Policies and Goals, Washington: U. S.
Government Printing Office, 1948, pp. 6-10.

[31] Loc. cit.

On the community or county basis, the need for improved local health services, public school facilities, land use controls in some areas, and similar matters are typical of such problems. On the broader front are such questions as the most appropriate long time program for agriculture, tax policies and public indebtedness in relation to national welfare, the proper role of this country in helping to maintain international stability and world peace, and many others.

The method by which it was determined (in the Brunner and Yang statement above) that two out of every three farms changed agricultural practices "as result of Extension teaching" is not given. However, even if allowance is made for the influence of many other forces that might be contributing to the welfare of rural people, a cursory review of data regarding the numbers of youth and adults who participate in Extension activities, and regarding financial appropriations for this work indicates that the Extension Service has become a major educational program in our country.

Present selection procedure in Michigan. In its present selection procedure, the Michigan Extension Service attempts to select workers who are adequate for the increased complexities of the job, but the evidences already cited indicate that this procedure is not entirely satisfactory. In it, an applicant is first interviewed by an average of five Extension Service

administrators, including District Extension Supervisors, the
Assistant Director and the Director of the Extension Service.
The opinions of these administrators are then pooled and if
they are generally favorable, the applicant is asked to fill out
an application blank which provides information about his work
experiences, academic accomplishments, and other phases of
his personal history. His references are then checked by
mail. No specific objective evaluation devices are used.
Through experience the Extension administrators have found
that certain work experiences, stated interests, and observed
personality traits tend to correlate with success in Extension
work and they select workers accordingly.

The Michigan Extension Service has made efforts to ob-
tain suggestions from other State Extension Services regarding
the improvement of selection techniques but these have not
yielded information that was considered applicable to the local
situation. Also, a review of the literature by this writer re-
vealed no studies which are directed specifically at discovering
or creating better methods of selecting Extension workers.
Therefore, since objective answers to this problem were not

available, the Michigan Extension Service decided to undertake its own study of the matter.

Origin of the Study

The Planning Committee: Active concern in the Michigan Extension Service over this need for improved selection techniques resulted in the assignment, early in 1950, of the Extension Training Specialist to initiate steps toward studying the problem. One of the first steps by this Specialist was the organization of a committee to assist in the study. From the beginning the Extension Service felt that wide use should be made of the various Michigan State College resources that could contribute to the study, regardless of departmental affiliations. The members of the committee were selected on the basis of (a) their familiarity with the problem, (b) their skill in research techniques, and (c) their willingness to serve. This resulted in a committee with representatives from the Department of Sociology, the Institute of Counseling, Testing and Guidance, the Agricultural Extension Department, the Counseling Center, and the Department of Written and Spoken English. From time to time assistance was also contributed by representatives from

the Department of Psychology and the Board of Examiners. The committee has met for two to four hour sessions almost weekly from the time of its organization. Its chief function has been that of planning the over-all research.

The General Research Project: The committee concluded after a very few meetings that an adequate solution to its problem would entail the cooperation of several other state Extension Services over a period of years for purposes of cross-validation of any significant results found in Michigan. However, it felt that a study of County Agricultural Agents and 4 H Club Agents in Michigan would be a feasible point of departure and would provide satisfactory preliminary data upon which further steps could be based. It therefore designed, after several more meetings, the project as described briefly on page one, and conceived of it as the first stage of a long range study.

Since the plan of this first stage was to analyze the relationship between four personal factors and the work adjustment ratings of the Agents, members of the Planning Committee then undertook separate phases of the study. The writer, a member of the Committee representing the Michigan State

College Counseling Center, accepted the vocational interest aspect of the study because it was in keeping with his training and experience in college student counseling work.

Limitations of the study. The following limitations are inherent in this study and the value of its findings are restricted accordingly.

(a) It was necessary to assume honesty on the part of the Agents in expressing their vocational interests and their job satisfaction and to assume objectivity on the part of the administrators in rating the work effectiveness of the Agents. As will be pointed out later in the study, several steps were taken in the administration of these measuring devices to elicit honesty and objectivity, but it was not possible to ascertain the degree to which this was attained.

(b) It would have been desirable to determine the specific SVIB item responses which might differentiate the variable work adjustment groups, but the number of Agents in Michigan was not large enough to permit this. Strong recommends that criterion groups of 300 to 500 should be used for

this purpose.[32] Furthermore, the representative-ness of the sample is definitely restricted by the use of Michigan Agents only.

(c) Although a long range study is included in the plans of the General Research Project, this particular study is subject to the possible limitations of a cross-sectional study in contrast to a longitudinal study.

(d) The statistical techniques used herein do not adequately test variables suspected to lack normality of distribution. However, some justification for their use is offered in Chapter IV.

Summary. In 1950 the Michigan Cooperative Extension Service initiated a research project for the purpose of obtaining information that will aid in the selection of County Agents and 4 H Club Agents who will be more effective and more satisfied in their work. The initial phase of the project calls for an analysis of the relationships of biographical data, vocational

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[32] Strong, op. cit., p. 649.

interests, personality traits, and academic backgrounds of the present Michigan Agents to their work effectiveness, as determined by ratings by their superiors and to their job satisfaction, as determined by an adaptation and extension of the Hoppock Job Satisfaction Blank.

The problem of this particular study was to analyze the relationship of the vocational interests of the present Agents to these two criteria of work adjustment for the purpose of providing a description of the Agents' interests and for determining Strong Vocational Interest Blank Scales that might be useful in the selection of more effective and more satisfied Agents. To do this the significance of the difference between the Strong Vocational Interest Blank mean scale scores of various "high" and "low" work adjustment groups of Agents was tested. The intensity of these relationships was determined, and the accuracy with which predictions could be made from these scores was tested.

Recognition of the need for more valid selection techniques is manifested by the Office of Naval Research of the United States Navy and the United States Department of Agriculture through financial assistance for this research. This

is prompted in part by Extension Administrators' concern about the rate of turnover and indications of dissatisfaction among County Agents and 4 H Club Agents. The Extension worker's job has increased in complexity in recent years but in view of the present conditions it appears that improvements in the selection procedures have not kept pace with this change.

A Planning Committee was organized to direct the General Research Project. Individual members of the Committee are conducting separate phases of the Project.

Certain limitations of the study were listed in this chapter. The remainder of the study is organized as follows:

Chapter   II – Definition of terms and description of instruments used.

Chapter   III – Review of related research.

Chapter   IV – Description of the sample, the procedures used in collecting, organizing and tabulating the data, and the techniques employed in analyzing them.

Chapter   V – Description of the methods used in establishing the variable work adjustment groups.

Chapter VI – Presentation of the findings of the study.

Chapter VII – Summary of the study, presentation of

conclusions, and suggestions for further

research.

CHAPTER II

DEFINITION OF TERMS AND DESCRIPTION OF INSTRUMENTS

The purpose of this chapter is to define certain terms to which frequent reference will be made in the remainder of the study and to describe the instruments used in appraising the job satisfaction and vocational interests of the subjects studied.

Definition of Terms

Extension Service worker. The term "Extension Service worker" will refer to the entire group of employees of the Michigan Cooperative Extension Service. Extension Service workers in other states will be designated accordingly. Reference will be made to three groups of Extension Service workers, namely, "Extension Administrators," "Extension Specialists," and "County Extension workers."

Extension Administrators. Extension administrators will include the Director of the Extension Service, the Assistant Director of the Extension Service, the State Agricultural Extension Leader, the State 4 H Club Leader, the four District

Supervisors, and the Specialist in Extension Training. The complete list of administrative personnel includes the State Home Demonstration Leader, the Assistant State Leaders of Home Economics, and the Assistant State Leaders of 4 H Club work.[1] However, these last named workers have had little direct concern with this particular study and consequently are not included among the Extension administrators referred to herein. The duties of the Extension administrators are administrative and supervisory in the areas designated by their titles.

Specialists. The term "Specialists" will refer to the Extension Service Subject Matter Specialists. Each Specialist works in the interests of the total Extension program by providing to rural people, through the County Extension workers, the most appropriate scientific information applicable to their problems. Each Specialist is responsible for a particular area of knowledge..

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[1] John T. Stone, Michigan Cooperative Extension Service: Organization, Development, Policies, East Lansing, Michigan: Michigan State College, Cooperative Extension Service (1950), p. 1.

County Extension workers. The term "County Extension workers" will refer to the County Agricultural Agents, the Associate County Agricultural Agents, the Assistant County Agricultural Agents, and the County 4 H Club Agents. Home Demonstration Agents and Assistant Home Demonstration Agents are also County Extension workers but are not included in the definition here since they were not studied in this research.

County Agent. The term "County Agent" will include the County Agricultural Agent, the Associate County Agricultural Agent and the Assistant County Agricultural Agent. In Michigan the County Agent is usually the staff member to whom the responsibility for the administration and coordination of the county Extension program is designated.

4 H Club Agent. The term "4 H Club Agent" will refer to the County 4 H Club Agent. The 4 H Club Agent is primarily responsible for the youth Extension programs in the counties. The duties of the 4 H Club Agent and the County Agent will be presented in more detail in Chapter IV.

Work effectiveness. Work effectiveness, which in this study was determined for the County Agents and 4 H Club Agents

by ratings by their superiors, is considered to be not only the over-all success with which they have performed the specific duties prescribed by the various agencies and organizations which have a part in directing their activities, but also their success as manifested by the type of initiative and discretion used in coping with new problems, particularly where public relations are involved.

Job satisfaction. Hoppock defines job satisfaction as "any combination of psychological, physiological, and environmental circumstances that causes a person truthfully to say, 'I am satisfied with my job.'"[2] This definition conveys the concept of job satisfaction implicit in this study and of course is well suited to the appraisal of job satisfaction by means of the adaptation and extension of the Hoppock Job Satisfaction Blank used herein.

Vocational Interest. Since Strong's Vocational Interest Blank was selected for appraising the interests of the County

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[2] Robert Hoppock, Job Satisfaction, New York: Harper and Brothers, 1935, p. 47.

Agents and the 4 H Club Agents, his conception of vocational

interests is basic to this study. He states that "an interest

is an expression of one's reaction to his environment."[3] This

statement will serve as an adequate definition of interest in

general. However, the concern here is with vocational interest

or the expression of one's reaction to his vocational environment.

In the development of his instrument for appraising this type of

interest, Strong has proceeded on the assumption that "if a

man likes to do the things which men like who are successful

in a given occupation and dislikes to do the things which these

same men dislike to do, he will feel at home in that occupa-

tional environment."[4] Vocational interest then is defined here

as the expression of one's likes and dislikes regarding many

factors that are believed to be inherent in a number of occupa-

tions.

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[3] Edward K. Strong, Jr., <u>Vocational Interests of Men and Women</u>, Stanford, California: Stanford University Press, 1943, p. 682.

[4] <u>Ibid.</u>, p. 56.

Description of Instruments Used

The procedures by which ratings of work effectiveness were obtained for the County Agents and 4 H Club Agents and the means by which their job satisfaction ratings were determined from their responses to the Job Satisfaction Questionnaire[5] are presented in Chapter V. A description of the Job Satisfaction Questionnaire and of the Strong Vocational Interest Blank is included at this point since numerous references will be made to these instruments in the remainder of this study.

The Job Satisfaction Questionnaire: The Job Satisfaction Questionnaire used in this study is derived from the Hoppock Job Satisfaction Blank. The Hoppock Blank consists of four questions, each having seven alternative answers. The questions require that the subject evaluate himself in connection with how well he likes his job, how he compares with other people in his liking for his job, how he feels about changing his job, and how much of the time he feels satisfied with his job. The Blank

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[5] "Job Satisfaction Questionnaire" is the name assigned to the adaptation and extension of the Hoppock Job Satisfaction Blank used in this study.

is an outgrowth of a study of the responses of 500 teachers to

approximately 200 questions. It was found that four of these

questions satisfactorily distinguished the 100 most satisfied and

the 100 least satisfied teachers. The four item Blank was

then standardized on 309 employed workers of New Hope,

Pennsylvania, representing 88 percent of the employed popula-

tion of a fairly typical American manufacturing village.[6] The

Blank has since been used in many studies of worker satis-

faction among professional and sub-professional groups.[7]

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[6] Hoppock, op. cit.

[7] Arthur H. Brayfield, ''The Interrelationship of Measures of Ability, Aptitude, Interests, and Job Satisfaction Among Clerical Employees,'' (unpublished Ph. D. Thesis, University of Minnesota, Minneapolis, 1946),

Robert Hoppock, and Thomas J. Hand, ''Job Satisfaction Researches of 1942-43,'' Occupations, 23: 412–415, April, 1945.

_____, and C. L. Odom, ''Job Satisfaction Researches and Opinions of 1938-39,'' Occupations, 19: 24–28, October, 1940.

_____, and H. Alan Robinson, ''Job Satisfaction Researches of 1948,'' Occupations, 28: 153–161, December, 1949.

_____, H. Alan Robinson, and Philip J. Zlatchin, ''Job Satisfaction Researches of 1946-47,'' Occupations, 27: 167–175, December, 1948.

_____, and R. H. Shaffer, ''Job Satisfaction: Researches and Opinions of 1940-41,'' Occupations, 21: 457–463, February, 1943.

_____, and Samuel Spiegler, ''Job Satisfaction Researches of 1935-37,'' Occupations, 16: 636–643, April, 1938.

The score for the Blank is the sum of the separate

weights for each of the four questions. Each question is given

a weight equal to the number (one to seven) of the alternative

that is marked by the subject. This method of scoring was

arrived at after it was discovered that a more complicated and

ostensibly more accurate method of assigning weights gave

almost identical results, the correlation between the two methods

equalling plus .98. The split-half reliability of the four item

Blank is reported by Hoppock to be plus .93.

Solis L. Kates, "Rorschach Responses Related to Vocational Interests and Job Satisfaction." Psychological Monographs, General and Applied Number 309, Vol. 64, No. 3, 1950, 34 pp.

_____, "Rorschach Responses, Strong Blank Scales, and Job Satisfaction Among Policemen," Journal of Applied Psychology, 34: 249-254, August, 1950.

Helen Nahm, "An Evaluation of Selected Schools of Nursing," Applied Psychology Monographs, No. 17, Stanford, California: Stanford University Press, 1948, Chapter IV.

Kenneth G. Nelson, "The Interests of Teachers of Vocational Agriculture As Related to Vocational Satisfaction" (unpublished Ph.D. Thesis, University of Minnesota, Minneapolis, 1951, 329 pp.).

Harold Pepinsky, "Job Satisfaction Among Social Case Workers," (unpublished M. S. Thesis, University of Minnesota, Minneapolis, 1940, 107 pp.).

Medford Wesley, "A Quantitative Study of Job Satisfaction in a Sample of Former University of Minnesota Graduates," (unpublished M. S. Thesis, University of Minnesota, Minneapolis, 1931, 129 pp.).

The questionnaire devised for this study consists of seven questions regarding job satisfaction each of which is followed by a question regarding the intensity of feeling accompanying the response to the job satisfaction question.[8] Four of the seven job satisfaction questions are adapted directly from the Hoppock Blank. The three additional questions ask for self-evaluations in terms of, "How well satisfied are you with your occupation?" "How enthusiastic are you about your occupation?" and "How interested are you in your work?"

The selection of the job satisfaction questions and the accompanying intensity questions was based upon the results of a pilot study in which a questionnaire consisting of 17 items believed to be pertinent to the measurement of job satisfaction was administered to a group of 100 teachers of vocational agriculture who were attending a conference at Michigan State College in 1950.[9] By submitting their responses to these

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[8] A copy of this questionnaire is included in Appendix B.

[9] This pilot study was conducted by Mr. Kenneth G. Nelson, Assistant Professor, Institute of Counseling, Testing, and Guidance, Michigan State College.

questions to scale analysis,[10] it was found that seven of the seventeen questions were scalable and therefore were considered suitable for this study.

Three questions contain six possible answers, two contain five, and two contain four. All of the intensity questions contain three alternative answers. The least favorable answer to each job satisfaction question is weighted as zero and the more favorable answers range up to four, five or six in weights according to the number of alternative answers to the questions. The score for each job satisfaction question is, as in the Hoppock Blank, the weight assigned to the alternative answer which the Agent checks. The total job satisfaction score for an individual could theoretically range from zero to 29. The intensity questions are assigned weights ranging from zero to two, with zero indicating the least intensity and two the most intensity.

Data concerning the reliability and validity of this questionnaire will be presented in Chapter V following the

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[10] Scale analysis is discussed in Chapter V.

discussion of scale analysis, since reliability was determined

by consideration of scaled scores found in this analysis.

The questionnaire is included as Part II of a three part

Survey of Occupational Attitudes which was designed to secure

information needed for various phases of the General Research

Project by the administration of a single instrument. Parts I

and III ask the Agents to rate the importance of eleven dif-

ferent roles, such as consultant, promoter, organizer, etc.,

which they are called upon to play in their work and to rate

the degree to which they enjoy performing these roles. The

information obtained from Parts I and III is not used in this

particular study.

The Strong Vocational Interest Blank.[11] The SVIB first

appeared in 1927 and was revised in 1938. It has been called

"the outstanding device of its kind."[12] The 1938 revision of

the men's blank (Form M) consists of 400 items which include

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[11] The Strong Vocational Interest Blank will hereinafter
be referred to as the SVIB.

[12] Harold O. Carter, "Vocational Interests and Job Sat-
isfaction," Applied Psychology Monographs No. 2, Stanford,
California: Stanford University Press, 1944, p. 14.

names of occupations, school subjects, amusements, activities,

peculiarities of people, order of preference of activities, types

of famous persons preferred, choice between two paired activi-

ties, and self-ratings of present abilities and characteristics.

The items are marked according to one's likes, dislikes, in-

differences, choices, and preferences. The test was standard-

ized in terms of the interests of men known to be successful

in their own occupation.[13] The criterion groups averaged 40·

years of age, and the test is especially applicable to men in

the 20 to 55 year age range.[14] The instructions for filling

out the blank are such that it can be self-administered.

The raw scores may be expressed in terms of percen-

tiles of the distribution, or as standard scores, or in terms of

letter ratings A, B+, B, B-, C+, and C.. These scores repre-

sent the algebraic sum of plus and minus weights assigned to

each item response. The weights have been determined by

comparing the responses of men "engaged in making a living"

in a particular occupation, with the responses of a much larger

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[13] Strong, op. cit., p. 57.

[14] Loc. cit.

"men-in-general" group, which is "a fair representation of

business and professional men earning $2,500 and over a

year."[15] Thus a high score on a particular occupational

scale means "that the individual has the interests of persons

successfully engaged in that occupation."[16]

The 1938 revision (Form M) of the SVIB[17] lists thirty-

five occupational scales and three nonoccupational scales,

namely, Interest Maturity, Masculinity-Femininity, and Oc-

cupational Level for which scores may be derived. However,

Strong offers directions for developing new scales[18] and a num-

ber of additional scales have appeared since 1938. In this

study the SVIB's were scored for thirty-nine occupational and

three nonoccupational scales, which were in general use in

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[15] Ibid., p. 63.

[16] Edward K. Strong, Jr., Manual for Vocational Interest Blank for Men, Stanford, California: Stanford University Press, 1951, p. 10.

[17] A copy of this blank is included in Appendix B.

[18] Edward K. Strong, Jr., Vocational Interest of Men and Women. Stanford, California: Stanford University Press, 1943, Chapters 5, 23, 24, 25, 26, 27.

September, 1950, and two recently validated scales, namely, Teacher of Vocational Agriculture and Teaching Satisfaction.[19]

Occupational Groups: Reference will be made in this study to the occupational grouping of the SVIB scales. Realizing that expression of inventoried interests in terms of types of occupations rather than in terms of specific occupations would be advantageous in many uses that might be made of the SVIB, Strong arranged the occupational scales into eleven Occupational Groups. He derived these Groups by factor analysis of the intercorrelations of the scores on 285 SVIB's of college seniors. All of the scales used in this immediate study are listed below by the Occupational Groups which Strong thus evolved.[20]

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[19] Kenneth G. Nelson, "The Interests of Teachers of Vocational Agriculture as Related to Vocational Satisfaction," (unpublished Ph. D. Thesis, University of Minnesota, Minneapolis, 1951, 329 pp.).

[20] Strong, op. cit., Chapters 8, 9.

Occupational Groups	Occupational Scales	Occupational Groups	Occupational Scales
I	Artist	V	YMCA Physical Director
	Psychologist		Personnel Director
	Architect		Public Administrator
	Physician		YMCA Secretary
	Osteopath		Social Science High School Teacher
	Dentist		City School Superintendent
II	Mathematician		Minister
	Physicist		
	Engineer		
	Chemist		
III	Production Manager	VI	Musician
IV	Farmer	VII	Certified Public Accountant
	Aviator		
	Carpenter	VIII	Accountant
	Printer		Office Man
	Mathematics-Physical Science High School Teacher		Purchasing Agent
			Banker
			Mortician
	Teacher of Vocational Agriculture	IX	Sales Manager
			Real Estate Salesman
	Policeman		Life Insurance Salesman
	Forest Service Man	X	Advertising Man
			Lawyer
			Author-Journalist
		XI	President-Manufacturing Concern

Nonoccupational Scales

Interest Maturity
Occupational Level
Masculinity-Femininity
Teaching Satisfaction

Strong's basis for this classification was that there should be a maximum average correlation between members of a group and a minimum average correlation with all other groups. He felt that unless an occupation correlated on the average of plus .60 with the other members of a group, it should not be included. He also had in mind the standard that occupations having no obvious connection in everyday life should not be included in the same group. However, he found that strict observance of these criteria "forced too many occupations to be grouped alone to be feasible at present."[21] It will be noted that four of the eleven Groups above contain only one occupation. Thus, "for the sake of simplicity"[22] these rules were violated in the following cases: (a) Personnel Manager correlates only plus .57 with the other members of Group V, (b) Banker correlates only plus .55 with the other members of Group VIII, (c) Aviator correlates above plus .60 with both Groups II and III but was assigned to Group IV "because it correlates on the average of .70 with the members

[21] Ibid., p. 134.

[22] Ibid., p. 135.

of that group and because it also agrees with the members of

that group in having a low negative correlation with occupa-

tional level and a high positive correlation with MF,"[23]

(masculinity-femininity), (d) Teacher of Vocational Agriculture

does not meet Strong's standard of plus .60 but it correlates

highest with Group IV and meets the same criteria as Aviator

in reference to correlation with masculinity-femininity and

occupational level,[24] (e) The inclusion of Artist in Group I,

of Mathematics-Physical Science High School Teacher and

Teacher of Vocational Agriculture in Group IV, conceivably

violate the standard mentioned in reference to grouping of

occupations which have no obvious connection in every-day life.

Strong refers to the fact that this grouping differs from

his first published grouping in 1933 and he indicates that

further research will probably result in more damages, such

as the addition of a new salesman group between Groups VIII

and IX and in the re-grouping of Group IV.[25]

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[23] Loc. cit.

[24] Nelson, op. cit., pp. 70-73.

[25] Strong, op. cit., pp. 159-160.

In general, Group II is concerned with mathematics and the physical sciences; Group V with the handling of people for their presumed good, or with social welfare activities; Group VIII with office activities; Group IX with sales; and Group X with linguistic activities. However, Strong himself states that Groups I and IV are not easy to summarize and that "although names make it easy to refer to a group and seem to be demanded by most people, even psychologists, yet it seems preferable at this stage in the development of our understanding of vocational interests to content ourselves with referring to the groups by mere number."[26]

Nonoccupational scales. The Interest Maturity scale is designed to differentiate between the interests of 15 and 25 year old men—"the degree to which one has the interests of the latter in contrast to the former."[27] However, Strong reports that interest maturity is not closely associated with age, since the correlation between the two is only about plus

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[26] Ibid., p. 180.

[27] Ibid., p. 285.

.50, and that use of the scores with older men is questionable. He further states that interest maturity is associated with occupational interests, negatively with scientific and linguistic interests and positively with office worker-accountant interests and with interests in people (Groups V and IX).[28]

The Occupational Level scale measures differences in the interests of laboring men, on the one hand, and business and professional men on the other hand. Strong reports that in his criterion groups there was a very large deviation about the average of each occupational group on this scale, but that there was a definite progression in scores from the unskilled groups upward to the business and professional men groups and that there was a high correlation between this scale and occupational Groups VII (C. P. A.), IX (sales), X (advertising, etc.) and XI (president) and a low correlation with Groups IV (farmer, etc.) and Group VI (musician).[29]

The Masculinity-Femininity scale measures differences in the interests of the two sexes—whether one's interests are

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[28] Ibid., Chapter 12.

[29] Ibid., Chapter 10.

similar to the interests of men or women. Strong's data indicate that the following occupational Groups have more masculine interests: III (production manager), IV (farmer, etc.), II (engineer, etc.), VIII (accountant, etc.), and XI (president). The remaining Groups have more feminine interests, i.e., I (artist, etc.), V (YMCA secretary, etc.), VII (C. P. A.), IX (sales), VI (musician), and X (advertising, etc.).[30]

The Teaching Satisfaction scale was constructed by Nelson as a sub-scale of the Teacher of Vocational Agriculture occupational scale and he indicates that it should be used only when reasonably sure an individual has the interests of Teachers of Vocational Agriculture. He concludes that "such individuals who also achieve A or B scores on the Sub-scale are more likely to have high job satisfaction in teaching vocational agriculture than those with C scores."[31]

Reliability and validity of the SVIB. Super states in reference to the SVIB that "It is without question one of the

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[30] Ibid., Chapter 11.

[31] Nelson, op. cit., p. 168.

most thoroughly studied and understood psychological instruments in existence."[32] Kuder also says that "the test has probably been the subject of more investigation and research than any other single test."[33] Reviews of research such as those by Fryer,[34] Berdie,[35] Carter,[36] Strong,[37] and Super,[38] confirm this thoroughness of study, and only a few examples will be included here.

Using the "odds versus evens" technique, Strong reports that the average coefficient of reliability of 36 revised occupational interest scales for men was plus .877 as based upon the records of 285 Stanford University seniors. The coefficient fell below plus .80 in only one case—the certified

[32] Donald E. Super, Appraising Vocational Fitness, New York: Harper and Brothers, 1949, p. 409.

[33] G. Frederick Kuder, "A Review" Psychometrika, 9: 145-146, 1944.

[34] Douglas Fryer, The Measurement of Interests, New York: Henry Holt and Company, 1931, 488 pp.

[35] Ralph F. Berdie, "Factors Related to Vocational Interests," Psychological Bulletin, 41: 137-155, 1944.

[36] Carter, op. cit.

[37] Strong, op. cit.

[38] Super, op. cit.

public accountant interest scale—where it was plus .727. In

thirteen cases the coefficient equalled plus .90 or higher. As

evidence not only of the reliability of the test but also of the

stability of interests, Strong found that "the median correla-

tion for eleventh grade boys over two and a third years is

plus .81; for college freshmen over one year it is plus .88,

over nineteen years, plus .72; for college seniors over five

years it is plus .84, and over twenty-two years, plus .75.[39]

Super concludes in reviewing Strong's data that "It is evident

that the scales are reliable enough for confident use in indi-

vidual diagnosis at least after age 17."[40]

Strong states that there are two measures of the validity

of his test. "The first is how well the test differentiates

occupations; the second is how well individuals are assigned to

occupations in which they succeed at least passably and at the

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[39] Edward K. Strong, Jr., Manual for Vocational Interest Blank for Men, Stanford, California: Stanford University Press, 1951, p. 14.

[40] Super, op. cit., p. 421.

same time find the work interesting."[41] He devotes an entire

chapter to research that substantiates the validity of the SVIB

as an instrument that will differentiate the interests of men

successfully engaged in an occupation from the interests of

men successfully engaged in other occupations.   An example

of this differentiating ability is taken from more recent find-

ings reported in his Manual.   "Only 15 per cent of 933 non-

engineers rate A in engineering interest in contrast with the

69 per cent of the engineers who rate A.   But the non-engineers

who rate A are not evenly distributed among all occupations;

they are largely found among occupations involving applications

of the physical, and to a lesser degree the biological sciences."[42]

Strong tends to favor the second criterion above which

is really occupational stability and his follow-up studies offer

evidence that with this criterion the test is valid.   His

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[41] Edward K. Strong, Jr., _Vocational Interests of Men and Women_, Stanford, California: Stanford University Press, 1943, p. 107.

[42] _____, Manual for Vocational Interest Blank for Men_, Stanford, California: Stanford University Press, 1951, p. 14.

five,[43] ten,[44] and twenty year[45] follow-up studies were based

upon the records of 285[46] seniors who filled out the SVIB at

Stanford University in 1927 and 306 Stanford freshmen who

completed the test in 1930. As many as possible of these

men were retested and the occupational status of each rechecked

at approximately five, ten, and twenty year intervals thereafter.

The main results of his "ten year" follow-up study, which in-

cluded 371 of the original cases, are as follows:[47]

> (a) Men continuing in an occupation for nine or ten
>
> years average higher interest scores (Standard

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[43] Edward K. Strong, Jr., "Predictive Value of the Vocational Interest Test," Journal of Educational Psychology, 26: 331-349, 1935.

[44] _____, Vocational Interests of Men and Women, pp. 393-403.

[45] _____, "Interest Scores While In College of Occupations Engaged in 20 Years Later," Educational and Psychological Measurement, 11: 335-348, Autumn, 1951.

[46] Strong's discussion of the five and ten year studies cited in footnotes 41 and 42 refer to 287 seniors, while his article cited in footnote 43 regarding the twenty year study refers to 285 seniors.

[47] Strong, Vocational Interests of Men and Women, pp. 404-406.

score 50.2) in that occupation than in any other

(Standard score 47.7)

(b) Men continuing in an occupation obtain a higher

score in it than men entering another occupation

obtain in it. (Average scores not summarized in

a manner comparable to those in point [a] above)

(c) Men continuing in an occupation obtain higher

scores in it than men who change from that occu-

pation to some other. (Standard 48.0 versus 44.0)

(d) Men who changed from one occupation to another

did not make higher scores in the second occupation

when they were in college. In discussing this par-

ticular conclusion of Strong's, Super points out that

the average scores of these men were substantially

lower in both the first and the second occupation

than were the scores of the men in groups (a), (b)

and (c) above. (Standard scores 42.4 and 40.5).

He believes that this suggests that "those who

change occupations have less clearly defined interests,

or less insight into them, than do those who re-

main in the occupation of their first post-college

choice."[48]

The results of the "twenty year" follow-up study, in

which 345 cases were used, are similar to those just listed.

Strong's main conclusion is stated as follows:[49]

> "Occupational interest scores of 345 college stu-
> dents agree with the occupation engaged in twenty years
> later to the extent of 86 per cent of the possible maximum.
> For the 230 men who did not change their occupation the
> agreement amounts to 91 per cent of the maximum; for the
> 115 men who have changed their occupations the agreement
> amounts to 77 per cent of the maximum."

On the basis of the facts just presented, the SVIB appears

to be a reasonably reliable and valid instrument for measuring

the vocational interests of the men studied in this research.

Summary

In this chapter certain terms which are used frequently

in this study have been defined and the Job Satisfaction

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[48] Super, op. cit., pp. 438-439.

[49] Strong, "Interest Scores While In College of Occupa-
tions Engaged in 20 Years Later," op. cit., p. 335.

Questionnaire and the Strong Vocational Interest Blank have

been described.

CHAPTER III

RELATED RESEARCH

A review of research that is pertinent to the relation-
ships between the inventoried vocational interests and work
adjustment of Extension workers will be presented in this
chapter.   Since no studies directed specifically at the pre-
diction of the success of Extension workers as such were
found by this writer, studies of the relationship of interests
to work adjustment in other occupations will contribute back-
ground information and points of departure for this study.
Much of the research related to this study has been summar-
ized by others and need not be repeated here.   Some of these
summaries will be mentioned first, then reviews of specific
researches concerning the relationship of interests to each of
the work adjustment criteria used herein will follow.

Related Summaries of Research

Research relative to Extension work in general: Among
the many publications dealing with various phases of Extension

work, five are particularly useful for background information

relative to this study. A book by Brunner and Yang[1] provides

a general treatment of the Extension Service including atten-

tion to Extension work in other countries. True[2] offers a

detailed history of Extension work in the United States up to

1923. Baker[3] gives special attention to the work of the County

Agent and its relationship to local, state and federal sponsor-

ing agencies. A recent general treatment of Extension work

by Kelsey and Hearne[4] gives special consideration to the de-

tails of Extension work methods. Finally, Wilson's[5] study

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[1] Edmund deS. Brunner and E. Hsin Pao Yang, Rural America and the Extension Service, New York: Bureau of Publications, Teachers College, Columbia University, 1949, 210 pp.

[2] Alfred Charles True, A History of Agricultural Extension Work in the United States, Washington: United States Government Printing Office, 1928, 220 pp.

[3] Gladys Baker, The County Agent, Chicago: .The University of Chicago Press, 1939, 226 pp.

[4] Lincoln David Kelsey and Cannon Chiles Hearne, Cooperative Extension Work, Ithaca, New York: Comstock Publishing Company, 1949, 424 pp.

[5] M. C. Wilson, "Extension Methods and Their Relative Effectiveness," Washington: U. S. Department of Agriculture Technical Bulletin No. 106, 1929, 48 pp.

gives a picture of the effectiveness of various Extension

methods.. The Division of Field Studies and Training of the

United States Department of Agriculture publishes reviews of

Extension studies semiannually,[6] but the major studies are

reviewed in the sources just mentioned.

General research relative to the relationship of interest

to work adjustment: Research concerning the relationship of

interests to work adjustment is adequately reviewed up to 1949

in publications dealing with the nature and role of vocational

interests. Studies in this area have been rather extensive. .

Super states that "Interests have probably received more atten-

tion from vocational psychologists during the past generation

than any other single type of human characteristic, including

intelligence, aptitudes, and personality traits."[7]

Reviews of research are among the works alluded to by

Super. Fryer in 1931 published the first comprehensive review

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[6] For an example see: Lucinda Crile, Review of Extension Studies, Washington: U. S. Department of Agriculture, Extension Service Circular 470, July, 1950, 47 pp.

[7] Donald E. Super, Appraising Vocational Fitness, New York: Harper and Brothers, 1949, p. 376.

of research concerning interests.[8] His book is especially

helpful as a source of the history of interest measurement.

In 1943 Strong published the results of his nineteen years of

research with his Vocational Interest Blank.[9] This book

also includes most of the significant research that others

have conducted with the SVIB. In 1944 both Berdie[10] and

Carter[11] brought out reviews of interest research. Carter

concentrated on the research since 1931 and condensed the

summaries into 85 pages which provide an excellent brief

over-view of the findings. The most recent comprehensive

treatment of research in this area is Super's book which ap-

peared in 1949.[12]

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[8] Douglas Fryer, The Measurement of Interests, New York: Henry Holt and Company, 1931, 488 pp.

[9] Edward K. Strong, Jr., Vocational Interests of Men and Women, Stanford, California: Stanford University Press, 1943, 746 pp.

[10] Ralph F. Berdie, "Factors Related to Vocational Interests," Psychological Bulletin, 41: 137-157, 1944.

[11] Harold D. Carter, "Vocational Interests and Job Orientation," Applied Psychology Monographs, No. 2, Stanford, California: Stanford University Press. 1944, 85 pp.

[12] Super, op. cit.

Research Concerning the Relationship of Interests to Work Effectiveness

Strong points out that in the differentiation of superior and inferior members of an occupation by means of interests, two different techniques for developing interest scales may be used. In one, the scales would represent the differences in interests between (a) the average member of an occupation and (b) the average of men-in-general. In the other, scales would represent the differences in interests between (a) superior and (b) inferior individuals.[13] In studies where the SVIB has been used to investigate the relationships between interests and work effectiveness, either of these techniques has been used. Therefore, the first group of studies which follow are those in which the interests of certain occupational groups are related to the interests of men-in-general and the second group are those in which the interests of certain occupational groups are related to the interests of successful and unsuccessful workers in these same groups. In these studies the means of measuring work effectiveness are usually records of production or ratings by superiors.

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[13] Strong, op. cit., p. 485.

The relationship of the inventoried interests of certain

occupational groups to the interests of a group of men-in-

general. Strong is reluctant to use the technique of relating

the interests of a given occupational group to the interests of

successful and unsuccessful workers in that same group for

two reasons: (a) The difficulty of establishing an adequate

criterion of success, and (b) the difficulty of securing enough

cases.[14] Therefore, in his own studies he usually used the

technique of relating the interests of a certain occupational

group to the interests of men-in-general and justifies it as

follows:[15]

> "We should not, theoretically, expect significant correlations between occupational scores and measures of superiority-inferiority . . . because the occupational scale is based on a comparison of the average member of an occupation with the average member of the men-in-general group . . . On the other hand, high scores can quite properly mean men with sufficient interests of the right sort to like that particular occupation, and low scores can similarly mean men with insufficient interests to enjoy doing what the occupation requires . . . In so far as tendency to like the work and to continue employed therein engenders good production, satisfactory ratings of superiors, or good

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[14] Ibid., pp. 485-486.

[15] Loc. cit.

grades from instructors, to that extent high occupational interest scores should correlate with measures of superiority."

Using scales devised on the basis just described, Strong compared various groups of life insurance salesmen and their production ratings, i.e., the amount of insurance that they wrote annually. He analyzed the records of 211 salesmen including men employed in four different insurance companies and agencies and a group of former salesmen who were rated as "unsuccessful" on the basis of the amount of insurance written. His findings are summarized in Table 1.[16]

According to the then-current standards an agent would have to sell $150,000 of insurance annually to make a living. As the above table indicates, only 6 per cent of those who rated C on the life insurance salesman scale of the SVIB wrote that much insurance, whereas 37 per cent of those who rated B+ and 56 per cent of those who rated A were successful in terms of the amount of insurance sold. This study indicates, then that those who made high scores on the life insurance interest scale of the SVIB tended to sell more insurance.

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[16] Strong, op. cit., p. 492. Adapted from Table 124.

TABLE 1

PERCENTAGE OF AGENTS IN EACH LIFE INSURANCE
INTEREST RATING WHO PRODUCE $0 TO
$400,000 AND UP ANNUALLY

Annual Production	No.	Per Cent in Each Rating				
		C	B-	B	B+	A
$0 $ 49,000	38	52	33	27	22	9
$ 50,000 to $ 99,000	52	24	17	45	34	16
$100,000 to $149,000	31	18	17	14	7	19
$150,000 to $199,000	37	6	17	9	13	22
$200,000 to $399,000	47	0	17	0	20	31
$400,000 up	6	0	0	5	4	3
Total		100	101	100	100	100
Number	211	17	6	22	45	121

Strong refers to a study by Decker in which seventy life insurance salesmen filled out the SVIB, the A-S Reaction test, the Allport-Vernon Study of Values and the Otis Intelligence test. The only test to give statistically significant mean scores between those earning over $3,000 and those earning an income of under $2,000 was the SVIB. 68 per cent of those who rated

A on the life insurance salesman scale earned $3,000 and up, whereas only 8 per cent who rated C earned this amount.[17]

In a further study of the relationship between success on the job and measured interests, Strong used his old life insurance interest scale, which was based upon the records of 209 men who had written at least $100,000 of business in each of three years, and a new scale developed from the records of 123 men who had written at least $200,000 a year for three years. Twenty-six of the records were new; the remaining 97 belonged to the 209 group. He found that the $300,000-and-up agents with a median raw score of 406.0 were significantly superior to the $100,000-to-$200,000 agents with a median score of 257.1 (critical ration of 5.1) and were superior, but not statistically significant to the $200,000-to-$300,000 agents (critical ration of 2.3). He cautions though, that the differentiation of the $300,000-and-up group and the $100,000-to-$200,000 group is caused to some extent at least

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[17] C. E. Decker, "An Experiment in the Use of Psychological Tests in the Selection of Life Insurance Agents," (unpublished Master's thesis, Dartmouth College, 1931), Cited by Strong, op. cit., p. 496.

by the fact that the former constitute the larger proportion of the criterion group of this scale and that the latter are not members of the criterion group. This consideration does not apply to the differentiation between the $300,000-and-up men and the $200,000-to-$300,000 men. He observes that "these data suggest that it would be possible to develop a series of scales based upon differing amounts of production which would differentiate men in terms of amount of business written."[18]

Strong, in referring to three studies just summarized here, offers the following conclusions:[19]

(a) Successful life insurance agents score higher on the life insurance interest scale than men-in-general.

(b) Successful agents score higher than the unsuccessful agents.

(c) Men with low life insurance interest ratings do not earn a living.

(d) Men with low life insurance interest ratings do not stay in the business, in contrast to the men with high ratings.

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[18] Strong, op. cit., pp. 497-498.

[19] Ibid., p. 500.

A study by Bills also pertains to this problem. She combined scores of the Life Insurance Salesman and Real Estate Salesman scales of the SVIB in studying 588 newly appointed casualty insurance salesmen. In comparing these scores with ratings of success after one year on the job, she found that for all ages "there is about three and one-half times the chance of failure for the low group as for the high" (76 versus 22 per cent).[20]

Ghiselli also studied casualty insurance salesmen.[21] Using the cases of 29 men, he found a correlation of plus .38 between the Certified Public Accountant scale of the SVIB and performance, and plus .27 between the Occupational Level scale and performance. Performance was determined by a combination of sales production and ratings by sales managers on (a) efforts to obtain new accounts, (b) efforts to renew

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[20] Marion A. Bills, "Selection of Casualty and Life Insurance Agents," Journal of Applied Psychology, 25: 6-10, 1941.

[21] E. E. Ghiselli, "Use of the Strong Vocational Interest Blank and the Pressey Senior Classification Test in the Selection of Casualty Insurance Salesman," Journal of Applied Psychology, 26: 793-799, 1942.

expiring policies, (c) willingness to render service to policy holders, and (d) willingness to render service to the company. Contrary to Bills, he found that the sales or personal contact type of scales on the SVIB did not correlate highly with performance. However, because of the small number of cases and certain differences between the jobs in his study and in Bills's study, it is doubtful that this disproves Bills's findings.

Otis studied a group of seventeen salesmen who sold various kinds of detergents to the laundry trade on a wholesale basis over large territories and also acted as service men.[22] He used selling cost as the criterion of job effectiveness and found that there was a positive correlation of .50 between the total of the Life Insurance Salesman and Real Estate Salesman SVIB scales and selling cost. However, since the number of cases was so small, these results can be considered as only suggestive, though promising.

A number of studies have been made in which the interests of occupational groups other than the sales field are

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[22] J. L. Otis, "Procedures for the Selection of Salesman for a Detergent Company," Journal of Applied Psychology, 25: 30-40, 1941.

related to job effectiveness. Strong studied thirty-six members of an advertising agency.[23] These men were rated as to their "account executive" standing by three officials of the agency, using 2 to mean "yes," 1 to mean "not sure," and 0 to mean "no." The results were as follows:

Rated A by interest test . . rated on average 1.69
Rated B by interest test . . rated on average 1.26
Rated C by interest test . . rated on average 0.43

He states that only three of the 17 men rated A by the test were judged as low as 1.0 by the three judges, whereas all the men rated C by the test were judged 0.7 or 0.3. Strong does not indicate that the significance of these relationships was tested, but it is clear that the men with the higher ratings tended to have higher scores on the advertising scale of the SVIB.

In a study of engineers, Strong compared engineers rated as outstanding by Dean J. T. Hoover of the Stanford University Engineering School, with full and associate members of four engineering societies and found that in general, the

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[23] Strong, op. cit., p. 501.

outstanding engineers made higher scores on the engineering

scale of the SVIB than did the associate members of the

societies.[24]

Strong refers to the doctoral dissertations of Ullman

and of Phillips in which the relationship between interest

scores and ratings of teachers for successful performance were

studied.[25] In neither case did the ratings correlate with the

interest inventory scales. Nelson found that 75 "more suc-

cessful" vocational agriculture teachers did not score signif-

icantly higher than 25 "less successful" teachers on the teacher

of Vocational Agriculture scale.[26] A study by Miller and

Glick found inconclusive results in attempting to differentiate

115 superior and 38 inferior vocational agriculture teachers by

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[24] Loc. cit.

[25] R. R. Ullman, "The Prognostic Value of Certain Factors Related to Teaching Success," (unpublished Doctoral dissertation, University of Michigan, 1930) and W. S. Phillips, "An Analysis of Certain Characteristics of Active and Prospective Teachers," (unpublished Doctoral dissertation, George Peabody College for Teachers, 1935), cited by Strong, op. cit., p. 502.

[26] Kenneth G. Nelson, "The Interests of Teachers of Vocational Agriculture as Related to Vocational Satisfaction," (unpublished Ph.D. Thesis, University of Minnesota, Minneapolis, 1951) p. 65.

a specially constructed vocational agriculture teacher SVIB scale.[27] Brown also found inconclusive results in relating certain SVIB scales of 109 teachers of vocational agriculture to their rated success in teaching.[28]

In studying psychologists Strong found that thirty-one who were starred in the first five editions of Men of Science scored only 48.7 (standard score) on the Psychologist scale of the SVIB.[29] He explains that the slightly lower than average score of those supposedly superior psychologists is probably due to pure versus applied interests rather than to superiority versus inferiority. When ten of the known animal and applied psychologists were excluded, the mean score for the remaining twenty-one men was 53. These data tend to

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[27] Charles W. Miller and Wendell P. Glick, "The Development of a Scale for the Strong Vocational Interest Test to Measure Basic Interests in Teaching Agriculture," (unpublished M. S. Thesis, Virginia Polytechnic Institute, Blacksburg, Virginia, 1940, 419 pp.).

[28] J. Frank Brown, "The Relationship of Personality Traits and Vocational Interests to Success in Teaching Vocational Agriculture," (unpublished M. S. Thesis, Virginia Polytechnic Institute, Blacksburg, Virginia, 1940, 88 pp.).

[29] Strong, op. cit., p. 502.

indicate that Strong's criterion group possible included an un-fair number of "pure" psychologists in comparison with "ap-plied" psychologists, but for purposes of this study, it can only be said that the outstanding psychologists taken as a group do not seem to differ in interests from the less eminent psychologists.

Although he did not relate the measured interests of psychologists to success, Kriedt followed up Strong's findings and in a pilot study of 92 "prominent psychologists" found that only 56 per cent received scores of A or B+ instead of the 84 per cent that Strong indicated would be secured if the key were completely appropriate.[30] He then constructed a new psychologist scale using 1048 members of the American Psychological Association listed in its 1948 directory and com-pared their scores on the new scale with the old scale. All sub-groups of psychologists scored higher on this new scale, but the industrial, guidance, and administrative psychologists showed the greatest increase in scores with experimental,

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[30] Philip H. Kriedt, "Vocational Interests of Psycholo-gists," *Journal of Applied Psychology*, 33: 482–488, 1949.

teaching, and research psychologists showing the least increase. He concludes that his group seems to have more of the interests of an applied psychologist and Strong's group more of the interests of a laboratory scientist, which tends to bear out Strong's findings above.

Fifty-nine of the supervisory staff (foremen) of a large chemical plant were rated, according to Strong "with more than ordinary care."[31] (He does not mention the specific characteristic that were considered.) It was found that these ratings correlated with certain SVIB scales as follows:

Ratings vs. chemist	+.341
Ratings vs. engineer	+.307
Ratings vs. certified public accountant score	+.253
Ratings vs. teacher	+.139
Ratings vs. personnel manager	+.134
Ratings vs. accountant	+.034
Ratings vs. lawyer	+.009
Ratings vs. life insurance salesman . . .	-.308

Strong pointed out that although the correlations were low, they described fairly accurately the characteristics of a foreman or chemical engineer in a chemical plant. However, he

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[31] Strong, op. cit., p. 502.

was at a loss to explain the reason for the difference between the Certified Public Accountant and the Accountant scale scores.

Shultz and Barnabas studied thirty factory foremen who were ranked according to ratings on budget–control efficiency and employee relations.[32] The correlation between the Production Manager and Occupational Level SVIB scales and the combined ratings were respectively plus .38 and plus .22. They conclude that although these correlations are low, they are not without predictive value in industry.

Strong reports a study by Berman, Darley, and Patterson of 44 janitor–engineers who were "rated above average in their work."[33] These men made higher scores on the SVIB scales in Occupational Groups I, II, and IV (technical and scientific interests) than did a group of 23 who rated below average. The

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[32] Irvin T. Shultz and Bentley Barnabas, "Testing for Leadership in Industry," Transactions of the Kansas Academy of Science, 48: 160–164, 1945–46.

[33] I. R. Berman, J. G. Darley, and D. G. Paterson, "Vocational Interest Scales," Employment Stabilization Research Institute, (University of Minnesota Press) vol. 3, No. 5, pp. 17–18, 1934. Cited by Strong, op. cit., pp. 503–504.

authors conclude that it is evident that interests in the technical

pursuits characterize the better workers on this job.

The same authors, as reported by Strong, studied 123

policemen from Duluth, Minnesota, who were rated in three

groups by their captain according to efficiency on the job.

They found that the groups rated A and B were in every case

more interested than the group rated C in occupations involving

social contacts.

The relationship of inventoried interests of certain oc-

cupational groups to the interests of successful and unsuccessful

workers in those same groups: This group of studies relates

the interests of certain occupational groups to the interests of

successful and unsuccessful workers in these groups. Strong

reports that a study by M. J. Ream in 1924 with life insurance

salesmen was the first to attempt this.[34] Craig also made an

early study of this type with saleswomen.[35] However, both

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[34] Strong, op. cit., p. 506.

[35] D. R. Craig, ''The Preference-Interest Questionnaire
in Selecting Retail Saleswomen,'' Journal of Personnel Research,
5: 142-56, 1926.

studies failed to differentiate superior from inferior workers,

but since the number of cases in each was less than thirty,

the results are not surprising.

The negative results of these studies might have been

the reason why no other studies of this kind appeared from

1931 to 1942. In 1942, however, Ryan and Johnson reported

their study in which standard type interest scales were de-

veloped for (a) accounting machine salesmen and (b) service-

men for the same machines.[36] For the 143 sales and 283

servicemen studied, the authors found that these new scales

differentiated the two groups from men-in-general, but that

these scores had no relation to success. They then developed

new scales in which the interests of the 62 successful and 32

unsuccessful salesmen were contrasted. These scales did

show statistically significant differences in the mean standard

scores (plus 67.10 for the successful, minus 51.88 for the un-

successful, critical ratio 12.79) not only between the two primary

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[36] T. A. Ryan and B. R. Johnson, "Interest Scores in the Selection of Salesmen and Servicemen: Occupational vs. Ability-Group Keys," Journal of Applied Psychology, 26: 543-572, 1942.

groups, but also between two control groups. The differences

for the service men groups had a critical ratio of 4.8.

As was mentioned earlier (page 58), Strong is reluctant

to use the technique of relating the interests of an occupational

group to the interests of successful and unsuccessful workers

in that group. In studying aviators, though, he did construct a

success-failure scale by contrasting the interests of 510 suc-

cessful aviators and 173 "failures."[37] However, this scale

was not effective in differentiating successes and failures in

new groups. He attributes this in the main to his objections

stated on page 58 to the use of this technique, i.e., that the

criterion group was probably too small and that the criterion

of success was not well defined.

Super also studied aviators and found that those who

failed in flying training were not significantly lower on the

Aviator SVIB scale than were those who were successful in

training.[38] He then developed success-failure scales and in

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[37] Strong, op. cit., p. 508.

[38] Super, op. cit., p. 434.

using these on 650 aviation cadets found that the correlations between them and success in primary flying training were not significant.

Summary of interest versus work effectiveness research. From the studies reviewed thus far, there is evidence that by the use of occupational differences keys of the SVIB, high inventoried interests in certain occupations are positively related to success therein. This is rather clearly established in the more thorough studies of life insurance salesmen (Strong, Decker). Fewer studies have been made of other occupations, but there is some evidence that the same relationship exists with casualty insurance salesmen (Bills), engineers (Strong), technical foremen (Strong), janitor-foremen (Berman, Darley, and Patterson) and policemen (Berman, Darley, and Patterson). There is some indication that this holds true for detergent salesmen (Otis), although the numbers studied were too small to be conclusive. However, this relationship was not found in the case of teachers (Ullman, Phillips, Nelson, Miller and Glick, and Brown) and psychologists (Strong).

There is also some evidence that by the use of success-failure keys, in studying an adequate number of cases, there is

a positive relationship between high interest scores and success

in office machine sales work and in office machine service

work. (Ryan and Johnson). This relationship was not found

in the case of aviators (Strong, Super).

The Relationship of Inventoried Interests to Job Satisfaction

. The literature concerning vocational satisfaction has

been well summarized by Hoppock and various collaborators.[39]

The studies reviewed here are selected from those in which

inventoried interests are related to job satisfaction, where job

satisfaction is considered as a measure of work adjustment.

These studies use either stability in an occupation, or self-

expressions of satisfaction or dissatisfaction as criteria and

are grouped here accordingly.

Studies using occupational stability as the criterion:

Hoppock's 1949 review of research dealing with job satisfaction

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[39] In addition to summaries included in his book, Job
Satisfaction, Hoppock and various collaborators have presented
seven research summaries in the following issues of the Journal
Occupations: April, 1938; October, 1940; February, 1943; April,
1945; April, 1948; December, 1948; and December, 1949. (See
footnote 7, p. 32).

showed that in 144 cases where percentages were given for workers judged to be dissatisfied with their jobs, there was a median of 19 per cent dissatisfied.[40] This was the same percentage that he found in his 1935 review of research.[41] These data, plus the results of studies with professional people,[42] point to the possibility that there are some dissatisfied persons among most groups of successful workers, including professional workers.

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[40] Robert Hoppock and H. Alan Robinson, "Job Satisfaction Researches of 1948," Occupations, 19: 24-28, October, 1940.

[41] Robert Hoppock, Job Satisfaction, New York: Harper and Brothers, 1935, p. 215.

[42] Arthur H. Brayfield, "The Interrelationship of Measures of Ability, Aptitude, Interests, and Job Satisfaction Among Clerical Employees," (unpublished Ph. D. Thesis, University of Minnesota, Minneapolis, 1946).

Helen Nahm, "An Evaluation of Selected Schools of Nursing," Applied Psychology Monographs, No. 17, Stanford, California: Stanford University Press, 1948, Chapter IV.

Kenneth G. Nelson, "The Interests of Teachers of Vocational Agriculture as Related to Vocational Satisfaction" (unpublished Ph. D. Thesis, University of Minnesota, Minneapolis, 1951, 329 pp.).

Harold Pepinsky, "Job Satisfaction Among Social Case Workers," (unpublished M. S. Thesis, University of Minnesota, Minneapolis, 1940, 107 pp.).

Strong accepts the fact that there are probably some in his criterion groups who have low job satisfaction and justifies including them on two bases. "First, some borderline cases are quite successful in their work even though they do not have the thrill that better satisfied men experience. And second, there is no virtue in setting the degree of satisfaction for our criterion so high that all within the range are so satisfied that they do not ever shift to any other occupation. . . . if a man is progressing as he goes along in life and is reasonably satisfied, he is well adjusted vocationally."[43] With these limitations in mind, Strong uses continuance in an occupation as a criterion of job satisfaction and offers his follow-up studies (discussed in Chapter II, pages 48-51) as evidence that there is a significant relationship between inventoried interests and job satisfaction. It will be recalled that he found that men continuing in an occupation for nine or ten years average higher scores in that occupation than in any other.

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[43] Strong, op. cit., p. 386.

Certain phases of Wightwick's study used occupational stability as a criterion of job satisfaction.[44] She followed up 115 women eight years after testing and four years after college graduation. She found that 58 per cent were employed in occupations in which they had made A or B+ ratings and 77 per cent followed primary, secondary, or tertiary interest patterns[45] as indicated on the SVIB given eight years earlier. These findings lend support to Strong's findings from his follow-up studies.

Studies using self-expressions of job satisfaction as the criteria: The studies in this group employ various methods of

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[44] M. Irene Wightwick, Vocational Interest Patterns, Teachers College Contributions to Education No. 900, New York: Bureau of Publications, Teachers College, Columbia University, 1945.

[45] Darley defines these terms as follows: "The primary pattern is the interest type within which he shows a preponderance (plurality or majority) of A and B+ scores on the specific occupational keys; the secondary pattern is the interest type within which he shows a preponderance of B+ and B scores and the tertiary pattern within which he shows a preponderance of B and B- score on the specific occupational keys." John G. Darley, Clinical Aspects and Interpretation of the Strong Vocational Interest Blank, New York: The Psychological Corporation, 1941, p. 17.

self-expressions of satisfaction or dissatisfaction with one's

work as the criterion or job satisfaction. Strong objects to

the use of this kind of criterion on the bases that (a) "dissat-

isfaction may be caused by conditions peculiar to a particular

job and not to the work per se" (b) "from the social point of

view it might be argued that a man should not be too satis-

fied," and (c) "at the present time we do not have adequate

measures of satisfaction against which we can check."[46]

However, Super does not reject the merit of this technique,

for he states that "there is a need for further studies using

clinical and psychometric indices of vocational satisfaction."[47]

Sarbin and Anderson in a study of 76 men who came to

the University of Minnesota Testing Bureau for vocational

guidance, related the subjects' statements of vocational satis-

faction or dissatisfaction to their primary interest patterns as

measured by the SVIB.[48] They found that 82 per cent of the

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[46] Strong, op. cit., pp. 384-385.

[47] Super, op. cit., p. 440.

[48] T. R. Sarbin and H. C. Anderson, "A Preliminary
Study of the Relation of Measured Interest Patterns and Occupa-
tional Dissatisfaction," Educational and Psychological Measure-
ment, 2: 23-26, 1942.

men who expressed dissatisfaction showed interest patterns not congruent with their present or modal occupation. Since it might be expected that clients who sought vocational advisement would be more dissatisfied vocationally than a more normal group, and since the study was based upon interest pattern analysis rather than exact standing on each scale, the results can be considered as suggestive only.

A study by Berdie is concerned with students rather than workers, but is somewhat related here.[49] Expressions of satisfaction in a professional curriculum by means of a modification of the Hoppock Job Satisfaction Blank were obtained from 154 University of Minnesota engineering sophomores who had been tested as freshmen. In comparing their satisfaction ratings with their scores on the Engineer scale of the SVIB, he found the correlation, plus .10, was too low to be significant.

Brayfield related the Kuder Preference Record scores of 231 female clerical employees of a large company to their

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[49] Ralph F. Berdie, ''Prediction of College Achievement and Satisfaction,'' Journal of Applied Psychology, 28: 239-245, 1944.

job satisfaction as expressed in a job satisfaction scale de-

veloped especially for his study.[50] He found that stenographers,

general clerical workers, and typists who were most satisfied

made significantly higher scores on certain Kuder scales than

did the least satisfied workers.

Hahn and Williams[51] studied 791 Marine Corps Women

Reservist clerical workers whose job satisfaction had been

determined in a previous study.[52] They related extreme high

and low job satisfaction groups to their scores on certain

scales of the Kuder Preference Record and found that these

scales "differentiate satisfied from dissatisfied workers" in the

cases of stenographers, clerk typists, and clerks general.

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[50] Arthur H. Brayfield, "The Intercorrelation of Measures of Ability, Aptitude, Interests, and Job Satisfaction Among Clerical Employees," (unpublished Ph. D. Thesis, University of Minnesota, Minneapolis, 1946).

[51] M. E. Hahn and C. T. Williams, "The Measured Interests of Marine Corps Women Reservists," Journal of Applied Psychology, 29: 198-211, 1945.

[52] The details of this study are not included in their article, but in reference to this point Brayfield, op. cit., p. 11, states that ". . . a personal communication from one of the authors indicates that it was an adaptation of the Hoppock Job Satisfaction Blank to the Military situation."

In a study of 146 counselors in a vocational rehabilitation agency, Di Michael asked them to rate their liking for the job as a whole and for particular phases of the job (e.g. interviewing) on a graphic rating scale.[53] He related these ratings to their scores on certain scales of the Kuder Preference Record and found low positive correlations (plus .21 to plus .43).

Kates in a study of 100 routine clerical workers related their job satisfaction, as measured by the Hoppock Job Satisfaction Blank, to their scores on the Office Worker Scale of the SVIB.[54] He found a correlation of plus .21 which was not significant at the one per cent level of confidence but was significant at the five per .cent level. Since this correlation was significant, but low, he dichotomized the group into those with high letters scores (A and B+) on the SVIB and those with

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[53] Salvatore G. DiMichael, "Work Satisfaction and Work Efficiency of Vocational Counselors as Related to Measured Interests," Journal of Applied Psychology, 33: 319-329, 1949.

[54] Solie L. Kates, "Rorschach Responses Related to Vocational Interests and Job Satisfaction," Psychological Monographs, General and Applied Number 309, Vol. 64, No. 3, 1950, 34 pp.

low scores (B, B-, C) and related these groups to three job

satisfaction sub-groups, dissatisfied, indifferent, and satisfied.

This relationship was not significant (chi square 2.89) at the

five per cent level, which led Kates to the conclusion that

there was no evidence that the vocational interest scores were

related to job satisfaction ratings when those measures were

divided into meaningful categories. In interpreting his results,

Kates pointed out that the mean score of his sample on the

office worker scale was 44.7 (standard deviation 9.7) as com-

pared with the mean score of 50 (standard deviation 10) for

Strong's sample of clerical workers. This difference is sig-

nificant at the one percent level. Also, Strong's group was

more heterogeneous, about one-third of whom could be termed

administrative workers. Kates believes that satisfaction with

routine clerical work might not be associated with the interests

of successful office workers, and that the utility of the Strong

Blank may be defined more precisely as indicative of an

individual's continuance in an occupation.

Kates found similar results in relating the SVIB Police-

man scale scores of 25 New York City policemen to their job

satisfaction as expressed in the Hoppock Job Satisfaction

Blank.[55] The correlation of plus .35 was low, positive, but not significant. However, he found a significant relationship of minus .51 between the job satisfaction scores and the Occupational Level scale of the SVIB. This indicates the possibility that the non-occupational scales of the SVIB may be related to job satisfaction.

Schwebel constructed an SVIB scale for pharmacists and a second scale to measure satisfied versus dissatisfied pharmacists.[56] This second scale contrasted the SVIB responses of 333 pharmacists who were labeled as "satisfied" by means of their scores on an adaptation of the Hoppock Job Satisfaction and 117 pharmacists who were considered "dissatisfied" by this Blank. In cross-validating these scales with another group of 105 pharmacists, a low but significant positive correlation was found with coefficients of plus .30 and plus .27 for the pharmacist and pharmacist satisfaction scales

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[55] Solis L. Kates, "Rorschach Responses, Strong Blank Scales, and Job Satisfaction Among Policemen," Journal of Applied Psychology, 34: 249-254, 1950.

[56] Milton Schwebel, "The Interests of Pharmacists," (unpublished Ph. D. Thesis, Columbia University, New York City, 1949, 118 pp.).

respectively. The pharmacist satisfaction scale was found to be superior to the pharmacist's scale in differentiating ''satisfied'' pharmacists from ''dissatisfied'' ones since 87 per cent of the satisfied portion of the cross-validation group obtained A or B+ scores on the pharmacist satisfaction scale while the dissatisfied group obtained 59 per cent.

Nelson's study with Teachers of Vocational Agriculture included some features similar to Schwebel's study.[57] He constructed an SVIB scale for Teacher of Vocational Agriculture and determined job satisfaction by an adaptation of the Hoppock Job Satisfaction Blank. The correlation between this new scale and the Hoppock Job Satisfaction Blank was found to be not significant for his Minnesota cross validation group (N 75) or for his Iowa (N 77) and Illinois (N 125) samples. The correlations clustered about zero with coefficients of plus .08, plus .03, and minus .04 respectively for the Minnesota, Iowa, and Illinois samples. He offers the following factors as possible explanations for this lack of relationship:

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[57] Nelson, op. cit.

(a) The narrow range of satisfaction found in the

samples of experienced teachers attenuates cor-

relations obtained.

(b) The use of the reference point of men-in-general

in the construction of the Teacher of Vocational

scale tends to obscure the differences in interests

between low and high satisfaction groups of teachers.

(c) The inclusion of individuals having low job satisfac-

    ' tion in the criterion group of the Teacher of Vocational

Agriculture scale probably helps to reduce its dis-

criminating ability in terms of satisfaction.

He found, however, that a comparison of other SVIB

scales and item responses for the variable satisfaction groups

revealed that the Group V or social welfare scales and the

Interest Maturity scales were significantly higher for the more

satisfied teachers, as well as a substantial number of differ-

ences found for individual item categories. The item analysis

led him to maintain that the content of items differentiating the

variable satisfaction groups is related to the function of teach-

ing rather than to what is taught.

Since these findings indicated that an interest-satisfaction relationship existed, Nelson constructed a Teaching Satisfaction sub-scale which used the item responses of the variable satisfaction groups as its base point rather than the traditional men-in-general point of reference. This teaching satisfaction sub-scale was found to have a positive correlation of .491 with job satisfaction in applying it to a cross-validation sample of 77 Iowa teachers.

Summary of interest versus job satisfaction research: This review of job satisfaction studies indicates that when continuance in an occupation is used as the criterion, there is a positive relationship between inventoried interests and job satisfaction (Strong, Wightwick). When self-expressions of job satisfaction are the criteria, the results are less clear.

The sample used by Sarbin and Anderson probably influences the results unduly. The contradictory findings of Kates and the Hahn-Williams and Brayfield studies regarding clerical workers may be due in part to the differences in type of interest inventory used, (SVIB versus Kuder) and appropriateness of the sample studied (e.g. Kates sample). The low relationship found by DiMichael might be attributed to the type

of satisfaction rating device used. However, when studies are considered which relate interests to variable self-rated satisfaction groups within a certain occupation (Schwebel, Nelson), there is evidence that interests may be an indication of job satisfaction.

Significance of research findings: The significance of the results of this review of research, in terms of background data and points of departure for this study, may be stated as follows: The problem facing the Michigan Extension Service is to discover or create techniques for selecting County Extension workers who will be more successful and happier in their work. The results of some of these studies indicate that in some occupations it has been possible to differentiate more successful from less successful and more satisfied from less satisfied workers on the basis of their inventoried vocational interests. Since this was found in other occupations, it is possible that County Agents and 4 H Club Agents could be so differentiated and these studies provide suggestions as to instruments and techniques that might be used in the process.

CHAPTER IV

THE SAMPLE, PROCEDURES, AND TECHNIQUES

The purpose of this chapter is to describe the population sample from which the data used in this study were obtained, the procedures followed in collecting and preparing the data for analysis, and the techniques employed in analyzing them. The presentation of the methods used in establishing the variable work adjustment groups of Agents among whom comparisons of their SVIB scores were made is reserved for Chapter V.

The Sample

In Chapter I it was pointed out that the reason for the General Research Project lies primarily in problems concerned with the selection of County Agents and 4 H Club Agents. The population to be studied was consequently determined by the definition of the problem. The chief consideration remaining was the size of the sample to be studied.

The sample in relation to the General Research Project:
It was also indicated in Chapter I that an adequate solution to
the problem of the General Research Project would entail the
study of many more Agents than were available in Michigan.
Plans have already been made to enlist the cooperation of Ex-
tension Services in other states in this endeavor. However,
due primarily to the fact that financial resources do not as yet
permit the establishment of a coordinated inter-state project,
the plan is such that each participating state in the initial
phase may proceed independently in the collection of data and
that cross validation of findings will be made at some future
time. In view of these considerations, the size of the sample
studied herein is limited to that of the present group of County
Agents and 4 H Club Agents in Michigan.

Number included in the sample: It was the intention of
the Planning Committee to study the total group of County
Agents and 4 H Club Agents who were employed in the Michi-
gan Extension Service in September, 1950. At that time the
number included 89 County Agents (including Associate and

Assistant Agents) and 53 4 H Club Agents.[1] However, between

then and May 1, 1951, when the last of the data necessary for

this particular study were received, eight County Agents and

five 4 H Club Agents had to be eliminated from further con-

sideration because of retirement, resignations, or transfers to

other positions within the Service. Therefore, the sample upon

which this study is based consists of 81 County Agents and 48

4 H Club Agents who were employed in the organization in

September, 1950, and were still employed in May, 1951. In

other words, the study is based upon the universe of Michigan

County Agents and 4 H Club Agents, with the exception of

those who were terminated or transferred during this period.

Limitations and favorable features of the sample: It

should be recognized that although the Agents studied herein

represent approximately 91 per cent of the Agents who were

employed in September, 1950, the sample is a selected sample

in that it does not include Agents who left the Service at any

time prior to May 1, 1951, or individuals who desired to

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[1] From the personnel files of the Michigan Extension

Service.

become County Agents or 4 H Club Agents but were not accepted into the organization. If such data as is used in this study had been available for these people over a period of years and if it could be assumed that such groups would include many individuals who might not have been well qualified for Extension work, it is possible that the inclusion of them in this study would have provided greater contrasts in the SVIB scores between variable work adjustment groups of Agents. The sample, then, represents a group which is already rather highly selective and consequently the range in terms of work adjustment is somewhat restricted.

On the other hand, there were various reasons why these two groups of Agents were considered well adapted for purposes of this research. (a) Since a member of the Planning Committee (the Extension Training Specialist) was on the administrative staff of the Extension Service, research data could be obtained from these Agents through their regular business meetings and other established channels of communication, thereby avoiding resistance that might have occurred if it were necessary to approach them through some "outside" source. (b) Extension Administrators believed that these Agents would be reasonably

willing to cooperate in this research project. (c) By studying

the total group and interpreting the results in terms of Michi-

gan Agents alone, there would be no problem as to the ap-

propriateness of the sample. (d) Although the number of cases

would not be large enough for certain desirable statistical

manipulations, for example, item analysis of the SVIB, the

numbers were considered adequate for the preliminary phases

of the General Research Project. (e) It was possible to

secure a rating of work effectiveness for each of these Agents.

The Agents' job situation: An analysis of the job of the

County Agent and the 4 H Club Agent is being made in connec-

tion with the General Research Project, so a detailed picture

of the activities which these Michigan Agents perform cannot

be presented until that study is completed. However, to the

extent that the work which a man performs aids in describing·

the man, a brief statement of the Agents' general functions

will serve to further describe the sample.

The County Agents and 4 H Club Agents are employed

by Michigan State College. They are members of the faculty

in the Agricultural Extension Department of the School of

Agriculture and enjoy the same rights and privileges that

pertain to the resident faculty members. Their salaries are paid jointly by Michigan State College and the United States Department of Agriculture. The funds for operating their county programs are furnished jointly by Michigan State College and the counties in which they work.[2] The exterior forces which direct their activities consequently come from federal, state, and county levels. In this work situation it is apparent that one of the criteria of work adjustment is the degree to which an Agent harmonizes these forces in the performance of his work.

Duties of the Agents: It was pointed out in Chapter I that the Cooperative Extension Service is essentially an educational organization, but that the work situation of the County Agents and 4 H Club Agents is such that their duties are somewhat different from those of a regular classroom teacher. The following description of the duties of a County Agent is adapted from a statement prepared by the Michigan Extension Service. The statement indicates that although the 4 H Club Agent is

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[2] From an unpublished statement in the personnel files of the Michigan Extension Service.

primarily responsible for the youth programs, these duties are

expected of all County Extension workers.[3]

1. The County Agent represents Michigan State College and the United States Department of Agriculture in the County.

2. He studies the resources, people and agriculture of the county to determine its problems that can be solved through education and cooperative effort.

3. He plans and works with local people on their problems, bringing science and knowledge to bear on a solution.

4. He develops an effective supporting organization of local voluntary leaders to help carry out the Extension program with the people of the county.

5. He develops rural leadership by providing opportunities for others to lead and by giving them training as leaders.

6. He maintains a public office where rural people and others can get information and advice. From the Extension office a constant flow of information is disseminated to all people of the county through newspaper articles, radio broadcasts, circular letters, personal contacts, etc. Efficient office management together with care in handling public funds is an important part of the job.

7. He arranges for meetings, demonstrations, exhibits, tours, etc., with the help of college specialists.

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[3] John T. Stone, Michigan Cooperative Extension Service: Organization, Development, Policies, East Lansing: Michigan State College Cooperative Extension Service, [1950].

8. He plans and conducts leader training meetings for the many local volunteer leaders.

9. The county worker must constantly evaluate his work. He prepares a monthly and annual report of his activities.

10. His job is that of a teacher above all else. Other workers in the Cooperative Extension Service, Specialists and administrators alike, serve primarily to help the County Agents carry out an effective Extension program with local people.

The Agents' worker roles. The description of the sample may be further clarified by reference to some of the worker roles which these varied duties demand of the Agents. In the job analysis study being conducted at present various monthly and annual reports of the Agents activities have been analyzed for the purpose of ferreting out the most common of these roles other than the general role of teacher. Although it is not possible to define such roles exclusively, this analysis has resulted in the following tentative list:[4]

1. Acting as a consultant, giving people information and advice as requested.

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[4] From unpublished preliminary data collected for a job analysis study, on file in the office of the Michigan Extension Service.

2. Acting as a <u>promoter</u>, stimulating people to action in face to face contact.

3. Acting as a <u>demonstrator</u> <u>or</u> <u>public</u> <u>speaker</u>, giving information, talks, lessons, etc., before groups.

4. Acting as a <u>newspaper</u> <u>reporter</u> or columnist.

5. Acting as a <u>radio</u> <u>broadcaster</u>.

6. Acting as an <u>organizer</u> or arranger of activities or events.

7. Acting as a <u>facilitator</u>, or expediter, making it easy or possible for people to follow extension recommendations or programs.

8. Acting as an administrator, organizing and seeing that things are done, writing reports, etc.

9. Performing <u>office</u> <u>details</u>, keeping records, writing reports, filing, etc.

10. Acting as <u>student</u>, keeping up to date on new developments, etc.

11. Acting as <u>public</u> <u>relations</u> <u>man</u>, maintaining good public relations, keeping up contacts, building useful friendships and good will, etc.

Theoretically, all Agents perform all of the activities and play all of the roles just listed, but probably in varying degrees depending upon differences in job demands and differences in personal characteristics. Again, to the extent that a man's work describes the man, the heterogeneous nature of this job offers some basis for suspecting that the Agents are a rather heterogeneous

group in so far as various personal factors, including voca-
tional interests, are concerned. This consideration entered
into the selection of the statistical techniques for the analysis
of their interests, as will be discussed later.

Ages and years of experience: The ages of the Agents
and the length of their experience in the Michigan Extension
Service are given in Table 2. The age figures represent the
Agents' actual age as of May 1, 1951. These data were ob-
tained from the personnel files of the Michigan Extension
Service. The data regarding number of years of experience
in the Michigan Extension Service were obtained from the office
of the Secretary of Michigan State College and represent the
length of time between the individual's first appointment to the
Agricultural Extension Department of Michigan State College,
and May 1, 1951. In a number of cases Agents have been
transferred from one county job to another, so these figures
do not necessarily reflect the number of years that an Agent
has been in his present job situation.

Perhaps the most obvious item in Table 2 is the differ-
ence in the mean age and mean number of years' experience

TABLE 2

MEAN AGES AND NUMBER OF YEARS OF EXPERIENCE IN
THE MICHIGAN EXTENSION SERVICE FOR COUNTY
AGENTS AND 4 H CLUB AGENTS AS OF
MAY 1, 1951

	County Agents (N81)			4 H Club Agents (N48)		
	Range	Mean	S. D.	Range	Mean	S. D.
Age	24–63	42.73	9.35	23–60	33.17	7.87
Years in Service	1–35	12.90	8.26	9 mo.–21	4.19	4.01

between the County Agents and the 4 H Club Agents. This
difference of about ten years in age and eight years in exper-
ience is a reflection of the fact that in Michigan, 4 H Club
Agent work is considered to be valuable experience for County
Agent work and consequently County Agents are usually
selected from among the 4 H Club Agents. Also, the base
salary of County Agents is somewhat higher than that of 4 H
Club Agents and it is possible that many 4 H Club Agents are
attracted by the increased authority vested in County Agents

and the opportunity of working primarily with adults as they themselves grow older.

Some 4 H Club Agents, however, prefer to remain in that work, which accounts for the age range extending to 60 years and the years in Service range extending to 21 years. The standard deviations for these two distributions bear out the fact, though, that not a great number remains in 4 H Club work for an extensive period of time.

Although the jobs of the two groups of Agents have many elements in common, these differences in age and experience were considered as evidence that the interests of the two groups should be analyzed separately. Differences in the interests of the two groups will be discussed in Chapter VI.

It will be noted in Table 2 that for the 4 H Club Agents the lowest number of years' experience in the Michigan Extension Service is nine months. The Planning Committee felt that an Agent should have had at least one year's experience before his effectiveness on the job could be rated fairly. In May, 1951, when the rating of the Agents was accomplished (the rating procedure will be described in the next chapter) eight 4 H Club Agents had been in the work for only nine months.

Due to the desirability of retaining as many cases as possible in the study and due to the fact that arrangements were made to re-rate these eight 4 H Club Agents after they had completed twelve months in the work and before any statistical analyses were made, they were included in the study.

The academic backgrounds of these agents were not analyzed in this particular study since this factor is being investigated at the present time as a separate phase of the General Research Project. However, preliminary data from that study indicates that this factor is fairly uniform among the Agents. Of the 81 County Agents, five per cent are high school graduates but have not attended college, one per cent have some college training, and ninety-four per cent hold B. A. or B. S. degrees. Of the 48 4 H Club Agents, six per cent have some college training and ninety-four per cent hold B. A. or B. S. degrees. In addition, twenty-six per cent of the County Agents and nineteen per cent of the 4 H Club Agents have completed some graduate work.[5]

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[5] From unpublished preliminary results of a study being conducted by Mr. A. Conrad Posz, Instructor, Written and Spoken English Department, Michigan State College, and a member of the Planning Committee for the General Research Project.

Collection of Data and Their Preparation for Analysis

Administration of the SVIB.   The SVIB was the first
instrument administered as part of the General Research Proj-
ect.   At this time attempts were made to orient the Agents to
the Project and to some of its specific features, including the
Job Satisfaction Questionnaire, which was administered later.

Since accomplishment of the General Research Project
will require a number of research instruments from the same
population, it was mandatory that each phase be conducted in
such a manner that the cooperation of the Agents in each suc-
ceeding step would not be jeopardized.   Some members of the
Planning Committee, described in Chapter I, were former
County Agents in Michigan and in anticipating the possible re-
actions of the present agents to requests to participate in this
Project, felt that persons within the Extension Service would be
most likely to achieve the maximum cooperation in these en-
deavors.   The other members of the Committee concurred in
this feeling and Mr. John T. Stone, Extension Training Special-
ist, agreed to administer the SVIB.

After being briefed by the Planning Committee on proper
techniques, Mr. Stone administered the 1938 revision, Form M,

of the SVIB to the County Agents and 4 H Club Agents in their
regular District Meetings in August and September, 1950. The
usual instructions for administering the test[6] were followed
except that the responses were entered on the Hankes Answer
Sheet for Men[7] rather than in the test booklet itself. A few
Agents who did not attend these meetings were asked by mail
to fill in the SVIB and return it to Mr. Stone.[8] In this man-
ner, SVIB's were received from 100 per cent of the sample.

In addition to using a member of their own organization
in administering the SVIB, six other steps were taken to at-
tempt to develop a receptive attitude on the part of the Agents
toward taking the test and toward filling it out honestly.
(a) The request to fill out the SVIB was stated in terms of
needing their assistance in the accomplishment of a research
project that was designed to improve the Michigan Extension

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[6] Edward K. Strong, Jr., Manual for Vocational Interest
Blank for Men, Stanford, California: Stanford University Press,
1951, 16 pp.

[7] A copy of this form is included in Appendix B.

[8] See footnote 11 page 105 for further information re-
garding the Agents who did not attend these meetings.

Service. (b) The General Research Project and the place of the vocational interest study within it was explained to them. The County Extension Agents have for many years been assigned comparative work effectiveness ratings for purposes of salary adjustment and some might therefore have envisaged the comparison of the test responses of different success groups.[9] However, the approach to their cooperation was essentially, "We need to know more about the vocational interests of County Extension workers," and the element of differential success ratings was not introduced because of the possible negative reactions that it might have aroused in those who had low success ratings at the time. (c) They were promised that each person would receive a copy of his SVIB answer sheet.[10] (d) They were assured that their anonymity would be preserved in the analysis of their test papers by using only identification numbers. However, they were asked to sign their papers so that

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[9] This rating is discussed in Chapter V.

[10] In due time a copy of the Hankes Report Form For Strong Vocational Interest Test – Men (see Appendix B for sample) was mailed to each Agent with a cover letter giving brief instructions for interpreting the scores. A copy of this letter is included in Appendix B.

each Agent could receive his own scored answer sheet.

(e) They were assured that their responses to the test would
have no bearing whatsoever upon their present or future status
within the organization.[11]   (f) A number of Specialists and ad-
ministrative officers were present at the meetings and took
the test along with the County workers, thereby possibly tending
to enhance the importance of the cooperation of all members of
the Extension Service in the study, and possibly tending to
minimize the ''guinea-pig'' effect that would be more likely
if only certain members of the group had been asked to take
the test.[12]

In spite of the fact that the precautionary steps outlined
above were designed to elicit the voluntary participation of each
man, it is possible that the influence of the group situation re-
sulted in some feelings of coercion.   However, since Mr. Stone
reported that he could detect no lack of cooperation in the testing

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[11] The Agents who did not attend the district meetings
were given the information in points (a), (b), (c), (d), and (e)
in a cover letter which accompanied the SVIB.. A copy of this
letter is included in Appendix B.

[12] A separate study of the interests of the Specialists
who took the SVIB at these meetings is included in Appendix A.

period, that several men later evidenced interest in the test

by asking many questions about it, and since no blanks were

filled out incorrectly, it is concluded that the Agents' test-

taking attitude was reasonably satisfactory. On the basis of

this conclusion it may then be assumed that the Agents' re-

sponses to the test items were reasonably sincere.

Scoring of the SVIB. The E. J. Hankes scoring ser-

vice (Engineers Northwest, Minneapolis, Minnesota) is among

such services recommended by Strong[13] and is described in

an article by Strong and Hankes.[14] This service was utilized

for the scoring of the SVIB's on the thirty-nine occupational

scales and the three non-occupational scales, Interest Maturity,

Occupational Level, and Masculinity-Femininity, which it was

equipped to score in September, 1950. The recently validated

scales for Teacher of Vocational Agriculture and Teaching

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[13] Strong, op. cit., p. 16.

[14] _____ and E. J. Hankes, "A Note on the Hankes Test Scoring Machine," Journal of Applied Psychology, 31: 212-214, 1947.

Satisfaction[15] were scored by hand using the appropriate punched

stencils and following the directions for hand scoring as given

in Strong's manual for the SVIB. The scoring for each Agent

on each of these two scales was checked a second time for

accuracy.

Administration of the Job Satisfaction Questionnaire.

For the same reasons mentioned on page 102 in reference to

the administration of the SVIB, Mr. John T. Stone adminis-

tered the Job Satisfaction Questionnaire. The Questionnaires

were obtained from the Agents by mail in May and June, 1951.

A cover letter was prepared by Mr. Stone with the aid of the

Planning Committee. The letter pointed out that the Question-

naire was another step in the General Research Project which

had been outlined to them in their District meetings in the

previous August and September. It included instructions for

answering the Questionnaire, and asked that they sign it, but

assured them that their names would be torn off as soon as

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[15] Kenneth G. Nelson, "The Interests of Teachers of
Vocational Agriculture as Related to Vocational Satisfaction,"
(unpublished Ph.D. Thesis, University of Minnesota, Minneapo-
lis, 1951, p. 329).

the forms were received and only identification numbers would be used by the research workers.[16] By use of follow-up letters, completed Questionnaires were received from the total group of County Agents and 4 H Club Agents used in the study.

Scoring of the Job Satisfaction Questionnaire. The Job Satisfaction Questionnaires were scored manually by totaling the weights assigned to the responses for each category of the seven job satisfaction questions and the accompanying intensity questions. In addition to the raw scores derived in this manner, it was considered desirable to determine whether or not the qualitative items represented in these scores were unidimensional, or could be expressed in a continuum, and whether or not a point could be fixed on the continuum which would separate those with positive attitudes toward their work from those with negative attitudes towards their work. This phase of the scoring of this instrument is described in detail in Chapter V.

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[16] A copy of the letter is included in Appendix B.

Recording of data. A personal data card was devised on which the raw data for each Agent was recorded.[17] These data included the Agent's identification number, age, number of years' experience, work effectiveness rating, county classification rating, job satisfaction scores, and SVIB scores. All of these items except the SVIB scores were recorded just as they appeared in their original sources.

To facilitate the processing of the data by International Business Machines equipment, the standard scores for the thirty-nine regular SVIB occupational scales were converted to one digit scores as follows:

Standard Scores	One Digit Scores
−05 through +04	0
+05 through +14	1
+15 through +24	2
+25 through +34	3
+35 through +44	4
+45 through +54	5
+55 through +64	6
+65 through +74	7

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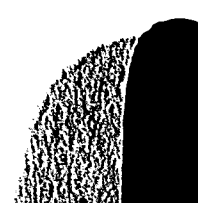
[17] A copy of the personal data card is included in Appendix B.

To aid in transferring these converted scores from the Hankes
Report Form to the personal data cards, a plastic mask was
devised with vertical lines indicating the exact position of the
scores of each scale on the Report Form. The scores for the
nonoccupational scales and for the two newly validated scales
were entered as regular two digit standard scores. All entries
for each Agent were checked a second time for accuracy.

The data from the personal data cards were punched
into International Business Machine Cards. The number repre-
senting each item punched was printed in the top of the cards
by an electrically operated tabulating machine and each of these
numbers was checked for accuracy against the entries on the
personal data cards.

Tabulation of the data. The IBM cards were processed
by electrical sorting and tabulating machines. The cards of the
County Agents and 4 H Club Agents were first sorted separately
according to four work effectiveness rating groups. The scores
for all SVIB scales, the date of birth and the date of appoint-
ment were tabulated for these eight subgroups. The two groups
of Agents were then sorted according to two job satisfaction
groups, and the scores for the same variables were tabulated

for these four subgroups. This tabulation provided the subgroup frequencies and total scores (sum of scores multiplied by frequencies) for each variable. All of these results were checked for accuracy.

Techniques of Analysis

Description of interests. Three methods were used to provide a description of the Agents' vocational interests: (a) Mean scores and standard deviations were calculated from the standard scores on all SVIB scales for both groups of Agents and the letter scores corresponding to the mean scores on the occupational scales were entered in the table. (b) The percentage of County Agents and 4 H Club Agents who received A, B+, B, and C letter scores on 34 occupational scales was computed and these percentages were compared with the corresponding percentages obtained by a group of 285 college seniors reported by Strong.[18] (c) The Agents' profile answer sheets were analyzed to determine their primary and secondary interest types. This

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[18] Edward K. Strong, Jr., Vocational Interests of Men and Women, Stanford, California: Stanford University Press, 1943, pp. 376-377.

involved a tabulation of the occupational groups in which there

was a preponderance of A and B+ scores (primary interest

types) and a preponderance of B+ and B scores (secondary

interest types). The percentages of the total number of County

Agents and the total number of 4 H Club Agents whose scores

fell into primary and secondary interest types on the various

occupational groups were then computed.

Significance of the difference between means. In attempt-

ing to determine SVIB scales that would differentiate "high" and

"low" work adjustment groups of Agents, the implicit problem

was to determine the scales on which the variable work adjust-

ment groups would differ significantly. The first step in this

direction was to discover the SVIB scales on which the differ-

ences in the mean scores among a number of differential work

adjustment groups of Agents were great enough that they could

not be attributed to the "chance" errors that normally occur

in the process of selecting any sample groups from a total

group, but that they could be considered "real" and that the

results of the comparisons could therefore be declared signifi-

cant. The customary basis for determining whether the results

were significant or insignificant was employed in this study and is defined by Johnson as follows:[19]

(1) The results are said to be significant if the conclusion that they are would be erroneous in 1 per cent or less of the cases.

(2) The results may be significant but further observations are necessary (that is, we suspend judgement) if the conclusion that the results are significant would be wrong in 5 per cent or less but more than 1 per cent of the cases.

(3) The results are not significant if our conclusion that they are significant would be in error more than 5 per cent of the cases.

Assumption of normal distribution. The assumption of normality is implicit in the application of most of the statistical techniques used in this study. No effort was made to test this assumption for the many variables studied. McNemar[20] and Snedecor[21] have observed that evidence is available to support the contention that a moderate skewness, piling up (leptokurtic),

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[19] Palmer O. Johnson, Statistical Methods in Research, New York: Prentice-Hall, Inc., 1949, p. 32.

[20] Quinn McNemar, Psychological Statistics, New York: John Wiley and Sons, 1941, pp. 216, 235.

[21] George W. Snedecor, Statistical Methods, 4th ed., Ames, Iowa: Collegiate Press, 1946, pp. 221-226.

or flattening out (platykurtic) is permissible in the use of various techniques, particularly the "t" test and analysis of variance. In the case of certain variables, such as SVIB scales which are not related to the Agents studied herein, it is natural that the distribution of these scores would have a severe positive skewness (a piling up of low scores). This makes questionable the use of the mean as a measure of central tendency. In spite of this, the mean was used as the description of central value in this study since, as pointed out by McNemar, it has more stability and better adaptation to other statistical uses (correlation, standard scores, tests of significance, analysis of variance, etc.) than other measures, such as the median or mode.[22]

The tests used. The "t" test is designed to test the hypothesis that the true difference between means is zero.[23] It consists essentially of dividing the difference between the means by the standard error of the difference. This was the

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[22] McNemar, op. cit., pp. 17-18.

[23] Johnson, op. cit., p. 72.

main technique used in this study for measuring the difference between the means and the significance of the "t" values found was consequently determined from the table of the distribution of "t" prepared by Fisher and Yates and reported by Johnson.[24]

The "t" test involves, however, the assumption that the variances (the average of the squared deviations from the average of the group) of the scores of the groups of Agents being compared do not differ greatly. As was pointed out earlier, there was reason to suspect that the SVIB scores of these Agents would be rather heterogeneous. Therefore, since it could not be assumed that the variances in these scores would not differ greatly among the subgroups to be compared, the variances were calculated for each variable and the homogeneity of the variances was tested by the "F" test. This consisted of dividing the larger variance by the smaller variance and determining the significance of this value by reference to the table for the distribution of F which has been prepared by Snedecor.[25] In comparisons in which the difference between the variances was not significant

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[24] Ibid., p. 360.

[25] Snedecor, op. cit., pp. 222-225.

at either the five or the one per cent level, the variances were considered to be homogeneous and the "t" test of the significance of the difference between the means was consequently applied.

In the comparisons in which the difference between the variances was significant at the five or one per cent levels, the variances were considered to be lacking in homogeneity and the Behrens-Fisher "d" test was used for testing the significance of the difference between the means.[26] This test is similar to the "t" test but is designed specifically to test the significance of the difference between means when the variances are unequal or unknown.

These tests were then applied to the comparison of the SVIB scores among the various work adjustment groups which will be described in Chapter V. In order to determine the intensity of the relationships indicated by the SVIB scales whose mean scores were found to be significantly different in these comparisons, biserial correlation coefficients were computed

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[26] This test is described in Johnson, op. cit., pp. 73-75.

for the scales significantly related to job satisfaction. The significance of these correlation coefficients was then determined by reference to Snedecor's table for the significance of correlation coefficients at the five and one per cent levels.[27]

On the basis of the SVIB scales thus found to have significant intensity of relationships to work effectiveness or to job satisfaction, attempts were made to predict Agents who were "less effective" and who had low job satisfaction scores by selecting profile answer sheets whose scores on the significant SVIB scales were within certain criterion cutting scores. The criterion scale scores used in the various prediction attempts are presented in Chapter VI. The actual work effectiveness ratings and job satisfaction scores of those Agents predicted to be "less effective" and to have low job satisfaction scores were then checked. The accuracy of these predictions was then determined by chi square analyses.

Summary. The sample consists of 81 County Agents and 48 4 H Club Agents which includes all of the Agents who

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[27] George W. Snedecor, Statistical Methods, Ames, Iowa: Collegiate Press, Inc., 1937, p. 125.

were in the Michigan Extension Service in September, 1950,

except eight County Agents and five 4 H Club Agents who re-

tired, resigned or were transferred to other positions within

the organization between that time and May 1, 1951. The sam-

ple is rather selective in that it does not include any individuals

who left the service at any time prior to May 1, 1951, or any

who desired to become Agents and were not accepted into the

organization. However, the sample was considered to be well

suited for research purposes.

The heterogeneous nature of the duties and worker roles

demanded of the Agents suggests that they are possibly rather

heterogeneous in respect to various personal characteristics,

including vocational interests. The mean age of the County

Agents is 42.73 and 33.17 for the 4 H Club Agents. The County

Agents' mean years of experience is 12.90 and the 4 H Club

Agents is 4.19. There is relatively little difference in the

amount of education between the two groups.

The SVIB was administered to the Agents in groups.

The regular scales were scored by the Engineers Northwest

scoring service and the two new scales were scored manually.

The Job Satisfaction Questionnaire was obtained from the Agents

by mail and scored manually. These scores and certain personal data were entered on personal data cards, then punched into IBM cards. The IBM cards were sorted by various work adjustment subgroups and the data on all variables were tabulated by these subgroups.

Means and variances were computed on all variables and comparisons of these two statistics were made between various work adjustment subgroups. The significance of the difference between variances was determined by the "F" test. Where this indicated homogeneity of variances the significance of the difference between means was determined by the "t" test and where the variances were not homogeneous, the "d" test was used.

The intensity of the relationships indicated by the significantly different mean scale scores was determined by biserial and product moment correlation coefficients. Attempts to predict "less effective" Agents and Agents with low job satisfaction scores were based upon selection of profile answer sheets whose scores were within certain criterion cutting scores on the scales which were found to have significant intensity of relationship.

CHAPTER V

THE VARIABLE WORK ADJUSTMENT GROUPS

The purpose of this chapter is to present the methods by

which the County Agents and 4 H Club Agents were separated into

variable work effectiveness and job satisfaction groups in order to

determine the relationship of their SVIB scale scores to the two

criteria of work adjustment. Since in the interests of the General

Research Project it was necessary that the four main studies being

conducted at present employ the same criterion groups of Agents,

the plans for the determination of these groups and the consequent

analyses of data involved were accomplished by several members

of the Planning Committee working cooperatively.

Problems in Rating Agents' Work Effectiveness

From writings of Symonds,[1] Tiffin,[2] and Thorndike[3] it ap-

pears that some of the problems faced in rating workers in general

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[1] Percival M. Symonds, Diagnosing Personality and Conduct, New York: D. Appleton-Century Company, 1931, Chapter III.

[2] Joseph Tiffin, Industrial Psychology, New York: Prentice-Hall, Inc., 1946, Chapter 9.

[3] Robert L. Thorndike, Personnel Selection, New York: John Wiley and Sons, Inc., 1947, Chapters 3, 4, 5.

are how to minimize bias or the "halo" effect, how to provide

adequate opportunity for observation of the workers but at the

same time to guard against too much familiarity, and how to

assure that the concept of the traits to be rated is uniform in

the minds of the several judges. In planning the rating of the

workers in this study each of these problems assumed partic-

ular significance because of conditions peculiar to the job.

Among these complicating factors, the following were predom-

inant: (a) Except for "teaching," there was no established hi-

erarchy of importance for the various duties and roles demanded

of either group of Agents. There was no basis for assuming

that any one of these factors was more important than any other

in the successful performance of the job. (b) There were indi-

cations that individual Agents who were considered to be rela-

tively equal in terms of over-all success on the job varied

considerably in their effectiveness in different roles. Where

some Agents appeared to be quite effective as consultants, for

example, and relatively ineffective as promoters, this situation

appeared to be reversed with other equally successful Agents.

(c) It appeared that the importance of the roles might vary in

different local situations. In one instance the work situation

could conceivably demand mainly good organizational ability and in another, good ability as a demonstrator or public speaker might be more essential.

Various rating methods considered. In view of the above .factors, The Planning Committee considered advantages and disadvantages of various rating techniques before selecting the method finally adopted. Quantified measures of success, such as increased production or increased membership in organizations were considered because of their apparent objectivity. However, it was recognized that it would be almost impossible to accurately isolate the contribution that a County Agent made, for example, to increased production of a certain product when in many localities there are other forces with a similar objective at work with the same group of farmers. Furthermore, the present objectives of the Extension Service are not in quantified terms. Increased membership in Extension enterprises, for example, would be less in keeping with the objectives than would "more fruitful life," as mentioned in Chapter I, that might result to individual members of an Extension organization.

The technique of conducting intensive interviews with a large sample of rural people might establish with some degree of accuracy the effectiveness of the Extension workers, but this method was rejected because of its impracticability in terms of time and money.

The method of asking rural people to rate Extension workers was considered. It can reasonably be argued that if the over-all objective of the Extension Service is to help rural people, they are the best source of information as to the success of the program. However, this method was not considered feasible for purposes of this study for two reasons: (a) The objective of the rating procedure in this case is to arrive at a comparative rating of effectiveness of the various County Agents and 4 H Club Agents. Since many of the rural people who might be asked to do the rating probably would have little direct knowledge of the work effectiveness of Agents in areas other than their own, these people would not have sufficient basis for comparison of all the Agents in the state. (b) The problem of selecting an unbiased sample of people to do the rating in each county would be an effort beyond the scope of this immediate study.

Having rejected the above and other methods suggested, the rating system now in use by the Michigan Extension Service for salary adjustment and other administrative purposes was considered. This procedure results in ratings of job effectiveness being assigned to County Agents and 4 H Club Agents by certain Extension administrative personnel on the basis of various evidences of program effectiveness and personal effectiveness on the job. Since the rating system finally used in this study was based upon this system, a summary of it is included here. This summary is adapted from materials on file in the office of the Michigan Extension Service and includes the essential features that pertain to the rating of County Agents and 4 H Club Agents.

The Michigan Extension Service Rating System

Specialists' rating of the County Agents. Each Extension Specialist is, as was described in Chapter II, responsible for providing to rural people, through the County Extension workers, the best scientific information available in his special field. In fulfilling this responsibility, the Specialists work closely with the County Agents and critically observe the effectiveness of

their appropriate phases of the County Agents' work, especially

in terms of the public's acceptance of it. On the basis of such

observations, the Specialists are asked each year to rate the

effectiveness with which the County Agents are carrying out

the particular phases of the over-all county program for which

the Specialists are to an extent responsible. The Specialist's

rating, therefore, is more a rating of the program of the County

Agent, than a rating of the County Agent's personal effective-

ness on the job.

Because some Specialists do not work in every county

in any one year, the Specialists are asked to rate only the pro-

grams in the counties in which they have worked in the previous

twelve-month period. For this reason, even though there are

98 Specialists in the Michigan Extension Service, only 30 or 40

ratings are obtained on some county programs. The ratings

are made in terms of A, B, C, or D, using the following in-

terpretations of these classifications:

"A" (Superior) A county program to which this rating is as-
signed should show unusual accomplishment as compared
to other counties in which the same program is being
carried on. The local people should evidence support of
the program by active interest and participation.

"B" (Good) This classification denotes that the progress and
accomplishments of the program are satisfactory or

somewhat better than average as compared to other counties. A "B" rating should only be assigned to county programs which are constructive and where there is evidence of public support.

"C" (Fair) A program rated "C" should be one that is somewhat satisfactory but in which improvements are needed and are obviously possible. This rating might indicate a poorly organized program or one in which there was slightly below average local interest and participation as compared to other counties having similar need for the work.

"D" (Poor) To be rated poor a county program might be one in which no activity is apparent in the county. It could be a program that was unwisely conceived or is poorly organized and does not meet the needs of the people. It might be a program where no local interest was evident because of lack of knowledge about the program. If a "D" rating is assigned it should indicate that progress towards accomplishing the objectives of the program are not at all satisfactory.

After each Specialist rates his particular project in each county, the ratings of all Specialists are recorded on an appraisal sheet by counties. The several projects of the Specialists are of varying importance in the different counties. For example, a dairy project in a county in which 75 per cent of the farm income is derived from the sale of dairy products is of greater importance than would be a fruit project if less than five per cent of the farm income came from the sale of fruit. Therefore, each project is assigned a degree of importance in each county in terms of major, average, minor or no importance.

The assignment of importance weights is based primarily on the most recent Census of Agriculture figures for the value of different farm commodities sold by counties. However, a final evaluation is made by a group of seven Extension Service administrators and Specialists, based upon their knowledge of factors peculiar to different localities in Michigan. Differential weights are then assigned to the Specialists' ratings of their projects in each county as follows:

Project Importance by Counties	Weights Assigned to the Specialists' Ratings of the Projects			
	A	B	C	D
Major	5	4	3	-5
Average	4	3	2	-3
Minor	3	2	1	-1
No Importance	0	0	0	0

Thus, if a Specialist rated a dairy program "A" and dairy was of "major" importance in the county, the rating would receive a weight of plus 5. On the other hand, if another Specialist rated the fruit project in that county as "D" and fruit was of

"minor" importance in that county, this rating would receive a weight of minus 1.

To determine the effectiveness rating of the over-all program in each county, a single score is arrived at by totaling the algebraic weights for each project, as explained in the table above, and dividing this total by the number of ratings given by the Specialists in each county. This is necessary because, as was mentioned before, the number of ratings by Specialists varies for each county. These ratings of effectiveness for each county are then totaled and by dividing this total by the number of counties, an average rating score for all counties is determined. With this score representing 100 per cent, the single scores for each county are converted to percentage scores and compared with this 100 per cent average score. The single county effectiveness scores usually range from a low of approximately 70 per cent of average to a high of approximately 130 per cent of average.

By thus securing the opinions of at least 30 to 40 Specialists regarding each county program, the relative effectiveness of these programs is determined, in so far as these ratings are valid. As was mentioned earlier, the Specialists' opinions are directed primarily at the effectiveness of the County

programs, but since the County Agent is responsible for conducting the program, these ratings reflect to a degree the effectiveness of the County Agent.

Appraisal of 4 H Club projects. Due to the fact that the Specialists do not have direct 4 H Club responsibilities and work less closely with the 4 H Club Agents, they do not rate these projects. Instead, the effectiveness of the 4 H Club programs in each county is rated in terms of the amount of money allocated to each county for 4 H Club work, and the proportion of eligible youth enrolled in 4 H Club projects by counties.

Each year the 4 H Club Department of the Extension Service receives a sum of money to be distributed to the counties for use as premiums and awards. The 4 H Club Department, with the advice of various workers in the counties, prepares a formula each year for the equitable distribution of this money to the 4 H Club members of the state. The formula appearing at the top of the following page was used in 1949 and is typical of the figures used each year.

By multiplying the values in the table by the number of boys and girls who complete the various projects, a money

Beef, Swine, Dairy $1.50
Sugar Beets, Sheep, Colt, and Junior
    Leadership. 1.00
Corn, Beans, Potatoes, Forest Fire, Deer
    Yard, Pheasant, Market Garden,
    Forestry 80
Home Gardens 55
Landscape, Electrical, Food Preparation,
    Canning, Clothing, Ass't. Homemaker,
    Home Furnishing, Handicraft, Farm
    Machinery 50
Wildflower, Soil Conservation, Bees,
    Wild Life, Farm Accounts 40
Hot Lunch, War Activities, and all
    others 25

value is determined for each project and at the end of the year

the funds are allocated to each county accordingly.

Situational differences among counties, such as better

adaptability of certain kinds of projects in some areas than in

others, and differences in numbers of eligible 4 H Club youth,

are provided for to an extent by a method of county classifi-

cation in which the counties are classified as A, B, C, or D

in terms of desirability of work situations. This classification

is determined by a group of Extension administrators, agricul-

tural economists, and Extension Specialists who assign weights

of importance to the following six factors based upon data gath-

ered from the most recent Census of Agriculture:

Factor	Weight
Number of farms	2
Number of commercial farms	2
Rural population	1
Urban population	1
Farm Income average 1929-1939	4
Area of the county	1

Using this scale of weights, a per cent of average representing the relative desirability of work situations by counties is calculated in much the same manner that the per cent of average is determined for the County Agent program ratings as described on page 128. With this per cent of average the counties are ranked in order according to work situations. From this ranking the counties are arbitrarily divided into four groups, A, B, C, and D according to rather obvious breaks in the per cent of average figures. This assignment to groups is used in preference to actual quartiles because careful study of the data for each county indicated that the top quartile would include an unusually wide range of county differences. The grouping used, therefore, includes 12 counties in Group A, 18 in Group B, 20 in Group C, and 25 in Group D.[4]

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[4] It will be noted that this represents a total of 75 counties whereas there are 83 counties in Michigan. In some of the

The amount of money allocated to each of the four groups of counties represents the total money value of all the projects within each county grouping. Comparison of the money value of the separate projects is made only within each of the four groups of counties. The money value of the projects in a county for which a 4 H Club Agent is responsible, and consideration of the proportion of eligible youth in his county who are enrolled in 4 H Club projects represents, by comparison with the other 4 H Club Agents in the same group of counties on the same two factors, a measure of the extent to which he has been successful in conducting his program. Among other things, the number of youth who follow projects through to completion is an indication of the quality of the training they have received. As in the case of the County Agent, this type of appraisal of the program reflects in a degree the effectiveness of the 4 H Club Agent himself.

Rating of personal effectiveness on the job. In addition to the program rating procedures just described, a rating of

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more sparsely populated areas County Agents and 4 H Club Agents are responsible for more than one county. In these cases the counties are classified as though they were one county.

each County Agent and 4 H Club Agent as to his personal ef-
fectiveness on the job is obtained from the four District Ex-
tension Supervisors for the men within their respective dis-
tricts. These Supervisors work closely with their Agents dur-
ing the year and have the opportunity of observing the effective-
ness with which they fulfill many of the various roles demanded
of them in their local work situations. The Supervisors review
the ratings assigned to the programs of their Agents and adjust
these ratings in terms of all pertinent factors known to them,
including local extenuating circumstances and personal problems
of the workers. These factors often materially influence the
program ratings. For example, one County Agent's wife had
been seriously ill during a recent year and required much addi-
tional attention by the Agent. As result, his program received
a low rating by the Specialists, although he had been given spe-
cial recognition in the previous year as one of the outstanding
Agents in the state. After the District Supervisors determine
a recommended rating of personal effectiveness on the job for
each worker, these ratings are reviewed by the Director of
Extension, who assigns the final rating. This rating is used
for various administrative purposes, including salary adjustment.

Rating Method Used in This Study

The Planning Committee felt that the ratings obtained
by the system just described would be satisfactory for the pur-
poses of the General Research Project except for the fact that
this system made no attempt to include any particular number
of Agents in any particular rating group. Therefore, since it
was considered desirable for comparison purposes to have fairly
equal numbers in the groups to be studied, the Planning Com-
mittee concluded that a separate modified forced ranking rating
should be made by as many as possible of the same personnel
who furnish the regular annual ratings. This type of rating was
consequently arranged for and was supervised by the Extension
Training Specialist, who was also a member of the Planning
Committee.

Description of the method. A panel of seven judges was
selected by the Extension Training Specialist in consultation
with the other members of the Planning Committee. The panel
consisted of the four District Extension Supervisors, the State
Leader of 4 H Club work, the State Leader of Agricultural Ex-
tension, and the Director of Extension. Of the various Extension

administrators available, it was felt that this group had had the best opportunities for observing the workers in the counties. In addition, most of them regularly participate in the annual rating of Extension workers.

The present project was outlined to the panel and it was explained that the purpose of their appraisal of the workers was to provide a rating of the work effectiveness of each County Agent in comparison with the entire group of County Agents and each 4 H Club Agent in comparison with the total group of 4 H Club Agents. Seven identical sets of 4 x 5 inch file cards were prepared, with the name of an Agent on each card. Each set included an individual card for each County Agent and 4 H Club Agent used in this study. Each set of cards was carefully shuffled then a set was given to each panel member. The judges were instructed first to divide the cards roughly in half by placing in one stack the cards for the workers whom they rated in the upper half of the group in terms of work effective-ness and in another stack the workers whom they rated in the lower half of the group on the same basis. They were instructed to then separate these two stacks into roughly even groups in order to provide their "forced" ranking ratings of the groups

by approximately the upper fourth, upper half, lower half and lower fourth.

Consistency of the ratings. After each judge had thus placed each worker's card in one of four stacks, the cards in each stack were numbered 1,2,3, or 4 according to the rating given. On a list of the workers' names a tally was made of the ratings assigned to each man by each judge. These ratings were averaged in order to determine the final "quartile" rating. The following table indicates the range of averages used as arbitrary points of separation in order to arrive at four fairly equal groups. This table also indicates the total average rating for each "quartile" group thus selected, the number of men in each group on whom there was perfect correlation or unanimous agreement among the judges' ratings, and the total number of men placed in each "quartile" rating group.

From Table 3 it is apparent that by considering the average of the seven ratings on each man there was in most cases a relatively high agreement among the judges as to the over-all work effectiveness of these men. Except in the third "quartile" of County Agents and the second "quartile" of 4 H Club Agents the spread or range of ratings was fairly consistent.

TABLE 3

SUMMARY OF RATINGS OF COUNTY AGENTS AND 4 H
CLUB AGENTS BY "QUARTILE" GROUPS

County Agents	Range of Rating Averages	Total Average Rating of Groups	Unanimous Agreement	Total
First "Quartile"	.57 (1.00-1.57)	1.12	12	21
Second "Quartile"	.57 (1.71-2.28)	2.05	3	19
Third "Quartile"	.71 (2.57-3.28)	2.83	4	20
Fourth "Quartile"	.58 (3.42-4.00)	3.79	7	21
4 H Club Agents				
First "Quartile"	.42 (1.00-1.42)	1.19	5	13
Second "Quartile"	.71 (1.57-2.28)	1.98	2	13
Third "Quartile"	.57 (2.71-3.28)	2.92	3	13
Fourth "Quartile"	.43 (3.57-4.00)	3.74	1	9

In other words, for the men in these two groups there was slightly less agreement among the judges as to the work effectiveness of these men. However, the extent of agreement seemed to be consistent enough throughout that the average rating for each man caused him to fall rather naturally into one of the four groups.

Although the ranges of average ratings for the first, second, and fourth groups of County Agents were almost the

same, the fact that all of the judges rated twelve men as 1,

and seven men as 4, indicates that in the eyes of the judges

certain of the ''more effective'' and ''less effective'' County

Agents stand out rather clearly in comparison with the ''in-

between'' Agents. This type of consistency was not as evident

with the 4 H Club Agents.

It should be pointed out in reference to Table 3 that the

fourth ''quartile'' of 4 H Club Agents originally included 12 men.

However, between the time of the rating and the time that the

job satisfaction data were obtained for all workers, three 4 H

Club Agents left the Extension Service either voluntarily or in-

voluntarily and therefore had to be eliminated from the study.

In keeping with the discussion on page 12 regarding unsatisfac-

tory work and dissatisfaction among 4 H Club Agents, it is

probably significant that these three Agents had been rated in

the lowest ''quartile'' group.

Reference was made on page 100 to the fact that eight

4 H Club Agents had been in the Extension Service for only

nine months on May 1, 1951, and that arrangements were made

to rerate these Agents after they had completed twelve months

of service. This was done in August, 1951, and at that time

each judge assigned the same rating to these Agents that he had assigned to them in May.

Consideration of only the average rating for each of the men could of course conceal a rather significant discrepancy in the ratings of one or more judges as compared with the ratings assigned by the other judges. To check on the degree of variation among the judges as to their assignment of ratings the rating data were submitted to an analysis of variance following procedures suggested by Snedecor.[5] Tables 4 and 5 on the following page provide the results of this analysis.

Since the F tests of the analyses of variances in Tables 4 and 5 (1.34 for County Agents, 1.18 for 4 H Club Agents) are not significant for the raters, it may be concluded that there were no significant differences among the judges as to the mean ratings which they assigned to these two groups of Agents, or that there was no significant variation among them in their assignment of ratings. Tables 4 and 5 also indicate that there were, in the opinions of the judges, significant differences among

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[5] George W. Snedecor, Statistical Methods, Ames, Iowa: Collegiate Press, Inc., 1946, p. 256.

TABLE 4

ANALYSIS OF VARIANCE OF THE RATINGS OF SEVEN
JUDGES ON THE WORK EFFECTIVENESS OF
COUNTY AGENTS (N-81)

Source of variation	Degrees of freedom	Sum of squares	Mean square	F
Raters	6	2.4938	.4156	1.34 [a]
Individuals	80	569.1429	7.1143	23.02** [b]
Error	480	148.3633	.3091	
Total	566	720.0000		

[a] F for raters (1.34) not significant.

[b] F for individuals (23.02**) significant at 1 per cent
level or less.

TABLE 5

ANALYSIS OF VARIANCE OF THE RATINGS OF SEVEN
JUDGES ON THE WORK EFFECTIVENESS OF
4 H CLUB AGENTS (N-48)

Source of variation	Degrees of freedom	Sum of squares	Mean square	F
Raters	6	2.1131	.3522	1.18 [a]
Individuals	47	297.1399	6.3221	21.18** [b]
Error	282	84.1726	.2985	
Total	335	383.4246		

[a] F for raters (1.18) not significant.

[b] F for individuals (21.18**) significant at 1 per cent
level.

the individuals being rated (23.02 for County Agents, 21.18 for

4 H Club Agents). This quantifies further the results shown

in Table 3.

Johnson[6] reports that Hoyt has developed a method for

estimating the reliability of a test by means of analysis of

variance. In this situation the number of correct responses to

each item on the test and the score of each individual on the

test are the basic data. The total sum of the squares is broken

down into three components: (a) between individuals, (b) between

items, and (c) residual component or error. By subtracting the

sum of the sum of squares among individuals and among items

from the total, the residual sum of squares is used to estimate

the discrepancy between the obtained and the true variance.

To obtain an estimate of the reliability of the ratings in

Tables 4 and 5, Hoyt's method was applied to these data.[7] In

this case, the variation among the raters is analogous to the

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[6] Palmer O. Johnson, Statistical Methods in Research, New York: Prentice-Hall, Inc., 1949, pp. 134-136.

[7] Dr. Paul L. Dressel, Chairman of the Board of Examiners, Michigan State College, confirmed the applicability of this method to the rating data.

variation among the test items in Hoyt's example and the variation among the individuals (Agents) is analagous to the variation among the scores of each individual on the test. By applying Hoyt's formula,[8] the correlation coefficient for County Agents is plus 0.956 and for 4 H Club Agents, plus 0.951. These coefficients indicate quite high reliability for these ratings. It should be pointed out that the magnitude of the coefficients is increased by the fact that they represent the estimate of the reliability of an Agent's rating as based upon the composite rating by all seven judges and not the reliability of an Agent's rating by individual raters.

Since the average ratings for each Agent indicated relatively high agreement among the judges, since there was no significant variation among the seven judges as to the mean ratings which they assigned to the Agents, and since estimates of the reliability were quite high, it was concluded that this rating provided a satisfactory measure of the relative work effectiveness of the men used in this study

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[8] $r_{tt} = (a-c)/a$, where a equals mean squares between individuals and c equals mean squares between raters.

The variable work effectiveness groups. It was pointed

out in Chapter I that Extension Administrators in Michigan have

indicated that a number of County Extension workers are not

performing satisfactorily in their jobs. However, discussion of

this matter in the Planning Committee brought out the fact that

these administrators feel that very few, if any, Agents could

be classified as "unsatisfactory" and that the actual number who

were not performing satisfactorily was not a majority of either

the County Agents or the 4 H Club Agents. Therefore it was

concluded that the lowest "quartile" rating groups of County

Agents and 4 H Club Agents would more fairly represent the

Agents who might be classified as "less effective" than would

the two lowest "quartiles." This of course would classify the

Agents who were rated in the three highest "quartiles" as the

"more effective" Agents.

For the purpose of analyzing the relationship between

the Agents' SVIB scale scores and their work effectiveness rat-

ings it was considered desirable to compare not only the total

group of "more effective" Agents with the "less effective" Agents

but also to compare the interests of the two extreme "quartile"

rating groups. Therefore, the various work effectiveness criterion groups of Agents established were as follows:

County Agents	N	4 H Club Agents	N
Three highest "quartiles"	60	Three highest "quartiles"	39
Highest "quartile"	21	Highest "quartile"	13
Lowest "quartile"	21	Lowest "quartile"	9

Homogeneity of the "quartile" groups. The homogeneity of these criterion groups was ascertained in terms of age and years of experience in the Michigan Extension Service. Table 6 presents the comparison of the means and variances of these two variables between the group in the three highest "quartiles" combined and the group in the lowest "quartile" and between the highest and lowest "quartile" groups of the County Agents and 4 H Club Agents.

The most important result of the comparisons in Table 6 is the fact that the "more effective" County Agents and 4 H Club Agents did not differ significantly from the "less effective" Agents in terms of mean age or mean years of experience in the Michigan Extension Service. In the case of years of

TABLE 6

COMPARISON OF MEANS $(\overline{X})$ AND VARIANCES (σ^2) OF AGES AND YEARS OF EXPERIENCE
FOR VARIOUS "QUARTILE" WORK EFFECTIVENESS RATING GROUPS OF
COUNTY AGENTS AND 4 H CLUB AGENTS

	Highest "quartile"		Three highest "quartiles"		Lowest "quartile"		Tests of Homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
County Agents	(N 21)		(N 60)		(N 21)			
Age	44.05	59.91			43.66	102.56	1.71	0.185
			42.40	81.78	43.66	102.56	1.37	0.678
Years in Service	15.19	40.93			13.43	96.75	2.36*	0.672
			12.72	54.47	13.43	96.75	1.68	0.337
4 H Club Agents	(N 13)		(N 39)		(N 9)			
Age	34.23	41.71			33.89	49.87	1.20	0.112
			33.00	64.56	33.89	49.87	1.29	0.334

TABLE 6 (Continued)

	Highest "quartile"		Three highest "quartiles"		Lowest "quartile"		Tests of Homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
Years in	5.92	29.45			4.33	19.11	1.54	0.697
Service			4.15	15.36	4.33	19.11	1.24	0.118

* Indicates significance at the five per cent level of confidence or less.

[1] The Behrens-Fisher "d" test, as explained on page 114, is used to test for significance of difference between means when variances are not homogeneous as indicated by a significantly large "F."

experience for the County Agents there was a significant difference between the variances of the highest and the lowest "quartile" groups (F = 2.36) but in no case were the means significantly different. This indicates that the various "quartile" groups are significantly homogeneous in respect to these two variables.

Rating of Job Satisfaction

Relationship of job satisfaction and work effectiveness. In order to analyze the relationship of the Agents' SVIB scores to the second criterion of work adjustment, self-rated job satisfaction, the relationship of their raw scores on the Job Satisfaction Questionnaire to their work effectiveness ratings was analyzed first. This was done to investigate the possibility that if there was a significant relationship between their job satisfaction and their work effectiveness ratings, then the relationships found between their interests and their work effectiveness would indicate that a similar relationship existed between their interests and their job satisfaction. The results of this analysis are shown in Table 7 which includes the comparison of the means

TABLE 7

COMPARISON OF MEANS ($\overline{X}$) AND VARIANCES (σ^2) OF RAW JOB SATISFACTION QUESTIONNAIRE SCORES FOR VARIOUS "QUARTILE" WORK EFFECTIVENESS GROUPS OF COUNTY AGENTS AND 4 H CLUB AGENTS

	Highest "quartile"		Three highest "quartiles"		Lowest "quartile"		Test of Homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
County Agents	(N 21) 24.38	6.65	(N 60)		(N 21) 22.52	10.56	1.59	2.05*
			23.86	5.30	22.52	10.56	1.99*	1.74
4 H Club Agents	(N 13) 22.54	10.29	(N 39)		(N 9) 20.77	11.44	1.11	1.24
			22.52	11.68	20.77	11.44	1.02	1.61

* Significant at the five per cent level or less.

[1] The Behrens-Fisher "d" test is used when the variances are not homogeneous as indicated by a significantly large "F."

and variances of the raw Job Satisfaction Questionnaire scores for the various work effectiveness "quartile" groups.

The analysis in Table 7 shows that in general the mean scores for the "more effective" Agents were higher than the mean scores for the "less effective" Agents. The three highest "quartiles" of the 4 H Club Agents scored slightly higher than the highest "quartile" alone. However the only group to score significantly higher than the "less effective" Agents was the highest "quartile" of the County Agents (t value 2.05 significant at five per cent level or less).

Although Table 7 shows that the relationship between work effectiveness and job satisfaction is positive in both groups of Agents, it is not generally high. It was therefore decided that to determine more clearly the relationship between interests and job satisfaction it would be necessary to separate the Agents into variable job satisfaction groups on some basis other than their work effectiveness ratings. This led to the decision to establish the job satisfaction groups in terms of their scores on the Job Satisfaction Questionnaire.

In many of the studies listed on pages 32 and 33, footnote 7, in which the Hoppock Job Satisfaction Blank or an

adaptation of it has been used, variable satisfaction groups have been established on the basis of the raw scores alone. However, before making a separation on this basis in this study, it was considered desirable to determine whether or not the qualitative items represented in the raw scores of the Job Satisfaction Questionnaire indicated attitudes that could be considered as unidimensional, or that could be expressed on a continuum, and whether or not a point could be fixed on the continuum which would separate the Agents with positive attitudes toward their work from the Agents with negative attitudes toward their work.

Scale analysis. Various methods such as those of Thurstone,[9] Likert,[10] and others which are reviewed by McNemar[11] have been developed for this type of attitude measurement.

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[9] L. L. Thurstone, "Attitudes Can Be Measured," American Journal of Sociology, 33: 529-554, 1928.

[10] _____ and E. J. Chave, The Measurement of Attitudes, Chicago: University of Chicago Press, 1929, 96 pp.
R. Likert, "A Technique for the Measurement of Attitudes," Archives of Psychology, 140: 1-55, 1932.

[11] Quinn McNemar, "Opinion-Attitude Methodology," Psychological Bulletin, 43: 289-374, 1946.

However, the new method developed by Guttman[12] as result of

his work in the Research Branch of the Army's Information and

Education Division was considered by the Planning Committee to

be somewhat more appropriate for use in this study. Guttman's

technique provides a test of hypothesis that the entire universe

of items forms a scale for the entire population of people.

His general criterion for acceptance of this hypothesis is: "The

universe is said to be scalable for the population if it is pos-

sible to rank the people from high to low in such a fashion that

from a person's rank alone we can reproduce his response to

each of the items in a simple fashion."[13]

The procedure involved in thus analyzing the extent of

reproducibility of an individual's response to an attitude ques-

tionnaire is essentially that of determining the extent to which

the rank order of the item responses for each question

[12] Louis Guttman, "The Cornell Technique for Scale and Intensity Analysis," Educational and Psychological Measurement, 7: 247-279, 1947.

Samuel A. Stouffer, Louis Guttman, et al., Measurement and Prediction, Princeton, New Jersey: Princeton University Press, 1950, 756 pp.

[13] Guttman, op. cit., p. 249.

corresponds to the rank order of the individuals according to their total scores on the attitude measuring instrument. This procedure may be clarified by the two simple hypothetical cases in Figure I. These cases represent the responses to an attitude question which has three alternative answers with a score of one for the least favorable response. The nine individuals are ranked from high to low in terms of their total raw scores on the imaginary test.

In Case A of Figure I there is perfect scalability. In other words, the three people who scored highest on this question were the three people who ranked highest on their total scores, the three who scored 2 were the three who ranked next highest on their total scores, and the three who scored lowest on the question were the three who ranked lowest on their total scores. (The Guttman technique does not distinguish among those who make the same score.) In case B, however, by setting up the same cut-off points (between the third and fourth and between the sixth and seventh individuals) one of the three highest ranking individuals scored 2 on this question and of the three lowest ranking people, one scored 1 and another scored 2. These "deviate" scores are called errors. The test of

FIGURE I

HYPOTHETICAL CASES OF ARRAYS OF ANSWERS TO AN
ATTITUDE QUESTIONNAIRE

Case A				Case B			
Individuals ranked by total score	Array of responses to three alternative answers			Individuals ranked by total score	Array of responses to three alternative answers		
	3	2	1		3	2	1
1	x			1	x		
2	x			2		x	
3	x			3	x		
4		x		4		x	
5		x		5		x	
6		x		6		x	
7			x	7			x
8			x	8		x	
9			x	9	x		

scalability is based on the percentage of error, or the converse

of this, the percentage of reproducibility found by such a rank-

ing of responses to each question.

Guttman has indicated that for an attitude questionnaire

to be scalable the individual items should have not more than

15 per cent error, or have reproducibility of 85 per cent, while

the total scale should have not more than ten per cent error or

at least 90 per cent reproducibility.[14] However, Eysenk and

Crown[15] in a study of attitudes on anti-Semitism in Britain

submitted the results to both factor analysis and scale analysis

and concluded that Guttman's 90 per cent reproducibility crite-

rion was too high. They found that if no individual item ex-

ceeded 20 per cent error and the error of the total scale was

not greater than 15 per cent, the scale would be reproducible.

The Eysenk and Crown criteria appear to be satisfactory for

use in this immediate study.

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[14] Stouffer, Guttman, et al., op. cit., p. 77.

[15] H. J. Eysenk and S. Crown, "An Experimental Study in Opinion-Attitude Methodology," International Journal of Opinion and Attitude Research, 3: 47-86, Spring, 1941.

Guttman points out that reproducibility is the principal test of scalability but that it is not sufficient by itself. He lists the following as essential additional criteria:[16]

(a) No item category should have greater error than nonerror.

(b) At least some of the item categories should have marginal frequencies of between 40 and 60 per cent with few, if any, less than 10 per cent.

(c) Pattern of error should be random, with no substantial number of nonscale types.

As a preliminary step to the application of Guttman's technique to the job satisfaction data, the distribution of scores was determined by calculating the proportion of County Agents and 4 H Club Agents who answered the various categories of the seven job satisfaction questions. These results are presented in Table 8. This table shows that the distribution of answers was rather narrow and that most of the responses were somewhat grouped among the favorable categories for

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[16] Stouffer, Guttman, et al., op. cit., pp. 77-80.

TABLE 8

PROPORTION OF COUNTY AGENTS AND 4 H CLUB AGENTS
ANSWERING THE VARIOUS CATEGORIES ON THE
SEVEN ITEMS ON THE JOB SATIS-
FACTION BLANK

Items	Percentages County Agents (N 81)	4 H Club Agents (N 48)
1. How well do you like your work?		
___I like it better than most anything else	30.9	·20.8
___I like it very much	62.9	56.2
___I like it fairly well	6.2	20.8
___I'm indifferent to it	0.0	2.2
___I don't like it	0.0	0.0
___I dislike it a great deal	0.0	0.0
2. How much of the time do you feel satisfied with your occupation?		
___All of the time	9.9	6.3
___Almost all of the time	53.3	41.7
___Most of the time	33.3	35.4
___A good deal of the time	2.5	6.2
___Some of the time	0.0	10.4
___Very little of the time	0.0	0.0

TABLE 8 (Continued)

Items	Percentages	
	County Agents (N 81)	4 H Club Agents (N 48)
3. How do you feel about changing your occupation?		
___Would not consider changing	16.0	10.4
___Might consider changing to a closely related occupation	50.6	39.6
___Undecided	30.9	37.5
___Am not eager to change but would consider changing to a related occupation	0.0	2.1
___Would like to change to some related occupation	2.5	8.3
___Would like very much to get into a completely different occupation	0.0	2.1
4. How well satisfied are you with your occupation?		
___Much more satisfied than other people	14.8	25.0
___More satisfied than the average person	60.5	45.8
___As well satisfied as most people	23.5	27.1
___Less satisfied than the average person	1.2	0.0
___Much less satisfied than other people	0.0	2.1

TABLE 8 (Continued)

Items	Percentages	
	County Agents (N 81)	4 H Club Agents (N 48)
5. How enthusiastic are you about your occupation?		
___Very enthusiastic	32.1	43.8
___Quite enthusiastic	·65.4	52.0
___Only mildly enthusiastic	2.5	4.2
___Not at all enthusiastic	0.0	0.0
6. How important do you think your work is as compared to that of other professional people?		
___Very important	76.6	77.5
___Quite important	22.2	22.5
___Slightly important	1.2	0.0
___Undecided	0.0	0.0
___Not important at all	0.0	0.0
7. How interested are you in your work?		
___Very interested	79.0	77.5
___Quite interested	21.0	22.5
___Only slightly interested	0.0	0.0
___Not interested at all	0.0	0.0

each question. This indicates that the number of Agents expressing dissatisfaction with their jobs was small.

The first step in applying Guttman's technique was to arrange the questionnaires in the order of the total raw scores. Next, the scores for each question were tallied for each Agent on a large sheet on which the questions and the item categories for each were listed across the top and the Agents' identification numbers were ranked on the left from high to low in the order of their total raw scores. This array of scores was studied for percentage of error in the following way: The various item response categories for each question were combined into two categories on the basis of combinations which would leave a minimum of overlapping and error after a cutting point had been established between the two categories.

In reference to the combining of categories, Guttman states that "it has seldom been found that an item with four or five categories will be sufficiently reproducible if the categories are considered as distinct."[17] He feels that the verbal habits of people are one of the main reasons for this and illustrates

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[17] Guttman, op. cit., p. 256.

by pointing out that "some people may say 'Strongly Agree' where others may say 'Agree,' whereas they have essentially the same position on the basic continuum but differ on an extraneous factor of verbal habits."[18] He then explains that combining categories to reduce error is entirely defensible if they are combined not arbitrarily, but on the basis of being closely related.

In keeping with Guttman's suggestions, the item response categories for the County Agents and 4 H Club Agents were dichotomized as indicated in Table 9.

The array of responses to item 6 was so scattered for both groups of Agents that the categories could not be combined in such a fashion that a cutting point could be established which would yield low enough error to meet the criteria of scalability. Since almost as many Agents with a low ranking on their total job satisfaction as with a high ranking tended to answer this question favorably, it appeared that it was not a discriminating item and it was therefore eliminated from further consideration in the scale analysis.

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[18] Loc. cit.

TABLE 9

DICHOTONIZATION OF JOB SATISFACTION ITEM
RESPONSE CATEGORIES USED FOR
TEST OF SCALABILITY

	County Agents			4 H Club Agents	
	Combinations of response categories into dichotomies			Combinations of response categories into dichotomies	
Item	(1)[a]	(0)	Item	(1)	(0)
1	(5)	(4,3,2,1,0)	1	(5,4)	(3,2,1,0)
2	(5,4)	(3,2,1,0)	2	(5,4)	(3,2,1,0)
3	(5,4)	(3,2,1,0)	3	(5,4)	(3,2,1,0)
4	(4,3)	(2,1,0)	4	(4,3)	(2,1,0)
5	(3)	(2,1,0)	5	(3)	(2,1,0)
6	not scalable		6	not scalable	
7	(3)	(2,1,0)	7	(3)	(2,1,0)

[a] Figures 1 and 0 in parentheses indicate the weights
of the combined categories.

Table 10 presents the results of the scale analysis found by using the item category combinations in Table 9 and establishing for each question, cutting points in the rank order of the Agents which allowed a minimum of overlapping of scores, e.g., a minimum of error.

From Table 10 it will be noted that for County Agents, items 1 and 3 are well over Guttman's individual item error maximum of 15 per cent, that items 2 and 5 are slightly over the maximum, but that items 4 and 7 meet this criterion. For 4 H Club Agents, items 3, 5, and 7 exceed the maximum per cent of error, while items 1, 2, and 4 are within the maximum. For both groups of Agents there is greater nonerror than error in the array of scores by the dichotomization of item response categories shown in Table 9.

In attempting to reduce these percentages of error, a second trial ranking of the Agents was made in keeping with Guttman's technique. This was done on the basis of the Agents' new total scores which were computed after assigning new weights to their item responses in terms of the dichotomized item response categories. Weights of 1 and 0 were assigned

TABLE 10

SCALE ANALYSIS OF THE FIRST TRIAL RANKING OF THE
SIX ITEM JOB SATISFACTION QUESTIONNAIRE FOR
COUNTY AGENTS AND 4 H CLUB AGENTS

| Item | County Agents | | | 4 H Club Agents | | |
| | % of Error | Nonerror/error Categories | | % of Error | Nonerror/error Categories | |
		(1)	(0)		(1)	(0)
1	22.2	13/2	50/6	6.25	35/2	10/1
2	16.0	48/4	20/9	10.41	22/1	21/4
3	24.6	39/15	22/5	20.83	14/10	23/1
4	14.8	53/8	16/4	14.51	29/5	112/2
5	16.0	22/4	46/9	22.92	18/3	19/8
7	13.5	57/7	13/4	18.75	32/5	7/4
Total	17.9			11.95		

to the category combinations as listed under (1) and (0) in

Table 9.

Table 11 presents the results found by thus reranking

the County Agents in accordance with their new total scores,

and by analyzing the extent to which their new item response

scores on each question corresponded to this new ranking.

TABLE 11

ILLUSTRATION OF THE SCALE ANALYSIS OF THE DICHOTOMIZED SIX ITEM JOB SATISFACTION QUESTIONNAIRE FOR THE SECOND TRIAL RANKING OF COUNTY AGENTS

Frequency	1 (1)	1 (0)	2 (1)	2 (0)	3 (1)	3 (0)	4 (1)	4 (0)	5 (1)	5 (0)	7 (1)	7 (0)	Scale score
12	x		x		x		x		x		x		6
7		(x)+	x		x		x		x		x		5
2	x		x			(x)	x		x		x		5
4	x		x		x		x			(x)	x		5
1	.x....*			(x)	x		x		.x....		x		5
11		x	x		x		x			x	x		4
1	(x)			(x)		(x)	x		(x)		x		4
3	(x)			(x)	x		x			x	x		4
3		x	x			x	x		(x)		x		4
4		x	x		x		x			x		(x)	3
3		x		(x)	x		x			x	x		3
3		x	x			(x)	x			x	x		3
1	(x)			(x)	x			(x)		x	x		3
1		x		.x....	.x....			..(x)..	x		x		3
3		x	(x)			x		x		x	x		2
3		x	x			(x)		x		x	x		2
4		x	x			x		(x)		x	x.		2
1		x		(x)		x	(x)			x	(x)		2
1		x		x	(x)		(x)			x		..(x).	2
1		x		x		x	(x)			x		x	1
2		x		x		x		x		(x)	x		1
3		x		x		(x)		x		x	x		1
1		x		(x)		x		x		x	x		1
1	(x)			x		x		x		x		x	1
5		x		x		x		x		x		x	0
Nonerror	19	49	47	20	47	18	54	18	22	51	62	11	
Error	6	7	5	9	7	9	7	2	4	4	2	6	
Per cent of error	16		17		19		11		09		09		
Marginal frequency per cent	31	69	36	67	33	75	25	23	32	68	79	21	

Total errors = 68. Average item error = 11.3 or 13.9 per cent.

Reproducibility = 100 − 13.9 = 86.1 per cent.

+X's parenthesized represent errors in item responses.
*Dotted lines across the "Questions" columns represent "cutting points."

Table 11 indicates that this reranking resulted in a reduced percentage of error for the total County Agent questionnaire responses and for five of the six individual questions. The per cent of error for item 2 rose from 16 to 17 per cent. Items 1, 2, and 3 still do not meet the Guttman criteria of 15 per cent maximum error (16, 17, and 19 per cent respectively) but are within the Eysenk and Crown criteria of 20 per cent. Items 4, 5, and 6 are well below the maximum error percentage. All of the categories have more nonerror than error, the marginal frequencies are adequate (the lowest is 21 percent), and the pattern of error is reasonably random. The reproducibility of the total scale is 86.1 per cent which is within the Eysenk and Crown criteria.

Table 12 presents similar data for the 4 H Club Agents. However, the results were different with this group. The per cent of error was higher in this reranking for each question but number 7, which remained the same. Also, the total error was higher and yielded an 81.3 percentage of reproducibility, which is below the 85 per cent criterion of Eysenk and Crown. All of the categories have greater nonerror than error, the marginal frequencies are satisfactory, and the pattern of errors

TABLE 12

ILLUSTRATION OF THE SCALE ANALYSIS OF THE DICHOT-
OMIZED SIX ITEM JOB SATISFACTION QUESTIONNAIRE FOR
THE SECOND TRIAL RANKING OF 4 H CLUB AGENTS

Frequency	Questions												Scale score
	1		**2**		**3**		**4**		**5**		**7**		
	(1)	(0)	(1)	(0)	(1)	(0)	(1)	(0)	(1)	(0)	(1)	(0)	
8	x		x		x		x		x		x		6
5	x		x		x		x		(x)+		x		5
1	x		x		x		(x)		x		x		5
5	x		x		(x)		x		x		x		5
2	x		(x)		x		x		x*		x		5
2	x		x		x		x		(x)		x		4
1	x		x		x		x		x		x		4
1	x		(x)		(x)		x		x		x		4
1	x		(x)		x		(x)		(x)		(x)		4
1	x		(x)		x		x		x		(x)		4
2	x		x		x		(x)		x		x		3
2	x		x		x		x		(x)		x		3
1	(x)		x		(x)		x		(x)		x		3
1	x		x		(x)		x		x		x		3
1	(x)		x		(x)		(x)		x		x		2
1	(x)		x		(x)		x		x		(x)		2
1	(x)	(x)			x		(x)		x		x		2
1	(x)		x		x		(x)		x		(x)		2
1	x		x		x		(x)		x		x		2
3	x		x		x		x		x		(x)		2
1	x		x		x		x		(x)		(x)		2
2		x	x		x		(x)		x		x		1
1		x	x		x		x		x		(x)		1
3		x	x		x		x		x		x		0
Nonerror	37	6	19	23	20	16	25	13	16	20	31	8	
Error	0	5	4	2	4	8	8	2	7	5	7	2	
Per cent of error	10.4		12.5		25.0		20.8		25.0		18.7		
Marginal fre-quency per cent	77	23	48	52	50	50	69	31	48	52	21	79	

Total errors = 54.   Average item error = 9 or 18.7 per cent.
Reproducibility = 100 - 18.7 per cent = 81.3 per cent.
+X's parenthesized represent errors in item responses.
*Dotted lines across the "Questions" columns represent
 "cutting points."

is reasonably random. Nevertheless, the reproducibility is such that it must be concluded that the job satisfaction attitudes expressed by the 4 H Club Agents in the questionnaire used in this study are not scalable.

Reliability of scales. The maximum likelihood estimate[19] of the split-half reliability of the questionnaire for the County Agents when corrected by the Spearman-Brown Prophecy formula was found to be plus 0.71 and for the 4 H Club Agents plus 0.69. The scaled version of the scores was found to have an estimated reliability of plus 0.80 for the County Agents. This reliability was Guttman's L_4 estimate of the "lower bound" of the parameter value of the reliability coefficient.[20] It is to be expected that the reliability for the 4 H Club Agents would be lower than for the County Agents, since their scores failed to meet the criteria for scalability. However, these reliabilities appeared to be high enough for purposes of studying group differences.

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[19] Johnson, op. cit., pp. 126-127.

[20] Stouffer, Guttman, et al., op. cit., pp. 300-311.

Validity. No direct means of testing the validity of the Job Satisfaction Questionnaire are known to this writer. Krech and Crutchfield state that "the validity of measurement of beliefs and attitudes can be determined only indirectly."[21] Hoppock concludes in discussing the validity of his Job Satisfaction Blank in his standardization study at New Hope, Pennsylvania, that a test of its validity "cannot be expected until there is developed a valid technique of measurement which is independent of the worker's willingness to tell the truth."[22] The ultimate test in the present study would be the accuracy with which the Questionnaire would predict the Agents' behavior toward their jobs. Various writers[23] have pointed out that

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[21] David Krech and Richard S. Crutchfield, Theory and Problems of Social Psychology, New York: McGraw-Hill Book Co., Inc., 1948, p. 209.

[22] Robert Hoppock, Job Satisfaction, New York: Harper and Brothers, 1935, p. 261.

[23] Stephen M. Corey, "Professed Attitudes and Actual Behavior," Journal of Educational Psychology, 28: 271-280, 1937.
   Krech and Crutchfield, op. cit., p. 266.
   Gardner Murphy, Lois B. Murphy, and Theodore M. Newcomb, Experimental Social Psychology, New York: Harper and Brothers, 1937, pp. 889-912.
   Symonds, op. cit., pp. 233-237.
   Thurstone, loc. cit.

both overt and verbal behavior should be considered in this respect for expressed attitudes frequently are not translated into overt action. Even if satisfactory techniques were available for observing these kinds of behavior, difficulties in terms of time and money would preclude making sufficient observations for this study.

Comparison of individuals' scores on a given attitude scale with scores derived from other quite different techniques designed to measure the same attitude or opinion has been suggested as an indirect test of validity.[24] Ratings of attitudes based on interview results or on analyses of case histories and attitudes revealed by projective techniques are examples of this approach. This method was not used in this study because of limitations in time and money and because, as Krech and Crutchfield point out,[25] it may justifiably be considered as merely another way of determining reliability. That two techniques

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[24] Krech and Crutchfield, op. cit., pp. 264-265.
Murphy, Murphy, and Newcomb, op. cit., pp. 908-909.
Harold M. Prochansky, "A Projective Method for the Study of Attitudes," Journal of Abnormal and Social Psychology, 38: 393-395, 1943.

[25] Krech and Crutchfield, op. cit., pp. 264-265.

show similar results may indicate their consistency but not

necessarily their accuracy in measuring what they purport to

measure.

Indirect validation by consideration of the attitudes of

"known" groups, as suggested by Krech and Crutchfield[26] and

Murphy, Murphy, and Newcomb[27] perhaps provides some basis

for establishing validity for the Job Satisfaction Questionnaire.

Krech and Crutchfield indicate that an attitude measurement

instrument is assumed to be valid if it differentiates certain

defined types of people in a direction expected on a priori

grounds. It might be expected that Extension workers would

have a relatively high degree of job satisfaction on such a pri-

ori grounds as that Agents select their occupations voluntarily

and continue in them voluntarily even though by virtue of their

training and experience they could change to other types of work

rather easily; that they realize considerable satisfaction in per-

forming a useful service to society; and that since their work

calls for maintaining friendly relationships with many people,

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[26] Ibid., pp. 262-264.

[27] Murphy, Murphy and Newcomb, op. cit., p. 910.

intense dissatisfaction would preclude success in their work.

That the Agents indicated relatively high satisfaction with their

work may, therefore, offer some basis for assuming that the

questionnaire is reasonably valid.

In view of the apparent lack of direct means of validat-

ing the questionnaire it was therefore necessary in this study

to assume that it had satisfactory validity. Symonds states in

this respect that "there is every reason for taking the results

of an attitude questionnaire at face value as an expression of

opinion, particularly when no immediate issue is at stake."[28]

Intensity Analysis. In addition to providing a rank or-

dering of individuals according to their attitude or a ranking

according to their degree of favorableness, the Guttman tech-

nique also provides by its "intensity analysis" a cutting point

in the rank order of individuals such that the people to the

right of the point may be considered as "favorable" and to the

left as "unfavorable" in their attitude toward an issue. Guttman

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[28] Percival M. Symonds, Diagnosing Personality and
Conduct, New York: D. Appleton-Century Company, 1931, p.
233.

points out that "a rank order alone does not distinguish between being favorable and unfavorable; it merely reflects being <u>more</u> favorable and <u>less</u> favorable actually means being unfavorable."[29]

The intensity score in this study was derived from the weights assigned to the responses to the separate intensity questions which follow each of the job satisfaction questions. Question 5 is reproduced below to illustrate the intensity items and their weights.

> 5. How enthusiastic are you about your occupation?
>
> ___Not at all enthusiastic
> ___Only mildly enthusiastic
> ___Quite enthusiastic
> ___Very enthusiastic
>
> | How strongly do you feel about this? | <u>Weights</u> |
> |---|---|
> | ___Not at all strongly | 0 |
> | ___Quite strongly | 1 |
> | ___Very strongly | 2 |

Intensity analysis is a cross tabulation of the scaled score ranking of individuals or the "content" score and the intensity score. The curve formed by joining the median intensity scores forms the intensity component. The usual curve found is in the form of a U or J. People at either end of this scale feel more strongly than those in the middle. In moving

down this curve a point is reached where intensity of feeling

begins to increase again. This is the zero or neutral point.

In practice this point is not sharply defined but usually is a

broad region of relative indifference or neutrality. If there is

a sharp point in the curve, it indicates that the population is

sharply divided on the issue. Table 13 shows the intensity

analysis of the job satisfaction for the County Agents.

It will be noted in Table 13 that the left side of the

usual U or J curve is missing. This indicates that according

to the questionnaire used in this study, there is practically no

intense job dissatisfaction among the County Agents. However,

the scores are so distributed that an arbitrary classification

of the County Agents into relative job satisfaction groups might

be stated as follows: (a) Those with scores of zero or one (16

per cent) have low job satisfaction or are indifferent to their

jobs, (b) those with scores of 2 or 3 (29.6 per cent) have "me-

dium" job satisfaction and (c) those with scores of 4, 5 or 6

(54.4 per cent) have high job satisfaction.

Table 14 shows the attempted intensity analysis for the

4 H Club Agents. The figures in parentheses do not indicate

the proper relationship between the scaled scores and the in-

tensity scores. This would be expected from the fact that the

TABLE 13

INTENSITY ANALYSIS OF THE SCALED JOB SATISFACTION
QUESTIONNAIRE FOR COUNTY AGENTS

Inten-sity Scores	Scaled content scores							Total
	0	1	2	3	4	5	6	
12			1		2	3	4	10
11			1	2	6	2	(3)*	14
10	1	1	1	2	(5)	(4)	4	18
9	1	1	(3)	(2)	2	2	2	11
8		(3)	2	3	2	3		13
7	(3)		2	1	1			7
6		2	2	2			1	7
5		1						1
Total	5	8	12	12	18	14	12	81

* Numbers in parentheses are positions of median intensity scores.

TABLE 14

INTENSITY ANALYSIS FOR THE SCALED JOB SATISFACTION
QUESTIONNAIRE FOR 4 H CLUB AGENTS

Inten-sity Scores	Scaled content scores							Total
	0	1	2	3	4	5	6	
12				1		2	2	5
11			1		2	2	(3)	8
10			2	1	(4)*	(5)	2	14
9	1	1	(2)	1			2	7
8	(1)	(1)	2	(1)		2		7
7		1	1	2		1		5
6			1					1
5	1							1
Total	3	3	9	6	6	12	9	48

* Numbers in parentheses are positions of median intensity scores.

scaled scores did not meet the criteria for scalability.

Selection of satisfaction groups. Since, as was indicated in Table 8, very few, if any, Agents could be described as being dissatisfied in their jobs in so far as their responses to the Job Satisfaction Questionnaire were concerned, it was of course implicit that a separation of Agents into variable satisfaction groups would represent "more" and "less" satisfied rather than "satisfied" and "dissatisfied" groups. Because the separation would therefore be on the basis of relative satisfaction it was considered desirable for comparison purposes to separate the Agents into groups of fairly equal size.

Since the responses of the County Agents were found to be scalable in the application of Guttman's Technique, the County Agents were separated on the basis of the scaled version of their raw scores. The distribution of the scaled scores is listed on the following page.

By separating between scores 3 and 4 the "more satisfied" group contained 44 Agents and the "less satisfied" group contained 37 Agents. This arbitrary division then provided the

Scale Scores	Frequency
6	12
5	14
4	18
3	12
2	12
1	8
0	5
Total	81

two satisfaction groups of County Agents for the analysis of
the relationship between interest and job satisfaction which
will follow in the next chapter.

Since the Job Satisfaction Questionnaire responses of
the 4 H Club Agents failed to meet the tests of scalability, the
scaled scores could not be used for the determination of rela-
tive satisfaction groups among these Agents. However, the dis-
tribution of raw scores indicated a considerable range in re-
sponses which in turn indicated that although the responses did
not represent satisfactorily unidimensional attitudes according
to the Guttman technique, they could be considered as indicat-
ing varying degrees of job satisfaction. The distribution of these
raw scores appears on the following page.

Raw Score	Frequency
29	1
28	1
27	1
26	5
25	7
24	7
23	4
22	5
21	5
20	3
19	4
18	1
17	0
16	2
15	0
14	2
Total	48

A separation between score 22 and score 23 provided twenty-six Agents in the "more satisfied" and twenty-two in the "less satisfied" groups, which comprise the groups used for the comparison of the interests and job satisfaction of the 4 H Club Agents.

Homogeneity of the satisfaction groups. The homogeneity of the variable satisfaction groups in respect to age and years of experience in the Michigan Extension service was tested and is shown in Table 15. This table indicates the comparison of

TABLE 15

COMPARISON OF MEANS $(\bar{X})$ AND VARIANCES (σ^2) OF
AGES AND YEARS OF EXPERIENCE FOR VARIABLE
SATISFACTION GROUPS OF COUNTY AGENTS
AND 4 H CLUB AGENTS

	"More satisfied"		"Less satisfied"		Tests of homogeneity	
	$\bar{X}$	σ^2	$\bar{X}$	σ^2	F	t or d[a]
County Agents	(N 44)		(N 37)			
Age	43.70	83.75	41.37	92.58	1.10	0.04
Years of experience	15.29	72.31	11.40	65.19	1.11	2.10*
4 H Club Agents	(N 26)		(N 22)			
Age	34.65	78.00	31.40	42.73	1.83	0.63
Years of experience	5.26	24.44	2.90	4.47	5.47**	2.20*

* Significant at the five per cent level or less.

** Significant at the one per cent level or less.

[a] The Behrens-Fisher "d" test is used to test for sifnificance of difference between means when variances are not homogeneous as indicated by a significantly large "F."

the means and variances of the two satisfaction groups of

County Agents and the two satisfaction groups of 4 H Club

Agents.

From Table 15 it is apparent that the satisfaction sub-

groups were not significantly different in terms of age, but that

both the "more satisfied" County Agents and 4 H Club Agents

have had significantly longer experience in the Michigan Exten-

sion Service than have the "less satisfied" Agents. This points

to a direct relationship between length of experience in the work

and satisfaction in it. · However, before it could be concluded that

liking for the work actually increases with the amount of time

spent in it, it would be necessary to determine the proportion

of "less satisfied" Agents who continue in the work but with no

evident increase in satisfaction.

Summary. Variable work effectiveness groups of Agents

were established on the basis of a modified forced ranking rat-

ing by a panel of seven judges who had had adequate opportuni-

ties to observe the work of the Agents and most of whom had

participated in the annual rating of the Agents which is con-

ducted for administrative purposes. The judges ranked each

Agent in one of four fairly equally sized groups ranging from

high to low in terms of comparative over-all success on the job. There was high consistency among the judges as to their "quartile" ratings of the Agents. There also was no significant lack of homogeneity among the "quartiles" of each group of Agents in respect to age and years of experience in the Michigan Extension Service.

Variable job satisfaction groups were established on the basis of their Job Satisfaction Questionnaire scores, since the relationship between job satisfaction and work effectiveness was not generally high. The raw scores were submitted to a scale and intensity analysis. The scores of the County Agents were found to be scalable, but there was no indication of intense dissatisfaction. The raw scores of the 4 H Club Agents failed to meet the criteria of scalability but the range of scores indicated that varying degrees of satisfaction were represented.

The reliability of the Job Satisfaction Questionnaire with the two groups of Agents appeared to be high enough for purposes of studying group differences. It was necessary to assume validity for the instrument since no direct means of validating measures of attitude were available to the writer.

The County Agents were separated into fairly equally sized "more satisfied" and "less satisfied" groups by selecting an arbitrary cutting point in the distribution of the scaled version of their raw scores and the 4 H Club Agents were similarly separated by an arbitrary cutting point in the distribution of their raw scores. There was no lack of homogeneity between the satisfaction groups of either the County Agents or the 4 H Club Agents in respect to age, but the "more satisfied" Agents had significantly longer experience in the Michigan Extension Service than did the "less satisfied" Agents.

CHAPTER VI

THE FINDINGS OF THE STUDY

The purpose of this chapter is to report the findings that resulted from following the procedures and techniques described in Chapters IV and V. A description of the vocational interests of the County Agents and 4 H Club Agents will be given first. This will be followed by the relationship found between the Agent's SVIB scores and their work effectiveness ratings, and the relationship between their SVIB scores and their job satisfaction scores.

Description of the Agents' Interests

Mean SVIB scores. The mean scores of the total group of County Agents and the total group of 4 H Club Agents on all SVIB scales used in this study were computed as the first approach to a description of their interests. These scores, together with the standard deviations and letter scores are presented by Occupational Groups in Table 16.

TABLE 16

MEAN STANDARD SCORES, STANDARD DEVIATIONS, AND LETTER SCORES FOR
81 COUNTY AGENTS AND 48 4 H CLUB AGENTS ON
44 SVIB SCALES

SVIB scales by Occupational Groups	County Agents			4 H Club Agents		
	Mean standard score*	Standard deviation	Letter score	Mean standard score	Standard deviation	Letter score
I						
Artist	20.86	7.28	C	20.20	10.21	C
Psychologist	16.42	11.55	C	16.66	10.38	C
Architect	22.10	9.32	C	19.37	12.10	C
Physician	27.28	8.95	C+	28.75	12.14	C+
Osteopath	32.59	9.06	B-	40.00	10.32	B+
Dentist	24.81	9.76	C+	28.12	12.66	C+
II						
Mathematician	17.04	9.44	C	16.66	10.17	C
Physicist	14.94	11.19	C	13.33	12.26	C
Engineer	26.42	9.27	C+	25.00	12.38	C+
Chemist	23.09	11.79	C	24.16	13.50	C
III						
Production Mgr.	33.58	7.65	B-	33.95	8.45	B-

TABLE 16 (Continued)

SVIB scales by Occupational Groups	County Agents			4 H Club Agents		
	Mean standard score*	Standard deviation	Letter score	Mean standard score	Standard deviation	Letter score
IV						
Farmer	45.31	8.39	A	47.08	7.98	A
Aviator	30.62	9.54	B–	35.00	10.71	B
Carpenter	25.80	9.99	C+	32.08	10.10	B–
Printer	30.62	8.42	B–	34.79	7.99	B
Math.–Sci. Tchr.	36.66	9.09	B	42.91	9.45	B+
Voc. Agr. Tchr.	45.39	9.20	A	48.31	9.00	A
Policeman	31.23	9.41	B–	38.33	9.54	B
Forest Service	38.52	9.83	B	43.33	9.08	B+
V						
YMCA Phys. Dir.	32.84	10.87	B–	43.54	10.21	B+
Personnel Dir.	32.47	10.06	B–	36.04	12.50	B
Public Admin.	40.00	8.22	B+	42.70	10.26	B+
YMCA Secy.	30.12	10.66	B–	34.37	11.47	B
Soc. Sci. Tchr.	36.54	9.64	B	40.62	10.56	B+
City Sch. Supt.	32.59	9.32	B–	32.91	9.67	B–
Minister	25.55	10.12	C+	29.79	9.84	B–

TABLE 16 (Continued)

SVIB scales by Occupational Groups	County Agents			4 H Club Agents		
	Mean standard score*	Standard deviation	Letter score	Mean standard score	Standard deviation	Letter score
VI						
Musician	21.85	10.50	C	29.16	9.42	C+
VII						
C. P. A.	19.51	7.74	C	14.58	7.99	C
VIII						
Accountant	27.41	6.86	C+	26.04	9.41	C+
Office Man.	29.75	7.07	B–	31.87	9.84	B–
Purch. Agent	30.00	7.07	B–	26.87	7.20	C+
Banker	34.32	7.41	B–	30.83	8.21	B–
Mortician	32.59	7.39	B–	35.00	7.72	B
IX						
Sales Mgr.	32.34	9.53.	B–	29.37	8.62	B–
Real Est. Sls.	35.06	6.74	B	34.16	8.22	B–
Life Ins. Sls.	33.33	9.23	B–	32.91	10.10	B–
X						
Advertising Man	27.65	6.95	C+	26..66	7.82	C+
Lawyer	29.50	8.94	B–	26.25	6.73	C+
Author–Journ.	26.91	10.56	C+	25.83	6.48	C+

TABLE 16 (Continued)

SVIB scales by Occupational Groups	County Agents			4 H Club Agents		
	Mean standard score*	Standard deviation	Letter score	Mean standard score	Standard deviation	Letter score
XI						
Pres. Mfg. Conc.	30.37	9.15	B-	27.29	7.07	C+
Int. Maturity	52.00	7.45		53.91	5.74	
Occup. Level	55.38	5.77		50.79	5.36	
Masc.-Femininity	49.63	6.07		49.33	13.78	
Teach. Satisfac.	49:38	7.66		54.62	8.30	

* Mean standard scores of the groups on which the scales were standardized were 50 and standard deviations were 10. Edward K. Strong, Jr., Manual for Vocational Interest Blank for Men, Stanford, California: Stanford University Press, 1951, p. 10.

A study of Table 16 reveals that according to mean scores the interests of the two groups of Agents are somewhat similar and that in general their interests are highest in the Group IV occupations and next highest in the Group V or "social welfare" type of occupations. It appears that their interests are most unlike the interests of people in certified public accountant work (Group VII), in mathematics and physical science occupations (Group II), in the occupation of musician (Group VI), and in some of the Group I occupations. The scores on the remaining occupational scales indicate that in general the interests of these Agents are neither definitely like nor unlike the interests of people in those occupations. The scores on the nonoccupational scales would be considered normal according to Strong's[1] and Nelson's[2] instructions for interpretation of the SVIB. The dispersion of scores as

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[1] Edward K. Strong, Jr., Vocational Interests of Men and Women, Stanford, California: Stanford University Press, 1943, Chapters 10, 11, 12.

[2] Kenneth G. Nelson, "The Interests of Teachers of Vocational Agriculture as Related to Vocational Satisfaction," (unpublished Ph.D. Thesis, University of Minnesota, Minneapolis, 1951, Chapter VII).

indicated by the standard deviations is similar to those found in several of Strong's studies.[3] The fact that the standard deviations are larger for the 4 H Club Agents on 31 of the 45 scales may be due to the normal tendency for smaller samples to show greater variation about the mean.[4]

The high scores for these Agents are generally in keeping with the interests that might be expected of men in County Extension work. The fact that the only mean "A" scores were on the Farmer and the Teacher of Vocational Agriculture scales appears significant in this respect. Since agriculture is essentially the subject matter with which the Agents deal, high scores on the Farmer scale are not surprising. Also, since the Agents theoretically are more concerned with teaching this subject matter than with earning their livelihood as farmers, it is interesting to note that, although the differences are very small, their scores on the Teacher of Vocational Agriculture scale were higher than on the Farmer scale (45.39 versus 45.31 for County Agents; 48.31 versus 47.08 for 4 H Club Agents).

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[3] Strong, op. cit., pp. 108, 109, 126, 174, 192, 231.

[4] Palmer O. Johnson, Statistical Methods in Research, New York: Prentice-Hall, Inc., 1949, p. 34.

It is not the purpose of this study to test the validity of the SVIB, but since the scores on these two scales are almost equally high and since the scales measure occupations that ostensibly have various elements in common, the question might arise as to whether or not they are measuring different interests. The Teacher of Vocational Agriculture scale was constructed by Nelson and although in his study it correlated higher with the Farmer scale than with any other scale, the correlation was only plus 0.548 and Nelson concludes that "this would seem to indicate that the teacher of vocational agriculture scale measures somewhat different interests than does the farmer scale."[5]

Comparison with college seniors. The previous discussion of the Agents' mean scores reflects their interests as compared with the interests of Strong's criterion groups. As a further attempt to describe the interests of these Agents, their scores on thirty-four SVIB scales were compared with the scores reported by Strong[6] of 285 Stanford University

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[5] Nelson, op. cit., p. 73.

[6] Strong, op. cit., pp. 376-377.

senior men representing a variety of college majors. This comparison is presented in Table 17 in the form of the percentages of college seniors, County Agents and 4 H Club Agents who received C, B, B+ and A letter scores. (C+ and B- scores are omitted.)

Several differences of interests are apparent in Table 17. As might be expected, the percentage of A scores is considerably higher for the Agents than for the seniors on the Farmer scale. (County Agents, 51.8; 4 H Club Agents, 66.6; seniors, 15.4.) Also, except for the County Agents' scores on the Carpenter and Printer scales (1.2 and 3.7 percentage respectively of A's) the Agents scored higher than the seniors on the remaining scales in Group IV. The Agents' scores in the Group V occupations are consistently higher than the scores for the seniors.

In the business areas, as represented by the occupations in Groups VII, VIII, and IX, the Agents generally scored lower than the seniors. Exceptions to this will be noted on the Banker scale where the County Agents had a higher percentage of A (6.1 versus 3.5) and B+ (11.1 versus 3.9) scores and on the Life Insurance Salesman scale where by consideration of A and

TABLE 17

PERCENTAGE OF C, B, B+, AND A[1] RATINGS OF 285 COLLEGE SENIORS, 81 COUNTY AGENTS, AND 48 4 H CLUB AGENTS ON 34 SVIB SCALES

SVIB Scales By Occupational Groups	285 College Seniors[2]				48 4 H Club Agents				81 County Agents			
	C	B	B+	A	C	B	B+	A	C	B	B+	A
I												
Artist	50.5	7.7	6.3	4.6	66.6	4.2	4.2	0.0	72.8	1.2	0.0	0.0
Psychologist	61.8	9.8	2.8	3.5	79.1	0.0	2.0	0.0	77.7	3.7	1.2	1.2
Architect	46.3	10.5	7.7	7.4	60.4	2.0	8.3	0.0	55.5	4.9	0.0	0.0
Physician	41.4	15.1	8.4	14.7	39.5	10.4	4.2	12.9	33.3	11.1	4.9	0.0
Dentist	49.5	9.8	9.1	7.7	33.3	10.4	8.3	8.3	50.6	4.9	4.9	0.0
II												
Mathematician	56.8	5.6	4.2	3.9	75.0	0.0	0.0	0.0	80.2	4.9	0.0	0.0
Engineer	36.5	8.8	6.7	21.4	43.7	6.3	6.3	6.3	44.4	12.3	3.7	0.0
Chemist	39.3	9.5	8.8	20.0	52.1	10.4	6.3	4.2	49.3	12.3	10.0	2.4
III												
Production Mgr.	23.2	20.4	11.6	13.3	12.9	12.9	18.7	10.4	8.6	23.4	12.3	3.7
IV												
Farmer	20.4	15.8	17.2	15.4	0.0	8.3	16.6	66.6	0.0	8.6	27.1	51.8
Carpenter	67.7	6.0	3.9	3.2	25.0	15.0	12.9	15.0	44.4	9.8	4.9	1.2
Printer	21.4	20.4	9.5	10.2	8.3	25.0	12.9	15.0	18.5	22.2	3.7	3.7
Math.-Sci. Tchr.	32.3	14.7	9.5	8.4	0.0	18.7	16.6	41.6	9.8	33.3	19.7	17.2
Policeman	41.4	7.0	5.6	2.8	4.2	18.7	18.7	29.1	22.2	28.3	2.4	4.9
Forest Serv. Man	53.0	9.1	5.3	2.1	0.0	20.8	15.0	43.7	2.4	19.7	34.5	17.2

TABLE 17 (Continued)

SVIB Scales By Occupational Groups	285 College Seniors[2]				48 4 H Club Agents				81 County Agents			
	C	B	B+	A	C	B	B+	A	C	B	B+	A
V												
YMCA Phys. Dir.	54.0	10.2	4.2	3.9	4.2	18.7	20.8	41.6	20.9	16.0	11.1	14.8
Personnel Mgr.	27.7	18.2	11.6	9.1	16.6	20.8	10.5	22.9	16.0	9.8	13.5	12.3
YMCA Secy.	62.8	4.6	3.9	1.8	20.8	20.8	10.4	20.8	28.3	13.5	14.8	9.8
Soc. Sci. Tchr.	45.3	10.9	7.7	6.7	10.4	12.9	20.8	39.5	9.8	17.2	22.2	18.5
School Supt.	68.4	6.0	4.9	1.8	16.6	18.7	20.8	6.3	16.0	23.4	11.1	6.1
Minister	73.3	3.2	3.2	0.7	31.2	10.4	10.4	6.3	46.9	7.4	8.6	1.2
VI												
Musician	38.9	11.6	9.8	11.9	33.3	18.7	8.3	2.0	64.1	7.4	4.9	1.2
VII												
C. P. A.	48.1	10.9	5.6	3.5	87.5	0.0	0.0	0.0	74.0	0.0	0.0	0.0
VIII												
Accountant	40.0	9.8	8.4	9.1	37.5	12.9	2.0	2.0	28.3	7.4	2.4	0.0
Office Man	20.4	17.2	15.1	14.0	22.9	16.6	10.4	8.3	23.4	4.9	9.8	1.2
Purch. Agent	26.7	14.4	12.3	11.9	37.2	6.3	2.0	0.0	16.0	16.0	6.1	0.0
Banker	47.0	11.9	3.9	3.5	18.7	20.8	8.3	2.0	9.8	24.6	11.1	6.1
IX												
Sales Manager	28.4	13.0	11.2	13.3	31.2	15.0	6.3	4.2	19.7	16.0	13.5	8.6
Real Est. Sls.	8.1	22.5	13.7	22.1	6.3	18.7	12.9	12.9	4.9	16.0	27.2	6.1
Life Ins. Sls.	31.2	16.1	10.9	10.9	15.0	16.6	16.6	8.3	18.5	14.8	12.3	11.1

TABLE 17 (Continued)

SVIB Scales By Occupational Groups	285 College Seniors[2]				48 4 H Club Agents				81 County Agents			
	C	B	B+	A	C	B	B+	A	C	B	B+	A
X												
Advertising Man	17.2	17.2	15.4	12.6	33.3	10.4	0.0	0.0	37.0	16.0	1.2	4.9
Lawyer	21.4	15.8	10.5	18.2	43.7	6.3	0.0	0.0	25.9	2.4	0.0	0.0
Author-Journ.	23.9	19.6	8.8	7.7	45.8	8.3	2.0	0.0	35.7	2.4	0.0	0.0
XI												
Pres. Mfg. Conc.	27.0	19.6	10.9	5.3	37.5	6.3	0.0	2.0	17.0	18.5	7.4	2.4

[1] C+ and B- scores are omitted.

[2] Adapted from Edward K. Strong, Jr., Vocational Interests of Men and Women, Stanford, California: Stanford University Press, 1943, pp. 376-377, Table 107.

B+ scores together, both groups of Agents scored slightly higher than the seniors (total percentage of A and B+ scores equals 24.9 for 4 H Club Agents, 23.4 for County Agents and 21.8 for the seniors). The high percentages of C scores for the Agents (87.5 for 4 H Club Agents, 74.0 for County Agents) on the C. P. A. scale is one of the more striking interest differences in Table 17. The business interests of Strong's seniors appear to be in keeping with the results of Darley's pattern analysis of 1,000 SVIB's of male clients at the University of Minnesota Testing Bureau which indicated that college and precollege students tend to score high in the business detail occupations, for the highest frequency of primary, secondary and tertiary interest patterns was in this area.[7]

Differences in high scores are evident in the Group X occupations for relatively few Agents received A or B+ scores as compared with the seniors. In all Group I and Group II occupations, the seniors scored somewhat higher than the Agents when A and B+ scores are considered together. Consideration

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[7] John G. Darley, Clinical Aspects and Interpretation of the Strong Vocational Interest Blank, New York: The Psychological Corporation, 1941, p. 20.

of C scores indicates that one of the greatest differences is on

the Mathematician scale (seniors, 56.8; 4 H Club Agents, 75.0;

and County Agents, 80.2).

Profile analysis. Analysis of the Agents' profile answer

sheets[8] was used as a third method of describing their inter-

ests. This step serves to describe interests in terms of occu-

pational groups or occupational types, and serves as a check on

possible distortions by extreme scores that would not be appar-

ent in consideration of mean scores alone. Darley[9] and Strong[10]

have indicated that in general, primary interest types are de-

fined as those related occupations in which a subject obtains

a majority of A or B+ scores and secondary interest types,

those in which he obtains a majority of B+ and B scores. Dar-

ley[11] emphasizes that a subject's highest scores should not be

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[8] A copy of this form, the Hankes Report Form for Strong Vocational Interest Test-Men, is included in Appendix B.

[9] Darley, op. cit., p. 17.

[10] Strong, op. cit., p. 432.

[11] Darley, loc. cit.

considered as representative of a primary interest pattern unless his scores are in the A or B+ categories. In other words, some individuals may have no primary interest type.

Determination of interest types is somewhat subjective in that some interest profiles do not have patterns that form clear cut types and discretion is necessary in their classification. However, as an indication of the relatively small extent to which differences of opinion might occur in this kind of classification, Darley found that two statistical clerks, with no counseling experience, agreed on the classification of 879 out of 1,000 profiles (88 per cent) into primary, secondary, and tertiary interest patterns when working independently after receiving instructions on the procedure. A trained counselor then checked approximately twenty-five per cent of the cases and agreed with the two clerks in 93 per cent of their identification of primary patterns, 80 per cent of their secondary patterns and 67 per cent of their tertiary patterns.[12]

Consequently, using the criteria just discussed, the profile sheets of the Agents were analyzed and the primary and

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[12] Ibid., p. 18.

secondary interest patterns were tallied. The results of this
step are shown in Table 18.

In the majority of cases high scores on the Production
Manager Scale accompanied high scores in Group IV and high
scores on the President of Manufacturing Concern scale accom-
panied high scores in Group IX. Since Production Manager
correlates plus 0.44 with Group IV and President of Manufac-
turing Concern correlates plus 0.41 with Group IX,[13] high
scores on these two scales were considered as supporting oc-
cupations for Groups IV and IX respectively, which is in keep-
ing with Strong's suggestions for interpretation of profile.[14]

It is apparent from Table 18 that by consideration of
primary and secondary interest patterns together, as by the
consideration of mean scores in Table 16, the County Agents
and 4 H Club Agents as groups indicated highest interests in
the Group IV (technical) occupations (75 and 77 per cent of the
County Agents and 4 H Club Agents respectively) and second
highest interest in the Group V (social welfare) occupations

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[13] Strong, op. cit., pp. 136-137.

[14] Ibid., pp. 432-438.

TABLE 18

SUMMARY OF INTERESTS OF COUNTY AGENTS AND 4 H CLUB AGENTS BY PRIMARY (P) AND SECONDARY (S) INTEREST TYPES

SVIB Occupational Groups	County Agents (N 81)						4 H Club Agents (N 48)					
	P	%*	S	%	Tot.	%	P	%	S	%	Tot.	%
IV (Technical)	41	50	20	25	61	75	20	42	17	35	37	77
V (Social welfare)	23	28	26	32	49	60	19	40	16	33	35	73
IX (Sales)	8	10	12	15	20	25	3	6	7	15	10	21
VIII (Business detail)	5	6	7	9	12	15	1	2	2	4	3	6
I (Artist, etc.)	1	1	9	11	10	12	3	6	5	10	8	16
X (Writing)	3	4	2	2	5	6	0	0	0	0	0	0
III (Physical science)	0	0	2	2	2	2	0	0	1	2	1	2
Totals	81	99	78	96			46	96	48	99		

* Indicates approximate per cent of <u>total</u> County Agents (81) or 4 H Club Agents (48).

(60 and 72 per cent respectively). Since the percentage of Agents with primary and secondary patterns in Group V is rather close to the percentage with patterns in Group IV, especially for the 4 H Club Agents (73 per cent versus 77 per cent) there is some indication that the Agents are interested in combined technical-social welfare activities. Apparently their interests reflect slightly more of the technical responsibilities inherent in their jobs than of the social or service aspects of them.

That a larger percentage of 4 H Club Agents than County Agents obtained primary and secondary interest patterns in the Group V occupations (73 per cent versus 60 per cent) ostensibly can be attributed to the fact that two different groups of people were tested. Strong states that "the primary conclusion regarding interests of men between 25 and 55 years of age is that they change very little.[15] He did find in his follow-up study of an occupationally heterogeneous group of 168 Stanford University seniors retested ten years after graduation that the greatest changes were in the social welfare group scales which were

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[15] Ibid., p. 313.

substantially higher on retest.[16]   In spite of this evidence to

the contrary, it would be interesting to know whether or not

the higher scores for the 4 H Club Agents reflect a high so-

cial service tendency or "missionary zeal" that might be at-

tributable to their younger age and whether or not this would

gradually decline in later years as might be indicated in the

comparison of their scores with the County Agents' Group V

scores.

In Chapter I it was indicated that because of the nature

of County Extension work, persuasive interests were believed

to be essential for County Agents and 4 H Club Agents.   Table

18 shows that the third largest percentage of primary and sec-

ondary interest patterns was in Group IX, the sales occupations.

However, only ten per cent of the County Agents and six per

cent of the 4 H Club Agents had primary interest patterns and

fifteen per cent of both groups had secondary interest patterns

in sales occupations.   The B and B- scores shown in Table 16

for the sales scales would be interpreted according to Strong

as meaning that "the person probably has those interests, but

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[16] Ibid., p. 267.

we cannot be so sure of the fact as in the case of A ratings."[17]
Therefore, to the extent that these scales reflect persuasive
interests, it must be concluded that the Agents possess neither
markedly high nor markedly low persuasive interests. The re-
lation of these scales to work effectiveness will be discussed
later.

Considering County Agents and 4 H Club Agents together,
the next largest percentage of primary and secondary interest
patterns was in the Group I occupations. Table 16 shows that
the higher mean scores in this Group were on the Physician,
Osteopath, and Dentist scales. Strong reports correlations of
two of these scales (Physician and Dentist) with the total scales
in Group IV. These correlations are low but positive (plus 0.18
for Physician and plus 0.43 for Dentist).[18] It might therefore
be concluded that the Agents' scores in Group I, at least the
scores on these three scales in that Group, tend to reflect or
support their primary interest patterns in Group IV.

Table 18 indicates that a small percentage of Agents
have primary and secondary interest patterns in the Group VIII

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[18] Ibid., p. 136.

(business detail) occupations. Since the Agents' work involves a considerable amount of administrative detail work, it perhaps is not surprising that some Agents indicated high interests in this area.

Summary of description of Agents' interests. The results of the foregoing approaches to a description of the Agents' interests may be summarized as follows: ·

a. In general, the interests of the two groups of Agents are somewhat similar.

b. Their interests are highest in the group of so-called "technical" occupations with very high interests in the specific occupations of farmer and vocational agriculture teacher.

c. Their interests are next highest in the area designated as the "social welfare" type of occupations.

d. Considered as a total group, the Agents do not have high interests in any of the remaining SVIB occupations. However, a minority of Agents have high interests in sales and business detail types of occupations, and in the specific occupations of physician, osteopath and dentist.

e. The Agents have quite consistently low interests in the mathematical and physical science areas and in the specific occupations of certified public accountant, artist, psychologist, architect, and musician.

Relationship Between SVIB Scores and Work Effectiveness

County Agents. The comparison of the means and variances of the SVIB scale scores for the County Agents who were rated in the three highest "quartiles" on work effectiveness and those who were rated in the lowest "quartile" is presented in Table 19.[19]

From Table 19 it will be noted that for the County Agents who were rated in the three highest "quartiles," the mean scores

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[19] In Table 19 and in the remaining tables in which means and variances are compared (Tables 20, 25, 26, 27, 30, and 34) the SVIB scale scores are expressed as standard score units with means of 50 and variances of approximately 100 for the populations on which the scales were standardized. (Edward K. Strong, Jr., Manual for Vocational Interest Blank for Men, Stanford, California: Stanford University Press, 1951, p. 10.) Also the Behrens-Fisher statistic "d" as explained on page 116, is used to test for the significance of the difference between means when the variances are not homogeneous as indicated by a significantly large "F." (Palmer O. Johnson, Statistical Methods in Research, New York: Prentice-Hall, Inc., 1949, pp. 73-75.)

TABLE 19

COMPARISON OF MEANS $(\overline{X})$ AND VARIANCES (σ^2)[1] ON 44 SVIB SCALES FOR COUNTY
AGENTS RATED IN THE THREE HIGHEST ''QUARTILES'' AND THE
LOWEST ''QUARTILE'' ON WORK EFFECTIVENESS

SVIB scales by Occupational Groups	Three highest ''quartiles'' (N 60)		Lowest ''quartile'' (N 21)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
I						
Artist	20.0	57.6	23.3	33.3	1.73	1.83
Psychologist	17.7	153.7	72.9	61.5	2.49*	2.05
Architect	21.5	80.7	23.8	104.8	1.29	0.97
Physician	26.8	89.7	28.6	52.9	1.69	0.76
Osteopath	32.2	81.6	33.8	84.8	1.03	0.72
Dentist	23.7	98.1	28.1	76.2	1.28	1.75
II						
Mathematician	16.7	90.4	18.1	86.2	1.05	0.58
Physicist	15.0	113.5	14.8	166.2	1.46	0.12
Engineer	25.8	85.7	28.1	86.2	1.01	0.96
Chemist	23.2	154.2	22.9	101.5	1.52	0.00
III						
Prod. Manager	33.7	64.3	33.3	43.4	1.48	0.18

TABLE 19 (Continued)

SVIB scales by Occupational Groups	Three highest "quartiles" (N 60)		Lowest "quartile" (N 21)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
IV						
Farmer	43.8	61.3	49.5	74.8	1.22	2.81**
Aviator	30.2	83.0	31.9	116.2	1.40	0.72
Carpenter	24.5	89.6	29.5	114.8	1.28	2.02*
Printer	30.5	69.2	31.0	79.1	1.14	0.20
Math.-Sci. Tchr.	37.5	83.5	34.3	75.7	1.10	1.41
Voc. Agr. Tchr.	45.1	78.0	46.1	106.3	1.36	0.43
Policeman	31.2	85.1	31.4	102.9	1.20	0.14
Forest Service	37.8	113.9	40.5	44.8	2.54*	1.35
V						
YMCA Phys. Dir.	33.5	107.9	30.9	149.1	1.38	0.92
Personnel Dir.	34.0	92.2	28.1	106.2	1.15	2.38*
Public Admin.	41.0	63.4	37.1	71.5	1.12	1.88
YMCA Secy.	30.8	92.5	28.1	176.2	1.90	0.86
Soc. Sci. Tchr.	38.0	80.7	32.4	109.1	1.35	2.36*
City Sch. Supt.	33.8	68.1	29.0	129.1	1.89*	1.78
Minister	25.3	89.7	26.2	144.8	1.61	0.33

TABLE 19 (Continued)

SVIB scales by Occupational Groups	Three highest "quartiles" (N 60)		Lowest "quartile" (N 21)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d^1
VI						
Musician	22.0	104.4	21.4	132.9	1.27	0.20
VII						
C. P. A.	20.5	55.7	16.7	63.4	1.13	1.98
VIII						
Accountant	27.8	47.8	26.2	44.8	1.06	0.95
Office Man	30.2	45.7	28.6	62.9	1.37	0.88
Purch. Agent	30.5	55.7	28.6	32.9	1.69	1.08
Banker	34.3	62.3	34.3	35.7	1.74	0.00
Mortician	32.5	63.1	32.8	31.5	2.00*	0.18
IX						
Sales Manager	33.2	96.6	30.0	70.0	1.38	1.32
Real Est. Sls.	35.0	49.2	35.2	36.2	1.36	0.14
Life Ins. Sls.	34.0	88.8	31.4	72.9	1.22	1.10
X						
Advertising Man	28.3	54.8	25.7	25.7	2.13*	1.78
Lawyer	29.8	86.4	28.6	62.9	1.37	0.55
Author-Journ.	26.8	42.3	27.1	89.1	2.11*	0.14

TABLE 19 (Continued)

SVIB scales by Occupational Groups	Three highest "quartiles" (N 60)		Lowest "quartile" (N 21)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
XI						
Pres. Mfg. Conc.	30.2	83.0	30.9	89.1	1.07	0.34
Int. Maturity	52.6	64.6	50.4	27.1	2.38*	1.43
Occup. Level	55.7	29.2	54.5	57.2	1.46	0.83
Masc.-Femininity	49.6	32.8	49.7	49.9	1.52	0.40
Teach. Satisfac.	50.1	48.2	47.2	84.9	1.76*	1.32

* Significant at the five per cent level or less.

** Significant at the one per cent level or less.

[1] Means and variances of Strong's criterion groups and the use of the "d" test are explained in footnote 19, page 204.

are significantly <u>higher</u> than for the County Agents who were

rated in the lowest "quartile" for the Personnel Director (34.0

versus 28.1) and the Social Science High School Teacher scales

(38.0 versus 32.4). The differences in the mean scores for

these scales are significant at the five per cent level of con-

fidence or less. The difference in the mean scores on the

Certified Public Accountant scale (20.5 versus 16.7) just missed

being significant at this level. A "t" value of 1.99 was neces-

sary (with 80 degrees of freedom),[20] but this value was 1.98.

The mean scores for the higher rated Agents are sig-

nificantly <u>lower</u> than the mean scores for the lower rated Agents

on the Carpenter (24.5 versus 29.5) and the Farmer scales

(43.8 versus 49.5). On the Carpenter scale the difference was

significant at the five per cent level, but the difference on the

Farmer scale was significant at the one per cent level or less.

In order to analyze differences in the interests of the

two extreme work effectiveness groups, the means and variances

of the SVIB scores for the highest and the lowest "quartile"

groups were compared. These results are shown in Table 20.

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[20] George W. Snedecor, <u>Statistical Methods</u>, Ames, Iowa: Collegiate Press, Inc., 1937, p. 55, Table 3.8.

TABLE 20

COMPARISON OF MEANS ($\overline{X}$) AND VARIANCES (σ^2)[1] ON 44 SVIB SCALES FOR COUNTY AGENTS RATED IN THE HIGHEST ''QUARTILE'' AND THE LOWEST ''QUARTILE'' ON WORK EFFECTIVENESS

SVIB scales by Occupational Groups	Highest ''quartile'' (N 21)		Lowest ''quartile'' (N 21)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
I						
Artist	18.6	52.8	23.3	33.3	1.58	2.35*
Psychologist	16.2	214.7	12.9	61.5	3.49**	0.28
Architect	21.4	102.8	23.8	104.8	1.01	0.75
Physician	25.7	95.7	28.6	52.9	1.81	1.08
Osteopath	29.5	54.8	33.8	84.8	1.55	1.66
Dentist	22.9	66.5	28.1	76.2	1.15	2.04*
II						
Mathematician	17.1	71.5	18.1	86.2	1.21	0.33
Physicist	14.3	105.7	14.8	166.2	1.57	0.27
Engineer	24.8	106.2	28.1	86.2	1.23·	1.10
Chemist	23.3	193.3	22.9	101.5	1.85	0.10
III						
Prod. Manager	34.3	65.7	33.3	43.3	1.51	0.40

TABLE 20 (Continued)

SVIB scales by Occupational Groups	Highest "quartile" (N 21)		Lowest "quartile" (N 21)		Test of homogeneity	
	$\overline{x}$	σ^2	$\overline{x}$	σ^2	F	t or d[1]
IV						
Farmer	44.3	45.7	49.5	74.8	1.64	2.20*
Aviator	28.6	72.9	31.9	116.2	1.59	1.11
Carpenter	23.3	83.4	29.5	114.8	1.37	2.01
Printer	29.5	74.8	31.0	79.1	1.06	0.53
Math.-Sci. Tchr.	35.7	85.7	34.3	75.7	1.13	0.52
Voc. Agr. Teacher	47.7	62.6	46.1	106.3	1.69	0.53
Policeman	31.4	72.9	31.4	102.9	1.41	0.00
Forest Service	38.1	181.2	40.5	44.8	4.04**	0.73
V						
YMCA Phys. Dir.	32.8	71.5	30.9	149.1	2.08	0.59
Personnel Dir.	33.3	103.3	28.1	106.2	1.02	1.66
Public Admin.	39.5	54.8	37.1	71.5	1.30	0.97
YMCA Secy.	29.5	124.7	28.1	176.2	1.41	0.37
Soc. Sci. Teacher	37.6	84.8	32.4	109.1	1.29	1.70
City Sch. Supt.	33.8	44.8	29.0	129.1	2.88*	1.67
Minister	22.8	81.5	26.2	144.8	1.78	1.02

TABLE 20 (Continued)

SVIB scales by Occupational Groups	Highest "quartile" (N 21)		Lowest "quartile" (N 21)		Test of homogeneity	
	$\bar{X}$	σ^2	$\bar{X}$	σ^2	F	t or d[1]
VI						
Musician	21.9	96.2	21.4	132.9	1.38	·0.14
VII						
C.. P. A.	21.4	52.9	16.7	63.4	1.20	2.02*
VIII						
Accountant	27.6	59.1	26.2	44.8	1.32	0.64
Office Man	30.9	79.1	28.6	62.9	1.26	0.92
Purch. Agent	31.4	52.9	28.6	32.9	1.61	1.41
Banker	37.6	69.1	34.3	35.7	1.94	1.50
Mortician	32.4	59.1	32.8	31.5	1.88	0.20
IX						
Sales Manager	34.3	65.7	30.0	70.0	1.06	1.69
Real Est. Sls.	34.3	45.7	35.2	36.2	1.26	0.49
Life Ins. Sls.	33.3	93.4	31.4	72.9	1.28	0.67
X						
Advertising Man	27.1	41.5	25.7	25.7	1.61	0.78
Lawyer	28.6	62.9	28.6	62.9	1.00	0.00
Author-Journ.	26.2	34.8	27.1	89.1	2.56*	0.37

TABLE 20 (Continued)

SVIB scales by Occupational Groups	Highest "quartile" (N 21)		Lowest "quartile" (N 21)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
XI						
Pres. Mfg. Conc.	31.4	62.9	30.9	89.1	1.42	0.17
Int. Maturity	53.1	18.8	50.4	27.1	1.44	1.81
Occup. Level	55.9	27.4	54.5	57.2	2.09	0.75
Masc.-Femininity	49.8	34.0	49.7	49.9	1.47	0.34
Teach. Satisfac.	49.0	42.9	47.2	84.9	1.98	0.72

* Significant at the five per cent level or less.

** Significant at the one per cent level or less..

[1] Means and variances of Strong's criterion groups and the use of the "d" test are explained in footnote 19, page 204.

From Table 20 it will be noted that the mean scores of

the County Agents who were rated in the highest "quartile"

scored significantly <u>higher</u> than those rated in the lowest "quar-

tile" on the Certified Public Accountant scale (21.4 versus 16.7).

This difference was significant at the five per cent level or

less. The highest "quartile" scored significantly <u>lower</u> than the

lowest "quartile" Agents on the Artist (18.6 versus 23.3), Den-

tist (22.9 versus 28.1), and Farmer scales (44.3 versus 49.5).

These differences are significant at the five per cent level or

less. The differences on the Carpenter scale (23.3 versus

29.5) just missed being significant. A "t" value of 2.02 is nec-

essary for significance (with 41 degrees of freedom)[21] but this

value was only 2.01.

In reference again to persuasive interests in County

Agents it will be noted that no significant differences appeared

on the sales scales (Group IX) in either the comparisons in

Table 19 or in Table 20. This indicates that although Exten-

sion administrators have felt that persuasive interests were

related to success in county Extension work, persuasive

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[21] <u>Loc. cit.</u>

interests as might be indicated by these scales fail to show

this relationship. However, it is possible that the type of in-

terests indicated by the sales scales represent a more restricted

concept of persuasive interests than is appropriate in county Ex-

tension work. It was mentioned in Chapter I that the "selling"

phase of the Agents' job is in terms of ideas and programs.

Therefore it is conceivable that the type of interests represented

in the Personnel Director and Social Science High School Teacher

scales indicates more nearly the type of persuasive interests

that is applicable to these men. A much more exhaustive anal-

ysis of this matter is necessary before any definite conclusion

can be made, but if this latter concept of persuasive interests

was found to be appropriate, it could be concluded that there

is some evidence that the "more effective" Agents could be dis-

tinguished from the "less effective" Agents on this basis.

It may also be of interest to note here that the relation-

ships in Tables 19 and 20 on the Teacher of Vocational Agri-

culture and the Teaching Satisfaction scales are in keeping with

those of Nelson who found that the difference on these scales

was not significant between 75 "more successful" and 25 "less successful" vocational agriculture teachers.[22]

Although the number of cases in which the variance between the groups compared in Tables 19 and 20 does not appear to be excessive, it is evident that the assumption mentioned in Chapter IV regarding the heterogeneity of these scores was valid and that the testing of the significance of the differences in variances was justifiable. In considering Tables 19 and 20 together, the variances were significantly different on the Psychologist, Forest Service Man, City School Superintendent, and Author-Journalist scales, and there appears to be little in the way of generalizations to be drawn from them.

Combined comparisons. To aid in pointing out further salient results of Tables 19 and 20 the SVIB scales on which significantly different scores were found are summarized in Table 21 which also includes the mean scores of the four separate "quartile" rating groups.

Table 21 indicates again that the mean scores for the total group of Agents who were rated in the three highest

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[22] Nelson, op. cit., pp. 63, 148.

TABLE 21

SUMMARY OF SVIB SCALES ON WHICH MEAN SCORES OF "MORE EFFECTIVE" AND
"LESS EFFECTIVE" COUNTY AGENTS DIFFERED SIGNIFICANTLY

SVIB scales	Mean Standard Scores					"t" Tests[a]	
	$Q1,2,3$[b] total (N 60)	Q1 (N 21)	Q2 (N 19)	Q3 (N 20)	Q4 (N 21)	Q1,2,3 versus Q4	Q1 versus Q4
"More effective" Agents higher than "less effective" Agents							
Personnel Director	34.0	33.3	34.7	34.0	28.1	2.38*	1.66
Social Sci. H. S. Teacher	38.0	37.6	37.4	39.0	32.4	2.36*	1.70
Certified Public Accountant	20.5	21.4	19.6	20.5	16.7	1.98	2.02*

TABLE 21 (Continued)

SVIB scales	Mean standard scores					"t" Tests[a]	
	Q1,2,3[b] total (N 60)	Q1 (N 21)	Q2 (N 19)	Q3 (N 20)	Q4 (N 21)	Q1,2,3 versus Q4	Q1 versus Q4
"More effective Agents lower than "less effective" Agents							
Artist	20.0	18.6	22.6	19.0	23.3	1.83	2.35*
Dentist	23.7	22.9	25.8	22.5	28.1	1.75	2.04*
Farmer	43.8	44.3	43.7	43.5	49.5	2.81**	2.20*
Carpenter	24.5	23.3	26.3	24.0	29.5	2.02*	2.01

*Significant at the five per cent level or less.

**Significant at the one per cent level or less.

[a]The "d" test was not used on any comparisons in this table.

[b]Indicates "quartiles" numbered consecutively from 1 (highest) to 4 (lowest).

"quartiles" (Q 1, 2, 3) were significantly higher on the Per-

sonnel Director and Social Science High School Teacher scales

than were the mean scores for the Agents who were rated in

the lowest "quartile" (Q 1, 2, 3 versus Q 4), but that the mean

scores for the two extreme "quartile" groups (Q 1 versus Q 4)

failed to show a significant difference. Since the mean scores

on these two scales were slightly higher for the combined group

than for the highest group alone, it follows that the Agents in

the two middle "quartile" groups evidenced higher interests in

these two occupations than did the Agents in the highest "quar-

tile" alone.

In the case of the Certified Public Accountant scale, the

highest "quartile" group (Q 1) scored significantly higher than

the lowest quartile group (Q 4). It should be pointed out, how-

ever, that the "t" value of 2.02 in this case is just above the

2.01 value (with 41 degrees of freedom) necessary for signifi-

cance at the five per cent level,[23] which indicates that the dif-

ference in mean scores for these two groups is barely signifi-

cant. The relatively small difference between the comparison

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[23] Snedecor, op. cit., p. 55, Table 3.8.

of the highest (Q 1) and the lowest (Q 4) groups and the comparison of the three highest and lowest groups (2.02 versus 1.98), indicates that in general the Agents who were rated as "more effective" scored barely significantly higher on this scale than did the Agents who were rated as "less effective."

On the Farmer scale a significant difference exists between the "more effective" and the "less effective" Agents when either the highest "quartile" group (Q 1) alone or the three highest groups combined (Q 1, 2, 3) are considered. The means on this scale show that the second (Q 2) and the third (Q 3) "quartile" groups scored slightly lower than the highest group. The scores on this scale are the highest of any of the scales in Table 21. The corresponding letter scores for each of the three highest "quartiles" is B+ and for the lowest "quartile," A. These results indicate that according to mean scores, all of the County Agents manifested high interests in the farmer area, but that the "more effective" Agents expressed significantly lower interest in this area than did the "less effective" Agents.

The differences in the Carpenter scale scores are similar to those of the Certified Public Accountant scores in that

although the difference between the means of the three highest "quartiles" and the lowest "quartile" is significant, the difference between the extreme "quartile" groups (Q 1 and Q 4) misses significance by one one-hundredth of a point. In other words, the difference between the mean score of the highest and the lowest "quartile" groups is almost high enough to be statistically significant.

In keeping with Johnson's definition of the criteria of statistical significance (given on page 113), it is evident that the majority of the differences shown in Table 21 "may be significant but further observations are necessary."[24] On only the Farmer scale is the difference such that it could have happened by chance errors in one per cent or less of the cases. Therefore, in the further references to these differences in this study it is implicit that with the exception of the Farmer scale, the significance is interpreted in terms of this limitation.

Occupational grouping. In further reference to Table 21 it may be pointed out that the seven scales which indicate significant differences are not scattered widely among the forty

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[24] Johnson, op. cit., p. 32.

occupational scales but are located within four of Strong's

eleven Occupational Groups. The high interests of the "more

effective" groups are in the "social welfare" Occupational

Group (Personnel Director and Social Science High School

Teacher) and in Group VII, Certified Public Accountant. The

low interests for the "more effective" groups are in the Group

I (Artist and Dentist) and Group IV (Farmer and Carpenter).

Although none of the other scales in Tables 19 and 20

were significantly different, it is of interest to note the number

of additional scales in Groups V, I, and IV on which the mean

scores differed in the same direction that the scales listed in

Table 21 differed. The directions of these differences are

shown in Table 22.

As Table 22 indicates, with the exception of the Minister

scale in Group V, and the Psychologist scale in Group I, the

scales in these Groups differ in the same direction as the

scales in these Groups in which the differences were signifi-

cant. In Group IV the differences are not quite as uniform,

with exceptions existing in the last three scales of that Group.

Although there is considerable uniformity of direction

of the differences among the scales of these Groups, it indicates

TABLE 22

DIRECTIONS OF MEAN SVIB SCORE DIFFERENCES IN OCCUPATIONAL GROUPS
V, I, AND IV FOR COUNTY AGENTS

SVIB scales	Highest "quartile"	Three highest "quartiles"
Group V		
YMCA Physical Director	Higher than lowest "Q"	Higher than lowest "Q"
Personnel Director	Higher than lowest "Q"	Higher than lowest "Q"
Public Administrator	Higher than lowest "Q"	Higher than lowest "Q"
YMCA Secretary	Higher than lowest "Q"	Higher than lowest "Q"
Social Science High School Teacher	Higher than lowest "Q"	Higher than lowest "Q"
City School Superintendent	Higher than lowest "Q"	Higher than lowest "Q"
Minister	Lower than lowest "Q"	Lower than lowest "Q"
Group I		
Artist	Lower than lowest "Q"	Lower than lowest "Q"
Psychologist	Higher than lowest "Q"	Higher than lowest "Q"
Architect	Lower than lowest "Q"	Lower than lowest "Q"
Physician	Lower than lowest "Q"	Lower than lowest "Q"
Osteopath	Lower than lowest "Q"	Lower than lowest "Q"
Dentist	Lower than lowest "Q"	Lower than lowest "Q"

TABLE 22 (Continued)

SVIB scales	Highest "quartile"	Three highest "quartiles"
Group IV		
Farmer	Lower than lowest "Q"	Lower than lowest "Q"
Aviator	Lower than lowest "Q"	Lower than lowest "Q"
Carpenter	Lower than lowest "Q"	Lower than lowest "Q"
Printer	Lower than lowest "Q"	Lower than lowest "Q"
Mathematics–Physical Science H. S. Teacher	Higher than lowest "Q"	Higher than lowest "Q"
Teacher of Vocational Agriculture	Higher than lowest "Q"	Lower than lowest "Q"
Policeman	Same as lowest "Q"	Lower than lowest "Q"

possible trends only. Strong suggests that scores on related

occupational scales should be considered in the interpretation

of the SVIB.[25] However, since the scores were significantly

different on only two scales in each Group, sufficient evidence

is lacking to support the contention that the "more effective"

and "less effective" County Agents can be differentiated in

terms of general interest types alone.

Intensity of relationships. In order to determine the

intensity of the relationships between work effectiveness and

the four SVIB scales in Table 21 on which significant differ-

ences occurred when the total group of "more effective" County

Agents was compared with the "less effective" Agents (Person-

nel Director, Social Science High School Teacher, Farmer, Car-

penter), biserial correlations were computed. These correla-

tions are reported in Table 23. It will be noted that although

these correlation coefficients do not appear to be large, each

one is significant at the one per cent level of confidence or

less, according to Snedecor's table for determining the significance

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[25] Edward K. Strong, Jr., Manual for Vocational Interest Blank for Men, Stanford, California: Stanford University Press, 1951, p. 11.

TABLE 23

CORRELATION COEFFICIENTS BETWEEN FOUR SVIB
SCALES AND WORK EFFECTIVENESS RATINGS
FOR 81 COUNTY AGENTS[1]

SVIB Scales	Biserial Correlations
Personnel Director	+.342**
Social Science High School Teacher	+.357**
Farmer	-.410**
Carpenter	-.298**
(79 Degrees of Freedom)	

** Significant at the one per cent level or less.

[1] Three highest "quartiles" (N 60) versus lowest "quartile" (N 21).

of correlation coefficients.[26] Also, they tend to correspond to

the "t" test values since the highest coefficient is on the Farmer

scale ("t" value 2.81) and the lowest is on the Carpenter scale

("t" value 2.02).

Prediction from significantly different scales. In view

of the position stated previously in this study that Extension

administrators consider the majority of the Agents to be

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[26] Snedecor, op. cit., p. 125, Table 7.2.

satisfactorily effective in their jobs, the concern of the General

Research Project is focused more directly upon determining

means of preventing the selection of Agents who will not be

effective in their work. In an effort to check on the usefulness

of the relationships found in the four scales just discussed, an

attempt was therefore made to predict the County Agents who

would be rated as "less effective" by means of these scales.

This step represented in effect a hypothetical situation in which

an Extension administrator would use these data as one of the

criteria for selecting new County Agents. As Super[27] and

Thorndike[28] have emphasized, a final test of the validity of

differences with small numbers of cases must rest upon cross-

validation with other similar groups and this is planned as a

future step in the General Research Project.

In a selection or counseling situation, letter scores

would be more useful than standard scores since they are

easier to obtain from the profile sheet and since most of

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[27] Donald E. Super, Appraising Vocational Fitness, New York; Harper & Brothers, 1949, pp. 51-52.

[28] Robert L. Thorndike, Personnel Selection, New York: John Wiley and Sons, Inc., 1949, pp. 54-60.

Strong's suggestions for interpretation are in terms of letter

scores.[29]   Although it was stated on page 225 that "more ef-

fective" and "less effective" County Agents could not be differ-

entiated on the basis of general interest types alone, some con-

sideration could justifiably be given to scores on related occu-

pations in Groups IV and V since, as was pointed out in Table

22, several of them differ in the same direction as the signif-

icantly different scales in these Groups and since Strong sug-

gests that scores on related scales should be considered in the

interpretation of the SVIB.[30]   Therefore, the criteria followed

in selecting profile sheets representing Agents predicted to be

"less effective" were that the sheets should generally have let-

ter scores as high as or higher than the letter scores corres-

ponding to the mean standard scores of the "less effective"

Agents on the Farmer (A) and the Carpenter (B-) scales and

as low or lower than the mean standard scores on the Person-

nel Director (C-) and Social Science High School Teacher scales

(B-).   A few cases were predicted to be "less effective" in

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[29] Strong, loc. cit.

[30] Loc. cit.

which not more than one scale score was slightly above or

below these criteria, but where related scale scores were high

or low in the appropriate direction.

After the profile sheets were thus selected, the Agents'

work effectiveness ratings were checked. The Agents whose

scores were within the criterion scores were designated as

the Agents predicted to be "less effective" and those whose

scores did not fall within the criterion scores were designated

as the Agents predicted to be "more effective." Table 24 shows

the comparison of these two groups with their actual work ef-

fectiveness ratings.

The chi square test of the significance of the comparison

in this table indicates that the hypothesis that the accuracy of

the prediction was not greater than would have occurred by

chance factors alone must be rejected. Twenty-four cases

fell within the criterion scores established for the Agents pre-

dicted to be "less effective." Of these 24 predicted cases, 13

actually had "less effective" and 11 had "more effective" rat-

ings. The total number of actually "less effective" Agents,

21, is approximately one-third of the number of actually "more

effective" Agents, sixty. If chance factors alone were operating,

TABLE 24

COMPARISON OF COUNTY AGENTS PREDICTED TO BE "LESS EFFECTIVE" WITH THOSE
PREDICTED TO BE "MORE EFFECTIVE" ON THE BASIS OF SCORES
ON FOUR DIFFERENTIATING SVIB SCALES

Group	Actual Work Effectiveness Rating Groups						Total fre-quency
	"Less effective"			"More effective"			
	Fre-quency	Per cent	χ^2 contri.	Fre-quency	Per cent	χ^2 contri.	
Predicted to be "less effective"	13	54.2	7.3877	11	45.8	2.5851	24
Predicted to be "more effective"	8	14.1	3.1194	49	85.9	1.0898	57
Totals	21			60			81

$$\chi^2 = 14.1820* \qquad df = 1 \qquad P = <.01$$

*Significant at the one per cent level or less.

there would then be about a one to three chance that an Agent predicted to be "less effective" would actually be in that category, rather than in the "more effective" group. In terms of the data in Table 24, by chance only about six of the 24 cases predicted to be "less effective" should be expected to be in the "less effective" group and about 18 in the "more effective" group. It is apparent therefore that prediction by means of the four SVIB scales was considerably more accurate than would have been attained by chance factors. This step provides preliminary validity for the predictive value of these scales.

Analysis of the interests of 4 H Club Agents. Table 25 includes the comparison of the means and variances on the SVIB scales for the 4 H Club Agents who were rated in the three highest "quartiles" on work effectiveness and those rated in the lowest "quartile."

The most striking result in Table 25 is the fact that the mean scores for the "more effective" 4 H Club Agents are neither significantly higher nor significantly lower than for the "less effective" Agents on any scales of the SVIB. The highest "t" value is on the President of Manufacturing Concern scale (1.92) but it falls short of significance at the five per cent

TABLE 25

COMPARISON OF MEANS $(\overline{X})$ AND VARIANCES (σ^2)[1] ON 44 SVIB SCALES FOR 4 H CLUB
AGENTS RATED IN THE THREE HIGHEST "QUARTILES" AND THE
LOWEST "QUARTILE" ON WORK EFFECTIVENESS

SVIB scales by Occupational Groups	Three highest "quartiles" (N 39)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
I						
Artist	20.5	110.3	18.9	86.1	1.28	0.41
Psychologist	15.6	104.2	21.1	111.1	1.07	1.45
Architect	19.2	165.2	20.0	75.0	2.20	0.32
Physician	28.2	146.7	31.1	161.1	1.10	0.64
Osteopath	40.3	96.7	38.9	161.1	1.66	0.36
Dentist	28.2	178.3	27.8	94.5	1.89	0.10
II						
Mathematician	16.2	108.5	18.7	86.1	1.26	0.72
Physicist	12.8	162.9	15.6	102.8	1.58	0.60
Engineer	24.6	162.3	26.7	125.0	1.29	0.44
Chemist	23.6	181.5	26.7	200.0	1.10	0.61
III						
Prod. Manager	34.4	72.6	32.2	69.5	1.06	0.68

TABLE 25 (Continued)

SVIB scales by Occupational Groups	Three highest "quartiles" (N 39)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
IV						
Farmer	46.4	62.7	50.0	50.0	1.31	1.22
Aviator	34.6	109.7	36.7	150.0	1.36	0.51
Carpenter	31.5	123.9	34.4	127.8	1.03	0.70
Printer	34.4	72.6	36.7	25.0	2.90	1.05
Math.-Sci. Tchr.	42.3	97.2	45.6	52.8	1.84	0.93
Voc. Agr. Teacher	47.9	85.1	50.2	66.5	1.28	0.70
Policeman	38.5	102.8	37.8	44.5	2.31	0.25
Forest Service	43.3	86.0	43.3	75.0	1.15	0.00
V						
YMCA Phys. Dir.	43.3	117.6	44.4	52.8	2.22	0.38
Personnel Dir.	35.9	166.9	36.7	125.0	1.34	0.15
Public Admin.	42.3	112.9	44.4	77.8	1.45	0.56
YMCA Secy,	33.8	140.0	36.7	100.0	1.40	0.66
Soc. Sci. Tchr.	40.5	136.6	41.1	136.1	1.00	0.14
City Sch. Supt.	32.6	103.8	34.4	52.8	1.96	0.52
Minister	29.7	92.0	30.0	100.0	1.09	0.10

TABLE 25 (Continued)

SVIB scales by Occupational Groups	Three highest "quartiles" (N 39)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
VI						
Musician	29.0	77.8	30.0	150.0	1.92	·0.30
VII						
C. P. A.	14.1	56.4	16.7	100.0	1.77	0.86
VIII						
Accountant	25.6	93.7	27.8	69.5	1..34	0.60
Office Man	32.1	106.2	31.1	61.1	1.74	0.24
Purch. Agent	27.7	55.1	23.3	25.0	2.20	1.68
Banker	30.5	73.4	32.2	44.4	1.65	0.55
Mortician	35.6	62.1	23.2	44.5	1.39	1.20
IX						
Sales Mgr.	30.3	76.2	25.6	52.8	1.44	1.50
Real Est. Sls.	34.4	67.3	33.3	75.0	1.11	0.34
Life Ins. Sls.	33.3	117.6	31.1	36.1	3.25*	0.21
X						
Advertising Man	26.9	64.0	25.6	52.8	1.21	0.48
Lawyer	26.4	49.9	25.6	27.8	1.79	0.36
Author-Journ.	25.9	45.9	25.6	27.8	1.64	0.14

TABLE 25 (Continued)

SVIB scales by Occupational Groups	Three highest "quartiles" (N 39)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
XI						
Pres. Mfg. Conc.	28.2	51.9	23.3	25.0	2.07	1.92
Int. Maturity	53.8	34.3	54.6	29.3	1.17	0.42
Occup. Level	51.1	31.1	49.4	18.0	1.72	0.82
Masc.-Femininity	49.3	211.7	49.4	107.0	1.97	0.14
Teach. Satisfac.	54.6	78.0	54.6	34.5	2.26	0.00

* Significant at the five per cent level or less.

[1] Means and variances of Strong's criterion groups and the use of the "d" test are explained in footnote 19, page 204.

level. (With 47 degrees of freedom a "t" value of 2.01 is re-
quired for significance at this level.)[31]   The variances are
significantly different on only the Life Insurance Salesman
scale.

As with the County Agents, the scores of the two extreme
"quartile" groups of 4 H Club Agents were compared. The re-
sults of the comparison of the means and variances of the high-
est and lowest "quartile" groups are shown in Table 26. This
table indicates that the only scale on which the means were sig-
nificantly different is the Purchasing Agent scale on which the
differences were significant at the five per cent level or less.
As in Table 25, the variances were significantly different on
only one scale, but in this case it was the Certified Public Ac-
countant scale.

The means for each of the four "quartile" groups on the
Purchasing Agent scale are as follows, ranging from the high-
est to the lowest "quartile": 30.0, 28.5, 24.6, 23.3. These
means indicate a rather direct relationship between ratings of
work effectiveness and scores on this scale. However, since

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[31] Snedecor, op. cit., p. 55, Table 3.8.

TABLE 26

COMPARISON OF MEANS $(\overline{X})$ AND VARIANCES (σ^2)[1] ON 44 SVIB SCALES FOR 4 H CLUB
AGENTS RATED IN THE HIGHEST "QUARTILE" AND LOWEST
"QUARTILE" ON WORK EFFECTIVENESS

SVIB scales by Occupational Groups	Highest "quartile" (N 13)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
I						
Artist	18.5	164.1	18.9	86.1	1.90	0.01
Psychologist	16.9	106.4	21.1	111.1	1.05	0.92
Architect	20.8	191.0	20.0	75.0	2.55	0.14
Physician	24.6	176.9	31.1	161.1	1.09	1.14
Osteopath	37.7	119.3	38.9	161.1	1.35	0.22
Dentist	28.4	230.8	27.8	94.5	2.44	0.10
II						
Mathematician	17.7	119.3	18.7	86.1	1.39	0.26
Physicist	13.8	225.7	15.6	102.8	2.19	0.29
Engineer	25.4	226.9	26.7	125.0	1.82	0.22
Chemist	23.8	225.7	26.7	200.0	1.12	0.44
III						
Prod. Manager	37.7	85.9	32.2	69.5	1.24	1.41

TABLE 26 (Continued)

SVIB scales by Occupational Groups	Highest "quartile" (N 13)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
IV						
Farmer	46.9	39.8	50.0	50.0	1.26	1.07
Aviator	36.2	142.3	36.7	150.0	1.05	0.98
Carpenter	35.4	110.2	34.4	127.8	1.15	0.20
Printer	40.0	50.0	36.7	25.0	2.00	1.22
Math.-Sci. Tchr.	43.8	75.7	45.6	52.8	1.43	0.47
Voc. Agr. Teacher	48.8	67.5	50.2	66.5	1.02	0.36
Policeman	40.8	91.0	37.8	44.5	2.04	0.80
Forest Service	44.6	76.9	43.3	75.0	1.03	0.34
V						
YMCA Phys. Dir.	46.2	42.3	44.4	52.8	1.25	0.56
Personnel Dir.	36.9	189.7	36.7	125.0	1.51	0.04
Public Admin.	42.3	119.7	44.4	77.8	1.53	0.48
YMCA Secy.	36.2	142.3	36.7	100.0	1.42	0.09
Soc. Sci. Teacher	41.5	130.8	41.1	136.1	1.04	0.08
City Sch. Supt.	33.1	89.8	34.4	52.8	1.70	0.36
Minister	33.1	73.1	30.0	100.0	1.37	0.77

TABLE 26 (Continued)

SVIB scales by Occupational Groups	Highest "quartile" (N 13)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
VI						
Musician	33.8	59.0	30.0	150.0	2.54	0.90
VII						
C. P. A.	13.1	23.1	16.7	100.0	4.33*	1.00
VIII						
Accountant	28.5	130.8	27.8	69.5	1.88	0.14
Office Man	34.6	126.9	31.1	61.1	2.08	0.80
Purch. Agent	30.0	50.0	23.3	25.0	2.00	2.43*
Banker	31.5	27.4	32.2	44.4	2.19	0.18
Mortician	33.8	59.0	32.2	44.5	1.33	0.50
IX						
Sales Mgr.	28.5	64.1	25.6	52.8	1.21	0.86
Real Est. Sls.	32.3	52.6	33.3	75.0	1.43	0.34
Life Ins. Sls.	30.8	107.7	31.1	36.1	2:98	0.08
X						
Advertising Man	26.2	75.7	25.6	52.8	1.43	0.17
Lawyer	23.8	25.7	25.6	27.8	1.08	0.75
Author-Journ.	23.8	42.3	25.6	27.8	1.52	0.64

TABLE 26 (Continued)

SVIB scales by Occupational Groups	Highest "quartile" (N 13)		Lowest "quartile" (N 9)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
XI						
Pres. Mfg. Conc.	25.4	26.9	23.3	25.0	1.08	0.92
Int. Maturity	55.1	45.1	54.6	29.2	1.54	0.19
Occup. Level	48.2	14.3	49.4	18.0	1.26	0.71
Masc.-Femininity	50.6	38.9	49.4	107.0	2.75	0.34
Teach. Satisfac.	55.4	61.1	54.6	34.5	1.77	0.23

* Significant at the five per cent level or less.

[1] Means and variances of Strong's criterion groups are explained in footnote 19, page 204.

differences between the "more effective" and "less effective"
groups of 4 H Club Agents appeared on only one scale, and
since the difference was significant only when the extreme groups
were compared, it was concluded that the "more effective" and
"less effective" 4 H Club Agents could not be satisfactorily dif-
ferentiated by means of SVIB scales. For these reasons the in-
tensity of the relationship on this one scale was not computed
and no attempt was made to study its predictive value.

The question arises as to why no more significant dif-
ferences were found in the interests of these subgroups of 4 H
Club Agents. It is possible that the smaller number of total
cases studied and particularly the small number on the lowest
"quartile" makes it more difficult for significant differences to
emerge in these comparisons than in the comparisons of the
County Agents. However, since the numbers represent the total
group of 4 H Club Agents as defined in Chapter IV, it is con-
cluded that the 4 H Club Agents studied herein are somewhat
more homogeneous in respect to vocational interests than are
the County Agents. The very small number of significantly
different variances adds some weight to this interpretation.

<u>Summary of the relationships between interests and work</u>

<u>effectiveness.</u> The results of the analyses of the relationships

between the SVIB scale scores of the County Agents and their

ratings of work effectiveness may be summarized as follows:

In comparison with the "less effective" County Agents the total

group of the "more effective" Agents indicated interests sig-

nificantly higher (at the five per cent level or less) in the spe-

cific occupations of personnel director and social science high

school teacher. These same Agents scored higher, but not

significantly higher on all but one of the remaining scales in

Occupational Group V. The extreme group of "more effective"

Agents indicated interests significantly higher (at the five per

cent level or less) in the certified public accountant occupation.

In comparison with the "less effective" County Agents

the total group of the "more effective" Agents indicated very

significantly lower interests (at the one per cent level or less)

in the specific occupation of farmer and significantly lower in-

terests (at the five per cent level or less) in the specific occu-

pation of carpenter. These same Agents scored lower, but not

significantly lower, on all but one of the remaining scales in

Occupational Group IV. The extreme group of "more effective"

Agents indicated interests significantly lower (at the five per

cent level or less) in the specific occupations of artist and

dentist and scored lower, but not significantly lower in all but

one of the remaining scales in Occupational Group I.

The four scales, Personnel Director, Social Science High

School Teacher, Farmer and Carpenter, on which the mean

scores for the total group of "more effective" Agents were sig-

nificantly different from the "less effective" Agents have corre-

lation coefficients indicating that the intensity of their relation-

ship to work effectiveness is significant at the one per cent

level or less. By use of appropriate high and low cutting

scores on these scales it was possible to predict with signif-

icant accuracy a group of "less effective" Agents from the cri-

terion group of County Agents. This provided a preliminary

test of the predictive validity of these scales.

The relationship between the SVIB scale scores of the

4 H Club Agents and their ratings of work effectiveness may

be summarized as follows: The total group of "more effective"

4 H Club Agents scored neither significantly higher nor signif-

icantly lower than the "less effective" Agents on any SVIB

scales. The extreme group of "more effective" 4 H Club Agents

scored significantly higher (at the five per cent level or less)

than the "less effective" Agents on the Purchasing Agent scale.

It was therefore concluded that the "more effective" and "less

effective 4 H Club Agents could not be satisfactorily differen-

tiated by SVIB scales. The intensity of the relationship of the

single differentiating scale to work effectiveness was not com-

puted and no attempt was made to study its predictive validity.

Relationship Between SVIB Scores and Job Satisfaction

Comparison of interests and job satisfaction of County
===

Agents. The comparison of the means and variances of the

SVIB scores of the "more" and "less" satisfied groups of County

Agents is presented in Table 27.

This table indicates that the mean scores of the "more

satisfied" County Agents were significantly higher than the mean

scores of the "less satisfied" Agents on the President of Manu-

facturing Concern occupational scale (32.7 versus 28.9) and on

the Occupational level (56.8 versus 52.3) and Teaching Satis-

faction (51.6 versus 46.7) nonoccupational scales. The "more

satisfied" Agents scored significantly lower than the "less

TABLE 27

COMPARISON OF MEANS ($\overline{X}$) AND VARIANCES $(\sigma^2)^1$ ON 44 SVIB SCALES FOR "MORE SATISFIED" AND "LESS SATISFIED" COUNTY AGENTS

SVIB scales by Occupational Groups	"More satisfied" (N 44)		"Less satisfied" (N 37)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
I						
Artist	20.2	39.5	21.6	69.5	1.76*	0.83
Psychologist	15.7	94.9	17.3	181..4	1.91*	0.61
Architect	21.6	74.2	22.7	103.6	1.40	0.53
Physician	27.9	53.9	26.5	112.3	2.08*	0.71
Osteopath	33.4	83.5	31.6	80.6	1.04	0.88
Dentist	24.7	72.0	24.8	125.7	1.75*	0.40
II						
Mathematician	16.1	89.4	18.4	86.2	1.04	1.07
Physicist	13.8	126.6	16.2	124.2	1.02	0.94
Engineer	27.5	84.3	25.1	86.8	1.03	1.15
Chemist	23.4	116.0	22.7	170.3˙	1.47	0.27
III						
Prod. Manager	35.0	58.1	32.1	61.9	1.07	1.67

TABLE 27 (Continued)

SVIB scales by Occupational Groups	"More satisfied" (N 44)		"Less satisfied" (N 37)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
IV						
Farmer	44.1	57.3	46.7	83.6	1.46	1.46
Aviator	30.0	102.3	31.3	78.7	1.30	0.63
Carpenter	25.0	90.7	26.5	112.3	1.24	0.67
Printer	28.8	66.1	32.7	70.3	1.06	2.08*
Math.-Sci. Tchr.	37.0	86.4	36.2	79.7	1.08	0.41
Voc. Agr. Teacher	46.2	15.4	46.2	104.9	6.83**	0.22
Policeman	31.6	83.5	30.8	96.5	1.16	0.37
Forest Service	37.7	69.1	39.4	71.9	1.04	0.92
V						
YMCA Phys. Dir.	33.8	121.9	31.6	114.0	1.07	0.92
Personnel Dir.	33.8	89.4	31.1	115.5	1.29	1.25
Public Admin.	40.9	68.9	38.9	59.9	1.15	1.11
YMCA Secy.	30.2	104.6	30.0	127.8	1.22	0.96
Soc. Sci. Teacher	36.8	96.6	36.2	90.8	1.06	0.28
School Supt.	34.3	94.9	30.3	74.9	1.27	1.96
Minister	25.4	118.4	25.7	86.4	1.37	0.10

SVIB scales by Occupational Groups	"More satisfied" (N 44)		"Less satisfied" (N 37)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
VI						
Musician	19.3	94.9	24.8	114.6	1.21	2.46*
VII						
C. P. A.	20.9	50.3	17.8	67.4	1.34	1.83
VIII						
Accountant	25.9	89.9	27.0	49.2	1.83*	0.61
Office Man	30.0	46.5	29.4	55.3	1.19	0.34
Purch. Agent	30.9	45.7	28.9	54.4	1.19	1.28
Banker	33.7	56.2	35.1	53.5	1.05	0.85
Mortician	33.4	55.6	31.6	52.9	1.05	1.09
IX						
Sales Manager	32.0	77.1	32.1	106.3	1.38	0.52
Real Est. Sls.	34.5	53.3	35.6	36.3	1.47	0.75
Life Ins. Sls.	34.3	90.2	32.1	78.5	1.15	1.05
X						
Advertising Man	27.5	42.4	27.8	56.3	1.33	0.22
Lawyer	29.3	71.6	29.7	91.6	1.28	0.20
Author-Journ.	26.3	33.0	27.5	46.7	1.42	0.86

TABLE 27 (Continued)

SVIB scales by Occupational Groups	"More satisfied" (N 44)		"Less satisfied" (N 37)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
XI						
Pres. Mfg. Conc.	32.7	62.2	28.9	87.7	1.41	2.01*
Int. Maturity	53.1	19.9	52.0	23.9	1.20	1.04
Occup. Level	56.8	23.9	52.3	118.8	4.96**	2.43*
Masc.-Femininity	48.5	91.5	50.1	30.8	2.97*	0.97
Teach. Satisfac.	51.6	58.3	46.7	104.2	1.79*	2.40*

* Significant at the five per cent level or less.

** Significant at the one per cent level or less.

[1] Means and variances of Strong's criterion groups and the use of the "d" test are explained in footnote 19, page 204.

satisfied" Agents on the Printer (28.8 versus 32.7) and Musician

(19.3 versus 24.8) occupational scales.

Strong reports a correlation of plus 0.63 between the

President of Manufacturing Concern and the Occupational Level

scales.[32] He also states that "Men with high OL [Occupational

Level] scores have the interests of business executives and

professional men but those with low scores have the interests

of workmen."[33] Strictly speaking, then, the scores on these

two scales indicate that the "more satisfied" County Agents

have significantly more of the interests of business executives

and professional men than do the "less satisfied" Agents. Ap-

parently the "more satisfied" County Agents respond favorably

to the administrative phases of their work.

The fact that the "more satisfied" Agents scored signif-

icantly higher than the "less satisfied" Agents on the Teaching

Satisfaction scale is not surprising. This finding is in keeping

with Nelson's results in which "more satisfied" teachers of

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[32] Edward K. Strong, Jr., Vocational Interests of Men
and Women, Stanford, California: Stanford University Press,
1943, pp. 136-137.

[33] Ibid., p. 195.

vocational agriculture scored significantly higher on this scale than did "less satisfied" teachers.[34]

The significance of the lower scores of the "more satisfied" Agents on the Printer scale is difficult to interpret. It is possible, though, that this reflects a lower interest in working with the hands or in skilled mechanical activities. This of course implies that the "less satisfied" Agents have higher interests in these activities.

The relationship of the scores on the Musician scale implies that the "less satisfied" Agents have significantly more of the interests of musicians than do the "more satisifed" Agents.

A rather unexpected result of this comparison is the lack of any significant differences in the Group V, "social welfare," occupations. The scores for the "more satisfied" Agents are higher than the scores for the "less satisfied" Agents on all but the Minister scale, but in no case was the difference great enough to be significant.

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[34] Nelson, op. cit., pp. 143-147.

The extent of variance in this comparison, is worthy of note, especially the variances on the Teacher of Vocational Agriculture and the Occupational Level scales, which were significantly different at the one per cent level or less. The range of standard scores for the "more satisfied" Agents on the Teacher of Vocational Agriculture scale was from 62 to 29, while for the "less satisfied" group it was from 64 to 22. On the Occupational Level scale the "more satisfied" Agents ranged from 67 to 43 and the "less satisfied" from 69 to 35. Nelson found that the Teacher of Vocational Agriculture scale scores were not significantly different in comparing his "more satisfied" and "less satisfied" teachers and does not report the ranges for his groups on this scale.[35] The range of Strong's total criterion group of 1,000 men on the Occupational Level scale was from 80 to 20. The range for his Salesmen, Managers-Owners, and Professional men criterion subgroups (total, 317) which ostensibly are more similar to the County Agents is from 80 to 34.[36] The range for the "less satisfied" County Agents, therefore, is

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[35] Ibid., p. 63.

[36] Strong, op. cit., p. 190.

not out of line with that found by Strong even though it caused

the variance to be significantly greater than the variance of

the "more satisfied" Agents on this scale. It is evident that

although the variable job satisfaction groups were drawn from

the same population as the variable work effectiveness groups,

the separation on the basis of job satisfaction resulted in groups

whose responses to these two scales were significantly more

varied.

Intensity of relationships.. To determine the intensity of

the relationship between job satisfaction and the SVIB scales

which differentiated the "more satisfied" and "less satisfied"

County Agents, product moment correlations were computed

for these two variables and the significance of the correla-

tions was determined by reference to Snedecor's table of cor-

relation coefficients.[37] Table 28 includes the results of the

comparison of the raw job satisfaction scores of each Agent

and his scores on the differentiating SVIB scales.

It is evident from Tables 27 and 28 that although the

mean scores of the "more satisfied" and "less satisfied"

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[37] Snedecor, op. cit., p. 125.

TABLE 28

CORRELATION COEFFICIENTS BETWEEN RAW JOB
SATISFACTION SCORES AND SCORES ON FIVE
DIFFERENTIATING SVIB SCALES FOR 81
COUNTY AGENTS

SVIB Scales	Product Moment Correlations
Printer	-.206
Musician	-.229*
President of Manufacturing Concern	+.121
Occupational Level	+.188
Teaching Satisfaction	+.325**

(79 degrees of freedom)

* Significant at the five per cent level or less.

** Significant at the one per cent level or less.

County Agents were significantly different on five SVIB scales, the intensity of these relationships was significant on only two scales. The correlation coefficient of minus 0.229 for the Musician scale is just slightly above the value required for significance at the five per cent level (0.219 is required with

79 degrees of freedom)[38] but the Teaching Satisfaction scale

showed a substantial intensity of difference since the coefficient

of plus 0.325 is significant at the one per cent level or less.

Prediction of job satisfaction. Even though the intensity

of the relationship between County Agents' interests and job

satisfaction was found to be significant on only two SVIB scales,

an attempt was made to determine the predictive value of one

of these scales. Since the correlation coefficient on the Musi-

cian scale was not high, and since the negative relationship be-

tween this scale and satisfaction in teaching is difficult to ac-

count for, a prediction attempt was made on the basis of the

Teaching Satisfaction scale alone.

In keeping with the discussion on pages 226-227, the

objective of this prediction attempt was to select County Agents

who appeared to be rather definitely dissatisfied in their work.

It was pointed out in Chapter V that very little, if any, intense

job dissatisfaction was evident among the County Agents from

their responses to the Job Satisfaction Questionnaire. However,

the Agents whose scaled scores were zero or one (16 per cent

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[38] Loc. cit.

of the total) were defined arbitrarily as having low job satis-
faction or as being indifferent to their jobs. The Agents in
this group were therefore used in this prediction and for con-
venience were designated as the "dissatisfied" group. The re-
maining Agents were designated as the "satisfied" group.

The criterion for selection of the profiles predicted to
be "dissatisfied" was that the standard score on the Teaching
Satisfaction scale should be 46 or lower, which corresponds to
the mean score of the "less satisfied" County Agents on this
scale. (The actual mean score, as shown in Table 27, is 46.7.)
The comparison of this group and the predicted to be "satis-
fied" group (those whose scores were above 46) with their ac-
tual job satisfaction ratings is presented in Table 29.

The chi square test of the significance of the compari-
son in Table 29 indicates that the hypothesis that the accuracy
of the prediction was not greater than would have occurred by
chance factors alone must be rejected. Thirty cases fell
within the criterion score established for the Agents predicted
to be "dissatisfied." Of these thirty predicted cases, nine ac-
tually had "dissatisfied" and 21 had "satisfied" job satisfaction
ratings. The total number of actually "dissatisfied" Agents,

TABLE 29

COMPARISON OF COUNTY AGENTS PREDICTED TO BE "DISSATISFIED" WITH THOSE
PREDICTED TO BE "SATISFIED" ON THE BASIS OF THE
TEACHING SATISFACTION SVIB SCALE

	Actual Job Satisfaction Ratings						Total Fre-quency
Group	"Dissatisfied"			"Satisfied"			
	Fre-quency	Per cent	χ^2 contri.	Fre-quency	Per cent	χ^2 contri.	
Predicted to be "dissatisfied"	9	30.0	3.646	21	70.0	.6972	30
Predicted to be "satisfied"	4	07.8	2:1368	47	92.8	.4567	51
Totals	13			68			81

$$\chi^2 = 6.9369* \qquad df = 1 \qquad P = <.01$$

*Significant at the one per cent level or less.

13, is approximately one-fifth of the number of actually "satisfied" Agents, 68. If chance factors alone were operating, there would then be about a one to five chance that an Agent predicted to be "dissatisfied" would actually be in that category, rather than in the "satisfied" group. In terms of the data in Table 29, by chance only about five of the thirty cases predicted to be "dissatisfied" should be expected to be in the "dissatisfied" group and about 25 in the "satisfied" group. It is apparent therefore that prediction by means of this one scale was more accurate than would have been attained by chance factors. This step provides some preliminary validity for the predictive value of this scale.

Comparison of the interests and job satisfaction of 4 H Club Agents. The means and variances of the SVIB scores for the "more satisfied" and "less satisfied" groups of 4 H Club Agents are presented in Table 30. This table indicates that the mean standard scores of the "more satisfied" Agents are significantly higher than the mean scores for the "less satisfied" Agents on the Teacher of Vocational Agriculture (50.8 versus 45.3), Policeman (41.9 versus 34.1), YMCA Physical Director (46.5 versus 40.0), Social Science High School Teacher

TABLE 30

COMPARISON OF MEANS $(\overline{X})$ AND VARIANCES (σ^2)[1] ON 44 SVIB SCALES FOR "MORE SATISFIED" AND "LESS SATISFIED" 4 H CLUB AGENTS

SVIB scales by Occupational Groups	"More satisfied" (N 26)		"Less satisfied" (N 22)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
I						
Artist	17.7	90.5	24.1	82.5	1.10	2.37*
Psychologist	14.6	89.8	19.5	109.3	1.22	1.71
Architect	16.1	136.6	23.1	137.0	1.00	2.07*
Physician	26.9	102.2	30.9	199.1	1.95	1.14
Osteopath	39.2	111.4	40.9	103.9	1.07	0.56
Dentist	27.3	92.5	30.9	208.7	2.26*	1.00
II						
Mathematician	15.7	97.4	18.2	101.3	1.04	0.83
Physicist	11.9	136.2	15.0	169.0	1.24	0.86
Engineer	24.6	129.8	26.8	156.1	1.20	0.64
Chemist	21.9	144.2	26.8	222.7	1.54	1.26
III						
Prod. Manager	34.6	65.8	33.2	79.9	1.21	0.58

TABLE 30 (Continued)

SVIB scales by Occupational Groups	"More satisfied" (N 26)		"Less satisfied" (N 22)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
IV						
Farmer	47.3	68.5	45.4	73.6	1.07	0.76
Aviator	35.4	121.8	34.5	111.7	1.09	0.27
Carpenter	34.2	113.4	29.5	128.4	1.13	1.47
Printer	34.2	41.4	34.1	82.5	1.99	0.62
Math.-Sci. Tchr.	43.8	80.6	41.8	101.3	1.26	0.74
Voc. Agr. Teacher	50.8	40.4	45.3	115.6	2.86**	2.12*
Policeman	41.9	80.2	34.1	72.9	1.10	3.08**
Forest Service	43.8	72.6	42.8	97.0	1.34	0.38
V						
YMCA Phys. Dir.	46.5	111.5	40.0	76.2	1.46	2.31*
Personnel Dir.	38.8	170.6	37.2	125.5	1.36	0.45
Public Admin.	45.0	114.0	40.0	85.7	1.33	1.72
YMCA Secy.	37.3	132.5	30.9	113.4	1.17	1.98
Soc. Sci. Teacher	44.6	121.8	35.9	111.0	1.10	2.78**
City Sch. Supt.	34.6	73.8	30.9	113.4	1.54	1.33
Minister	32.3	106.5	26.8	60.8	1.75	2.05*

TABLE 30 (Continued)

SVIB scales by Occupational Groups	"More satisfied" (N 26)		"Less satisfied" (N 22)		Test of homogeneity	
	$\overline{X}$	σ^2	$\overline{X}$	σ^2	F	t or d[1]
VI						
Musician	28.8	82.6	29.5	99.8	1.21	0.25
VII						
C. P. A.	15.0	74.0	14.1	53.9	1.37	0.39
VIII						
Accountant	27.7	98.5	34.1	72.9	1.35	1.33
Office Man	33.8	96.6	29.5	90.3	1.07	1.53
Purch. Agent	30.7	38.2	26.8	70.3	1.84	1.88
Banker	32.7	52.5	28.6	79.0	1.50	1.74
Mortician	35.7	57.4	34.1	63.4	1.10	0.75
IX						
Sales Manager	29.2	71.4	29.5	80.7	1.13	0.13
Real Est. Sls.	34.2	49.4	34.1	92.0	1.86	0.58
Life Ins. Sls.	33.4	95.5	32.2	113.6	1.19	0.40
X						
Advertising Man	25.4	73.8	28.2	44.2	1.67	1.25
Lawyer	26.5	47.5	25.9	44.3	1.07	0.32
Author-Journ.	24.2	41.4	27.7	37.4	1.11	1.92

TABLE 30 (Continued)

SVIB scales by Occupational Groups	"More satisfied" (N 26)		"Less satisfied" (N 22)		Test of homogeneity	
	$\bar{X}$	σ^2	$\bar{X}$	σ^2	F	t or d[1]
XI						
Pres. Mfg. Conc.	25.4	25.8	30.0	66.7	2.59*	2.30*
Int. Maturity	54.7	38.5	53.4	25.8	1.49	0.56
Occup. Level	49.3	24.8	52.5	28.6	1.16	2.17*
Masc.-Femininity	49.7	34.2	48.9	73.2	1.35	0.34
Teach. Satisfac.	56.1	84.1	52.8	49.4	1.70	1.37

* Significant at the five per cent level or less.

** Significant at the one per cent level or less.

[1] Means and variances of Strong's criterion groups and the use of the "d" test are explained in footnote 19, page 204.

(44.6 versus 35.9), and Minister (32.3 versus 26.8) occupational scales. The "more satisfied" Agents scored significantly <u>lower</u> than the "less satisfied" Agents on the Artist (17.7 versus 24.1), Architect (16.1 versus 23.1), and President of Manufacturing Concern (25.4 versus 30.0) occupational scales and on the Occupational Level nonoccupational scale (49.3 versus 52.5). The relationships on the Policeman and Social Science High School Teacher scales are significant at the one per cent level or less, and the remaining relationships are significant at the five per cent level or less.

It is of interest to note that whereas the "more satisfied" County Agents (Table 27) scored significantly higher than the "less satisfied" on the President of Manufacturing Concern and Occupational Level scales, the "more satisfied" 4 H Club Agents scored significantly lower than the "less satisfied" 4 H Club Agents on these two scales. However, the relationships in Table 30 for the 4 H Club Agents are somewhat more in keeping with Nelson's findings than are the results for the County Agents. Nelson found in comparing the SVIB scores of 95 vocational agriculture teachers who had relatively higher job satisfaction, as measured by an adaptation of the Hoppock

Job Satisfaction Blank, and 105 vocational agriculture teachers who had relatively lower job satisfaction, that the more satisfied teachers scored significantly higher on all scales in Occupational Group V.[39] The 4 H Club Agents scored significantly higher on three of the scales in Group V, whereas the "more satisfied" County Agents (Table 27) did not score significantly higher than the "less satisfied" County Agents in any scales in Group V.

The very significant difference on the Policeman scale is one of the surprising results in Table 30. This scale was standardized on 254 policemen from California, Ohio, Minnesota and Kansas. Their average age was 34.8 years and their average education was 10.4 grades.[40] The letter score, B+, for the "more satisfied" Agents indicates that they have interests similar to the interest of the policemen upon whom the scale was standardized. In one respect the scores on this scale are in keeping with Strong's findings in which there was a high negative correlation (minus 0.77) between the scores on the

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[39] Nelson, op. cit., pp. 126-128.

[40] Strong, op. cit., p. 697.

Policeman scale and the Occupational Level scale.[41]   Also the

fact that this scale correlates plus 0.65 with the seven older

scales in occupational group IV,[42] and plus 0.44 with the Teacher

of Vocational Agriculture scale,[43] which has since been added to

that group, tends to keep this score from being entirely unre-

lated to other findings.   Therefore, in spite of the rather unu-

sual nature of this relationship, it must be concluded that the

"more satisfied" 4 H Club Agents studied herein have interests

more similar to the interests of the policemen than do the "less

satisfied" Agents.

The fact that the "more satisfied Agents scored signif-

icantly lower than the "less satisfied" Agents on the Artist

scale is somewhat in keeping with the relationship found with

the County Agents on the Musician scale.

In reference to Occupational Groups, it may be noted

that the "more satisfied" Agents scored higher, but not signif-

icantly higher, on all of the remaining scales in Groups IV and

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[41] Ibid., p. 192.

[42] Ibid., p. 136.

[43] Nelson, op. cit., p. 71.

V and lower than the "less satisfied" Agents on all of the re-

maining scales in Group I.

It will be recalled from Table 16 that the total group of

County Agents and the total group of 4 H Club Agents scored

high on the Teacher of Vocational Agriculture scale and that in

the succeeding comparisons no subgroups have scored signifi-

cantly different on this scale until the comparison in Table 30.

This would indicate that County Agents and 4 H Club Agents

have interests somewhat similar to those of vocational Agricul-

ture teachers but that for County Agents there is no significant

relationship between work effectiveness or job satisfaction and

interests in vocational agriculture teaching and for 4 H Club

Agents there is no significant relationship between work effec-

tiveness and interests in that occupation. Nelson concludes

after analyzing the specific SVIB items that his criterion groups

of Vocational Agriculture Teachers liked most, that the majority

of the items refer to <u>what</u> is taught rather than to the function

of teaching,[44] which agrees with Strong's conclusions regarding

his Social Science High School Teacher and Mathematics-Physical

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[44] <u>Ibid.</u>, pp. 59-60.

Science Teacher scales.[45] From this standpoint it might be

argued that one factor contributing to job satisfaction among

4 H Club Agents is a higher interest in the subject matter

which vocational agriculture teachers teach than in the function

of teaching.

Intensity of relationships. The intensity of the relation-

ship between job satisfaction and the scores on the nine SVIB

scales which differentiated "more" and "less" satisfied 4 H

Club Agents was determined by product moment correlations.

These correlation coefficients and their significance as deter-

mined by Snedecor's correlation coefficient table[46] are shown

in Table 31.

The correlation coefficients in Table 31 indicate that

with the 4 H Club Agents the intensity of the relationship be-

tween job satisfaction and interests is statistically significant

in the case of six of the nine SVIB scales in question although

only one of these, the Social Science High School Teacher scale,

is significant at the one per cent level or less.

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[46] Snedecor, op. cit., p. 125.

TABLE 31

CORRELATION COEFFICIENTS BETWEEN RAW JOB
SATISFACTION SCORES AND SCORES ON NINE
DIFFERENTIATING SVIB SCALES FOR 48
4 H CLUB AGENTS

SVIB Scales	Product Moment Correlations
Artist	-.091
Architect	-.351*
Policeman	+.300*
Teacher of Vocational Agriculture	+.311*
YMCA Physical Director	+.206
Social Science High School Teacher	+.465**
Minister	+.330*
President of Manufacturing Concern	-.254
Occupational Level	-.358*

(46 degrees of freedom)

* Significant at the five per cent level or less.

** Significant at the one per cent level or less.

Prediction from profiles. To investigate the predictive
value of the significant relationships found in Table 31 an at-
tempt was made to predict 4 H Club Agents who could be con-
sidered as having quite low job satisfaction. As in the predic-
tion of job satisfaction with County Agents, a group of 4 H
Club Agents was therefore defined arbitrarily as "dissatisfied"

on the basis of low raw scores on the Job Satisfaction Questionnaire. A cut-off point between scores 21 and 20 yielded 25 per cent of the total or 12 cases with scores ranging from 20 down to 14. The Agents with scores from 21 up to 29 were therefore designated as the "satisfied" group.

The letter scores corresponding to the mean standard scores of the "less satisfied" Agents on the five significant occupational scales in Table 31 and the standard score of this group on the Occupational Level scale were used as criteria for the selection of "dissatisfied" Agents. These scores are as follows:

Scale	Score
Architect	C+ or higher
Policeman	B- or lower
Teacher of Vocational Agriculture	B- or lower
Social Science High School Teacher	B- or lower
Minister	C+ or lower
Occupational Level	53 or higher

In a preliminary selection it was found that only two profile sheets for "dissatisfied" Agents contained scores which fell within the criterion scores on all of the above six scales. Therefore the criteria were modified to the extent that profile

sheets were selected on which at least five of the six scale

scores in question were within these cutting scores. After

the sheets were selected on this basis, a tally was made of

the single scales whose scores did not fall within the criterion

scores above. Of the 11 cases predicted to be "dissatisfied"

in Table 32, the scores were within the criterion scores on

all six scales in two cases, as mentioned above. Of the re-

maining nine cases not less than one and not more than two

had deviant scores on any one of the six scales. This quite

even distribution of deviant scores added justification for pre-

dicting on the basis of the conformity of any five of the six

scales to the criterion scores.

The results of this prediction attempt are shown in

Table 32. In this table the 4 H Club Agents predicted to be

"dissatisfied" are compared with those predicted to be "satis-

fied" (those whose scores did not meet the criterion scores

discussed above) in respect to their actual job satisfaction

ratings.

The value of the chi square test of significance in this

case is such as to reject the hypothesis that the accuracy of

the prediction was not greater than chance. Of the 11 cases

TABLE 32

COMPARISON OF 4 H CLUB AGENTS PREDICTED TO BE "DISSATISFIED" WITH THOSE
PREDICTED TO BE "SATISFIED" ON THE BASIS OF SCORES ON ANY
FIVE OUT OF SIX DIFFERENTIATING SVIB SCALES

| Group | Actual Job Satisfaction Ratings | | | | | | Total Fre- quency |
| | "Dissatisfied" | | | "Satisfied" | | | |
	Fre- quency	Per cent	χ^2 contri.	Fre- quency	Per cent	χ^2 contri.	
Predicted to be "dissatisfied"	8	72.7	10.0197	3	27.3	3.3420	11
Predicted to be "satisfied"	4	10.8	2.9794	33	89.2	.9937	37
Totals	12			36			48

$$\chi^2 = 17.3348* \qquad df = 1 \qquad P = <.01$$

*Significant at the one per cent level or less.

which fell within the criterion scores for the predicted to be

"dissatisfied" Agents, eight actually had "dissatisfied" and three

had "satisfied" ratings. The total number of "dissatisfied"

Agents, 12, is one-third of the number of "satisfied" Agents,

so in applying this one to three relationship to the 11 predicted

to be "dissatisfied" cases, by chance about three should be ex-

pected to fall in the "dissatisfied" and about nine in the "satis-

fied" categories. This test then indicates that with the 4 H

Club Agents' scores on the six SVIB scales in question it was

possible to predict a group of Agents who had low job satis-

faction.

Summary of the relationships between interests and job

satisfaction. The results of the analysis of the relationship be-

tween the SVIB scale scores of the County Agents and their

self-rated job satisfaction may be summarized as follows: In

comparison with the "less satisfied" County Agents, the "more

satisfied" Agents had significantly higher mean scores on the

President of Manufacturing Concern occupational scale and on

the Occupational Level and Teaching Satisfaction nonoccupational

scales. These same Agents scored significantly lower than the

"less satisfied" Agents on the Printer and Musician scales.

Each of these relationships was significant at the five per cent level or less.

Product moment correlations indicated that only the Musician and Teaching Satisfaction scales had significant intensity of relationship to job satisfaction. However, since the intensity of the relationship on the Musician scale was low, and since reasons for its negative relationship to satisfaction in teaching were not evident, a cutting score on the Teaching Satisfaction scale was used to attempt to predict County Agents defined arbitrarily as "dissatisfied." This attempt was significantly more accurate than would have occurred by chance factors alone.

The relationship of interests to job satisfaction with the 4 H Club Agents may be summarized as follows: In comparison with the "less satisfied" 4 H Club Agents, the "more satisfied" Agents had very significantly higher (at the one per cent level or less) mean scores on the Policeman and Social Science High School Teacher scales, and significantly higher (at the five per cent level or less) on the Teacher of Vocational Agriculture, YMCA Physical Director, and Minister scales. These same Agents scored higher, but not significantly higher on all of the

remaining scales in Groups IV and V. These Agents scored

significantly lower (at the five per cent level or less) than the

"less effective" Agents on the Artist, Architect, and President

of Manufacturing Concern occupational scales and the Occupational

Level nonoccupational scale. These Agents also scored lower,

but not significantly lower on all of the remaining scales in

Group I.

Product moment correlations indicated that six of the

above nine scales (Architect, Policeman, Teacher of Vocational

Agriculture, Social Science High School Teacher, Minister, and

Occupational Level) had intensity of relationships to job satis-

faction significant at the one or five per cent levels. By se-

lecting profile sheets on which scores on five of these six

scales corresponded to criterion cutting scores, it was possible

to predict with significant accuracy a group of 4 H Club Agents

who were defined arbitrarily as "dissatisfied" on the basis of

low raw scores on the Job Satisfaction Questionnaire.

Summary of the chapter. The findings of the study have

been reported in this chapter. They have been summarized in

three parts as follows: (a) description of the Agents' interests,

page 203, (b) the relationships between interests and work effectiveness, page 242, and (c) the relationships between interests and job satisfaction, page 271. These summaries indicate that the Agents have certain characteristic interests and that some variable work effectiveness and job satisfaction groups of Agents could be differentiated by means of certain SVIB scales. Preliminary validity was found for some of these scales in predicting work adjustment in the Agents.

CHAPTER VII

SUMMARY, CONCLUSIONS, AND SUGGESTIONS
FOR FURTHER RESEARCH

Summary

The problem. In 1950 the Michigan Cooperative Exten-
sion Service initiated a research project for the purpose of ob-
taining information that will aid in selecting County Agents and
4 H Club Agents who will be more effective and more satisfied
in their work. The project design calls for an analysis of the
relationships of biographical data, vocational interests, person-
ality traits, and academic backgrounds of the present Michigan
Agents to their work effectiveness, as determined by ratings by
their superiors, and to their job satisfaction, as determined by
an adaptation and extension of the Hoppock Job Satisfaction
Blank.

These personal factors were selected for analysis as
the preliminary phase of the project because the Extension Ser-
vice believes that they are possible bases for the differentiation
of the more successful from the less successful and the more

satisfied from the less satisfied Agents. If these or other fac-

tors are found to be differentiating characteristics and if they

are supported in future cross-validation studies, they should

be useful in improving the selection of these workers.

The problem of this particular study was to analyze the

relationships of the vocational interests of the present County

Agents and 4 H Club Agents in Michigan to their work effec-

tiveness and job satisfaction as determined above. The Strong

Vocational Interest Blank was used for determining their in-

terests. The purpose of this analysis was to provide a descrip-

tion of the Agents' vocational interests and to attempt to de-

termine Strong Vocational Interest Blank Scales that might be

useful guides in the selection of more effective and more sat-

isfied County Agents and 4 H Club Agents.

Recognition of the need for more valid selection tech-

niques is manifested by the Office of Naval Research of the

United States Navy and the United States Department of Agri-

culture through financial assistance for this research. This is

prompted in part by Extension Administrators concern about

the rate of turnover and indications of dissatisfaction among

County Agents and 4 H Club Agents. The Extension worker's

job has increased in complexity in recent years but in view of the present conditions it appears that improvements in the selection procedures have not kept pace with this change.

In realization of this need the Michigan Extension Service assigned its Extension Training Specialist the responsibility of coordinating a study of the problem. This Specialist in turn organized a Planning Committee with representatives from five departments of Michigan State College. The Committee planned the General Research Project and individual members of the Committee are conducting separate phases of the Project, such as the study reported herein.

The objectives of the Extension Service are educational in nature. However, the setting in which the County Extension Worker functions and the specific methods by which he accomplishes his objectives are enough different from those of the classroom teacher that the negative results of several research attempts to predict success in teaching did not appear to indicate that some useful results could not be determined for improving the selection of Extension Service workers.

Although no studies were found by this writer which pertained specifically to the relationship between Extension workers'

interests and their work effectiveness or their job satisfaction,
studies of these relationships in other occupations indicated
that in some cases, notably with various sales occupations,
more successful men had been differentiated from less success-
ful men by means of their inventoried vocational interests. Also,
in a limited number of studies certain inventoried vocational
interests were found to be significantly different when "more
satisfied" and "less satisfied" groups were compared.·

The methods. The sample consisted of 81 County Agents
and 48 4 H Club Agents. This represented all of the Agents
who were in the Michigan Extension Service in September, 1950,
except thirteen who retired, resigned, or were transferred to
other positions within the organization between that time and May
1, 1951, when the last of the data necessary for this study were
received. On May 1, 1951, the mean ages were 42.73 for the
County Agents and 33.17 for the 4 H Club Agents. The mean
number of years' experience in the Michigan Extension Service
were 12.90 for the County Agents and 4.19 for the 4 H Club
Agents.

The Job Satisfaction Questionnaire (an adaptation and ex-
tension of the Hoppock Job Satisfaction Blank) was obtained from

the Agents by mail. The SVIB was filled out by most of the Agents at their regular district meetings. It was obtained by mail from the few who did not attend the meetings. The thirty-nine regular occupational scales and the three nonoccupational scales (as of September, 1950) were scored by the E. J. Hankes scoring service. Two recently validated scales, Teacher of Vocational Agriculture and Teaching Satisfaction, were scored manually.

Variable work effectiveness groups were established on the basis of a modified forced ranking of the Agents by a panel of seven judges, most of whom regularly participate in the annual rating of these workers for salary adjustment and other administrative purposes. The County Agents and the 4 H Club Agents were each ranked in four fairly equal groups. There was no significant variation among the judges as to their recorded opinions of the relative over-all effectiveness with which the Agents were performing their jobs. There also were no significant differences among the various "quartile" rating groups as far as age and number of years' experience in the Michigan Extension Service were concerned.

In comparing the raw Job Satisfaction Questionnaire scores of the four work effectiveness "quartile" groups of County Agents and 4 H Club Agents it was found that although the relationship between work effectiveness and job satisfaction was positive, it was not satisfactorily high. Consequently, in order to determine more clearly the relationship between their interests and job satisfaction, new groups of "more satisfied" and "less satisfied" County Agents and 4 H Club Agents were established on the basis of their responses to the Job Satisfaction Questionnaire. The raw scores were tested for scalability by Guttman's "Cornell Technique for Scale and Intensity Analysis."[1] This revealed that the scores of the County Agents were scalable but those of the 4 H Club Agents were not. Therefore, the County Agents were separated into two fairly equally sized "more satisfied" and "less satisfied" groups on the basis of the scaled version of their raw scores and the 4 H Club Agents were similarly separated but on the basis of their raw scores. There were no significant differences in the ages of

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[1] Louis Guttman, "The Cornell Technique for Scale and Intensity Analysis," Educational and Psychological Measurement, 7: 247-279, 1947.

these satisfaction groups, but the "more satisfied" County Agents and 4 H Club Agents had significantly longer experience in the Michigan Extension Service.

Identification numbers, SVIB scores, ages, years of experience, work effectiveness ratings, and job satisfaction scores were entered on personal data cards and this information was subsequently punched into IBM cards. The IBM cards, for the County Agents and 4 H Club Agents separately, were sorted first by the four work effectiveness "quartile" groups and the SVIB scores were tabulated accordingly. The cards were next separated by the job satisfaction groups and the SVIB scores for these groups were tabulated. The means and variances were computed for all SVIB scales by these work effectiveness and job satisfaction subgroups. Comparisons were made of the SVIB scale score means and variances between the three highest work effectiveness "quartile" groups combined and the lowest "quartile" group and between the highest and lowest "quartile" groups for both the County Agents and the 4 H Club Agents. In the case of job satisfaction, comparisons were made of the same statistics between the "more satisfied" and "less satisfied" groups of both County Agents and 4 H Club Agents.

The "F" test was used for determining the significance of the difference between the variances. In comparisons in which this test indicated no significant differences, the significance of the difference between the means was determined by the "t" test. Where the "F" test indicated that the variances were significantly different, the Behrens-Fisher "d" test was used for determining the significance of the difference between the means.

Biserial correlations were used for determining the intensity of the relationship between differentiating SVIB scales and work effectiveness; product moment correlations were used for determining this relationship to job satisfaction. The scales which were found to have significant intensity of relationship by this step were used as the basis for attempts to predict "less effective" and "dissatisfied" groups of Agents from the criterion groups. The accuracy of these prediction attempts was tested by chi square analyses.

Descriptions of the Agents' interests were provided by the mean standard scores and corresponding letter scores of both groups of Agents on all SVIB scores, by comparison of their high and low letter scores on 34 scales with the scores

of 285 college seniors on these same scales, and by analysis

of their primary and secondary interest patterns.

The results.

(a) The vocational interests of the County Agents and

4 H Club Agents in Michigan are somewhat similar,

as measured by the SVIB. Their interests are high-

est in the so-called "technical" occupations, par-

ticularly in farming and vocational agriculture teach-

ing. They also have high interests in the "social

welfare" type of occupations, but in general these

interests are slightly lower than in the "technical"

areas. Considered as a total group, the Agents do

not show high interests on any of the remaining SVIB

scales. However, a minority of Agents indicate

fairly high interests in sales and business detail

types of occupations and in the physician, osteopath

and dentist occupations. The Agents have quite con-

sistently low interests in the mathematical and

physical science areas and in the occupations of

certified public accountant, artist, psychologist,

architect, and musician.

(b)   In comparison with the "less effective" (lowest "quartile") County Agents, the total group of "more effective" (three highest "quartiles" combined) County Agents have significantly higher mean scores (at the five per cent level or less) on the Personnel Director and Social Science High School Teacher scales. These same Agents scored higher, but not significantly higher, on all but one of the remaining scales in Occupational Group V, the "social welfare" occupations. The extreme group of "more effective" County Agents (highest "quartile" alone) scored significantly higher (at the five per cent level or less) on the Certified Public Accountant scale.

In Comparison with the "less effective" County Agents, the total group of the "more effective" Agents have very significantly lower mean scores (at the one per cent level or less) on the Farmer scale and significantly lower (at the five per cent level or less) on the Carpenter scale. These same Agents scored lower, but not significantly lower, on

all but one of the remaining scales in Occupational Group IV, "technical" occupations. The extreme group of "more effective" Agents scored significantly lower (at the five per cent level or less) on the Artist and Dentist scales and lower but not significantly lower on all but one of the remaining scales in Occupational Group I.

The SVIB scales on which the mean scores of the total group of "more effective" County Agents were significantly higher or lower than the mean scores of the "less effective" Agents have significant intensity of relationship to work effectiveness. Biserial correlation coefficients of these relationships were significant at the one per cent level or less in each of these scales (Personnel Director, plus 0.342; Social Science High School Teacher, plus 0.357; Farmer, minus 0.410; Carpenter, minus 0.298; 79 degrees of freedom). An attempt to predict a group of "less effective" County Agents by selection of profile answer sheets whose scores were lower than the mean scores of the "less effective" Agents

on the first two of these scales and higher than
the mean scores on the last two scales was sig-
nificantly more accurate than chance as revealed
by the chi square test of significance of the pre-
diction. (Chi square 14.1820, one degree of free-
dom, significant at the one per cent level or less.)

(c)   The total group of "more effective" 4 H Club
Agents have neither significantly higher nor sig-
nificantly lower mean scores than the "less effec-
tive" 4 H Club Agents on any SVIB scales. The
extreme group of "more effective" 4 H Club Agents
scored significantly higher (at the five per cent
level or less) than the "less effective" Agents on
the Purchasing Agent Scale. Since this one rela-
tionship appeared to be of questionable value in
differentiating "more effective" and "less effective"
4 H Club Agents, the intensity of this relationship
was not computed and no attempt was made to test
its predictive validity.

(d)   In comparison with the "less satisfied" County

Agents, the "more satisfied" County Agents have

significantly higher mean scores (at the five per

cent level or less) on the President of Manufac-

turing Concern occupational scale and on the Occu-

pational Level and Teaching Satisfaction nonoccupa-

tional scales. These same Agents scores signif-

icantly lower (at the five per cent level or less)

than the "less satisfied" Agents on the Printer and

Musician scales.

Product moment correlations indicated that the

Musician and Teaching Satisfaction scales showed

significant intensity of relationship to job satis-

faction. However, the correlation coefficient on

the Musician scale (minus 0.299, 79 degrees of

freedom) was just above the value required for

significance at the five per cent level and the

negative relationship between this scale and satis-

faction in teaching was difficult to account for.

Therefore an attempt to predict job satisfaction

was based upon the Teaching Satisfaction scale

alone. The correlation coefficient on this scale (plus 0.325, 79 degrees of freedom) was significant at the one per cent level or less. Thirteen County Agents whose scaled Job Satisfaction Questionnaire scores were zero or one, were defined arbitrarily as "dissatisfied." An attempt to select "dissatisfied" Agents on the basis of scores below the mean standard score of the "less satisfied" Agents on the Teaching Satisfaction scale (46) was significantly more accurate than chance, as was indicated by the chi square test. (Chi square 6.9369, one degree of freedom, significant at the one per cent level or less.)

(e)   In comparison with the "less satisfied" 4 H Club Agents, the "more satisfied" 4 H Club Agents have very significantly higher mean scores (at the one per cent level or less) on the Policeman and Social Science High School Teacher scales and significantly higher (at the five per cent level or less) on the Teacher of Vocational Agriculture, YMCA Physical Director, and Minister scales. These same Agents

scored higher, but not significantly higher on all of the remaining scales in Group IV, "technical" occupations and Group V, "social welfare" occupations. These Agents scored significantly lower (at the five per cent level or less) than the "less effective" Agents on the Artist, Architect, and President of Manufacturing Concern occupational scales and the Occupational Level nonoccupational scale. These Agents also scored lower, but not significantly lower on all of the remaining scales in Occupational Group I (Psychologist, Physician, Osteopath, Dentist).

Product moment correlations indicated that the scores on six of the nine scales above showed intensity of relationship to job satisfaction significant at the one or five per cent level as shown in the table on the following page.

A group of 12 4 H Club Agents with raw Job Satisfaction scores of 20 or less was defined arbitrarily as "dissatisfied." An attempt was made to

Scale	Product Moment Correlation
Architect	-.351*
Policeman	+.300*
Teacher of Vocational Agriculture	+.311*
Social Science High School Teacher	+.465**
Minister	+.330*
Occupational Level	-.358*

(46 degrees of freedom)

* Significant at five per cent level or less.
** Significant at one per cent level or less.

predict a group of "dissatisfied" Agents by selecting profile answer sheets whose scores were lower than or higher than the mean scores of the "less satisfied" Agents on five of the six scales listed above. The chi square test of the significance of this comparison (17.3348, one degree of freedom) was significant at the one per cent level or less and therefore indicated that the prediction attempt

was significantly more accurate than would have
occurred by chance factors alone.

Conclusions

On the basis of the summary just presented and related
findings in the body of this study, the following conclusions seem
justified:

(a)   The description found herein of the Agents' voca-
        tional interests provides information that should be
        useful in characterizing County Agents and 4 H Club
        Agents as occupational groups.

(b)   There is a low but significant relationship between
        the scores of County Agents and 4 H Club Agents
        in Michigan on certain SVIB scales and their rated
        work effectiveness and self-rated job satisfaction.
        The final test of the validity of the SVIB scales
        which indicate significant intensity of relationship
        to work effectiveness and to job satisfaction will
        be the extent to which future Michigan Agents and
        Agents in other states, whose selection is based in
        part on their scores on these scales, actually prove

to be more effective and more satisfied in their work. However, the preliminary tests of predictive validity with the criterion groups of present Michigan Agents indicate that certain SVIB scales may be considered as useful guides for improving the selection of County Agents and 4 H Club Agents.

The significance of the preliminary predictive validity found for these SVIB scales should be interpreted in light of the selected nature of the criterion groups. Since these SVIB scales have preliminary predictive validity with groups which do not include individuals who left the Extension Service because of unsatisfactory performance on the job, or individuals who desired to become Agents but were not employed as such, it is possible that the scales would prove to have higher differentiating value than the present tests indicate, if they were used with more heterogeneous groups.

(c)   The General Research Project is attempting to determine factors that will differentiate Agents

who are both more effective and more satisfied from those who are less effective and less satisfied. The relationship between work effectiveness and job satisfaction was found to be positive in the present Michigan Agents, but not generally high. The contributions of this study therefore are limited to an extent by the fact that it was necessary to regroup these same Agents in order to determine more clearly the relationships between their interests and their job satisfaction.

(d) With the above limitation in mind, the preliminary tests of predictive validity support the following specific uses of the scales: (i) Scores of A on the Farmer scale, B- or higher on the Carpenter scale, together with scores of C- or lower on the Personnel Director scale and B- or lower on the Social Science High School Teacher scale may be used as indicators of ''less effective'' County Agents. A standard score of 46 or lower on the Teaching Satisfaction scale may be used as an indicator of County Agents who will have low job satisfaction.

(ii) No scales were found which satisfactorily differentiate "more effective" and "less effective" 4 H Club Agents. However, 4 H Club Agents with low job satisfaction may be indicated by any five of the six following scale scores: Architect C+ or higher, Policeman B- or lower, Teacher of Vocational Agriculture B- or lower, Social Science High School Teacher B- or lower, Minister C+ or lower, Occupational Level 53 (standard score) or higher.

(e) It has been pointed out that in general the interests of the total group of County Agents and the total group of 4 H Club Agents are somewhat similar. However, the SVIB scales which significantly differentiated the variable work effectiveness and job satisfaction groups of County Agents were not the same scales which differentiated these groups of 4 H Club Agents. Therefore evidence is lacking in this study to support the contention that the use of the scale scores recommended in (d) above for the selection of County Agents would improve the

selection of 4 H Club Agents, or vice versa. This is especially pertinent since the majority of County Extension workers in Michigan are first hired as 4 H Club Agents, yet no SVIB scales were found to be sufficiently related to work effectiveness in the present 4 H Club Agents. The data at hand provide for the improvement of the selection of 4 H Club Agents only in terms of Agents who will be more satisfied in their work.

Suggestions for Further Research

This study has revealed a number of unanswered questions. In the interests of the General Research Project, the following appear to be some of the additional steps that should be made:

(a)   As has been mentioned, studies are needed for determining the predictive validity of findings in this study when applied to new groups of Agents. Such cross-validation studies should be based both on future Agents in Michigan and Agents in other states. It will of course be important to determine

the extent to which new populations agree with the Agents studied herein in respect to age and length of experience. In the interests of further research it is suggested that the SVIB be obtained from as many as possible of the individuals who apply for County Agent and 4 H Club Agent positions but are not accepted.

(b)   In view of the Michigan Extension Service's present policy of drawing most of its County Agents from the ranks of the 4 H Club Agents, further studies should be made of differences between the two groups of Agents. Some differences were found herein between the interests which differentiate variable work effectiveness and job satisfaction groups of County Agents and the interests which differentiate these groups of 4 H Club Agents. It will be helpful to know whether studies with larger numbers of Agents will reveal more or less similarity of differentiating interests in the two groups. Such findings should aid in determining whether or not a single criterion group of SVIB scale scores may

be valid for improving the selection of both County Agents and 4 H Club Agents. Such studies should also be directed toward determining the extent to which Agents' interests, particularly 4 H Club Agents, change with age and experience in Extension work.

(c)   In this study the ''more satisfied'' County Agents and 4 H Club Agents had significantly longer experience in the Michigan Extension Service than did the ''less satisfied'' Agents. This might imply that job satisfaction increases with length of experience in the work. However, this hypothesis should be tested by follow-up studies of the present groups of ''less satisfied'' Agents. It should be helpful to know the proportion of Agents who remain in the work but evidence no increase in job satisfaction and to know about the effectiveness of their performance on the job. This would necessitate periodical appraisals of job satisfaction. If this could be accomplished, it would also be of value to study the relationships between job

satisfaction and length of service among those who leave the work.

(d) It is suggested that when sufficient numbers of cases are available item analyses of the SVIB be made for the purpose of determining whether or not a new SVIB scale or scales could be constructed which would adequately differentiate the interests of County Agents and/or 4 H Club Agents as a distinct occupational group or groups.

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APPENDICES

APPENDIX A

THE VOCATIONAL INTERESTS OF SEVENTY-THREE MICHIGAN EXTENSION SPECIALISTS

In Chapter IV of this study it was mentioned that a number of Extension Specialists and Administrative Officers were present at the District meetings in which the SVIB was administered to the County Agents and 4 H Club Agents, and that these people took the SVIB along with the County workers.[1] The General Research Project[2] is concerned at present with County Extension workers only, so the SVIB's of the Specialists and Administrators could not be used in this study. However, since the test results were on file for seventy-three Specialists and eight administrators, a descriptive report of the vocational interests of the Specialists was believed to be appropriate here. The interests of the administrators are not included because the number is so small.

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[1] See page 105.

[2] Described on pages 1 and 2.

In September, 1950, when the last of the SVIB's was re-
ceived, there were 98 Specialists in the Michigan Extension
Service.[3]   However, twenty-one of these Specialists were women,
and the women Specialists who attended the District meetings
did not take the SVIB.   Therefore this report is based upon the
SVIB's for 95 per cent (73 out of 77) of the male Specialists
in Michigan as of September, 1950.   The SVIB's for these men
were administered and scored, and the item responses were
recorded and tabulated following the same procedures outlined
in Chapter IV for the County workers.

The purpose of this report is primarily to present the
SVIB results for these Specialists.   However, a comparison of
their scores with the scores of some other group should make
them more meaningful.   Since the age and length of service
variables had been analyzed for all subgroups used in this
study, they provided a basis for selecting a comparison group.
The means and standard deviations for the age and length of
service of Specialists, County Agents, and 4 H Club Agents,
are presented in Table 33.

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[3] From the personnel files of the Michigan Extension
Service.

TABLE 33

MEANS ($\overline{X}$) AND STANDARD DEVIATIONS (σ) FOR AGE AND
LENGTH OF SERVICE OF SPECIALISTS, COUNTY
AGENTS AND 4 H CLUB AGENTS

	Specialists (N 73)		County Agents (N 81)		4 H Club Agents (N 48)	
	$\overline{X}$	σ	$\overline{X}$	σ	$\overline{X}$	
Age	43.97	9.96	42.73	9.35	33.17	7.86
Length of service	11.71	7.97	12.90	8.26	4.19	4.01

Table 33 shows a difference of 1.24 in mean age (43.97 - 42.73) and of 1.19 in mean length of service (12.90 - 11.71) between the Specialists and the County Agents, as contrasted with the considerably larger differences of 10.80 (43.97 - 33.17) between the Specialists and the 4 H Club Agents in age and 7.52 (11.71 - 4.19) in length of service. Because of their greater similarity with the Specialists on these two factors, the County Agents were selected as the most appropriate group against which to compare the vocational interests of the Specialists.

Table 34 includes not only the mean standard scores, variances, and mean letter scores on the SVIB scales for the 73 Specialists, but also the same scores for the County Agents, and for descriptive purposes indicates the tests of the homogeneity of the variances and means, or the converse of this, the significance of the difference of the variances and means for the SVIB scales of these two groups.

From Table 34 certain significant vocational interest differences are evident. The Specialists scored significantly higher (at the five per cent level or less) than the County Agents on the Mathematician (21.09 versus 17.04) and Advertising Man (30.68 versus 27.65) SVIB scales. However, most of the differences are negative in nature. The Specialists scored very significantly lower (at the one per cent level or less) than the County Agents on the Teacher of Vocational Agriculture Scale (38.03 versus 45.39), and significantly lower (at the five per cent level or less) on the Farmer (41.78 versus 45.31), Forest Service Man (35.07 versus 38.52), Social Science High School Teacher (33.01 versus 36.54), City School Superintendent (29.45 versus 32.59), and Mortician (30.14 versus 32.59) scales.

TABLE 34

COMPARISON OF MEANS ($\bar{X}$), VARIANCES $(\sigma^2)^1$ AND LETTER SCORES (LS) ON 44 SVIB SCALES FOR SPECIALISTS AND COUNTY AGENTS

SVIB scales by Occupational Groups	Specialists (N 73)			County Agents (N 81)			Test of homogeneity	
	$\bar{X}$	σ^2	LS	$\bar{X}$	σ^2	LS	F	t or d^1
I								
Artist	23.01	113,0	C	20.86	53.0	C	2.13**	2.02
Psychologist	19.04	139.3	C	16.42	133.3	C	1.05	1.39
Architect	24.25	163.7	C	22.10	86.8	C	1.89**	1.18
Physician	27.81	78.5	C+	27.28	80.0	C+	1.02	0.37
Osteopath	30.00	108.3	B–	32.59	82.0	B–	1.32	1.65
Dentist	24.93	147.6	C+	24.81	95.0	C+	1.55*	0.69
II								
Mathematician	21.09	115.4	C	17.04	88.8	C	1.30	2.49*
Physicist	17.40	155.6	C	14.94	125.3	C	1.24	1.29
Engineer	28.90	109.9	C+	26.42	85.8	C+	1.28	1.56
Chemist	26.03	149.3	C+	23.09	139.1	C	1.07	1.52
III								
Prod. Mgr.	34.25	58.1	B	33.58	58.3	B–	1.00	0.54

TABLE 34 (Continued)

SVIB scales by Occupational Groups	Specialists (N 73)			County Agents (N 81)			Test of homogeneity	
	$\overline{x}$	σ^2	LS	$\overline{x}$	σ^2	LS	F	t or d[1]
IV								
Farmer	41.78	81.5	B+	45.31	70.2	A	1.16	2.51*
Aviator	30.55	146.9	B–	30.62	90.9	B–	1.62*	0.39
Carpenter	25.07	147.6	C+	25.80	99.7	C+	1.48*	0.40
Printer	30.41	106.8	B–	30.62	70.9	B–	1.51*	0.13
Math.-Sci. Tchr.	35.61	99.9	B	36.66	82.5	B	1.21	0.74
Voc. Agr. Teacher	38.03	147.2	B	45.39	84.3	A	1.75**	4.18**
Policeman	29.31	81.4	B–	31.23	88.5	B–	1.09	1.29
Forest Service	35.07	130.9	B	38.52	96.5	B	1.36	2.01*
V								
YMCA Phys. Dir.	30.00	102.8	B–	32.84	118.1	B–	1.15	1.67
Personnel Dir.	30.68	117.5	B–	32.47	101.3	B–	1.16	1.06
Public Admin.	38.49	76.8	B	40.00	67.5	B+	1.14	1.10
YMCA Secy.	27.40	105.6	C+	30.12	113.7	B–	1.08	1.61
Soc. Sci. Tchr.	33.01	107.5	B–	36.54	92.9	B	1.16	2.19*
School Supt.	20.45	91.3	B–	32.59	86.9	B–	1.05	2.06*
Minister	22.46	160.5	C	25.55	102.5	C+	1.57*	1.66

TABLE 34 (Continued)

SVIB scales by Occupational Groups	Specialists (N 73)			County Agents (N 81)			Test of homogeneity	
	$\overline{X}$	σ^2	LS	$\overline{X}$	σ^2	LS	F	t or d[1]
VI								
Musician	23.42	139.5	C	21.85	110.3	C	1.27	0.87
VII								
C. P. A.	21.64	91.7	C	19.51	59.8	C	1.53*	1.51
VIII								
Accountant	27.81	72.9	C+	27.41	47.0	C+	1.55*	0.31
Office Man	30.27	61.0	B–	29.75	49.9	B–	1.22	0.43
Purch. Agent	30.14	70.8	B–	30.00	50.0	B–	1.42	0.11
Banker	32.74	78.5	B–	34.32	54.9	B	1.43	1.20
Mortician	30.14	56.9	B–	32.59	54.4	B–	1.05	2.03*
IX								
Sales Manager	32.88	87.4	B–	32.35	90.7	B–	1.04	0.35
Real Est. Sls.	35.75	122.0	B	35.06	45.3	B	2.69**	0.45
Life Ins. Sls.	31.37	117.5	B–	33.33	85.0	B–	1.38	0.75
X								
Advertising Man	30.68	88.4	B–	27.65	48.2	C+	1.83**	2.25*
Lawyer	30.14	51.3	B–	29.50	79.8	B–	1.55*	0.49
Author–Journ.	29.18	57.6	C+	26.91	111.6	C+	1.94**	1.54

TABLE 34 (Continued)

SVIB scales by Occupational Groups	Specialists (N 73)			County Agents (N 81)			Test of homogeneity	
	$\overline{X}$	σ^2	LS	$\overline{X}$	σ^2	LS	F	t or d[1]
XI								
Pres. Mfg. Conc.	32.33	59.7	B–	30.37	83.6	B–	1.40	1.43
Int. Maturity	52.71	26.7		52.00	55.2		2.07**	0.69
Occup. Level	56.37	46.2		55.38	33.2		1.39	0.97
Masc.-Femininity	48.56	66.0		49.63	36.8		1.79**	0.91
Teach. Satisfac.	48.71	76.1		49.38	58.5		1.30	0.50

* Significant at the five per cent level or less.

** Significant at the one per cent level or less.

[1] Means and variances of Strong's criterion groups and the use of the "d" test are explained in footnote 19, page 204.

It should also be noted that the Specialists not only scored significantly higher than the County Agents on the Mathematician and Advertising Man Scales, but also higher, although not significantly so, on all of the scales in Groups II, and X. This consistency of differences is apparent in the Group IV and Group V scales in that the Specialists scored lower than the County Agents on all scales in these Groups although significantly lower on only the scales previously indicated. This consistency is not as clear cut in Group VIII.

These differences indicate interests that do not seem to be inconsistent with the type of work performed by the Specialists. Since these workers are primarily concerned with the discovery, collection, organization and dissemination of scientific facts, their higher scores in the physical science areas represented in Group II and in the writing areas represented in Group X may have been expected when compared with the County Agents. Also, since the County Agents are primarily concerned with influencing and helping people, the Specialists lower scores in Group V are not surprising.

The fact that the Specialists scored higher than the County Agents on the Group II scales and lower than the County

Agents on the Group IV scales points out differences between "scientific" interests and "technical" interests. The Specialists alone have higher interests in the "technical" occupations than in the "physical science" occupations (note the letter scores for these two Groups). However, in comparison with the County Agents, they tend to indicate greater interest in the more purely scientific or research type of occupations than in the more mechanical or applied science types of occupations such as some of the Group IV scales represent. This difference also seems to be in keeping with the nature of their work.

The differences in variances between these two groups should be noted. Except on the Lawyer, Author-Journalist, and Interest Maturity scales, the Specialists indicated significantly greater variance than the County Agents on the remaining thirteen scales on which the variances were significantly different. It is possible that this greater variance on the part of the Specialists is due to an extent to the rather heterogeneous nature of their areas of specialization. For example, the men in this group include Specialists in agricultural engineering, information service, agricultural economics, tourist and resort service, and rural sociology and anthropology, in addition to

such fields as poultry, horticulture, farm crops, soil science, animal husbandry, etc.[4]

In summary, the Specialists indicated significantly higher interests than the County Agents in the specific occupations of mathematician and advertising man, and higher, but not significantly higher interests in the remaining physical science and writing types of occupations. The Specialists indicated significantly lower interests than the County Agents in the specific occupations of vocational agriculture teacher, farmer, forest service man, social science teacher, city school superintendent and mortician. They also indicated lower, but not significantly lower interests in the remaining and technical and social welfare occupations.

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[4] From the personnel files of the Michigan Extension Service.

APPENDIX B

FORMS USED IN THE STUDY

VOCATIONAL INTEREST BLANK FOR MEN (Revised)

By EDWARD K. STRONG, JR.
Professor of Psychology, Stanford University
Published by STANFORD UNIVERSITY PRESS, Stanford University, California

It is possible with a fair degree of accuracy to determine by this test whether one would like certain occupations or not. The test is not one of intelligence or school work. It measures the extent to which one's interests agree or disagree with those of successful men in a given occupation.

Your responses will, of course, be held strictly confidential.

Date...................:.........................

1. Name.. 2. Age.................... 3. Sex....................

4. Address to which correspondence should be sent..

....

If you are still attending school or expect to return to school, answer items 5–12; if you have left school, answer items 13–20. Any additional remarks may be entered at 21.

5. Grade I am now in: Grammar School 1 2 3 4 5 6 7 8   High School 1 2 3 4   College 1 2 3 4 5 6 7

(PUT A CIRCLE AROUND APPROPRIATE GRADE)

6. School grade I expect to complete..

7. School subjects I am now most interested in...

8. School subjects I expect to specialize in later on..

9. Occupation I am planning to enter.. 10. Sure of this........ Not sure........

11. Jobs I have been employed at (e.g., clerical, retail selling, farming, giving number of months employed at each)................

....

....

12. Occupations I have formerly considered entering..

....

To be Answered by Those Who Have Left School

13. Last grade you finished in school (e.g., Grammar 6th, High School 2nd, College 4th)..

14. What technical or business courses have you taken? (Underline those you finished).......................................

....

15. Occupation (e.g., Carpenter)... 16. Years of experience in it.................

17. Just what do you do?..

....

18. Why did you select the above occupation?..

....

19. What occupations, other than your present one, have you at one time or another engaged in?...........................

....

20. What occupations, if any, have you in mind entering? Why? ....

....

....

21. Remarks ....

....

Part I. Occupations. Indicate after each occupation listed below whether you would like that kind of work or not. Disregard considerations of salary, social standing, future advancement, etc. Consider only whether or not you would like to do what is involved in the occupation. You are not asked if you would take up the occupation permanently, but merely whether or not you would enjoy that kind of work, regardless of any necessary skills, abilities, or training which you may or may not possess.

    Draw a circle around L if you like that kind of work
    Draw a circle around I if you are indifferent to that kind of work
    Draw a circle around D if you dislike that kind of work

Work rapidly. Your first impressions are desired here. Answer all the items. Many of the seemingly trivial and irrelevant items are very useful in diagnosing your real attitude.

1 Actor (not movie)	L	I	D	46 Jeweler	L	I	D
2 Advertiser	L	I	D	47 Judge	L	I	D
3 Architect	L	I	D	48 Labor Arbitrator	L	I	D
4 Army Officer	L	I	D	49 Laboratory Technician	L	I	D
5 Artist	L	I	D	50 Landscape Gardener	L	I	D
6 Astronomer	L	I	D	51 Lawyer, Criminal	L	I	D
7 Athletic Director	L	I	D	52 Lawyer, Corporation	L	I	D
8 Auctioneer	L	I	D	53 Librarian	L	I	D
9 Author of novel	L	I	D	54 Life Insurance Salesman	L	I	D
10 Author of technical book	L	I	D	55 Locomotive Engineer	L	I	D
11 Auto Salesman	L	I	D	56 Machinist	L	I	D
12 Auto Racer	L	I	D	57 Magazine Writer	L	I	D
13 Auto Repairman	L	I	D	58 Manufacturer	L	I	D
14 Aviator	L	I	D	59 Marine Engineer	L	I	D
15 Bank Teller	L	I	D	60 Mechanical Engineer	L	I	D
16 Bookkeeper	L	I	D	61 Mining Superintendent	L	I	D
17 Building Contractor	L	I	D	62 Musician	L	I	D
18 Buyer of merchandise	L	I	D	63 Music Teacher	L	I	D
19 Carpenter	L	I	D	64 Office Clerk	L	I	D
20 Cartoonist	L	I	D	65 Office Manager	L	I	D
21 Cashier in bank	L	I	D	66 Orchestra Conductor	L	I	D
22 Certified Public Accountant	L	I	D	67 Pharmacist	L	I	D
23 Chemist	L	I	D	68 Photo Engraver	L	I	D
24 Civil Engineer	L	I	D	69 Physician	L	I	D
25 Civil Service Employee	L	I	D	70 Playground Director	L	I	D
26 Clergyman	L	I	D	71 Poet	L	I	D
27 College Professor	L	I	D	72 Politician	L	I	D
28 Consul	L	I	D	73 Printer	L	I	D
29 Dentist	L	I	D	74 Private Secretary	L	I	D
30 Draftsman	L	I	D	75 Railway Conductor	L	I	D
31 Editor	L	I	D	76 Rancher	L	I	D
32 Electrical Engineer	L	I	D	77 Real Estate Salesman	L	I	D
33 Employment Manager	L	I	D	78 Reporter, general	L	I	D
34 Explorer	L	I	D	79 Reporter, sporting page	L	I	D
35 Factory Manager	L	I	D	80 Retailer	L	I	D
36 Factory Worker	L	I	D	81 Sales Manager	L	I	D
37 Farmer	L	I	D	82 School Teacher	L	I	D
38 Floorwalker	L	I	D	83 Scientific Research Worker	L	I	D
39 Florist	L	I	D	84 Sculptor	L	I	D
40 Foreign Correspondent	L	I	D	85 Secretary, Chamber of Commerce	L	I	D
41 Governor of a State	L	I	D	86 Secret Service Man	L	I	D
42 Hotel Keeper or Manager	L	I	D	87 Ship Officer	L	I	D
43 Interior Decorator	L	I	D	88 Shop Foreman	L	I	D
44 Interpreter	L	I	D	89 Social Worker	L	I	D
45 Inventor	L	I	D	90 Specialty Salesman	L	I	D

Part I. Occupations, continued.

91 Statistician	L	I	D
92 Stock Broker	L	I	D
93 Surgeon	L	I	D
94 Toolmaker	L	I	D
95 Traveling Salesman	L	I	D
96 Typist	L	I	D
97 Undertaker	L	I	D
98 Watchmaker	L	I	D
99 Wholesaler	L	I	D
100 Worker in Y.M.C.A., K. of C., etc...	L	I	D

Part II. School Subjects. Indicate as in Part 1 your interest when in school.

101 Algebra	L	I	D
102 Agriculture	L	I	D
103 Arithmetic	L	I	D
104 Art	L	I	D
105 Bookkeeping	L	I	D
106 Botany	L	I	D
107 Calculus	L	I	D
108 Chemistry	L	I	D
109 Civics	L	I	D
110 Dramatics	L	I	D
111 Economics	L	I	D
112 English Composition	L	I	D
113 Geography	L	I	D
114 Geology	L	I	D
115 Geometry	L	I	D
116 History	L	I	D
117 Languages, ancient	L	I	D
118 Languages, modern	L	I	D
119 Literature	L	I	D
120 Mathematics	L	I	D
121 Manual Training	L	I	D
122 Mechanical Drawing	L	I	D
123 Military Drill	L	I	D
124 Music	L	I	D
125 Nature Study	L	I	D
126 Philosophy	L	I	D
127 Physical Training	L	I	D
128 Physics	L	I	D
129 Psychology	L	I	D
130 Physiology	L	I	D
131 Public Speaking	L	I	D
132 Shop work	L	I	D
133 Sociology	L	I	D
134 Spelling	L	I	D
135 Typewriting	L	I	D
136 Zoölogy	L	I	D

Part III. Amusements. Indicate in the same manner as in Part I whether you like the following or not. If in doubt, consider your most frequent attitude. *Work rapidly.* Do not think over various possibilities. Record your first impression.

137 Golf	L	I	D
138 Fishing	L	I	D
139 Hunting	L	I	D
140 Tennis	L	I	D
141 Driving an automobile	L	I	D
142 Taking long walks	L	I	D
143 Boxing	L	I	D
144 Chess	L	I	D
145 Poker	L	I	D
146 Bridge	L	I	D
147 Observing birds (nature study)	L	I	D
148 Solving mechanical puzzles	L	I	D
149 Performing sleight-of-hand tricks	L	I	D
150 Collecting postage stamps	L	I	D
151 Drilling in a company	L	I	D
152 Chopping wood	L	I	D
153 Amusement parks	L	I	D
154 Picnics	L	I	D
155 Excursions	L	I	D
156 Smokers	L	I	D
157 "Rough house" initiations	L	I	D
158 Conventions	L	I	D
159 Full-dress affairs	L	I	D
160 Auctions	L	I	D
161 Fortune tellers	L	I	D
162 Animal zoos	L	I	D
163 Art galleries	L	I	D
164 Museums	L	I	D
165 Vaudeville	L	I	D
166 Musical comedy	L	I	D
167 Symphony concerts	L	I	D
168 Pet canaries	L	I	D
169 Pet monkeys	L	I	D
170 Snakes	L	I	D
171 Sporting pages	L	I	D
172 Poetry	L	I	D
173 Detective stories	L	I	D
174 "Time"	L	I	D
175 "Judge"	L	I	D
176 "New Republic"	L	I	D
177 "System"	L	I	D
178 "National Geographic Magazine"...	L	I	D
179 "American Magazine"	L	I	D
180 "Popular Mechanics"	L	I	D
181 "Atlantic Monthly"	L	I	D
182 Educational movies	L	I	D
183 Travel movies	L	I	D
184 Social problem movies	L	I	D
185 Making a radio set	L	I	D

Part IV. Activities. Indicate your interests as in Part I.

186 Repairing a clock................ L I D
187 Adjusting a carburetor........... L I D
188 Repairing electrical wiring........ L I D
189 Cabinetmaking .... L I D
190 Operating machinery .... L I D

191 Handling horses .... L I D
192 Giving "first aid" assistance........ L I D
193 Raising flowers and vegetables..... L I D
194 Decorating a room with flowers..... L I D
195 Arguments .... L I D

196 Interviewing men for a job........ L I D
197 Interviewing prospects in selling... L I D
198 Interviewing clients .... L I D
199 Making a speech................. L I D
200 Organizing a play .... L I D

201 Opening conversation with a stranger L I D
202 Teaching children .... L I D
203 Teaching adults .... L I D
204 Calling friends by nicknames...... L I D
205 Being called by a nickname........ L I D

206 Meeting and directing people...... L I D
207 Taking responsibility .... L I D
208 Meeting new situations........... L I D
209 Adjusting difficulties of others...... L I D
210 Drilling soldiers .... L I D

211 Pursuing bandits in sheriff's posse.. L I D
212 Doing research work............. L I D
213 Acting as yell-leader............. L I D
214 Writing personal letters.......... L I D
215 Writing reports .... L I D

216 Entertaining others .... L I D
217 Bargaining ("swapping") .... L I D
218 Looking at shop windows.......... L I D
219 Buying merchandise for a store..... L I D
220 Displaying merchandise in a store.. L I D

221 Expressing judgments publicly
    regardless of criticism.......... L I D
222 Being pitted against another as in
    a political or athletic race....... L I D
223 Methodical work .... L I D
224 Regular hours for work.......... L I D
225 Continually changing activities..... L I D

226 Developing business systems....... L I D
227 Saving money .... L I D
228 Contributing to charities.......... L I D
229 Raising money for a charity....... L I D
230 Living in the city............... L I D

231 Climbing along edge of precipice... L I D
232 Looking at a collection of rare laces. L I D
233 Looking at a collection of antique
    furniture .... L I D

Part V. Peculiarities of People. Record your first impression. Do not think of various possibilities or of exceptional cases. "Let yourself go" and record the feeling that comes to mind as you read the item.

234 Progressive people .... L I D
235 Conservative people .... L I D

236 Energetic people .... L I D
237 Absent-minded people .... L I D
238 People who borrow things......... L I D
239 Quick-tempered people .... L I D
240 Optimists .... L I D

241 Pessimists .... L I D
242 People who are natural leaders..... L I D
243 People who assume leadership...... L I D
244 People easily led................ L I D
245 People who have made fortunes in
    business .... L I D

246 Emotional people .... L I D
247 Thrifty people .... L I D
248 Spendthrifts .... L I D
249 Talkative people .... L I D
250 Religious people .... L I D

251 Irreligious people .... L I D
252 People who have done you favors... L I D
253 People who get rattled easily....... L I D
254 Gruff men .... L I D
255 Foreigners .... L I D

256 Sick people .... L I D
257 Nervous people .... L I D
258 Very old people................ L I D
259 Cripples .... L I D
260 Side-show freaks .... L I D

261 People with gold teeth........... L I D
262 People with protruding jaws....... L I D
263 People with hooked noses......... L I D
264 Blind people .... L I D
265 Deaf mutes .... L I D

266 Self-conscious people .... L I D
267 People who always agree with you.. L I D
268 People who talk very loudly....... L I D
269 People who talk very slowly....... L I D
270 People who talk about themselves... L I D

271 Fashionably dressed people........ L I D
272 Carelessly dressed people.......... L I D
273 People who don't believe in evolution L I D
274 Socialists .... L I D
275 Bolshevists .... L I D

276 Independents in politics........... L I D
277 Men who chew tobacco........... L I D
278 Men who use perfume............ L I D
279 People who chew gum............ L I D
280 Athletic men .... L I D

Part VI. Order of Preference of Activities. Indicate which three of the following ten activities you would enjoy most by checking (√) opposite them in column 1; also indicate which three you would enjoy least by checking opposite them in column 3. Check the remaining four activities in column 2.

	1	2	3	
281	( )	( )	( )	Develop the theory of operation of a new machine, e.g., auto
282	( )	( )	( )	Operate (manipulate) the new machine
283	( )	( )	( )	Discover an improvement in the design of the machine
284	( )	( )	( )	Determine the cost of operation of the machine
285	( )	( )	( )	Supervise the manufacture of the machine
286	( )	( )	( )	Create a new artistic effect, i.e., improve the beauty of the auto
287	( )	( )	( )	Sell the machine
288	( )	( )	( )	Prepare the advertising for the machine
289	( )	( )	( )	Teach others the use of the machine
290	( )	( )	( )	Interest the public in the machine through public addresses

Indicate in the same way what you consider are the three most important factors affecting your work; also the three least important factors. Check the remaining four items in column 2. Be sure you have marked three items under 1, three items under 3, and four items under 2.

	1	2	3	
291	( )	( )	( )	Salary received for work
292	( )	( )	( )	Steadiness and permanence of work
293	( )	( )	( )	Opportunity for promotion
294	( )	( )	( )	Courteous treatment from superiors
295	( )	( )	( )	Opportunity to make use of all one's knowledge and experience
296	( )	( )	( )	Opportunity to ask questions and to consult about difficulties
297	( )	( )	( )	Opportunity to understand just how one's superior expects work to be done
298	( )	( )	( )	Certainty one's work will be judged by fair standards
299	( )	( )	( )	Freedom in working out one's own methods of doing the work
300	( )	( )	( )	Co-workers—congenial, competent, and adequate in number

Indicate in the same way the three men you would most like to have been; also the three you would least like to have been. Check the remaining four men in column 2.

	1	2	3	
301	( )	( )	( )	Luther Burbank, "plant wizard"
302	( )	( )	( )	Enrico Caruso, singer
303	( )	( )	( )	Thomas A. Edison, inventor
304	( )	( )	( )	Henry Ford, manufacturer
305	( )	( )	( )	Charles Dana Gibson, artist
306	( )	( )	( )	J. P. Morgan, financier
307	( )	( )	( )	J. J. Pershing, soldier
308	( )	( )	( )	William H. Taft, jurist
309	( )	( )	( )	Booth Tarkington, author
310	( )	( )	( )	John Wanamaker, merchant

Indicate in the same way the three positions you would most prefer to hold in club or society; also the three you least prefer to hold. Check the remaining four in column 2.

	1	2	3	
311	( )	( )	( )	President of a Society or Club
312	( )	( )	( )	Secretary of a Society or Club
313	( )	( )	( )	Treasurer of a Society or Club
314	( )	( )	( )	Member of a Society or Club
315	( )	( )	( )	Chairman, Arrangement Committee
316	( )	( )	( )	Chairman, Educational Committee
317	( )	( )	( )	Chairman, Entertainment Committee
318	( )	( )	( )	Chairman, Membership Committee
319	( )	( )	( )	Chairman, Program Committee
320	( )	( )	( )	Chairman, Publicity Committee

Part VII. Comparison of Interest between Two Items. Indicate your choice of the following pairs by checking (√) in the first space if you prefer the item to the left, in the second space if you like both equally well, and in the third space if you prefer the item to the right. Assume other things are equal except the two items to be compared.

Work rapidly.

321 Street-car motorman	( )	( )	( )	Street-car conductor
322 Policeman	( )	( )	( )	Fireman (fights fire)
323 Chauffeur	( )	( )	( )	Chef
324 Head waiter	( )	( )	( )	Lighthouse tender
325 House to house canvassing	( )	( )	( )	Retail selling
326 House to house canvassing	( )	( )	( )	Gardening
327 Repair auto	( )	( )	( )	Drive auto
328 Develop plans	( )	( )	( )	Execute plans
329 Do a job yourself	( )	( )	( )	Delegate job to another
330 Persuade others	( )	( )	( )	Order others
331 Deal with things	( )	( )	( )	Deal with people
332 Plan for immediate future	( )	( )	( )	Plan for five years ahead
333 Activity which produces tangible returns	( )	( ).	( )	Activity which is enjoyed for its own sake
334 Taking a chance	( )	( )	( )	Playing safe
335 Definite salary	( )	( )	( )	Commission on what is done
336 Work for yourself	( )	( )	( )	Carry out program of superior who is respected
337 Work which interests you with modest income	( )	( )	( )	Work which does not interest you with large income
338 Work in a large corporation with little chance of becoming president until age of 55	( )	( )	( )	Work for self in small business
339 Selling article, quoted 10% below competitor	( )	( )	( )	Selling article, quoted 10% above competitor
340 Small pay, large opportunities to learn during next 5 years	( )	( )	( )	Good pay, little opportunity to learn during next 5 years
341 Work involving few details	( )	( )	( )	Work involving many details
342 Outside work	( )	( )	( )	Inside work
343 Change from place to place	( )	( )	( )	Working in one location
344 Great variety of work	( )	( )	( )	Similarity in work
345 Physical activity	( )	( )	( )	Mental activity
346 Emphasis upon quality of work	( )	( )	( )	Emphasis upon quantity of work
347 Technical responsibility (head of a department of 25 people engaged in technical, research work)	( )	( )	( )	Supervisory responsibility (head of a department of 300 people engaged in typical business operation)
348 Present a report in writing	( )	( )	( )	Present a report verbally
349 Listening to a story	( )	( )	( )	Telling a story
350 Playing baseball	( )	( )	( )	Watching baseball
351 Amusement where there is a crowd	( )	( )	( )	Amusement alone or with one or two others
352 Nights spent at home	( )	( )	( )	Nights away from home
353 Reading a book	( )	(.)	( )	Going to movies
354 Belonging to many societies	( )	( )	( )	Belonging to few societies
355 Few intimate friends	( )	( )	( )	Many acquaintances
356 Many women friends	( )	( )	( )	Few women friends
357 Fat men	( )	( )	( )	Thin men
358 Tall men	( )	( )	( )	Short men
359 Jealous people	( )	( )	( )	Conceited people
360 Jealous people	( )	( )	( )	Spendthrifts

Part VIII. Rating of Present Abilities and Characteristics. Indicate below what kind of a person you are right now and what you have done. Check in the *first* column ("Yes") if the item really describes you, in the *third* column ("No") if the item does not describe you, and in the *second* column (?) if you are not sure. (Be frank in pointing out your weak points, for selection of a vocation must be made in terms of them as well as your strong points.)

	YES	?	NO
361 Usually start activities of my group...	( )	( )	( )
362 Usually drive myself steadily (do not work by fits and starts)	( )	( )	( )
363 Win friends easily..	( )	( )	( )
364 Usually get other people to do what I want done......................................	( )	( )	( )
365 Usually liven up the group on a dull day..	( )	( )	( )
366 Am quite sure of myself..	( )	( )	( )
367 Accept just criticism without getting sore..	( )	( )	( )
368 Have mechanical ingenuity (inventiveness)...	( )	( )	( )
369 Have more than my share of novel ideas...	( )	( )	( )
370 Can carry out plans assigned by other people.......................................	( )	( )	( )
371 Can discriminate between more or less important matters.............................	( )	( )	( )
372 Am inclined to keep silent (reticent) in confidential and semi-confidential affairs..............	( )	( )	( )
373 Am always on time with my work...	( )	( )	( )
374 Remember faces, names, and incidents better than the average person	( )	( )	( )
375 Can correct others without giving offense..	( )	( )	( )
376 Able to meet emergencies quickly and effectively.....................................	( )	( )	( )
377 Get "rattled" easily..	( )	( )	( )
378 Can write a concise, well-organized report...	( )	( )	( )
379 Have good judgment in appraising values...	( )	( )	( )
380 Plan my work in detail..	( )	( )	( )
381 Follow up subordinates effectively...	( )	( )	( )
382 Put drive into the organization..	( )	( )	( )
383 Stimulate the ambition of my associates..	( )	( )	( )
384 Show firmness without being easy..	( )	( )	( )
385 Win confidence and loyalty..	( )	( )	( )
386 Smooth out tangles and disagreements between people...............................	( )	( )	( )
387 Am approachable	( )	( )	( )
388 Discuss my ideals with others...	( )	( )	( )

Check (√) in the first, second, or third column at the right according as the first, second, or third statement in each item below applies to you.

			(1st)	(2nd)	(3rd)
389 (1) Feelings easily hurt	(2) Feelings hurt sometimes	(3) Feelings rarely hurt......	( )	( )	( )
390 (1) Usually ignore the feelings of others	(2) Consider them sometimes	(3) Carefully consider them..	( )	( )	( )
391 (1) Loan money to acquaintances	(2) Loan only to certain people	(3) Rarely loan money......	( )	( )	( )
392 (1) Rebel inwardly at orders from another, obey when necessary	(2) Carry out instructions with little or no feeling	(3) Enter into situation and enthusiastically carry out program	( )	( )	( )
393 (1) When caught in a mistake usually make excuses	(2) Seldom make excuses	(3) Practically never make excuses	( )	( )	( )
394 (1) Best-liked friends are superior to me in ability	(2) Equal in ability	(3) Inferior in ability........	( )	( )	( )
395 (1) Handle complaints without getting irritated	(2) Become annoyed at times	(3) Lose my temper at times..	( )	( )	( )
396 (1) Borrow frequently (for personal use)	(2) Borrow occasionally	(3) Practically never borrow..	( )	( )	( )
397 (1) Tell jokes well	(2) Seldom tell jokes	(3) Practically never tell jokes	( )	( )	( )
398 (1) My advice sought by many	(2) Sought by few	(3) Practically never asked...	( )	( )	( )
399 (1) Frequently make wagers	(2) Occasionally make wagers	(3) Never make wagers......	( )	( )	( )
400 (1) Worry considerably about mistakes	(2) Worry very little	(3) Do not worry..........	( )	( )	( )

Be Sure You Have Not Omitted Any Part: Note Particularly the Second Columns on Pages 2, 3, and 4.

Occupation	Artist	Psychol- ogist	Architect	Physician	Dentist	Mathema- tician	Engineer	Chemist	Production Manager	Farmer
Raw Score										
Standard Score										
Rating										

Occupation	Carpenter	Printer	Mathematics Science Teacher	Policeman	Forest Service	Y.M.C.A. Physical Director	Personnel	Y.M.C.A. General Secretary	Social Science Teacher	City School Superin- tendent
Raw Score										
Standard Score										
Rating										

Occupation	Minister	Musician	Certified Public Accountant	Accountant	Office Worker	Purchasing Agent	Banker	Sales Manager	Real Estate Salesman	Life Insurance Salesman
Raw Score										
Standard Score										
Rating										

Occupation	Advertising Man	Lawyer	Author- Journalist	President, M'f'g Concern	Occupational Level	Masculinity- Femininity	Interest Maturity	Aviator		
Raw Score										
Standard Score										
Rating										

Occupation										
Raw Score										
Standard Score										
Rating										

Strong Vocational Interest Inventory

by Edward K. Strong Jr.,

Instructions

1. All answers are to be marked on this answer sheet—do not write in the test booklet.

2. Answer spaces, three squares in vertical position, are numbered to correspond to the numbering of the items in the test. You are to decide how you wish to answer the question, then make a mark in the answer space that corresponds to this answer.

Example: 1. Actor (not movie).

Mark the upper square (the row marked "L") of number 1 if you *like* that kind of work.

Mark the middle square (the row marked "I") of number 1 if you are *indifferent* to that kind of work.

Mark the lower square (the row marked "D") of number 1 if you *dislike* that kind of work.

3. Use a soft lead pencil, No. 2, No. 1 or electrographic, to mark the square you select, making broad, **heavy glossy black** lines from **Corner to corner** of

the square—thus

Erase your first mark if you change your mind and mark another square.

Make sure your marks are carefully made—thus

Go from **Corner to corner** of the square; make **heavy glossy black** lead pencil lines.

It is important that you keep your pencil sharp & use enough pressure to make **heavy glossy black** lines.

Be sure each vertical group of 3 squares has **one** and **only one mark.**

4. Be sure to read the instructions in the booklet as they vary from part to part.

Engineers Northwest   100 Metropolitan Life Bldg.,   Minneapolis 1, Minn.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
I D	PART I																														HOOL OR AGENCY
L I D	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
L I D	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	
L I D	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	

PART II

| | 121 | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 |

PART III

| 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 |

SCHOOL VR

| 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 |

PART IV

| 211 | 212 | 213 | 214 | 215 | 216 | 217 | 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 | 238 | 239 | 240 |

PART V

ADDRESS

| 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 | 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 |

MARK 3 YOU ENJOY MOST HERE — MARK 3 MOST IMPORTANT HERE

| 271 | 272 | 273 | 274 | 275 | 276 | 277 | 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 | 298 | 299 | 300 |

PART VI — MARK REMAINING 4 HERE — MARK REMAINING 4 HERE

MARK 3 YOU ENJOY LEAST HERE — MARK 3 LEAST IMPORTANT HERE

MOST — MARK 3 MOST LIKE TO HAVE BEEN HERE — MARK 3 MOST PREFERRED HERE — PRE LEFT

| 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 | 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 |

EQUAL — MARK REMAINING 4 HERE — MARK REMAINING 4 HERE — EQU

PART VII

LEAST — MARK 3 LEAST LIKE TO HAVE BEEN HERE — MARK 3 LEAST PREFERRED HERE — PRE RIGHT

LEFT ITEM — PRE LEFT

| 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 | 358 | 359 | 360 |

EQUAL — EQU

RIGHT ITEM — PRE RIGHT

YES — 1ST

| 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 | 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 |

? — 2ND

PART VIII

NO — 3RD

FORM ME

1ST — | 391 | 392 | 393 | 394 | 395 | 396 | 397 | 398 | 399 | 400 |

2ND

3RD

See other side for instructions
Make sure your marks are carefully made—thus ☒

Go from **Corner to corner** of the square, make **heavy glossy black** lead pencil lines
It is important that you keep your pencil sharp & use enough pressure to make **heavy glossy black** lines
Be sure each vertical group of 3 squares has **one** and **only one** mark.

GROUP	OCCUPATION STANDARD SCALE	C	C+	B-	B	B+	A
I	ARTIST						
	PSYCHOLOGIST						
	ARCHITECT						
	PHYSICIAN						
	OSTEOPATH						
	DENTIST						
II	MATHEMATICIAN						
	PHYSICIST						
	ENGINEER						
	CHEMIST						
III	PRODUCTION MANAGER						
IV	FARMER						
	AVIATOR						
	CARPENTER						
	PRINTER						
	MATH. PHYS. SCI. TEACHER						
	POLICEMAN						
	FOREST SERVICE MAN						
V	Y.M.C.A. PHYS. DIRECTOR						
	PERSONNEL DIRECTOR						
	PUBLIC ADMINISTRATOR						
	Y.M.C.A. SECRETARY						
	SOC. SCI. H.S. TEACHER						
	CITY SCHOOL SUPT.						
	MINISTER						
VI	MUSICIAN						
VII	C.P.A.						
VIII	ACCOUNTANT						
	OFFICE MAN						
	PURCHASING AGENT						
	BANKER						
	MORTICIAN						
IX	SALES MANAGER						
	REAL ESTATE SALESMAN						
	LIFE INSURANCE SALESMAN						
X	ADVERTISING MAN						
	LAWYER						
	AUTHOR-JOURNALIST						
XI	PRESIDENT-MFG CONCERN						

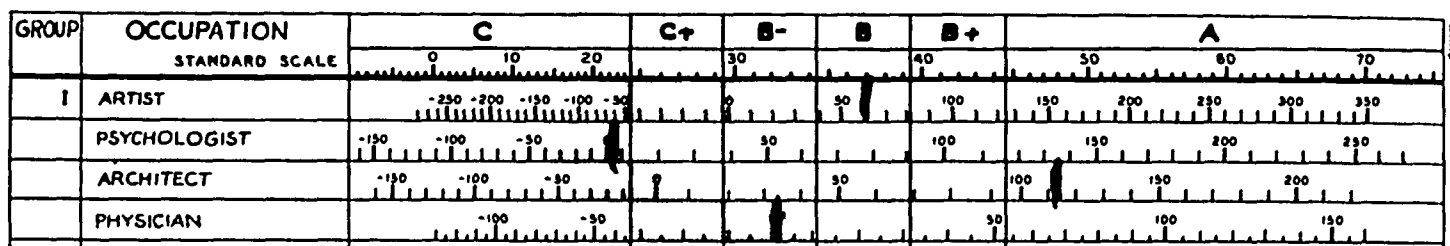|	STD	15 20 25 30 35 40 45 50 55 60 65 70 75
INTEREST MATURITY	RAW	-350 -300 -250 -200 -150 -100 -50 0 50 100 150 200 250
OCCUPAT. LEVEL	STD / RAW	15 20 25 30 35 40 45 50 55 60 65 70 75 / -200 -150 -100 -50 0 50 100 150 200
MASCULINITY-FEMIN.	STD / RAW	15 20 25 30 35 40 45 50 55 60 65 70 75 / -200 -150 -100 -50 0 50 100 150 200

Report on Vocational Interest Test for Men (Continued)

Your occupational interests are recorded by heavy lines on the scales opposite the appropriate occupations.

In the example below the man has a B rating in the interests of artists (note the B at the top of the report blank), a C rating in the interests of psychologists, an A rating in the interests of architects, and a B— rating in the interests of physicians.

GROUP	OCCUPATION	C		C+	B-	B	B+	A	
	STANDARD SCALE	0　　　10　　　20		30		40		50　　　60　　　70	
I	ARTIST	-250 -200 -150 -100 -50		0	50	100		150　200　250　300　350	
	PSYCHOLOGIST	-150　-100　-50			50	100		150　　200　　250	
	ARCHITECT	-150　-100　-50	0		50		100	150　　200	
	PHYSICIAN	-100　-50				50		100　　150	

An A rating means that the individual has the interests of persons successfully engaged in that occupation; a C rating means that the person does not have such interests; and the ratings B+, B, and B— mean that the person probably has those interests but we cannot be so sure of that fact as in the case of A ratings. It is seldom that persons with C ratings are found in the occupation, and if so engaged they are either indifferent successes who are likely to drop out or are carrying on the work in some more or less unusual manner. The latter situation is exemplified by a physician with a rating of C in the interests of a physician who is engaged as superintendent of a hospital.

All high ratings (B+ and A) should be considered. One may choose one occupation so rated or plan to utilize one's interests in two or more such occupations. Thus, if one scores high in both law and engineering one might prepare for both and become a patent attorney, or a lawyer specializing in engineering problems.

The higher a score to the right of the shaded area the greater the certainty that one has the interests characteristic of that occupation. The lower the score to the left of the shaded area the greater the certainty that one does not have the interests of the occupation. Scores falling within the shaded area are indeterminate: they help sometimes to show, along with other scores, the general trend of one's interests in an occupational group. But generally they can be ignored. Consequently, in the above diagram the scores for psychologist and physician are disregarded, and we conclude that the individual has an A rating in the interests of an architect and a B rating in the interests of an artist.

Occupations included in the same group all correlate highly with one another.

Men's interests change very little from 25 to 55 years of age. They change somewhat from 20 to 25 years and much more so from 15 to 20 years. Consequently, the younger the man, particularly below 20 years of age, the less certainly can his interests be identified in terms of some occupation. Such changes in interests as take place are more likely to result in higher ratings than the reverse. This is particularly true with respect to ratings in Group V.

The ratings from this test should not be viewed as conclusive; they are not guaranteed. Instead they should be viewed as merely suggestive and to be considered in the light of all other information bearing upon one's vocational choice. Occupations rated A and B+ should be carefully considered before definitely deciding against them; occupations rated C, C+, and B— should be carefully considered before definitely deciding to enter them. Remember only a few from among all the hundreds of occupations are reported on here.

Remember also this is a test of your interests. Your abilities must also be considered. Interests point the way you want to go, abilities determine how well you can progress.

Scores on the three special scales (see bottom of report sheet) are for the use of trained counselors and should be explained personally by them. The IM scale expresses maturity of interests. One's age must be taken into consideration in interpreting this score. It applies only to men between the ages of 15 and 20. The OL scale indicates whether one's interests are similar to common workmen (a low score) or to business and professional men (a high score). The MF scale indicates whether one's interests are similar to the interests of men or women. The average man scores 50 on the OL and MF scales.

The report blank gives simultaneously (1) raw scores, (2) standard scores, and (3) letter ratings. Raw scores are the sum of the plus and minus weights assigned to the items as marked by the person taking the test. They are indicated on the lines opposite each of the occupations and so distributed as to correspond properly to the standard scores, which are given on the line immediately below the letter ratings C to A. Thus, in the example, the B rating in interests of artists equals a standard score of 37 and a raw score of 60. See the author's *Vocational Interests of Men and Women*.

EDWARD K. STRONG, JR.
Professor of Psychology

Stanford University, California

MICHIGAN STATE COLLEGE
U. S. DEPARTMENT OF AGRICULTURE
COOPERATING

COOPERATIVE EXTENSION SERVICE
COUNTY AGENT WORK

September 15, 1950

As you probably know, we are undertaking a research project for the general purpose of trying to improve the Extension Service. One step in this project is to find out more about the vocational interests of the Agents so that we can use this information in doing a better job of selection and training. At the last District Conference the Agents present filled out the Strong Vocational Interest Blank for this purpose.

Since you did not attend this conference, I am enclosing a copy of this test and hope that you will be able to find about 45 minutes for filling it out. There are no right or wrong answers, so you should answer the questions just as you feel about them. In most cases, your first impression gives a better picture than if you study over the questions too long. Your answers will have no bearing whatsoever on your present or future status in the Extension Service.

After you return the blank to me, an identification number will be assigned to your test so that you will be anonymous to the research workers. However, you should put your name on the test so that we can send you a copy of your answer sheet after the test has been scored.

With the cooperation of everyone on this project we should be able to improve our organization and do a more effective job of selecting and training new Agents.

Sincerely yours

John T. Stone
Specialist in Extension Training.

Enclosure

JTS:ba

October 3, 1950

Enclosed is a profile sheet made up from the answers you gave
to the questions on the Strong's Vocational Interest Blank you
filled out at the Chatham Conference. The red marks on the profile
sheet show how your interests compare to the interests of successfully
employed persons in the 39 occupations listed.

I hope you will find it interesting to compare your interests
with those of workers in these various occupations. On the back of
the profile sheet is an explanation of the interest scale used. If
you happen to have an M.F. or masculinity-feminity score of less
than 50, it doesn't mean you are effeminate. Most social workers
tend to have a score less than 50. It only indicates a greater than
average interest in people, children and their well being.

At the present time, no one knows whether or not extension
workers have any common interest patterns. The composite data from
your answers to this battery of questions is now in the process of
being sorted and coded to be fed into the I.B.M. machines. Out of
this analysis an interest scale for extension workers will be developed,
thanks to your cooperation. This is the same way Strong made up the
interest scales for artists, farmers, etc., with which your interests
are compared on the profile sheet.

Thanks for your help. By working together, carefully analyz-
ing our work and by studying the characteristics of successful
agents, we should be able to improve our effectiveness and do a
better job of selecting and training new agents.

Sincerely yours

John T. Stone
Specialist in Extension Training.

Enclosure

JTS:ba

MICHIGAN STATE COLLEGE
U. S. DEPARTMENT OF AGRICULTURE
COOPERATING

COOPERATIVE EXTENSION SERVICE
COUNTY AGENT WORK

May 2, 1951

    ·   You will recall that we are in the process of a research project
that is designed primarily to improve our selection and training of new
Agents. The Strong Vocational Interest Blank which you filled out last
fall was the first main step in this project. As a second step, we
would like to know more about the Agents attitudes toward their job.
The enclosed <u>Survey of Occupational Attitudes</u> has been prepared for
this purpose.

       I would appreciate it if you would answer this questionnaire and
return it to me as soon as possible. The instructions are given on the
first page. We simply want your frank answers and nothing you put down
will have any bearing on your present or future status in the Extension
Service. You will notice that after you return the blank to me your
name will be removed and a code number will be replaced so that you
will be anonymous to the research workers.

       The project is moving along and by the cooperation of each Agent
we should soon have some worthwhile information for improving the
effectiveness of our organization.

                               Sincerely yours

                               John T. Stone
                     Specialist in Extension Training.

Enclosure

JTS:ba

EXTENSION SERVICE RESEARCH PROJECT

· <u>SURVEY OF OCCUPATIONAL ATTITUDES</u>   **336**

Sponsored by

The Michigan Cooperative Extension Service

WHAT THIS IS: People have varying opinions about their occupations and

the work that they do from day to day. Your reactions

to the attached questions will be used to help us estab-

list standards for selecting future agents.

WHAT WE WANT YOU TO DO:

1. Enter your name, title, and address on the bottom of

the page. This portion of the questionnaire will be re-

moved and replaced by a code number.

2. There are no right or wrong answers.

3. Indicate <u>some</u> answer to every question. It is im-

portant that you do <u>not</u> skip any of the questions.

Name ....

Title ....

Address ....

Few people can excell in performing all of the different roles or tasks required of county extension agents. Listed below are 11 of the most common kinds of things agents are called on to do. They each require somewhat different abilities and training to perform satisfactorily. From your experience, which of these tasks would you say it was most important for a new agent to show promise of doing particularly well, recognizing they are all important. Rate each role in comparison to the others listed.

Circle (E) if you feel it is extremely important that an agent be able to perform the role exceptionally well.

Circle (V) if you feel it is very important that an agent perform this role well.

Circle (I) if you feel this role is important for an agent to be able to perform satisfactorily.

Circle (N) if you feel it is not important for an agent to be able to perform this role satisfactorily.

E V I N   Performing office details, keeping records, writing reports, filing, etc.

E V I N   Acting as radio broadcaster.

E V I N   Acting as administrator, organizing and seeing that things are done, writing reports, etc.

E V I N   Acting as demonstrator or public speaker, giving information, talks, lessons, etc. before groups.

E V I N   Acting as a public relations man, maintaining good public relations, keeping up contacts, building useful friendships and good will, etc.

E V I N   Acting as an organizer or arranger of activities or events.

E V I N   Acting as a consultant, giving people information and advice as requested.

E V I N   Acting as a facilitator, or expediter, making it easy or possible for people to follow extension recommendations or programs.

E V I N   Acting as student, keeping up to date on new developments, etc.

E V I N   Acting as newspaper reporter or columnist.

E V I N   Acting as a promoter, stimulating people to action in face to face contact.

(T)

This set of questions is widely used to determine how satisfied people are in different kinds of work. We are asking you to fill it out to see if there is a relationship between extension agents' vocational interests and job satisfaction. In addition, we need to know the job satisfaction of county extension workers so that we can use it as a standard against which to compare prospective extension workers. This is not a measure of a person's performance on the job or of his intent to change jobs. It is merely an indication of the satisfaction which the total job provides.

Each question, it should be noted, is made up of two parts. The first part ask how you feel about some element of your work. The second part is an attempt to determine how intensely you feel about it. Be sure to answer both parts of each question.

1. How well do you like your work? (check one)
    .... I dislike it a great deal
    .... I don't like it
    .... I'm indifferent to it
    .... I like it fairly well
    .... I like it very much
    .... I like it better than almost anything else.

    How strongly do you feel about this? (check one)
    .... Not at all strongly
    .... Quite strongly
    .... Very strongly

2. How much of the time do you feel satisfied with your occupation? (check one)
    .... All of the time
    .... Almost all of the time
    .... Most of the time
    .... A good deal of the time
    .... Some of the time
    .... Very little of the time

    How certain are you about this? (check one)
    .... Very certain
    .... Fairly certain
    .... Not at all certain.

3. How do you feel about changing your occupation? (check one)
    .... Would like very much to get into a
    completely different occupation.
    .... Would like to change to some related occupation
    .... Am not eager to change but would consider
    changing to a related occupation
    .... Might consider changing to a closely related
    occupation.
    .... Would not consider changing
    .... Undecided.

    How sure are you about this? (check one)
    .... Not at all sure
    .... Fairly sure
    .... Very sure

(T)

4. How well satisfied are you with your occupation? (check one)
   .... Much more satisfied than other people
   .... More satisfied than the average person
   .... As well satisfied as most people
   .... Less satisfied than the average person
   .... Much less satisfied than other people

   How strongly do you hold this opinion? (check one)
   ....Very strongly
   ....Quite strongly
   .... Not at all strongly

5. How enthusiastic are you about your occupation? (check one)
   .... Not at all enthusiastic
   ....Only mildly enthusiastic
   ....Quite enthusiastic
   ....Very enthusiastic

   How strongly do you feel about this? (check one)
   ....Not at all strongly
   ....Quite strongly
   ....Very strongly

6. How important do you think your work is as compared to that
   of other professional people? (check one)
   ....Very important
   ....Quite important
   .... Slightly important
   .... Not important at all
   ....Undecided

   How sure are you about this?
   ....Very sure
   .... Fairly sure
   .... Not at all sure

7. How interested are you in your work? (check one)
   .... Not interested at all
   ....Only slightly interested
   ....Quite interested
   ....Very interested

   How much does being interested in your work mean
   to you personally? (check one)
   ....Means very little
   .... Means quite a lot
   .... Means a great deal

In the job analysis study we are conducting to find ways extension agents use their time it would be unrealistic to omit from careful consideration likes and dislikes. In every job there are things we get a lot of personal pleasure and satisfaction from doing. Other things we do because they need to be done. Your answers will help us to find out what Michigan agents like to do most and what they do because it is expected of them by the job.

Draw a circle around the key letter which best describes your feelings:
V if you enjoy very much; S if you get some enjoyment from it; D if you don't enjoy doing it. Example: If you do not like playing the part of a public relations man, circle D.

1.	Acting as a consultant	V	S	D
2.	Acting as a promoter	V	S	D
3.	Acting as an organizer	V	S	D
4.	Acting as newspaper reporter	V	S	D
5.	Acting as radio broadcaster	V	S	D
6.	Acting as administrator	V	S	D
7.	Acting as a demonstrator or public speaker	V	S	D
8.	Acting as a facilitator or expediter	V	S	D
9.	Performing office details	V	S	D
10.	Acting as student	V	S	D
11.	Acting as a public relations man	V	S	D

(T)