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The Development and Validation of a Vocational Interest Survey Instrument With Audio-Visual Format

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THE DEVELOPMENT AND VALIDATION OF A VOCATIONAL INTEREST SURVEY INSTRUMENT WITH AUDIO-VISUAL FORMAT.

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Andrews University

School of Graduate Studies

THE DEVELOPMENT AND VALIDATION OF A VOCATIONAL INTEREST SURVEY INSTRUMENT WITH AUDIO-VISUAL FORMAT

A Dissertation

Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

by

Paul Gene Elliott

August 1978

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THE DEVELOPMENT AND VALIDATION OF A VOCATIONAL INTEREST SURVEY INSTRUMENT WITH AUDIO-VISUAL FORMAT

A dissertation presented

in partial fulfillment of the requirements

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Paul Gene Elliott

APPROVAL BY THE COMMITTEE:

Robert A. Williams
Robert Williams, Chairperson

Robert J Cruise
Robert Cruise

Ruth Murdoch
Ruth Murdoch

Conrad A. Reichert
Conrad A. Reichert

Harold Lang
Harold Lang

Robert A. Williams
Dean, School of Graduate Studies

July 7, 1978
Date approved

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ABSTRACT

THE DEVELOPMENT AND VALIDATION OF A VOCATIONAL INTEREST SURVEY INSTRUMENT WITH AUDIO-VISUAL FORMAT

by

Paul Gene Elliott

Chairperson: Robert Williams

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ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

Andrews University

Department of Education

Title: THE DEVELOPMENT AND VALIDATION OF A VOCATIONAL INTEREST SURVEY INSTRUMENT WITH AUDIO-VISUAL FORMAT

Name of researcher: Paul Gene Elliott

Name and title of faculty adviser: Robert Williams, Ph.D.

Date completed: August 1978

Problem

Many present day vocational interest surveys rely exclusively on printed reacing materials to assess youngsters' vocational interest. The use of printed reading materials alone may not best serve the youngsters who are unable to read or who learn best through a different kind of learning structure. There needs to be a variety of valid assessing techniques that explore the youngster's vocational interest. These techniques should not raise side issues of academic skills, but provide a pure measure of interest. The purpose of this research was to develop and test an instrument

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using photographs as choice stimulants in place of a printed reading list of occupations.

Method

Six hundred and thirteen subjects were chosen by a stratified random method from among a polled sample population of 799 persons. The 613 subjects were divided into three major research groups. The first group was the professional-worker group which consisted of 202 people who were employed in occupational classifications similar to one of the six classifications hypothesized by John Holland (1973). The second group was the secondary sample which consisted of 200 students whose vocational major was similar to one of hte six Holland typologies, and third; the post-secondary sample which included 211 members whose major two-year study was similar to one of the six Holland types.

Each group was administered the Visual Imagery Selector for Indexing Occupational Needs (V.I.S.I.O.N.), an instrument especially designed for this study. The professional-worker sample was also administered the Vocational Preference Inventory (V.P.I.) to compare similarities between the two vocational surveys. The other two student samples were administered only the V.I.S.I.O.N. survey. The V.I.S.I.O.N. survey consists of 120 slides depicting two types of vocational work tasks as described by Holland. The individual taking the inventory selected one of the work tasks he/she performed from the slides and marked their response on an answer sheet especially designed for the study. The responses were tabulated for each participating sample and prepared for analysis.

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A χ^2 analysis was used for all sample populations to determine if the expected frequency of responses were the same or different than the observed frequency of responses. Second, a factor analysis was performed for the professional-worker sample alone to determine if any similarities existed between the V.I.S.I.O.N. and the V.P.I. surveys.

Results

People employed or going to school that were appropriately grouped under one of the six occupational types purposed by Holland chose photographs of work tasks that were most nearly like their own work experience or school majors. A comparison between the V.I.S.I.O.N. occupational interest inventory and the V.P.I. occupational interest inventory showed a similarity between elements of two tests. That is, people who responded most often to one of the six major Holland types on the photographic occupational inventory also responded the same way on the printed occupational inventory.

The answer sheet that was designed especially for the photographic inventory seemed to fulfill its expected role of response gathering and occupation informing for those people that were administering the survey.

Conclusions

It is possible to assess occupational interest using photographs of people working in one of the six Holland occupational types. Information about work and work options can be described with a non-reading format. More than half of the variance

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for both the χ^2 analysis and the factor analysis for the three samples describe a strong relationship between the research variables and their concomitant parts. The advantages of such a format open the possibility of counselors for helping youngsters that either (1) do not have skills necessary to decipher printed descriptions of occupations or, (2) whose prime mode of learning is not reading.

Since the test was used on a wide range of persons, it also holds the possibility for developmental study.

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TABLE OF CONTENTS

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LIST OF ILLUSTRATIONS

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LIST OF TABLES

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ACKNOWLEDGEMENTS

My experience as a counselor led me to the study contained in the following pages. During that time I witnessed many youngsters struggling with inadequate methods with which to understand their life goals. As part of my work, I assisted with the task of both academic and non-academic testing. Most students fear assessment. They viewed the process as a prerogative of school officials to open or draw shut curtains to one's future. Few students see testing as an opportunity to learn more about themselves.

It was the particular area of occupational inventory testing that captured my interest. The structure of some of the occupational interest instruments were built around the already suspect academic test format. It was a condition, I felt, that was incompatible with good ways for youngsters to acquire information about jobs.

How to improve upon the printed format became a challenge for me. At the time of the original idea, there was much public discussion about the possible adverse nature of television viewing by school-age youngsters. It was my thought to use the attention qualities of visual media to the youngsters' advantage. An audio-visual format seemed to be a naturally attractive way to package occupational interest testing. The next problem became an acceptable way in which to organize and present the visual materials.

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My introduction to Holland's theory brought forth the structure I was seeking. I organized photographs under the Holland structure and made the same assumption as Holland did about their generic selection.

Any large undertaking by an individual demands the support of friends, friends to support the soul and friends to support the the work. I had the very good fortune to have both.

My best friends in this venture, and the ones to whom I dedicate this work, are the members of my family. They have endured and sacrificed many times for the completion of this dissertation. Most notable among them has been my wife, Marilyn.

Besides my family, I have felt the encouragement and warmth of the many friends at Andrews University. I have particularly appreciated the patience and understanding of the members of my doctoral committee. They have been steadfast in their devotion to my ultimate success. Principal among the committee members has been my most ardent supporter and friend, Dr. Robert Williams. He has been both uplifting in his encouragement and consistent in his guidance.

The experiences and support I received while at the Indiana Career Resource Center guaranteed the success and direction of the project. My present position as Guidance Counselor for the Northern Regional Service Center has resulted in even more people who have helped along the way. Most notable among these has been my secretary, Patricia Pejza. She has helped organize and plan my work experience to insure success.

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A very large measure of my thanks goes to my lifelong friend, Rosemary Onderdonk, for the organization, guidance, and final typing of this thesis. An experienced typist of dissertations, she made her work a present to me one Christmas. It is with great gratitude that I humbly accept it.

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CHAPTER I

INTRODUCTION

The choice of a career is one of the most important steps taken by any individual. A career sets the stage for economic security and personal independence. A career also creates, in many instances, the opportunity for marriage and the establishment of a household. In many cases, a career is the culmination of specialized learning and the beginning of an individual's climb toward professional proficiency (Ginzberg, 1971, p. 5).

Such an important event would be expected to receive careful consideration in the nation's schools. Until very recently, the opposite was true. Most schools have given little or no attention to the subject of career programs. Schools actually foster misinformation about the nature of work. Through their neglect to initiate career programs, they allow myths and legends to continue about certain kinds of jobs (Venn, 1970, p. 85). There are too many cases where only feeble attempts are made to instruct the nation's youth in the nature and understanding of the world of work.

In some schools there are attempts made to provide for a limited activity in career discovery. In most instances, this activity takes the form of an occupational interest survey. The results

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of these surveys are intended to help the students in identifying areas in which they may have an occupational interest. One problem that often arises with such interest surveys is that they are often administered too late in the school experience to help the student plan adequately for a career choice. The surveys are typically administered in the last year of high school, giving little opportunity for youngsters to discuss the results with a competent counselor, or to make plans for a post-high school education.

Another problem with present interest surveys is the nature of their construction. They are often limited in their ability to reflect an accurate picture of the vocational interest of the student (Kuder, 1970, p. 205). By relying on the exclusive use of a pencil and paper format, the results of the survey reflect only the student's vocabulary skills. Responses then become either answers about how the student feels toward certain kinds of work, or how proficient the student is in deciphering the vocabulary stimulus used by the survey. One suggestion to remedy this situation has been made by Chrochran, Vinitsky and Warren (1974). They suggest a developmental career counseling process that helps the student to "conceptualize work environments." They further suggest that the best way to accomplish this task is through the use of an audio-visual technique. It will be one of the purposes of this study to see if a Visual Imagery Selector for Indexing Occupational Needs (V.I.S.I.O.N.) can assist in this conceptualization process.

Statement of the Problem

The exclusive use of printed occupations by some of the

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current interest surveys tends to limit many other important individual responses that need to be part of the total career exploration process. The sole reliance on these types of surveys places the whole career guidance program in jeopardy. Their exclusive use brings into question the fairness or accuracy of the results as they relate to certain student populations (Doppet and Bennett, 1967, p. 3). If fairness and accuracy are compromised, the resulting misconceptions about work can do great harm to a youngster's perspective about certain jobs (Doppett and Bennett, 1967, p. 5). There needs to be available to career guidance counselors alternative ways of assessing vocational interest. Also, the way schools presently rely on the use of one type of interest survey to assist youngsters' vocational choice needs to be broadened to include other strategies of career exploration. Gysbers (1972) feels a need for a more comprehensive system of career exploration--one that incorporates self-discovery along with occupational discovery.

Purpose of the Study

The purpose of this study is to investigate an alternative approach to traditional types of vocational interest assessments. By the development and validation of this method of assessing vocational interest, the study seeks to minimize some of the limitations of contemporary printed vocational interest surveys. The study's development essentially of a non-verbal interest survey with an audio-visual format will provide to vocational counselors a reliable tool with which to help their clients.

The development and empirical validation of the proposed

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vocational interest survey is aimed at broadening the base of vocational understanding and providing vocational knowledge for the client. The development of the Visual Imagery Selection Survey Inventorying Occupational Needs (V.I.S.I.O.N.) will include consideration of the problem of non-verbal assessment validation, as well as ways in which the survey can be used as part of an overall plan for career guidance. Both students and counselors should benfit by such a program. It should provide new ways for them to communicate with each other about vocational and career guidance problems.

Background of the Problem

Vocational counselors are presently becoming more aware of the need to help youth find different ways to explore and test career choices (Wampler, 1973). A study of the role of the counselor as described by superintendents, principals and counselors by DeSilvestro (1972) placed special emphasis on the necessity for counselors to be more involved with students in career development. In a report for the State of Indiana entitled "The Counselor and Career Education" (Wampler, 1973, p. 3), special emphasis was placed on the important part played by the use of assessment instruments in helping the counselor guide youngsters with career and vocational exploration. Wampler states:

> As students become more perceptive of the characteristics in each of the occupational clusters, the counselor must be prepared to guide them in analyzing their own interests, aptitudes, and abilities. Students' interest, aptitudes, and abilities may be identified many different ways, using instruments designed to facilitate this assessment.

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> However, the identification is only the first step. The second step, and the most important part, involves the teacher-counselor guidance team assisting the student in relating this self-information to his expanding knowledge of the world at work. Using this information in an individual and/or group setting, counselors can help students explore life styles associated with a variety of ways one might choose to make a living (p. 7).

The role of assessment. Super and Crites (1962) divided individual interest assessments into the following classifications: (1) expressed interest--those interests that a person says he is interested in; (2) manifest interest--those interests that an individual actually pursues; (3) assessed interest--those interests that are manifest by the individual's job knowledge, and (4) inventoried interest--those interests that determine an individual's preferences by his responses to a list of occupations or activities.

One of the other problems utilizing the assessed or inventoried assessments has been their appropriateness for school-age youngsters. Ginzberg (1971) cautions counselors to "restrict the use of interest testing until the counselor can be adequately prepared for the test and be informed what he can or cannot expect to learn from it." The counselor must also be aware that interest assessment is only one part of the overall picture of occupational selection. Other things such as career exploration--the process of obtaining job knowledge, career development--the stage that accompanies chronological age and signals certain career growth patterns, and career goals selection--the end results of the career development process, all have an important influence on occupational choice (Prediger, 1974, p. 18).

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The role of career development. Tuckman (1974, p. 194) defines career development as a sequence of predictable experiences that influences youngsters' self-awareness, career awareness, and career decision-making skills. Ginzberg, Ginsburg, Axelrad, and Herma (1951, p. 107) view career choice as a developmental process and not just a single event. This idea is shared by Super (1970, p. 201) who views the individuals' ability to deal with vocational developmental tasks to be related to the individual's stage of career maturity. Crites (1974, p. 27) was later to elaborate on this same idea by stating that the process of career maturity is like other types of maturity. Career maturity develops over a period of time and is predictable as to its approximate sequence. Hansen (1967, p. 97) asserts that the development of self and an appropriate career are both part of the total developmental process. Their appearance varies with the developmental readiness of the person experiencing growth. Many of these contemporary ideas coincide with the more classical developmental theories of such men as Erickson, Piaget and others (Tuckman, 1974, p. 195).

Interest assessment in career development. With the acceptance of the idea of career development as being an integral part of the total growth process, teaching and assessment strategies could play a positive role in guiding youngsters in career choices (Prediger, 1974, p. 16). A carefully planned process of positive experiences in career exploratory behavior by the use of interest assessment techniques could help youngsters focus on job opportunities. The experience could enhance a youngster's career growth and

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understanding about his vocational and job options. The chosen tools to accomplish this task will have to meet the challenges of a modern society. They must be tools that have wide acceptance in both school and community. Counselors need to be aware of the advantages and limitations of such interest assessments and how they contribute to the positive development of youth. In too many cases, assessment today is not a good experience for youngsters.

A general review of both technical and non-technical literature dealing with people's attitudes and feelings about current assessment instruments points to a general dissatisfaction with test construction and test interpretation (Anastasi, 1968). Specific reform in testing is being sought for equitable methods of individual assessment that take into account (1) cultural biases (Thorndike, 1971, p. 63); (2) sexual biases in the vocational selection assessment of women (Dewey, 1974, p. 311); and (3) the need to change the general feeling of many segments of our population that testing of any kind is synonymous with failing (Ebel, 1964, p. 134). Those who are concerned with vocational testing are asking for more careful attention to the many factors that are part of the vocational selection process (Holland, 1976).

Pritchard (1970, p. 19) maintains the important activity of matching one's talent to a job is also matching one's needs and ambitions to a process of self-discovery. Much of the criticism of existing standardized assessment instruments is that they fail to take into account the many important functions that describe a person's behavior or his interests (McCormack, 1976).

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Model Considerations for Study Development

The visual interest survey which was developed and validated by this study uses as its model the Holland system of defining interest and vocational selection. John Holland's conceptual base comes from a belief in a theory of personality and environmental types; therefore, its philosophical base is rooted in the trait-factor theory. The attraction of this theory for this study was the organizing or systematizing effect the theory offers to testing methodology. The theory also offers a complete explanation of vocational choice, which may be compared to the results of the interest survey under development and can be helpful for testing concurrent validity. A more complete explanation of the Holland theory will follow in the next section.

The developmental models used by this study originate from several sources. They originate first, from the literature of the general area of counseling and guidance, and second, from the specific area of vocational or career guidance. In the general area of counseling and guidance, Carl Rogers (1942, 1951), Edward S. Bordin (1955), Gilbert Wrenn (1973), and others began the push for humanizing the counseling psychology process and bringing it closer to the needs of the individual. Borrow (1970, p. 14) makes the observation that the appropriate role of the counselor is as a "development facilitator," a person who arranges environments and spurs social change.

The career guidance part of the developmental model which the study utilizes has its antecedents in the works of Super,

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Gysbers, Tuckman, and Healy (1974, p. 653).

Model Selected for This Study

John Holland (1958, 1964, 1966, 1973) views the occupational choice as a matching process between personality constructs of the individual and preferences for occupations and career selections. He sees the individual as being predisposed to one of six types of environments: realistic, investigative, artistic, social, enterprising, and conventional. According to his theory, these environments are related to vocational areas which are universally determined by people's preferences schemes.

Holland has authored two instruments relating to the theory, The Vocational Preference Inventory (V.P.I.), which has been the mainstay of most of the research to support his ideas. The sixth revision (1965) consists of 160 occupational titles. The individual responds to these occupational titles in a "yes" or "no" fashion depending on his personal preference for or rejection of the title. The inventory can be used with children ages fourteen through adult.

The second instrument developed by Holland is The Self-Directed Search (1972). The instrument introduces several unique ideas to vocational counseling procedures. It is self-administered, self-scored, self-interpreted, and is based on the vocational theory cited above. The follow-up research to determine its effectiveness has been very favorable as to the workability and validity of the results (Edwards and Whitney, 1972). The instrument utilizes the same typology of persons and environments to explain

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careers as the basic Holland theoretical structure. The explanation of what the types mean are given in the following sections:

Explanation of typologies. The ideas tested in Holland's typology were first formulated in 1959. Specific explanations (Holland and Whitney, 1966; Holland, 1968; Whitney, Cole, and Richard, 1969) of the different types yield a concensus as follows:

(1) Realistic people prefer activities that include explicit, ordered, or systematic manipulation of objects, tools, achines, animals, and avoidance of situations that demand heavy social involvement. The expected personality orientations of the realistic persons are that of one who has mechanical abilities and values objects that are tangible. He prefers to work in jobs which deal with products rather than people.

(2) The investigative person prefers activities that are observational, symbolic, systematic, and creative. The expected personality orientation includes a preference for scientific and mathematical competencies. He views himself as being weak in persuasive skills, and prefers tasks that include scholarly and intellectual competencies. He views science as a prior consideration in most matters.

(3) The artistic type person prefers activities that may be ambiguous, free, unsystematized. The expected personality orientation would be toward physical, verbal, or other materials to create expressions in the form of products or other things relating to art. He would perceive himself as original, intuitive, nonconforming, and having an artistic and/or musical ability. He

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would particularly value esthetic qualities in all things.

(4) The social person prefers activities that include "the manipulation of others to inform, train, develop, cure, or enlighten." The expected personality orientation would be preferences for "liking to help others" and acting as a facilitator of social activities. He would perceive himself as being concerned about social and related problems.

(5) The enterprising type would favor those activities that include "the manipulation of others to attain organization goals or economic gain" (Holland, 1973, p. 16). The epxected personality orientation would be striving in areas of "leadership, interpersonal, and persuasive competencies." He would be little concerned about scientific or investigative matters. He would perceive himself as being "aggressive, popular, and self-confident." Some of his major interests would be political and economic achievements.

(6) The conventional type would prefer those activities which include ordered, systematic manipulation of data (Holland, 1973, p. 17). The expected personality orientation would include preferences in keeping records, filing, organizing written and numerical materials according to an exact plan. He would have an aversion to the type or life style of the artistic person. He would perceive himself to be orderly, having numerical and clerical ability. His major concern would be about business and economic achievement.

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Companion career choices to personality typologies. Realistic personality types would choose career as laborers, farmers, mechanics. Intellectual types would prefer career choices such as electrical engineer, laboratory technician, and chemist. Social types would select careers related to teaching, nursing, and the clergy. Artistic personality types would be represented by such careers as artistic, dramatist, acting, writing, musician, and photography, while the Enterprising types would be attracted to careers in banking, sales, and personnel management. Finally, Conventional type persons would prefer careers in accounting, data processing, secretarial, and bookkeeping operations (Holland, 1973).

Questions to Be Answered

The idea of employing "pictorial psychology" as a device to measure responses to picture arrangement or picture completion is not new to the field of psychological assessment. Many tests such as the Rorschach, Thematic Apperception Test, and the Wechsler Adult Intelligence Scale have as part of their interpretive format a section or sections devoted to pictorial perceptual data. There are many other similar assessments too lengthy to recount in this report. The idea of having, as part of the vocational assessment of a youngster, a visual factor of work task recognition gave rise to the first considerations of relating this technique to the area of vocational survey assessment. The principal question to be answered by this study is "given the validity of past research and investigation utilizing pictorial perceptual assessment, will this

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type of assessment be successful in surveying vocational interest?" If this is possible, can this description be used as a pictorial assessment of people's interest based on the theoretical structures of the classifications suggested by Holland?

Some of the questions to be studied by this investigation are the following:

1. Is there any significant relationship between the V.P.I. and the V:I.S.I.O.N. survey? Do the two surveys measure the same constructs for a person taking both tests? The significance of the second question is the similarity between the two surveys and the information they both produce.

2. Is there a similarity between V.I.S.I.O.N. survey results and the V.P.I. survey results when they are tested by factor analysis? Are the surveys similar in their ability to test for strengths in the six types?

3. Is there a relationship between what a professional worker receives on his/her V.I.S.I.O.N. results and the category of the worker's job title as defined by Holland's occupational classification?

One of the earlier questions associated with the Holland typology was its initial testing with National Merit Scholarship Students (Carkhuff, Alexik, and Anderson, 1967). Although research has confirmed Holland's instrument's ability to make distinctions between interest responses of professional-worker and their job classification (Holland, 1968b), this study seeks to observe if the visual survey can perform an equal task. If the visual survey can

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perform such a task, then it can be used by professional counselors as a predictive tool to assist students with their occupational selection.

4. Is there a relationship between the highest responses on the V.I.S.I.O.N. results received by secondary school vocational students and their vocational school majors?

As with question 3, if the V.I.S.I.O.N. survey would successfully relate to the preference and majors of secondary school vocational students, it could become a valuable tool for junior high counselors in helping students plan for the secondary school experience. It could also be used by high school and vocational school curriculum directors to plan for subject matter offerings. In addition to the strictly cognitive preparation that would result from such information, schools could begin to enhance curriculum offerings with affective training materials appropriate to the career goals of their students.

5. Is there a relationship between the highest responses received by post-secondary school students and the vocational major they are presently studying?

As was true for question 4, the ability of the V.I.S.I.O.N. survey to identify the occupational preferences of post-secondary students and their vocational major would produce a predictive tool for students in planning for a post-high school experience. It would also provide information for post-secondary school institutions regarding the needs for curriculum alterations to the training programs for post-secondary students. An additional benefit

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might be derived in anticipating and planning for the job market availability when the post-secondary students complete their training.

6. Can independent raters agree on job descriptions if given a list of both specific occupational titles and corresponding photographs of workers performing some typical work task? Will picture reliability be established by finding significant relationship between these judgments by three experienced raters regarding their independent matching of each photograph to its intended occupational title?

Several photographs will be provided for each title so that the final selection of 240 photographs broadly represents the occupations represented. The inclusion of any photo in the instrument will constitute an agreement by the raters that it represents a sample portraying the occupational title.

Delimitations of the V.I.S.I.O.N. Study

The following qualifications of this study are noted:

1. Photographic representation of work task may differ from place to place. (A person's knowledge about certain work tasks would be greater if that task were performed routinely in his geographical location.

2. The effects of the use of a 35 mm projector and tape player on the overall responses of those taking the survey were not tested by this study.

3. The effects of the use of a special answer sheet were not tested as to the ease of responding to the photographs. (A

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cursory survey was made by requesting written comments at the end of the survey.)

4. As part of an idea to observe the relationships of school performance with the ability to choose vocational interest, a (?) response was offered for post analysis. The results of that information will not be part of the major questions for this study.

5. The questions of the suitability of the V.I.S.I.O.N. survey with different grades or age levels was not answered by this study.

6. A stratified random sample is used in order to insure that each Holland category is proportionately represented in the sample.

The establishment of the appropriateness for different grade and age levels (to which the last delimitation refers to) has some important implications. An answer to this question would open the possibility of designing a visual survey to use with elementary school children. This question has been a dominant theme in the professional literature for many years. The resolution to this question, however, will have to wait for a program designed to measure specifically its acceptability for different grade and age levels. This study will accept the age restriction outlined by Holland. He suggests the V.P.I. be reserved for junior high or high school age youngsters (Holland, 1975, p. 3).

Definitions

For purposes of this study the following definitions were adopted:

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1. Indiana Career Resource Center is defined as a program funded by the State Board of Vocational and Technical Education, state of Indiana, located in South Bend, Indiana.

2. Career is defined as both paid and unpaid activities that form a person's work history and vocational aspirations from birth to death.

3. Personality types are defined as those characteristic occupational groups defined by Holland. These occupational groups include the following: (1) realistic, (2) investigative, (3) artistic, (4) social, (5) enterprising, and (6) conventional.

4. Professional-Worker is defined as a person who participated in the survey sample group and who is a member of an occupational activity descriptive of one of the six Holland typologies.

5. Career Development is a sequence of planned experiences designed to help students develop self-awareness, career awareness, and career decision-making skills.

6. Post-Secondary is defined as those technical and academic schools which have two- to four-year training programs designed for those who have completed secondary school.

Summary and Overview

Some of the problems of present-day interest surveys that are of concern to this study are: (1) the exclusive use of printed media tends to bias interest surveys in favor of those people who understand middle-class occupations (Doppet and Bennett, 1967, p. 3); (2) the use of printed media alone fails to provide a realistic picture of the meaning of different work tasks; (3) the

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interpretation of printed survey results tends to become a "test and tell" session of static information between counselor and client (Cochran, Vinitsky, Warren, 1974).

The present study explores a new way of assessing vocational interest by using photographs and a searching technique instead of printed descriptors for vocational interest surveys. The rationale for this direction is that photographs of people at different work tasks have a more common ground for understandability than the more abstract notions sometimes engendered by present-day printed descriptions (Levie and Dickei, 1975).

The V.I.S.I.O.N. survey was constructed by utilizing the ideas of personality and environmental types offered by John Holland. The validation of the Holland theory has been "broad, varied, and comprehensive" (Osipow, 1973, p. 77).

The Holland Theory also adapts itself to systematizing occupational information. In both the areas of exploration and the understanding of occupations, the system is easily comprehended by both the counselor and client. The results can be used as reference to specific literature about certain jobs such as the Dictionary of Occupational Titles (D.O.T.), or it can be used to discover a whole family of related occupations that can be surveyed and digested by the student (Viernstein, 1972).

The activity of surveying and understanding occupations and how they related to self-growth can lead to a more carrer-conscious individual. The resulting growth produces a healthier personal and vocational future for the client (Cochran, 1974, p. 659).

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The chapters that follow will elaborate and test the basic premises and assumptions made in the first section of this study. Chapter II will survey that part of the literature that best describes for the reader the research that is pertinent to the study, while Chapter III will explain the method of analysis used. Chapter IV will describe the outcomes of the analysis and Chapter V will review and offer recommendations concerning the appropriate use of the information.

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CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

The following chapter surveys some of the literature that describes reports important to career exploration and their relationship to career guidance. It further examines and contrasts the different theories and approaches that were briefly discussed in the previous chapter.

The spectrum of investigation covering the selected theories will range from a short discussion of the different theoretical approaches to a consideration of the theory's application to career exploration. This chapter looks at the different theoretical suggestions for providing youngsters with better understandings of occupation choices. An accepted point of reference for this study is that each theory offers worthwhile ideas for vocational counselors in understanding the planning necessary for their own counseling approaches, and in influencing good exploratory habits of their clients.

This chapter reviews the theoretical orientations of John Holland and his ideas about career development, the effects of career development over the life span, and the possibilities the theory holds for exploratory behavior. Special attention will be

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given to some of the research that has been done in related areas that demonstrate the theory's usefulness for this study. For instance, the results of feedback that clients received from the interest instruments developed by Holland are important in understanding this study's orientation as to what constitutes good exploratory activity.

The final part of this chapter will examine evidence supporting the ideas about the usefulness of media in career guidance. It will report on some tested and untested techniques used by career practitioners and others in communicating guidance strategies utilizing an audio-visual format.

Approaches to Career Exploration

Frank Parsons. Most authors agree that vocational guidance began with the work of Frank Parsons in 1908, with the establishment of the Vocation Bureau in Civic Service House in Boston. In his classic work, Choosing a Vocation (1909), Parsons emphasized the need for individuals to explore their particular understandings of interest, abilities and aptitudes. With this knowledge, along with their stated ambitions, resources, and limitations, Parsons maintained that a person could match these characteristics to similar job characteristics. Katz (1963) was later to define Parsons' ideas concerning vocational guidance as the "trait" theory of occupational guidance. The theory dominated most of the vocational thinking well into the early 1950s (Bailey and Stadt, 1973). Its expansion and integration into the many areas of vocational

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counseling methodology gives witness to its usefulness in modern career counseling.

Much of the cricism of "trait" theory has been directed at the matching individuals to appropriate jobs. Critics argue that the theory stresses occupational orientation to the exclusion of process orientation. However, many forget that the theories' beginnings were with underprivileged children who had poor preparation for understanding themselves or their future (Ginzberg, 1971). Cooley (1964) stated that the modern trait and factor theory is much more sophisticated than just matching a test score. The theory produces patterns of relationships for the counselor and client to consider in choosing a vocational selection. The theory is the foundation of many vocational testing structures used today. Super and Crites (1962) stated that the tests were better predictors of job success than actual job experience; however, many have since modified this attitude and advise the use of these kinds of assessment instruments in conjunction with other kinds of information about an individual. It must be remembered that the vocational perspective of occupations in 1909 was much different than the complex mixture of jobs and individuals that we face today. Nevertheless, Parson's contribution will continue to be refined and modified for use in career guidance models.

Anne Roe. One of the contemporary theorists that use psychological characteristics as important in determining vocational choice is Anne Roe. In her more classic view of vocational exploratory behavior, she states that early experiences in the home

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influence vocational selection. According to Roe, an individual comes to what can be called the exploratory threshold with genetic determinants flavored with emotional preparedness for the work world. While the "exploratory" part of Roe's theory is a small part of the overriding consideration of personality traits, the theory becomes the result of fixed patterns of growth.

The major element of the theory points to the emotional climate of one's experience in the home, such as the development of basic attitudes, interest and capacities that will later be reflected in the adult's vocational expression of job choice (Bailey and Stadt, 1973). Influenced by both the work of Gardner Murphy and A. H. Masolw, Roe uses an explanation of early childhood experiences and motivational differences to explain individual career goals. From this hypothesis, she generalizes as to the physical and mental determinants that will shape exploratory behavior and vocational choice. Roe states: "Reflection of early experience in vocational choice . . . will be given expression in the general pattern of the adult's life, in his personal relations, in his emotional reactions, in his activities and in his vocational choice" (p. 108).

An important part of the theory is the differentiation that is made between people who are oriented toward "people occupations" and those who are not. These orientations have been translated by Roe into a field and level classification of occupations that include eight fields of occupations and six levels of job competency. This means that within one field of occupational pursuit, many levels of responsibility may exist. Roe maintains that the

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aspiration to the different levels are determined by the previously mentioned limitations of family and genetics. At this point any exploratory behavior on the part of an individual would have to stay within the boundries of the level structure offered by Roe, which is seen by many as being very deterministic and disablying to vocational growth.

Of particular interest to this study is the preliminary testing of the ideas of Roe with the use of the Rorschach Inkblot and the Thematic Apperception Tests (Roe, 1949, 1950), which demonstrated the possibility of a visual perceptive instrument measuring the concurrent validity of a theoretical structure. However, some have criticized the use of a projective technique as a measure of test validity.

The reception of others toward the validity of Roe's research is mixed. Perione (1964), in a study to discover the relationship between high school cognitive measures and the right occupational fields suggested by Roe, discovered that boys with similar cognitive measures preferred similar fields of interests as defined by Roe. Crites (1962), however, dismissed the idea of a continuum of occupational groups as an interpersonal relationship dimension.

A summary of contributions made by Roe to the general area of career guidance and this report might include, first, the suggestion that personality characteristics are influenced by the family which in turn influences vocational choice; and second, the scheme of field and levels purposed by the theory suggest a construct that counselors might use to enhance exploratory behavior by

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clients. Whether that explanatory behavior should be restricted to the boundaries of level considerations is another matter.

Ginzberg, Ginsburg, Axelrad and Herma. One of the first studies to explore the influence of developmental growth on vocational choice was by Ginzberg, Ginsburg, Axelrad and Herma (1951). Their major thesis stated that occupational choice was not a single occurrence but rather a developmental process.

The developmental stages offered by the theory include the fantasy period, the tentative period, and the realistic period. The fantasy period is characterized by make believe roles tested by youngsters between the ages of six to eleven. It is also the one period that is not broken down into subtopics as are the others. The tentative period includes youngsters eleven to seventeen years of age. One of the subtopics of this period described by the theory is the "interest" phase. It is during this phase that the youngster sorts through a number of vocational likes and dislikes. This phase is of major interest to this study. The general theme of the entire period of the tentative stage is that of deciding a future vocational goal. The third period described by the theory is the "realistic" period. This period occurs around the age of eighteen. This period, as does the tentative period, holds much interest for those counselors looking for appropriate times to provide exploratory activities for their client. The period is divided into sub-stages of "exploration," "crystallization," and "specification" (Ginzberg, Ginsburg, Axelrad and Herma, 1951).

The exploratory sub-stage is composed of a combination of

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educational and occupational pursuits. The youngster begins during this period, according to the theory, to narrow his pursuits down to the principal ones he intends to follow. The sub-stage of crystallization is accomplished when the individual has focused on one occupational choice and has "synthesized" his choice through various means. Throughout this period, according to Ginzburg, the youngster must make "compromises" between how he sees himself and how things actually are. Ginzberg did view this compromise as irreversible, but later modified that idea to one of "optimizing" career choice (Ginzberg, 1972, p. 169).

In testing one part of the validity of the Ginzberg theory, O'Hara and Teidman (1959) concluded that the interest stage of the tentative period ended in their "tested" sample after students completed the tenth grade. This information, coupled with their observation of a growth in work values, seem to corroborate an important part of the theory. A youngster during this period, for example, would profit most from an exploration of interest rather than from information about aptitudes (Osipow, 1973, p. 93)

In summary, the basic contribution of Ginzberg and his associates seem to be in the areas of "life-stage" formulations, and the developmental aspects of occupational choice. It also suggests that in the developmental ladder, the one stage called the tentative stage is most ameliorative to the interest test techniques suggested by the trait factor theorist.

Donald Super. In an attempt to synthesize knowledge about vocational development, Donald Super (1953) produced the beginnings of one of the most durable essays on the explanation of vocational

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development yet written. While agreeing in essence with the work of Ginzberg, Ginsberg, Axelrad, and Herma (1951), Super disagreed with the theory's failure to include more information about educational and vocational development that influence career patterns and occupational selection.

Super sees the major contribution of a career theory as being developmental in scope, interlocking in effect and identifiable by life stages that describe vocational behavior (Super, 1972). The life stages that Super devised were first, the "Growth Stage," ages birth through fourteen years of age; second, the "Exploration Stage," ages fifteen through twenty-four; third, the "Establishment Stage," ages twenty-five through forty; fourth, the "Maintenance" stage which includes the ages beyond forty and fifty, the "Decline" stage which includes the ages of sixty-five and beyond. Each of these stages has expected vocational and personality behaviors which characterizes or describes the stages. A more complete explanation of the stages follows:

> (1) Growth Stage. Ages from birth through fourteen years of age. The development of a "self" comes about through family influence. Visualized career goals are fantasized during this period and are subordinated to any reality testing.
>
> (2) Exploration Stage. The expected ages for this stage are fifteen through twenty-four. Learning more about one's self and one's role in society are dominant during this period. This period is similar in several respects to that suggested by Ginzberg, Ginsburg, Axelrad and Herma (1951). It also suggests similar strategies for counselors in enhancing vocational exploration.
>
> (3) Establishment Stage. The expecte age limits for this stage are seen as twenty-five to forty-four years of age. Career activity during this period of time is seen as securing one's position and reputation in one's chosen field.

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> (4) Maintenance. The age limits for this stage are between forty-five years of age to sixty-four years of age. The major objective at this point is to hold the career ground already gained.
>
> (5) Decline. This stage encompasses the age of sixty-five and beyond. It is the inevitable decline of both mental and physical powers that result in deceleration and retirement (Bailey and Stadt, 1973, p. 19).

The above stages illustrate the theory's concepts concerning the continuous process of compromise and synthesis of career choice. Inherent in the theory is the ever-present concept of the actualization of the self-concept. In Super's revised theory (1963), the emphasis is still placed on the individual's occupational preferences as being an attempt to enhance the self-concept. The self-image, says Super, must be congruent with the occupational expectations. It is evident that an array of options must be available to the counselor and client during this critical period of time in order to explore career directions. It is also important to explore career alternatives so that a person can understand individual capabilities and the positive combinations of work traits that are possible to optimize career choices.

In a study by Super and Overstreet (1960), the idea that vocational maturity of ninth grade boys is related to "their degree of intellectual and cultural stimulation" was explored. As a result of this study, Super strongly suggested that a school should provide "planfulness" in helping youngsters to become aware of their occupational goals. This idea would seem to be consistent with Super's thoughts about exploratory behavior in general.

In another study, Blocher and Schutz (1961) compared the interaction between self-descriptions, occupational stereotypes,

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and vocational preferences; and they concluded that an individual's vocational "self-description" and ideal "self-concept" are similar to his stereotype of a member of an occupation in which he expresses some interest. This study seems to confirm the usefulness of some stereotypical arrangements of occupations for use with career exploration.

In summarizing the parts of Super's theory that are important to this paper, it is critical to remember that the entire theory offers a comprehensive explanation of differential-developmental-social and phenomonological psychology. In appraising the usefulness of Super's theory in helping the vocational guidance needs of youngsters, Osipow (1973) makes the following observations:

> (1) A counselor applying Super's theory would orient his clients to the understanding of the stages of life development and have the client match his own growth progress against those suggested by Super;
> (2) A counselor would make use of vocational appraisal instruments for self understanding and planning;
> (3) A counselor would make use of experiences outside of the school and inside the community to help establish career identity (p. 163).

In a major attempt to resolve the theoretical conflict among vocational choice theories, Super has created a theoretical cohabitation of behavioral and vocational theory. Super appeals to other theorists for understanding of the interplay of behavioral and environmental considerations. He views the trait-factor explanation of vocational choice and the social-personality approach as only a partial account of the concepts that describe career choice.

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John L. Holland

John L. Holland (1973) in a major work entitled Making Vocational Choices: A Theory of Careers, mapped out a theory of vocational selection that was to challenge the imagination of many researchers. The idea that individuals work best at jobs that are extensions of their personalities became a central theme in Holland's work. Attached to this theory is a framework of job classifications that allow people to match personal preferences with occupational preferences. This modal personal orientation posits into one of six classifications: realistic, investigative, artistic, social, enterprising and conventional. The occupational orientation also explains the environments that will satisfy a particular orientation. Each occupational group provides explanations of abilities, identifications, values, and attitudes that members of the group share. Like Roe, Holland includes levels of job competencies in each group to explain the intellectual demands of the work.

Classification of occupational stereotypes is not original with the Holland theory. Holland gives J. G. Darling credit for inspiring the creation of the Vocational Preference Inventory and the subsequent research that was to follow (Holland, 1973). Holland also gives credit to J. P. Guilford in inspiring the construction of the typology through a comprehensive factor analysis of human interest. It was from this work that Holland formulated the basic assumptions of his theory.

Early formulation by Holland led to "a priori" occupational

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classification of the six categories. The first group, realistic, included the technically skilled and laboring occupations. The second group, intellectual, included the scientific and related kinds of occupations. The third group, social, included educational and other socially related occupations. The fourth group, conventional, accounted for those jobs that were of an office or clerical nature. The fifth group, enterprising, included sales and managerial occupation. The sixth occupational group, artistic, included the artistic, literary and musical occupations. Holland (1973) states that these classifications were used from 1959 to 1965 in several theoretical studies, but were not tested empirically until 1966. In 1966, Holland re-defined these major categories, and they became the first six scales of the Vocational Preference Inventory (V.P.I.).

One of the first of several studies by Holland (1962) demonstrated that two samples of National Merit Scholarship finalists manifested certain personality variables that were significantly related to the modal occupational orientations discussed earlier. The mean number responded to by the participants as "appealing" or "of interest" were calculated for each scale (realistic, intellectual, etc.). A profile for each Vocational Preference Inventory scales was constructed for each occupation. The highest scale mean was plotted first, the next highest scale mean was plotted second, and so forth, until the student preferences were identified. The study demonstrated the membership preferences of individuals to certain occupational typologies.

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A special study by Holland (1960) compared the V.P.I. to the Cattell Sixteen Personality Factor Questionnaire (16PF). The result of that study seems to confirm a positive inter-correlation between the V.P.I. and the 16PF. It further suggested that the V.P.I. had sufficient concurrent validity for use in subsequent studies. This was to take on further importance in the following study designs.

A second study published by Holland (1963) was a four-year longitudinal study utilizing an earlier group of National Merit Scholarship finalists. They were classified into the six Holland occupational scales by interpolating the six selected scales from the Strong Vocational Interest Blank (S.V.I.B.). The study lasted from the first to the fourth years of college. It included an array of dependent variables such as choice of field at graduation, self-ratings, etc., to test the validity of placement. The results of the second study bore out the results of the first study, that is, that subjects responded by grouping themselves into predictable types of categories similar to the types suggested by Holland.

In a third report by Holland and Nichols (1964), an attempt was made to study changes in career plans in a sample of 332 boys and 181 girls for a period of one year. The period selected was from the high school senior year to the end of the freshman year in college. The assessment included such things as interest, personality, originality, self-rating, achievement, and aptitude measures. After the first year in college, the students were assessed one more time and their answers were compared to their pre- and

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post-college plans. The assumptions that were made were based on a questionnaire containing their choice of a major field, their personal history and a selected inventory of seventeen personality instruments. These measures indicated the stability of choice and the solidarity of the likeness of the subject to members of the original group.

In a fourth report, Holland (1963-64) again tested the hypothesis about types. The assumptions held stable in describing certain work types. The descriptions of preferred task seemed to correlate highly with the outcomes of the individual V.P.I.'s. In a series of investigations, Holland (1966) solidifies the types used to designate the major categories. The results, as was mentioned before, became the first six scales of the V.P.I. V.P.I. profiles were formulated by placing the highest scale mean first, the next highest second, etc. It was through this method that subgroups were constructed to give breadth to the main occupational groups. These secondary high-point scales resulted in not only one classification such as realistic, but included the next coded occupational classification. This procedure provided additional vocational shadings to Holland's personality types. As a result of the information collected, students in the typologies were identified as being significantly different in their responses.

Efficiency of the Holland Predictors. Holland (1968), using the previously mentioned group of people, applied the typology to a longitudinal study. The hypothesis tested the efficiency of the predictors of vocational aspirations. The study spanned an

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eight- to twelve-month interval and resulted in 79 per cent of the men and 98 per cent of the women responding affirmatively to the congruency of their vocational choices that were described by the survey. Individual profiles that were mentioned by the study in personality and attitudinal ratings differed significantly enough in the study to suggest a relationship between the variables.

The question of the nature of the independence of the individual scales was tested by Richard (1968). The result of a sample of 3,771 men and 3,492 women seems to indicate that each scale does differ substantially from the other. It also suggested that there are six different types of orientations. "There may be more," the report suggested, "not fewer."

Discovery of the hexagon model. In the earlier studies concerning typology classification, the subgroups were not organized into any special arrangement. It was discovered that the intercorrelational matrix for the V.P.I. scales (used to describe the categories) could be approximated by arranging them into a hexagon. Cole, in a study (Holland, Whitney, Cole and Richards, 1969) was later to verify the hexagonal configuration mathematically and verify the arrangement for use with ordering of the typologies. The discovery of this arrangement was viewed as important to the relatedness of the occupational and psychological aspirations of people exploring careers. In figure 1, the main body of the hexagon arrangement categorizes in the following order (starting with realistic and proceeding in a clockwise direction around the hexagon). Realistic, investigative, artistic, social, eterprising and

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conventional. The "subclasses" are arranged in the hexagon so that they follow the clockwise arrangement for the major categories.

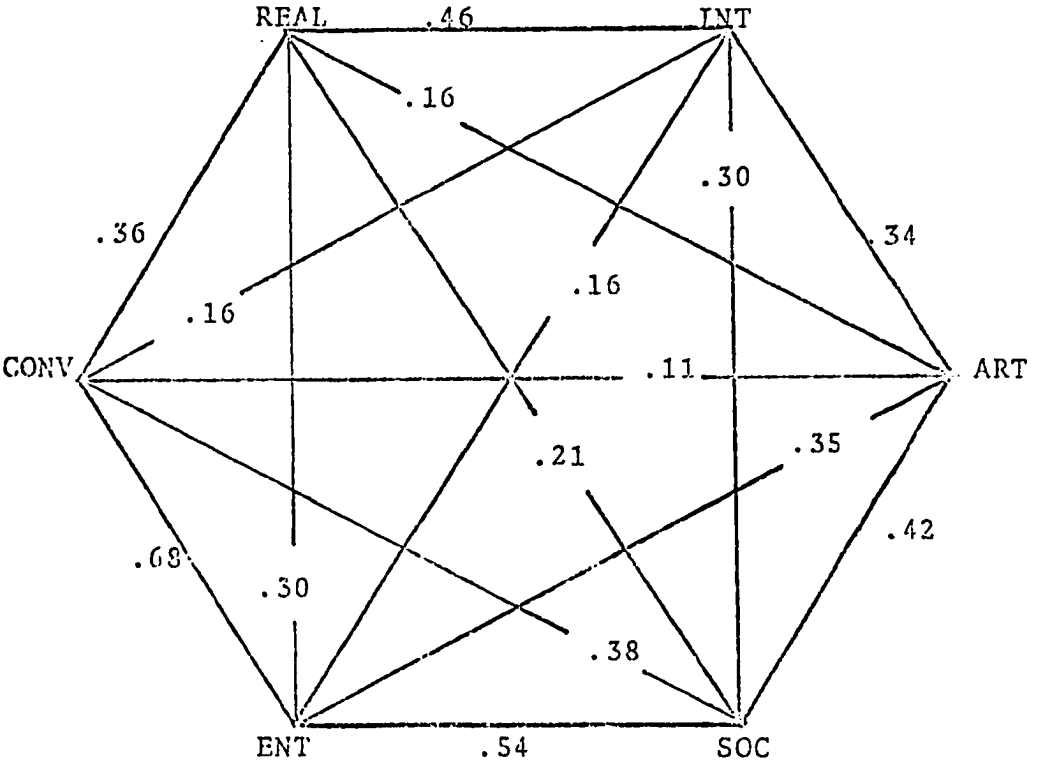

Fig. 1. A hexagonal model for interpreting inter- and intra-class relationships

According to Holland (1973), the hexagonal model is valuable to the theory in the following three ways:

> (1) It defines the degree of consistency in person's personality pattern. Using a person's V.P.I. profile, the two highest scale scores can be labeled as having one of three levels of consistency. Profile patterns composed of adjacent types on the hexagon are least consistent (realistic, social, investigative, enterprising and artistic-conventional) and profile patterns composed of every other type on the hexagon form an intermediate level of

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> consistency (for example, realistic-artistic, investigative-social, artistic-enterprising).
>
> (2) The hexagon defines the consistency of an environment in the same way. In this case, the percentage of type (real people) in each of the six categories is used to form an environmental profile.
>
> (3) The hexagon defines degrees of congruence between a person and his environment. The most congruent situation for a social person would be to be in a social environment. The most incongruent situation for a social person would be to be in a realistic environment. By using the hexagon, several intermediate degrees of congruence can be defined (p. 24).

Holland (1973) feels that the hexagon model acts as an occupational map for linking the main notions about the theory. The map can be used to decide the consistency and congruence of the outcome of occupational preferences. For example, the similarity of the types of classification is related to the distances between the types on the hexagon. The closer (correlationally) between types, the more consistent is the classification. Holland suggested some practical implications for the hexagon model by stating its use for counselors. He suggested that the model can be used to "organize vocational informational information." Also, be knowing the student's occupational choice and other related information, reference to the hexagon model can inform its users of other related resources.

All of the study results that have been previously mentioned were the products of the V.P.I. (see appendix A). The V.P.I. has been the mainstay of earlier studies by Holland and his associates until the development of the Self-Directed Search (S.D.S.).

The S.D.S. utilizes the six typological profiles found in the V.P.I. (Holland, 1972). It is self-administered, self-scored,

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and self-interpreted. The instrument utilizes two booklets in its administration. One is an assessment booklet, the other lists the occupations associated with the person's choices. The time taken to compute the full assessment is forty to sixty minutes.

In one of the earlier studies using the S.D.S. as the principle research tool, Edwards and Whitney (1972) performed several factor analyses on the four domains of the survey. These include activities, competency, occupations, and self-ratings. The results of the research showed that the main factors position themselves as expected for all four domains. The implications of the research suggest that personality types can be assessed by one or more of the four domains of the survey.

In another study, Gottfredson and Holland (1975) investigated the usefulness of the self-report method of interest, abilities, activities and self-estimates in predicting career choice. Ancillary to the study was the interest in structured methods of career exploration and the nature of six specific norms in measuring the career directions of both men and women. The main hypothesis of the study was supported. That is, the current vocational choice of an individual is the best prediction of later choice. As a result, the author of the study viewed the most valuable tool for a career guidance program as the "occupational daydreams" held by the participants. Dolliver (1969) found similar results in his study utilizing the S.V.I.B.

In summary, several studies have contributed data and results to the ideas formulated by Holland. The theoretical model of

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personality types and environmental characteristics seem to have impirical support, utilizing both the Vocational Preference Inventory and the Self-Directed Search (Osipow, 1973). Recent revision of the Strong-Campbell Interest Inventory utilizes the main typological ideas formulated by Holland. This would suggest support for the theory by its acceptance and application elsewhere in the career field. The current study is proposing the idea of utilizing visual and auditory media to expand interest measurement utilizing Holland's theory of vocational choice.

Review of literature concerning Holland's career development theory. One of the assumptions by Holland concerning career development is that the process is controlled by the adjustment of the individual to one of the six occupational environments. Generally, the theory states that people have specific perceptions concerning occupational stereotypes. The best occupational "fit" will result when a resolution occurs among a person's occupation, environment, or surroundings. This resolution will result in a "career adjustment." This adjustment is dependent on the degree of "differentiation or clarity" of a person's personality pattern and the "level of pattern consistency" of responses to typology.

In a report (Holland, 1975) entitled "Using a Typology of Persons and Environments to Explain Careers: Some Extensions and Clarifications," an attempt is made by Holland to explain some concepts of career phenomena and its relationships to vocational choice, involvement, satisfaction and career achievement.

Holland describes a career as "a person's work history and

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his/her history of vocational aspirations (both kind and level) from birth to death." It is with this understanding that Holland examines both the personal development and vocational choice of the individual.

According to this understanding, people come to resemble one of the six types because of influences exerted by parents, schools, and neighborhoods. These factors serve as influential environments which reinforce some behavior more than others. These behaviors consist of certain activities, interest, self-estimates, and competencies that the child models. This modeling lends to certain pre-dispositions of characteristics which form a "cluster" of personal traits. It is with this background that the individual is "predisposed" toward some groups of occupations more than others (Grandy and Stahmann, 1974).

One explanation the theory gives of why some people make better career choices than others is based on the ideas of differentiation and consistency. Holland, Gottfredson and Nafziger (1975) discovered that the differentiation and consistency of responses predict decision-making ability better than do the predictors of age, social class, and personality variables. Holland suggests that some types of people are better decision makers than others.

Baird (1969) in a study of undecided students discovered that there was no difference between decided and undecided students in making "timely" decision. Kelso (1975) discovered that the choice of "realism" is greatest for young people when they are

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about to enter the job market. Both studies may suggest that there are different rates of personal development and environment contingencies that weigh on the immediacy of making decisions.

The structure of the Holland typology makes no assumptions concerning vocational crises or predictable problems at different stages of life. The theory explains career dispositions by an "explicity" structuring of individuals' typological influences. Inquiries about the type of persons involved, the environmental situation they are living in, and the congruence of the environmental situation to their personality suggest developmental patterns for everyone.

As was suggested earlier, the ability to cope with vocational selection is dependent on the interaction of personality type and environment. The consistency and differentiation of both seem critical to vocational progress for any age. Holland (1975b) gives the following examples to explain this interaction:

> For example, a woman with a well-defined Investigative-Artistic personality pattern would be expected to have high educational and vocational aspirations, to have good decision making ability, to have a strong and lifelong interest in learning, to have moderate personal competency, and to have a marked interest in creative and high level performance rather than in leadership. In addition, such a person would be prone either to remold her environment or leave it in the face of adversity.
>
> In contrast, a man with a poorly defined Social-Artistic pattern would be expected to have low educational and vocational aspirations, to ave poor decision-making skills, to have a weak interest in lifelong learning, to have a modest degree of inter-personal competency, to lack interest in high level performance (vocational or educational), to readily accede to environmental adversity rather than struggling to revise his environment or moving to a new environment (p. 16).

The theory states upon obtaining specific information about certain

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expectations of characterizing development patterns, one can predict a person's occupation. As a person becomes older, the "clarity" of the prediction based on interest and ability becomes better. Campbell (1971) reported that the stability coefficients of interest of men over a twenty-year period ranged from .64 to .72.

One of the advantages that was not anticipated for the theory was its natural organizing qualities. The typology is used to organize occupational material and experiences for easy references, which is seen as a way to describe and explain career information and exploratory behavior (Holland, 1973).

Zener and Schnuelle (1972) in a report examining the effectiveness of the S.D.S. state that people become "actively" involved in understanding their career choices when using the typology. Krivatsy (1974) discovered that there was more reliance on a person's own exploratory behavior and less dependency on others for information.

By using materials that are well organizaed, self-administered and self-scored, a person can become more reliant on his own resources. This can free the counselor to help the individual test career choices and explore environmental conditions. Holland emphasizes the importance of the client's need to explore. Exploring leads to choices which in turn lead to learning. This cognitive activity leads to involvement and responsible problem solving.

In the area of test administration, the counselor is free

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from hiding test manuals, test, etc. These are readily available to the person because of the nature of the self-administration of the survey. Because of the ease of test administration and scoring, the counselor and student can begin to explore the possibilities together. Frantz (1972) demonstrated that the Holland typology could be used to help counsel a person who showed a flat Strong Vocational Interest Blank (S.V.I.B.) profile. Viernstein (1972) extended the occupational classification by Holland to include the Dictionary of Occupational Titles. Prediger (1976), in explaining his development of the American College Testing Program Occupational Classification System (ACT-OCS), confirmed the need for a comprehensive classification system for adequate exploration.

Holland (1973) proposes that the distribution of the S.D.S. profiles could be used to help organize and plan for a school's counseling resources. The assumption is made that normal or adaptive behavior can lead to a clear "differential and consistent" behavior profile. The theory suggests the following action to help students:

> 1. Provide students with relevant school and nonschool experience. This means giving them the opportunity to experience the six curriculums and the six kinds of nonschool experiences. This orientation implies that unless schools, parents, or other agencies provide a full range of experience, they lessen a student's ability to understand himself and his future possibilities.
> 2. Provide students with accurate and accessible information about themselves and jobs over a long time span rather than at a few critical decision points.
> 3. Provide students with translations of personal characteristic and jobs that are readily accessible and easily comprehended. The typical use of tests violates this principle. Test information is usually inaccessible, not clearly translated, incomplete, and unintegrated with other data (p. 92).

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The Background of Employing Visual Methods in Individual Assessment

The choice of employing an audio-visual method in assessing and exploring career options is based on more than one assumption. First, that a strict one-dimensional written approach to test vocational interest may be inappropriate. Second, evidence from many different sources is that the manipulation of visual stimulus can result in predictable interest statements. Third, that a counseling approach utilizing visual projection can provide helpful clues to an individual's career behavior.

A brief historical perspective of the growth of visual media. The idea of projective assessment grew out of the researcher's curiosity of the relationship of man's values, activities, needs, motives and impulses to objects, behavior, and occupations outside of themselves. The idea grew that it should be possible to study men's motives, emotions, activities and occupational preferences by getting them to project these internal states onto external objects. Usually these stimuli take the form of ambiguous stimuli. This is to facilitate a subject's expression of projected needs, activities, and values (Crammer and Shostrom, 1968). Many modes of stimuli are used to elicit responses. Drawing pictures, writing essays, role-playing, handwriting, associating words to other words, and music interpretation are only a few of the possible methods.

The Thematic Apperception Test (T.A.T.) is a picture-story type of projective measure. It was first introduced in 1935 by its co-authors, Morgan and Murray of the Harvard Psychological Clinic.

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The test utilizes a number of pictorial scenes about which the individuals are asked to make up stories. It is expected that by this process, the individual will tend to project his own conflicts and worries into the response. Zuben (1968) reports that Binet and Simon in 1905 measured successive stages in the verbal responses of children by eliciting reactions to pictures. Bettelheim (1947), Deabler (1947), and Morton (1955) indicated in a series of separate studies the usefulness of client responses elicited by the T.A.T.

Another visual projective technique that has some popularity among practicing clinical psychiatrists is the Rorschach test. The test is named after the Swiss psychiatrist Herman Rorschach, who introduced the process to personality assessment in 1911. The client responds to ink blots by constructing a series of verbal perceptions of what the picture represents. The Rorschach, unlike the T.A.T., cannot be used for self-interpretation. The interpretation demands a skilled clinician and adequate time for review.

The relationship of visual stimulus techniques to activities and personality. Ecklard Hess (1965, 1977), in a series of studies, determined that changes in attitudes can be detected by measuring changes in pupil size. The idea that the eyes are clues to emotions led Hess to perform several important experiments. Subjects were asked to peer into a box looking at a screen on which was projected a stimulus picture. A mirror reflected the image of the eye into a motion picture camera. Several control slides were presented and base-line data were collected and recorded for pupil size, light intensity, etc. Many kinds of stimuli pictures were

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presented to the subject. The evidence of the study suggest that when stimulus visual material that is interesting or pleasing to the subject is presented, an image of mild to extreme dilation takes place. Visual material that is unpleasant or distasteful results in mild to extreme constriction of the pupil. The experiment has importance to this study by virtue of its demonstration of physical reaction to visual preferences.

In a study of pictures on children's activities toward stories, Samuels (1974, p. 244) discovered that stories represented pictorially were preferred to non-illustrated stories. While the study was predominantly investigating reading skills, the result suggested a visual preference for encoding written messages. Oliver (1974) tested twenty-four male undergraduates using 102 slides with occupational titles printed on them. The subjects were asked to view the slides three times and make realistic choices of job selection. Although the study was limited by numbers, one of the results suggested was that counselors offer more of a variety of career choices for their clients. Krumboltz (1970) investigated the effect of stimulating vocational exploration by employing motion picture films. Two hundred and seventy subjects were randomly assigned to view three experimental films. One film had active participation that involved viewers solving occupational problems. The second film had only partial participation, while the third film had little or no participation. The results suggested, among other things, that the experimental film versions used with students were more effective than nonfilm materials selected for the

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same subjects. The experimental treatment of generating interest in banking occupations by the use of films seemed to be verified.

Levie (1971) in a major paper examined the advantage of certain types of media. Pictorial media, according to the author, had certain properties that suit them best to certain kinds of information. Pictorial media, for instance, communicate concrete information best, while printed media communicate abstractions best. The authors claim that psychological responses to pictorial stimuli are different than psychological responses to written stimuli. Levie and Dickie (1975) state that pictures, whether on a piece of paper or television screen, will result in predictable viewer results. Dallett and Wilcos (1968) have found in their research that pictures provide more cues for recall and recognition than verbal stimuli. Baker and Popham (1965) studied the relationship between pictorial embellishments and verbal material. The results did not increase learning, but did increase interest and enjoyment. Pictures have been found to be most useful for recall and recognition, or when the subject lacks a verbal equivalent. One important result of the paper suggests visual presentations of verbal material have advantages for certain groups of learners. It suggested further that some persons would profit most from auditory stimuli, while still others would profit from print or speech alone.

Dilley (1971) reviewed the use of a visual mode to personal and vocational counseling. Dilley suggests that the use of visuals can be used to facilitate communication between counselors and

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clients. Walker (1965) demonstrated the effectiveness of visuals in stimulating vocational exploration.

Using the visual medium of photography, counselors have been able to explore with clients the dimensions of personal growth. Haase and Tepper (1972) and Loeffler (1970) report that creative expression through art, music, and writing has positive therapeutic value to counseling. Denny (1969), Mitchell and Campbell (1972) report that a visual dimension in counseling gives more insights into understanding problems. It also provides more permanence than verbal interaction provides a clear understanding of the counseling process (Dilley, 1971). Goscrewski (1975) has presented evidence that photographic exchanges have important value in the counseling process. The photographic essay provides important information about the client's environment, background, history, family and career aspirations.

An attempt to organize the ideas of pictorial stimulus for career exploration came from several sources. Most notable was the work done by Kosuth and Clancy (1972) in the construction of the Pictorial Inventory of Careers (P.I.C.).

The P.I.C. is a pictorial representation of a person's vocational interest. The authors describe the structure of the survey as being composed of two parts. The major pictorial section is composed of 210 items, while the last section is made up of eleven pictures. The scenes depicted were of typical work tasks, work situations and job tasks that would routinely occur in twenty-one different occupational clusters. There were ten pictures for

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each cluster. An effort is made by the authors to focus in on the work task being performed by limiting the camera angle. It was reasoned that this effort would eliminate most of the biases related to sex, race, or physical preferences. Reactions to the pictures are recorded by giving two initial reactions (either "strongly like" or "strongly dislike") to the twenty-one clusters of pictures shown.

The reporting of scores is not in the traditional interest assessment mode, but rather in a community college cluster mode. The reliability of the inventory was tested by administering the Pictorial Inventory of Occupational Training Interest (P.I.O.T.I.) to a group of eighty-eight high school students. (The P.I.O.T.I. was a model for the P.I.C.) The authors felt that on a test-retest design the statistical data would be significant for both inventories. The inventory was administered and then readministered to the same group after an interval of twelve days. The test-retest coefficient of coorelations were computed for each of the thirty-six "occupational training categories." Both male and female students were correlated using the product-moment method. The authors reported that the coefficients of the test-retest reliability showed an acceptable level of significance.

The chapter reviewed the background of several vocational theories important to this study. It focused special attention on the contributions made by John Holland and the importance of his theoretical constructs. It examined the history and rationale of many other types of assessment instruments that use visual stimulus

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as part of their methods for measuring reactions to their test structure. The chapter also reviewed specific attempts by different individuals to measure vocational interest by using pictures.

In summary, a review of the literature did not find a comprehensive study that compared visual stimuli and Holland's typologies. However, several researchers have identified the relationship between visual recognition of work task and career exploration and identification.

The next chapter will examine the research methodology used by this study and review the expected results of the research design.

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CHAPTER III

RESEARCH METHODOLOGY

Introduction

This chapter will present the research design which will include a description of the initial program, as well as a pilot study and a description of the present study; the process used in the selection of the sample; background citations concerning instrumentation and sample population; the null hypotheses; the testing procedures; and the instrumentation methods used in data collection, processing and analysis.

Design

An ex post facto comparative design was employed to determine the relationship between a Visual Imagery Selection Technique for Inventorying Occupational Needs (V.I.S.I.O.N.) and the Vocational Preference Inventory (V.P.I.). The samples included worker groups who were representative of those typologies described by Holland located geographically in proximity to the South Bend-Mishawaka area. Student group samples, both secondary and post-secondary, were enrolled in courses that were representative of those typologies described by Holland and located geographically in Northern Indiana and Southern Michigan.

The design of the present study was based on the results of

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an initial program produced for college freshmen and a pilot program designed for testing the validity of a visual technique for testing occupational interest. A general description of these two programs follows so that the reader will understand the background development of the present study.

The initial program. The original organization of the program was in response to a request by Edward Morton at the University Division at Indiana University at South Bend. This initial program was designed to assist students in identifying college majors that fit their personality styles. They viewed slides that represented personality orientations described by Holland. For example, pictures of power symbols were planned by the presenters to elicit high responses from realistic and enterprising personalities. Pictures of art objects were expected to elicit high responses from those people who preferred jobs related to occupations which were primarily art related. The program had a taped interlude of music which was played on a Wollensak tape recorder that in turn drove a Kodak Carousel projector at ten-second intervals between slides. The participants would view the slides and mark on an answer sheet one of three possible responses. The first possible response to picture acceptance was "high" (designating a positive acceptance); the second "medium" (designating a medium acceptance); and the third was "low" (designating a negative acceptance). The response sheet was designed in such a way that the responses by the subjects assigned them to one of Holland's six typologies. At the end of the program, the subject counted the

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most "high" responses recorded on the answer sheet and punched a hole with a pencil at that location on the paper. By turning the paper over the subject could observe which one of Holland's six occupational areas had been selected.

Preliminary validation of the initial system was by requesting the participants to rate the exercise as helpful or not helpful. The program seemed to meet the initial objectives of motivating and informing students about college majors they might want to investigate (appendix B). It was from this primary program that a more sophisticated program was developed (Elliott, 1975).

The pilot program. There were important changes in the design planned for the pilot study from what was used in the initial program. The visuals were changed from general "one shot" scenes used in the initial programming, to multiple scenes of people performing some typical work task descriptive of a Holland classification. The photographs were taken in the nearby community and then sorted according to the Holland six occupational classifications. For example, a picture of a truck driver was placed in the "realistic" part of a photographic file, while a picture of an artist was placed under the "artistic" part of the photographic file.

From the photographic file, the contrasting and randomly drawn sets of pictures were selected by hand and made into 120 test slides. When a single slide was projected onto a screen, the viewers saw four scenes: two scenes, labeled A, which were at the top of the slide, and two scenes labeled B, which were at the

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bottom of the slide. The two A scenes at the top of the picture remained the same job type for ten slides--then changed. The two B scenes at the bottom of the picture would change with each slide to show the jobs in the remaining five types of occupations. For example, if the two top scenes shows a truck driver, a "realistic" occupation, the bottom scenes might show a chemist, an "investigative" occupation. The next slide would show different scenes, but the same pattern; that is, there would be a "realistic" occupation at the top two scenes again, but the bottom two scenes would rotate to another occupational type such as "artistic." After ten slides the top occupational scenes would change to a new occupational constant and the bottom scenes would start their rotation again through the remaining five types. This pattern would continue for sixty slides, with each occupational type being the occupational constant for the next ten slides. After the first sixty slides had been shown, the next slide began the process over again with another sixty slides. The person taking the survey had an opportunity to respond to each occupational type twenty times. The plan used to control the process of rotating the work scenes for the program was the hexagon arrangement of the six occupational types used by Holland (see figure 1). Starting at the top of the hexagon with "realistic" as a constant, the process would rotate clockwise around the hexagon, distributing the photographs automatically to the program construction.

The entire program consisted of 136 slides (twenty slides were instructional slides) which appeared on the screen at eight- to

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eleven-second intervals. Coupled with the visual appearance was an electrical impulse signal to change the slides. The entire program, plus scoring the answer sheets by the respondents, took thirty to thirty-five minutes. In the inventory, there was no attempt to give the individual pictures titles or labels that described the type of work task being performed. Scoring was accomplished by counting the number of responses for each of the six classifications and placing that number at the top of each of the six columns. The results were found much like the initial program--by turning the paper over and seeing which occupational classification had the highest raw score (appendix C).

The next change in design planned for the pilot program was the answer sheet. The answer sheet was re-designed to improve the reporting of the scores for the person taking the survey. The two broad areas of "values" and "occupations" that were used in the initial program were dropped in favor of reporting the results in occupational preferences alone. The values section on the initial answer sheet was to see how people valued certain occupations. It was reasoned that these occupations would be the ones they should investigate further for possible selection. Since the responses to the values were so similar to reporting occupational preferences, the "values" term was dropped in favor of an "occupational preferences" term.

The program was tested by gathering data from 131 employed adults and evaluating the results. The adults tested were randomly selected but were not proportionally accounted for in the six major

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areas (a limitation that was corrected in the study).

A working hypothesis was planned to test the rationale of the program. The hypothesis was brief and designed to test only one aspect of the survey. The null hypotheses stated that "There would be no similarity in the results of the visual survey and the occupations of a professional sample taking the survey." As a re-result of a chi-square analysis, the null hypotheses was not upheld, indicating that the relationship between the visual survey and the professions' samples of the people taking the survey were similar (see appendix D).

Like the initial program, the pilot program included some of the self-exploration activities that are utilized by Holland's Self Directed Search (S.D.S.). A person taking either the S.D.S. program or V.I.S.I.O.N. could then investigate a number of jobs listed under the six occupation areas in The Occupational Finder or the Dictionary of Occupational Titles. The activity of a "searching" component was seen as necessary for all the projects. It was felt that this search activity gave the entire exercise the necessary ingredients of self- and occupational exploration.

A report of the pilot program was given at the 1974 convention of the American Personnel and Guidance Association in New Orleans. The Educational Resources Information Center (E.R.I.C.) requested copies of the study which was included in the E.R.I.C. system as "Validation Study of V.I.S.I.O.N." (Visual Imagery Selection Inventorying Occupational Needs) original research, R.I.E., vol. 10, no. 7, July, 1975.

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A serious limitation of the pilot survey was the small size of the sample in some of the classifications in relation to the total sample. The influence of the sample size on the pilot study could conceivably be great. A proportional correction was planned for the present investigation. Several other adjustments in the design of the components and research of the pilot program led the investigator to make plans for improvement of the design for this study.

A Description of This Present Study

As was mentioned earlier, the V.I.S.I.O.N. survey was initiated through a program developed in response to a request by the University Division of Indiana University at South Bend. From that program a pilot study was undertaken and the survey was empirically tested for construct validity. The present survey resembles the pilot program in all but a few revisions. The present study was accomplished under a grant funded by the Indiana State Board of Vocational and Technical Education (Project No. 37-75-C).

The present V.I.S.I.O.N. package includes 120, two-by-two slides. The slides used in the study are visually constructed much like those that were produced for the pilot program. One point of contention that was mentioned by some observers taking the pilot survey was the subjective way that the photos were selected for the program. It was decided for the present study to test the selection of the photographs used by having three expert raters match occupational titles with corresponding pictures.

Three raters were selected who had expert knowledge about

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jobs and work tasks. They were the Director of the Division of General and Technical Studies, Indiana University at South Bend; the Campus Coordinator of Professional Practice Program, Indiana University at South Bend, and the Director of Vocational and Technical Education, Elkhart Community Schools, Elkhart, Indiana.

Each rater was given a randomized list of occupational titles and randomized pictures in a photo album. Randomization was accomplished by reference to a table of random numbers in Conducting Educational Research (Tuckman, 1972, p. 368). The pictures in the album were numbered one through 240 (two pictures for each slide). The raters were asked to go through the photo album and select those pictures of work scenes that corresponded to one of the occupational titles on a prepared list. They were then asked to place the number of the photo beside the matching occupational title. According to the program design, an agreement by all three raters for a particular photograph automatically selected that photograph into the program. Where two raters did not agree on a photograph, two other photographs were substituted in their place until an agreement took palce by all three raters. This exercise in itself demonstrated the feasibility of picturing and reorganizing work task orientations. A copy of the list of photos and cover letter instructions are found in appendix E.

The pictures were also matched, as nearly as possible, for educational level compatibility, which Holland includes in his theory levels of "general educational development." According to Holland, these levels reflect the necessary education to hold a job. For

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instance, levels five and six would demand a college education. Levels three and four would mean a minimum of high school plus additional training. Levels one and two would mean an elementary or less educational requirement. The pictures that appear on the screen are matched in this way. For example, if the top picture is of a physician, an "investigative" occupation and an educational level of six, it would be matched with a bottom picture of a mechanical engineer, a "realistic" occupation and also an educational level of six. In this way, the person taking the survey would not have to choose between what might be considered prestigous and non-prestigous work. The pictures were also checked for compatibility with the D.O.T.'s workers' trait requirements (a system to match physical, mental, and educational requirements with job requirements). Holland utilized the six-digit number from the D.O.T. in The Occupation Finder. Each picture was checked and recorded as to the "General Educational Development" requirements of the D.O.T. A copy of this program planner for the V.I.S.I.O.N. project is in appendix F.

The conversion of the pictures into a slide format was accomplished by placing the pictures into a format similar to the pilot program. The picture format was then placed under a photographic stand and changed into a slide. One of the pictures in each of the A and B rows used in the pilot program was eliminated, and a symbolic drawing was substituted in its place.

A person viewing one of the slides would see two rows, each consisting of a black and white drawing and a companion picture of

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a person performing a work task. One row is labeled A, while the other row is labeled B. The black and white drawing is designed to give a visual clue of the worker trait requirements symbolic of the job. A photographic example for each of the six types can be seen in appendix G. Again, the top row is labeled A and the bottom row is labeled B. The top row of drawings and pictures are the control and remain constant for ten frames. The drawings and pictures in B change through all ten contrasting job descriptions. The top row then changes to a new constant. Prior to the slides picturing the occupational selections are slides illustrating the proper method of marking the answer sheet. All the responses requested by the survey have matching places for responses on the answer sheet.

The front of the answer sheet has response spaces for A, B, and ?. The ? response was for an indecision choice between A and B. The responses on the answer sheet are grouped into six major columns with 120 total responses (see appendix C). At the end of the occupational slides, slides describing the proper method of scoring and interpreting the test results are included. On the back side of the answer sheet are the "scoring" and "interpreting directions" plus a list of occupations and corresponding "fields of study" (appendix C). By comparing the response profile on the front of the answer sheet with the "occupations" and "fields of study" on the back of the answer sheet, the respondent could gain an idea of his occupational interest. Along with the visual portion of the program and the answer sheet is an audio portion. The audio portion helped synchronize the entire program and gave

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preliminary instructions. The program switched to a music background while the respondents viewed the slides. After the last test slide was shown, the audio portion then switched back to an instructional mode and described the steps necessary to score the survey. At the proper time the audio and visual portion of the survey ended together.

Considerations in the Selection of the Sample for the Present Study

This investigation used three discrete samples to test the working hypothesis for the study. The first selected sample included 202 professional workers, each coming from one of the 456 occupations described in The Occupations Finder, a publication by Holland to describe the major job titles that account for over 90 per cent of the occupations in which Americans presently find emplyment. To be included in this study an individual had to be presently employed and had to have at least one year's experience on the job. The second selected sample came from a population of two hundred secondary students attending local vocational schools. Each student was enrolled in a major subject area that reflects occupations in one of the six areas described by Holland. The third sample was composed of 211 post-secondary students from the surrounding area who were enrolled in vocational subject areas which reflected one of the six areas described by Holland.

A decision was made to try to describe both the size of the sample population and the proportion of the categories represented by each of the six typologies. The size of the sample was

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determined by reference to Cohen's statistical procedures (Cohen, 1969). Cohen (1962, 1969) and others argue for explicit computation of power relative to reasonable hypotheses. Brewer (1972) states: "It is almost universally accepted by educational researchers that the power (probability of rejecting H^o when H^o is false, that is $1-\beta$ of a statistical test is important and should be substantial" (p. 391). From these references it was determined that an appropriate size to generate significant results would be at least two hundred persons from each sample, or a total of six hundred.

In examining the distribution of the number of job titles for each of Holland's six areas, it was discovered that a stratified random sample was necessary in order to reflect a true proportion of types for the total study population. This was accomplished by counting the total number of occupational titles in each of the six categories of The Occupations Finder and calculating a percentage of the total. This percentage was then applied to the two hundred sample population for each hypothesis across job categories. The proportions in table 1 were used in stratifying the sample.

Selection Procedures for Sample Population

The selection procedures took two forms. First, people who were presently employed and whose employment represented one of Holland's personality types were candidates for study inclusion. Second, students who were presently attending a secondary or post-secondary school and whose major represented one of Holland's

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personality types were considered eligible for the study. The initial selection of subjects began in the fall of 1976.

TABLE 1

PROPORTIONAL STRATIFIED REPRESENTATIVE OF THE HOLLAND OCCUPATIONS CLASSIFICATION SAMPLE

Holland Category	Sample Size	Percentage of Total
Realistic (R)	68	33
Investigative (I)	31	15
Artistic (A)	15	8
Social (S)	38	19
Enterprising (E)	30	15
Conventional (C)	20	10
Totals	202	100

The professional subjects were selected first. Contacts were made through professional organizations and/or union affiliations. Telephone contact was made with the organizational or union office and the nature of the study was outlined. Officials of organizations were then requested to ask the persons in their membership if they would be willing to participate in the study. Letters of introduction and explanation were sent to the organizational officers upon request. Included were letters from Educational Research in Counseling (E.R.I.C.) and from people who had used the pilot program and had expressed comments about its usefulness. After these officials had time to consult with members, another contact was

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made with them and a date and time was set to administer the survey. No attempt was made to control the resulting pool of subjects for either age or sex. All sample members who held an employment title commensurate with one of Holland's types or subtypes were considered eligible for the study. A pooled sample of over 270 responses was created for the working group of which a random sample of 202 was drawn (table 2).

The selected sample V.P.I. tests administered to the working groups were drawn from the resulting pool and attached to the V.I.S.I.O.N. results. The selected worker sample numbered 202 people. The unselected group in the random sampling numbered seventy-four people for a total p-ol worker sample size of 276 people.

Selection Procedures for the Student Population

For the student population, initial contact was made first with the appropriate deans and chairmen of departments in appropriate schools. A request was then sent from their offices to instructors who taught classes similar in nature to the typologies of Holland. The determinate for inclusion of the student population into the study was their declared major and/or class membership. All students, both secondary and post-secondary, were members of study classes during the winter and spring semesters of 1976. All students were polled prior to administering the survey to verify their class membership.

The responses for the secondary and post-secondary samples

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TABLE 2

SELECTED SAMPLE--WORKER GROUP

Type	Selected Number	Unselected Number
Realistic		
Vocational Teacher	22	
Mechanical Engineer	16	
Farmer	4	
Police	26	
	68	8
Investigative		
Optometrist	11	
Chemist	11	
Psychologist	3	
Lab. Technician	2	
Inst. Electronics	1	
Manufacturing Engineer	2	
	30	0
Artistic		
Art Teacher	13	
Art Designer	3	
	16	4
Social		
Adjuster	8	
Nurse	18	
Vocational Counselor	5	
Clergyman	5	
Elementary Teacher	2	
	38	14
Enterprising		
Insurance Sales	18	
Distributive Ed. Coordinator	4	
Banking	8	
	30	6
Conventional		
Bookkeeper	4	
Secretary	6	
Accountant	8	
Business Teacher	2	
	20	14

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were selected in much the same way as was the worker sample. In some cases where the numbers of the sample were close to the proportional parameters, the entire population was used. An exact accounting of the student population sample for both the secondary and post-secondary areas are provided in tables 3 and 4 respectively.

Background Citations Concerning
Study Instrumentation and Population

The following reporting of studies is intended to provide information as to the reliability, validity, and standardization of the V.P.I. and how past use of the instrument with similar samples used by this study applies.

To try to gain more information about the theory, a study to determine the intercorrelation of the Holland Vocational Preference Inventory (H.V.P.I., an earlier form of the V.P.I.) and Cattell's Sixteen Personality Factor Questionnaire (16PF), a single form was developed from the male forms of the H.V.P.I. According to the study, the single form may have biased the responses for girls; however, the results of both male and female responses of the correlation for boys and girls were significant beyond the 5 per cent level (Holland, 1962, p. 293).

In another study, Holland (1968b) samples college freshmen from twenty-eight colleges with a wide range of academic talent and social status (1,576 men and 1,571 women). One of the goals of the study was to compare the responses of the individuals according to their types and sub-types. These were then compared to twenty-two

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TABLE 3

SELECTED SAMPLE--SECONDARY STUDENTS

Type	Selected Number	Unselected Number*
Realistic		
Auto Mechanics	47	
Machinery Trades	19	
	66	0
Investigative		
Laboratory Technician	14	
Electronics-Tool Design	10	
Medical Lab. Assistant	2	
	30	3
Artistic		
Photography	16	
	16	4
Social		
Cosmetologist	20	
Nurses Aid	18	
	38	6
Enterprising		
Distributive Education	30	
	30	8
Conventional		
Secretary	15	
Commercial Sewing	5	
	20	10

*In cases where the unselected cases are 0, the entire sample was used.

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TABLE 4

SELECTED SAMPLE--POST-SECONDARY STUDENTS

Type	Selected Number	Unselected Number
Realistic		
Auto Mechanics	45	
Welders	25	
	70	0
Investigative		
Laboratory Technician	30	
	30	20
Artistic		
Photography	11	
Commercial Art	5	
	16	16
Social		
Licensed Practical Nurse	41	
	41	20
Enterprising		
Radio/T.V. Announcers	18	
Business Students (two-year program)	12	
	30	15
Conventional		
Secretarial	24	
	24	11

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dependent variables including competencies, life goals, self-rating, and personality and attitudinal variables. Several of the results for females suggested more reliable data than had been true of past studies. Second, while 76 per cent of the predictions were corrected for comparisons across types for men, 84 per cent of the predictions were correct across types for women. Across two-letter subtypes the percentages for men and women were 75 per cent and 75.4 per cent respectively. Across three-letter subtypes the results were 64.1 per cent for men and 72.7 per cent for women.

The results of the samples were then pooled for statistical investigation. Appropriate methods were then applied to test the hypothesis for the study. It was decided that the most appropriate statistical technique to measure the resemblance between the results of the V.I.S.I.O.N. survey and the V.P.I. was a factor analysis. A chi-square analysis was employed to test the results of the expected frequencies of the V.I.S.I.O.N. survey for the worker, secondary and post-secondary samples.

In a study to test the efficiency of the V.P.I. to sample occupational interest of women, Werner (1969) administered the V.P.I. and a survey to a sample of 348 women. The requirements for inclusion into the sample were full-time employment and the subjects ranged in age from seventeen to sixty years. The results again confirmed that the V.P.I. profiles for women in the six main categories were as expected.

Lacy (1971, p. 61) explored the relationship between professional samples and V.P.I. results. A sample of 210 men who were

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judged to be "well established in their occupations" were tested. The results for sub-samples of project engineers, research chemists, computer programmers, high school teachers, actuaries, executives and college professors matched test profiles of college students expressing interest in the same areas.

A study by Werner (1969) as reported by Holland (1973, p. 66) sampled 527 high school age boys and girls in seven occupations training centers. Students were selected from six training programs to match the six typologies suggested by Holland. Auto mechanic students were selected to represent the realistic type, technical electronics students for investigative, practical nursing students for social, data processing students for conventional, distributive education students for enterprising, and commercial art students for artistic. The study assumed that the special occupational training would be treated as the environment. This would would for instance, that auto mechanics training would equal a realistic environment. A person who would peak on the realistic scale of the V.P.I. and was also training as an auto mechanic would be considered to be in a congruent environment. Utilizing the working definition of congruence, consistency, and homogeneity as they relate to Holland's typology, Werner crystallized the following results from his study:

1. Students expressing congruent environments displayed higher achievement scores than students expressing incongruent environments.
2. Congruence was more closely related to satisfaction for boys than girls.
3. Remaining in a program was related to congruence.
4. Profiles that showed no differentiation had inconsistent and negative results.

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> 5. The more consistent and ocngruent the profiles, the more expected achievement; however, this did not hold true for satisfaction (p. 67).

Edwards, Nafziger and Holland (1974) studied the perceptional power of occupational choice. The idea that perceptions about occupations play a major role in behaviors and theories of vocational development was tested by this study. One part of the study was to investigate the idea of occupational perceptions being more specific (differentiated) for older age groups than for younger age groups, the assumption being that older people would be more able to discriminate more accurately among occupations than younger people. The samples selected for this part of the study were taken from previous samples selected by Jeanneret and McCormic (1969). The results confirmed the idea of differentiation being more characteristic of older ages than for younger ages.

In reports concerning samples, Holland et al. (1973); McLaughlin and Tiedeman (1974); Nafziger et al. (1974); Parsons and Wigtil (1974) have confirmed that investigators using nationally representative samples of high school students, employed adults, and college students, have given a representativeness to the theory's formulations.

In a report entitled A Factor Analytic Validation of Holland's Vocational Preference Inventory, William DiScipio (1974) applied a principal component analysis to a 135-item pool of the Holland Vocational Preference Inventory, the Sixth Revision. One of the earlier principal components analysis of the H.V.P.I. by Gonyea (1961) demonstrated that the interplay of other things

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besides the ability to group occupations may hold other implications for college students who were asked to participate in the study.

DiScipio (1974, p. 390) used Gonyea's study as a base to extend his own investigation along the same lines, and to expand the sample size in order to (1) test the statistical validation of the interrelationship of the individual items in the V.P.I.; 2) compare the results of a hypothesized set of factors with the factors defined by the use of the principal components analysis; and (3) investigate the relationship of the tested samples to the students' sex and choice of major subject.

The sample used by DiScipio consisted of one hundred men and two hundred women who were enrolled in college and under the age of twenty-five years. All students were administered the V.P.I. by the same person.

The responses of the sample group were then subjected to a factor analysis. The method of factor analyzing the responses was by intercorrelating all of the 160 items of the V.P.I. This was done by employing Pearson's r for men and women separately. The pool of items was reduced to 135 items which were common to each group. The reason for the elimination of some twenty-five items was that DiScipio considered redundancy within survey. Such items as "Army General" were eliminated because it correlated .86 with another item, "Army Officer," in the men's sample. Other items were scrutinized as to their unfamiliarity or rejection by the students.

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Eight factors were predicted in each separate analysis to compare to eight hypothesized clinical scales. Ten factors were extracted from the analysis and rotated orthogonally by the Varimax method and obliquely by the Promax method. These analyses resulted in eight psychological scales.

Outcomes of the DiScipio study. The results produced eight factors for men, which accounted for 45 per cent of the total variance, and eight factors for women, which accounted for 43 per cent of the total variance.

The difference between the factor structure of this study and the one performed by Holland on the item pool of the V.P.I. resides in the clinical and interpretative nature of the statistical assumptions made. The study not only attempts to validate Holland's hypothesized factor structure by using an objective statistical technique, but makes statements concerning the descriptive content of Holland's scales and criterion groups.

Significance of DiScipio study for the present study. The study suggests that factor analysis can "prove useful in validating the hypothetical structure of vocational interest inventories." It further suggests that the results should be viewed in their sociological settings and influences.

This study along with the factor analysis described by Holland, Whitney, Cole and Richards (1969) in a report entitled An Empirical Occupational Classification Derived from a Theory of Personality and Intended for Practice and Research, has provided

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encouragement to pursue the factor analytical approach for the present study.

As an illustration of the analysis performed by Holland, the results are graphically represented in figures 2 and 3. The illustrations (figures 2 and 3) of the configuration for the V.P.I. scales gives some idea of the comparative design of the present survey. The projections represent or attempt to minimize the deviation of the variables and place the six points onto a "best fitting" plane. It is interesting to note that a distinction is made between the sexes. Such a distinction is not made in this study.

Statistical Null Hypotheses

The following null hypotheses are based on the questions proposed in chapter I. They form the operational part of the statistical design for this study. The Occupations Finder is used as the sole source for defining occupational types and work categories (Holland, 1972).

Hypothesis 1. There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for the professional, secondary, and post-secondary groups.

Hypothesis 2. There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for the professional worker.

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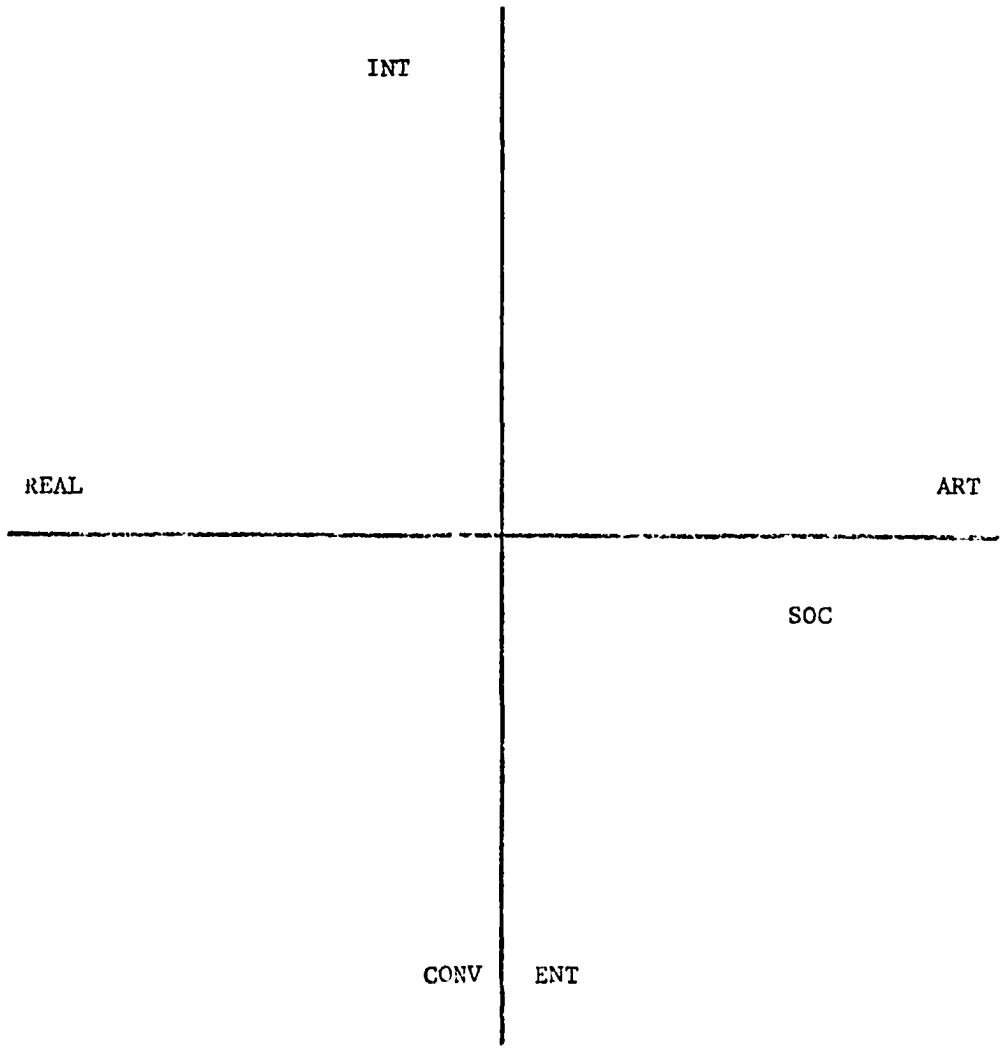

Fig. 2. Configuration of six V.P.I. scales in a "best-fitting" plane from analysis of the correlation matrix for men.

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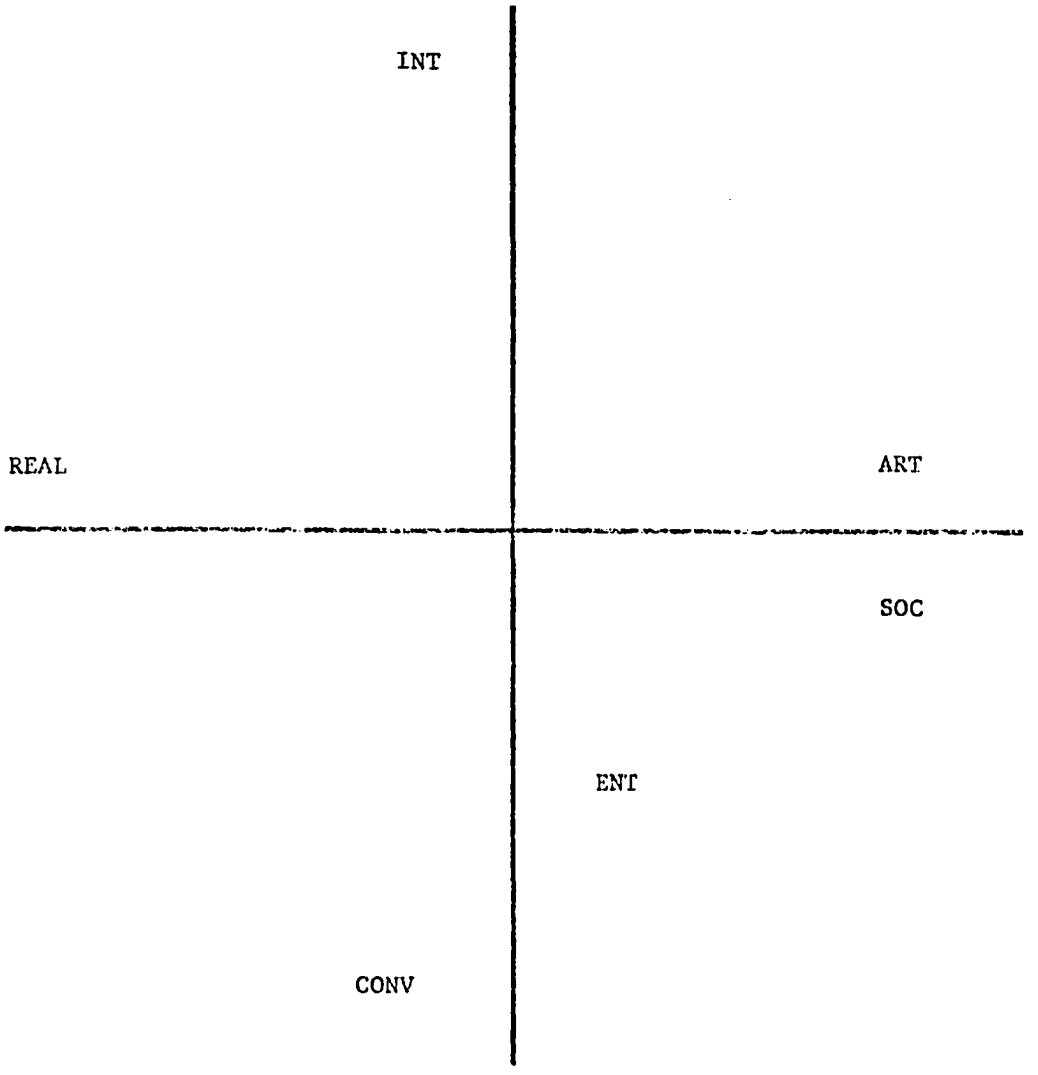

Fig. 3. Configuration of six V.P.I. scales in a "best-fitting" plane from analysis of the correlation matrix for women.

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Hypothesis 3. There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for a secondary student sample.

Hypothesis 4. There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for a post-secondary student sample.

Hypothesis 5. There will be no similarity between a factor analysis performed on the Vocational Preference Inventory as reported in the professional literature and a factor analysis performed on the Visual Imagery Selector for Indexing Occupational Needs.

Hypothesis 6. Given a list of both specific occupational titles and corresponding photographs of workers performing some typical work task, there is no significant difference between the observed and expected judgments by three experienced raters regarding their independent matchings of photographs to their intended occupational title.

The operational statistical considerations used in the analysis of the null hypotheses are the following:

1. All Ho were tested at the .05 level of significance using an appropriate statistical technique.

2. Rejection of Ho 5 constitutes a measure of concurrent validity with a paper-pencil test measuring the same construct.

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3. Rejection of Ho 2 constitutes a measure of empirical or predictive validity using indicators of job titles.

4. Rejection of Ho 3 and 4 constitutes a measure of predictive validity using a single indicator of training majors.

5. Several photographs were provided for each title for Ho 6 so the final selection of 240 photographs broadly represents the occupations depicted. Based on significant raters' reliability, the inclusion of any photo in the instrument will constitute agreement that it represents a sample portraying the occupational title.

6. The statistic chosen to test hypotheses one, two, three, four and six was a chi-square analysis. The statistic chosen to test hypothesis five was a factor analysis.

Testing Procedures

The major part of both the worker and student data sample was collected during the fall and winter months of 1976. The professional setting was typically a professional or union meeting where the surveys were the principal part of the program. The people attending these professional-worker meetings were administered both the V.P.I. and V.I.S.I.O.N. surveys

The student participants were members of vocationally oriented programs in southern Michigan and northern Indiana schools. In the case of the student population, V.I.S.I.O.N. only was administered in a classroom setting during regularly scheduled class periods. Student selection into Holland types was accomplished by their academic resemblance to a job title or school

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major. Statistical analyses were accomplished on the student group according to occupational or major declarations.

To all but a few cases, the response sheets were used for all subjects in all groups. Those response sheets that were only partially filled out or were illegible were discarded.

Instrumentation and Data Analysis

The definition of a vocational personality type for all samples was decided to be the highest single scale score an individual received in any one of the first six scores on the Holland V.P.I. or the V.I.S.I.O.N. (Only the results of the first six scales of the V.P.I. were used in the present investigation.)

The V.P.I. utilizes responses both in the measurement of personality constructs and occupational interest. The instructions direct the respondent to mark either "like" or "dislike" in response to a list of 160 occupational titles (1965 edition). The scored inventory gives results for a total of eleven scales: realistic, investigative, artistic, social, enterprising, conventional, self-control, masculinity, status, infrequency and acquiescence. As was mentioned earlier, only the first six scales were used. All responses for both surveys were then coded according to the procedures suggested by Tuckman (1972) and prepared for computer analysis.

Data Collection and Recording

Initial collection of the data came from recording the raw responses of each person from the three test groups and

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transferring this data to a punch card format. This data were then managed by an appropriate statistical procedure mentioned in the operational portion of this chapter.

The first hypothesis describing the significance of the relationship of response for the V.I.S.I.O.N. survey was examined by comparing each person's observed six scores on V.I.S.I.O.N. with the expected scores for the same survey for all samples.

The second hypothesis comparing similarity of worker categories to a Holland description, was investigated by comparing the respondent's highest observed responses on V.I.S.I.O.N. with the expected worker responses for the same survey. Responses were matched as to the categories of Holland's typology and to the corresponding job categories listed in the Occupational Finder.

The third hypothesis comparing a secondary student's major to a Holland description was analyzed to verify the observed responses on the V.I.S.I.O.N. survey with the expected responses for the same survey.

The fourth hypothesis comparing a post-secondary student's major to a Holland description was analyzed to verify the highest observed preferences on the V.I.S.I.O.N. inventory of the post-secondary students with the expected highest preference for the same survey.

The fifth hypothesis investigating the similarity of a factor analysis performed for the V.P.I. and the V.I.S.I.O.N. inventories was computer-programmed for comparative purposes. Statistical characteristics for each analysis was examined for the V.P.I.

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and the V.I.S.I.O.N. survey. The analyses for both were then compared to identify any similarities.

The sixth hypothesis investigated the ability of three raters to compare photographs with printed occupational titles. Observed responses for the comparisons were matched with the expected responses for the same operation. These were subjected to empirical analysis and reported in the next chapter.

Summary

This chapter attempted to provide the reader with an explanation of the research methodology used by this study. It examined important parts of the population sample used, other reports concerning validations of study instrumentation, statistical null hypotheses,, testing procedures, instrumentation, and finally, collection and recording of the data. The chapter described the statistical design to be (1) a chi-square analysis to test the expected results for all the combined and separate samples, (2) a factor analysis for the V.P.I. and the V.I.S.I.O.N. surveys, and (3) a chi-square analysis for the rater comparisons. The circumstances of the sample selection dictated the type of statistical test selected.

In the chapter to follow, the results on these statistical tests are reported.

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CHAPTER IV

FINDINGS AND ANALYSIS OF THE RESEARCH

Introduction

The first three chapters described the rationale and methodology used in investigating an audio-visual technique for measuring occupational interest. An occupational survey was constructed utilizing photographs depicting people working in one of the six areas described by Holland (1973). It was reasoned that this technique would form a more complete milieu for understanding occupational choices and personal preferences.

Holland (1973) has consistently stated that persons search for environments that are congruent with their personality. He further states that this search for environment "is carried on in many ways at different levels of consciousness and over a long period of time" (p. 4).

This study hypothesizes that a part of the consciousness which includes the visual senses could be used to assess occupational visual discriminators in selecting preferred job environments. The study decided to test these visual discriminators by comparing the research survey with a tested instrument.

This chapter presents the research findings of the data that were collected by random selection. These populations served

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as the sample group for the study. The present chapter gives an appraisal of the facts obtained in relation to the assumptions made prior to the analysis. It compares, when appropriate, relationships of the analysis of these data to the research reports previously cited in the last chapter. A brief review of both the research design and management of the data should prepare the reader for the data reporting.

Review of the research design. The research design detailed in the last chapter explained the use of John Holland's six environmental orientations. Holland's rationale was used as a model to construct the research audio-visual instrument to measure the responses of individuals to job preferences. The first six scales of the Vocational Preference Inventory (a vocational inventory authored by Holland) were utilized as the comparative instrument for the research model. The resulting audio-visual research instrument was the Visual Imagery Selector for Indexing Occupational Needs (V.I.S.I.O.N.). It consists of 120 photographs which allowed persons to respond either like, dislike, or undecided. The instrument was tested on a total sample population of 613 workers, secondary students and post-secondary students. The worker population was administered both the V.P.I. and the V.I.S.I.O.N. surveys. Statistical comparisons were made with this sample in order to test the compatibility of the two tests.

A brief description of the management of the data. The resulting data from all samples were composed of the number of times subjects responded either favorably or unfavorably to choices

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presented either in printed or photographic form. Therefore, the data lent itself best to measures that accounted for frequency appraisals. It could not be assumed, for instance, that the population from which the data was drawn was normally distributed, nor that the resulting data grouped itself in any form of linearality.

It was decided it was most appropriate to use a non-parametric appraisal in the form of a chi-square analysis for all three groups. It was also decided to factor analyze the professional sample alone for both the V.P.I. and the V.I.S.I.O.N. surveys. This was done to determine factors common to both surveys individually and separately. A principal components analysis with a varimax rotation was employed. Factor loadings no greater than .333 accounting for less than 10 per cent of the variance were retained for interpretive purposes, but were not included in empirical considerations. The cut-off score of .333 is a customary standard of acceptable loading value in factor analysis literature (Williamsen, 1974, p. 151).

The method used to interpret the data generated by the raters' scores was a chi-square analysis. The raters used comparative techniques that resulted in frequency responses and lent itself best to a chi-square analysis.

To guard against instability of values appearing in individual cells, a Yates correction for continuity was employed (Siegel, 1956, p. 64). It was applied when necessary to all calculations that failed to meet a minimum number of five cases per cell.

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Research Findings for V.I.S.I.O.N.
and Four Groups of Samples

Comparison Holland types with all three samples. The first hypothesis states that there is no significant difference between the responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for the professional, secondary, and post-secondary groups.

The results of the chi-square analysis for all combined groups are presented in table 5. An examination of the results of the chi-square analysis for the combined groups reveals a chi-square result of 715.87, with twenty-five degrees of freedom. The results of this analysis are significant beyond the .001 level. This indicates the likelihood that the difference between responses for occupational types and the combined responses for all three groups was due to non-chance factors is 999 out of 1,000. A significant difference exists between the observed and expected frequency for the sample.

A contingency coefficient of .77 was obtained for the combined groups. This demonstrated a statistically significant relationship between the variables. Further calculations for relationships were made utilizing Cramers ϕ. This index is used to measure the strength of the relationships for tables larger than two by two. The results of that calculation is .54. This value would be considered a moderately strong indicator of the relationship between the variables and the associative nominal categories (Welkowitz, et al., 1976, p. 265).

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TABLE 5

COMBINED RESPONSES* OF THREE SAMPLE GROUPS TO PHOTOGRAPHS DEPICTING DIFFERENT TYPES OF WORK

Group	Holland Types						
	Realistic	Investi-gative	Artistic	Social	Enter-prising	Conven-tional	Totals
Realistic	155	20	5	2	8	6	196
Investigative	35	44	2	0	4	3	88
Artistic	2	3	36	0	3	3	47
Social	11	12	26	43	1	18	111
Enterprising	19	2	11	4	29	16	81
Conventional	1	4	10	2	1	35	53
Totals	223	85	90	51	46	81	576

Note: Contingency coefficient: .74; Cramer's ϕ: .49; $\chi^2 = 715.87$ (Yates corr.); df = 25; $p < .001$.

*Tied scores not counted.

An examination of a proportional relationship among the entries in the contingency table for the combined group shows the relationship between groups and types for the combined group. Table 6 presents the proportional relationship for the combined groups.

The relationship between associative nominal categories and types is also demonstrated by the proportional table. This table (along with χ^2 analysis) indicates that the internal consistency of the survey meets adequate criterion (Wallace, p. 48).

TABLE 6

PROPORTIONS FOR FREQUENCIES OF RESPONSES FOR TABLE 5

Group	Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Realistic	.79	.10	.02	.01	.04	.03
Investigative	.39	.50	.02	.00	.04	.03
Artistic	.04	.06	.76	.00	.06	.06
Social	.09	.10	.23	.38	.00	.16
Enterprising	.23	.02	.13	.04	.35	.19
Conventional	.01	.07	.18	.03	.01	.66

Specific results in the combined sample indicate that the largest proportional representation according to table 6 is the realistic type. This type corresponds with the realistic group of people in all samples. The next highest relationship displayed was .76 which was achieved in the artistic classification for both

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types and groups. The weakest proportional value for responses was the enterprising type of the responding group of people. (These values will change for each proportional calculation made for each separate sample to follow. Both secondary and post-secondary will also have different values.)

The combined calculations used to test the first hypothesis demonstrate a significant difference between the observed and expected outcomes of the research. Therefore, the first null hypothesis must be rejected and the alternate hypothesis accepted. The alternate hypothesis would support the premise that a significant relationship does exist between the observed and expected responses. A sub-hypothesis might also include that the proportional estimate produced six different and distinct values for the combined groups assessed.

Comparison of Holland occupational types and professional workers. The second hypothesis states that there is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for the professional worker.

The results of the chi-square analysis for the professional sample are given in table 7. A review of the results of the chi-square analysis performed for the professional worker group reveals a chi-square result of 258.36 with twenty-five degrees of freedom. The results indicate a significance level beyond the .001 level. This shows the difference between responses for occupational types

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TABLE 7

RESPONSES* OF PROFESSIONAL-WORKER SAMPLES TO PHOTOGRAPHS DEPICTING DIFFERENT TYPES OF WORK

Group	Holland Types						
	Realistic	Investigative	Artistic	Social	Enterprising	Conventional	Totals
Realistic	41	13	2	2	1	2	61
Investigative	4	22	0	0	2	0	28
Artistic	0	1	14	0	0	1	16
Social	5	3	11	11	0	4	34
Enterprising	6	1	2	0	13	3	25
Conventional	1	4	4	0	0	10	19
Totals	57	44	33	13	16	20	183

Note: Contingency coefficient: .78; Cramer's ϕ: .57; $\chi^2 = 258.36$ (Yates corr.); df = 25; $p < .001$.

*Tied scores not counted.

and professional workers was due to non-chance factors. A significant difference does exist between the observed and expected frequency of responses to photographs representing worker task.

A contingency coefficient of .73 was obtained for the professional worker group indicating a significant relationship between the variables and the associative nominal categories.

Cramer's was performed on the results of the chi-square analysis for the worker sample. The results disclosed an adequate strength of relationship in table 7 of .481819. This, once more, according to Welkowitz et al. (1976), is considered adequate strength for relationships between the variables.

A table to describe the proportional relationships between the entires was also constructed for the worker sample. Table 3 was formed from the values appearing in the contingency table of the chi-square analysis for the worker sample.

As with the combined sample, the worker sample demonstrates that the internal consistency of the measure for the worker sample meets adequate criterion. The specific results in the worker sample show that the largest proportion of .87 is recorded in the artistic type. This corresponds with the artistic sample of respondents which responded to the photographic stimulus on the vocational interest survey.

The next highest relationship, .78, was recorded for the investigative type of the Holland typology. This in turn corresponds with the investigative sample of persons that responded to photographic items in the survey. The majority of this sample

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registered their occupations as optometrist, chemist, psychologist, lab technician, electrician and manufacturing engineers (see table 2). The weakest proportional representation for responses was the social.

TABLE 8

PROPORTIONS FOR FREQUENCIES OF RESPONSES FOR TABLE 7

Group	Holland Types					
	Real-listic	Investi-gative	Artistic	Social	Enter-prising	Conven-tional
Realistic	.67	.21	.03	.03	.01	.03
Investigative	.14	.78	.00	.00	.07	.00
Artistic	.00	.06	.87	.00	.00	.06
Social	.14	.08	.32	.32	.00	.11
Enterprising	.24	.04	.08	.00	.52	.12
Conventional	.05	.21	.21	.00	.00	.52

The combined analysis for the second hypothesis demonstrates a significant difference does exist between the observed and expected outcomes of the research. It can be concluded from the above analysis that the second null hypothesis must be rejected and the alternate hypothesis accepted. That is, a significant relationship does exist between the observed and expected responses.

Comparison of Holland's occupational types and secondary students. The third hypothesis states that there is no significant difference between the observed frequency of responses for

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occupational types receiving the most preferred choices of the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for a secondary student sample.

The results of the chi-square analysis for the secondary sample are presented in table 9. An investigation of the results of the chi-square analysis for the secondary group reveals a chi-square of 218.4253, with twenty-five degrees of freedom. The results are significant beyond the .001 level. The results indicate that a significant difference exists between the observed and expected frequencies of responses for the secondary sample.

A test to determine the association between the variable was performed and resulted in a contingency coefficient of .728. Cramer's ϕ was applied to determine the strength of relationship for tables that exceed two by two sizes. The result of that calculation was .474532, indicating that an adequate strength exists between the variables.

An examination of the proportional relationship among the entries for the chi-square contingency table for the secondary sample displayed an adequate relationship between Holland social types and groups (table 10).

Specific results for the secondary group indicate that the strongest proportional relationship exists between Holland social type and individuals who responded to the photographic stimulus items on the survey. This sample, according to table 3, is composed of forty-seven auto mechanic students and nineteen machinery trade students. The next highest proportional result was registered between the conventional Holland typology and the same

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TABLE 9

RESPONSES* OF SECONDARY STUDENTS TO PHOTOGRAPHS DEPICTING DIFFERENT TYPES OF WORK

Group	Holland Types						
	Realistic	Investigative	Artistic	Social	Enterprising	Conventional	Totals
Realistic	62	1	0	0	3	0	66
Investigative	21	6	1	0	2	0	30
Artistic	2	2	8	0	1	2	15
Social	5	0	7	18	1	5	36
Enterprising	6	0	6	3	8	5	28
Conventional	0	0	3	2	0	14	19
Totals	96	9	23	23	15	26	194

Note: Contingency coefficient: .72; Cramer's ϕ: .47; $\chi^2 = 218.42$ (Yates corr.); df = 25; $p < .001$.

*Tied scores not counted.

previously described sample. This part of the sample was composed of fifteen secretarial trainees and five commercial sewing students. The lowest proportional representation for the table was recorded in the investigative category. A review of table 3 reveals that the group used for that testing sample were fourteen lab technicians, ten electronic tool designers and two medical lab assistants.

TABLE 10

PROPORTIONS FOR FREQUENCIES OF RESPONSES FOR TABLE 9

Group	Holland Types					
	Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Realistic	.93	.01	.00	.00	.04	.00
Investigative	.70	.20	.03	.00	.06	.00
Artistic	.13	.13	.53	.00	.06	.13
Social	.13	.00	.19	.50	.02	.13
Enterprising	.21	.00	.21	.10	.28	.17
Conventional	.00	.00	.15	.10	.00	.73

The combined calculations used to measure the third hypothesis shows internal consistency. The analysis also shows a difference between the observed and expected outcomes for the secondary sample. It can be concluded from the above analysis that the third null hypothesis must be rejected.

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Comparison of Holland's occupational types and post-secondary students. The fourth hypothesis states that there is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for a post-secondary student sample.

The chi-square analysis was performed on the data collected for the post-secondary students. The results of that analysis are presented in table 11. Inspection of the results of the chi-square analysis for the post-secondary sample reveal a chi-square value of 228.6221, with twenty-five degrees of freedom. The results indicate a significance level beyond the .001 value. This indicates the difference between responses for Holland's occupational types and post-secondary students was due to non-chance factors. A significant difference does exist between the observed and expected frequencies of responses for the post-secondary sample.

A contingency coefficient of .731 was obtained for the post-secondary sample, indicating a close association between the variables and the associative nominal categories.

Cramer's ϕ test was applied to measure the strength of relationship between the variables. The result of that test was a value of .4793442, an adequate index of association.

An examination of the proportional relationship among the entries for the chi-square analysis for the post-secondary sample displays the relationship between the Holland type and sample group.

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TABLE 11

RESPONSES* OF POST-SECONDARY STUDENTS TO PHOTOGRAPHS DEPICTING DIFFERENT TYPES OF WORK

Group	Holland Types						
	Realistic	Investigative	Artistic	Social	Enterprising	Conventional	Totals
Realistic	52	6	3	0	4	4	69
Investigative	10	16	1	0	0	3	30
Artistic	0	0	14	0	2	0	16
Social	1	9	8	14	0	9	41
Enterprising	7	1	3	1	8	8	28
Convention	0	0	3	0	1	11	15
Totals	70	32	32	15	15	35	199

Note: Contingency coefficient: .73; Cramer's ϕ: .48; $\chi^2 = 228.622$ (Yates corr.); df = 25; $p < .001$.

*Tied scores not counted.

Table 12 shows the proportional relationship for the post-secondary sample.

TABLE 12

PROPORTIONS FOR FREQUENCIES OF RESPONSES FOR TABLE 11

Group	Holland Types					
	Realistic	Investigative	Artistic	Social	Enterprising	Conventional
Realistic	.75	.08	.04	.00	.05	.05
Investigative	.33	.53	.03	.00	.00	.10
Artistic	.00	.00	.87	.00	.13	.00
Social	.02	.21	.19	.34	.00	.21
Enterprising	.25	.03	.10	.03	.28	.28
Conventional	.00	.00	.20	.00	.06	.73

Specific results for the post-secondary group indicate that the strongest proportional relationship exists in the artistic classification. This classification included eleven students in a two-year program for photography and commercial art. The second highest classification resulted in the realistic category. This included forty-five auto mechanics students and twenty-five students enrolled in a welding course. The weakest category was registered in the enterprising classification. This was composed of eighteen radio operators and twelve business students.

The computations used to test the validity of the fourth hypothesis again demonstrate the survey to have internal

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consistency with the post-secondary group. It also shows a difference between the observed and expected outcomes for the post-secondary sample. Therefore the fourth hypothesis must be rejected.

Summary table for the first four hypotheses. A summary table is provided for the results of the first four null hypotheses. Table 13 is intended to provide the reader with a composit picture for all four hypotheses.

Table 13 shows all null hypotheses were rejected for the chi-square analysis and the alternative hypotheses were accepted. All chi-square analyses with twenty-five degrees of freedom showed significant levels well beyond the .001 level. The accompanying contingency coefficients and Cramer's ϕ coefficients showed adequate strength between the variables.

Research Findings for V.I.S.I.O.N. and V.P.I. Using Factor Analysis

Factor analysis results for the V.P.I. The fifth null hypothesis reads that there will be no similarity between a factor analysis performed on both the Vocational Preference Inventory and the Visual Imagery Selector for Indexing Occupational Needs.

A factor analysis performed on the Vocational Preference Inventory resulted in the outcomes for table 14. An inspection of the results for table 14 shows the results of a principal component analysis with a varimax rotation resulting in six factors for eighty-four variables.

To the left of the table are the individual V.P.I. items that appear as variables for the analysis. To the right of the

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TABLE 13

SUMMARY OF RESULTS OF THE FOUR NULL HYPOTHESES FOR RESPONSES TO PHOTOGRAPHS DEPICTING DIFFERENT TYPES OF WORK

Null Hypothesis	χ^2	df	Significance	Contingency Coefficient	Cramer's ϕ	Rejected
Combined	715.870	25	$p < .001$	.74	.49	x
Professional	258.360	25	$p < .001$	.78	.57	x
Secondary	218.420	25	$p < .001$	.72	.47	x
Post-Secondary	226.622	25	$p < .001$	.73	.48	x

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TABLE 14

PRINCIPAL FACTOR SOLUTION FOR ITEMS ON THE FIRST SIX SCALES OF THE V.P.I.*

	V.P.I. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
	Factor I--Conventional						
1.	Bookkeeper	.72677	.07072	.05620	.03831	.02171	.11108
2.	Quality Control Expert	.36872	.20746	.31112	.26560	.05584	.14410
3.	Budget Reviewer	.70775	.12134	.07562	.07605	.03969	.21786
4.	Traffic Manager	.23543	.10397	.02168	.46800	.23134	.22237
5.	Statistician	.63049	.05540	.13753	.05712	.03650	.00037
6.	Court Stenographer	.28714	.04994	.01996	.01610	.23623	.06344
7.	Bank Teller	.57429	.06874	.12031	.02637	.28391	.00217
8.	Tax Expert	.64995	.00474	.02470	.02162	.10064	.31428
9.	Inventory Controller	.54137	.14772	.13424	.28852	.20269	.03875
10.	I.B.M. Equipment Operator	.52448	.02438	.21413	.26591	.13145	.06454
11.	Financial Analyst	.66927	.08789	.04088	.00747	.03828	.37374
12.	Cost Estimator	.63155	.13042	.10490	.22931	.05693	.23312
13.	Pay Roll Clerk	.64742	.02877	.19161	.19317	.09752	.11853
14.	Bank Examiner	.73327	.01724	.06582	.07714	.05721	.21554
	Factor II--Artistic						
1.	Poet	.22663	.66008	.04266	.21108	.10430	.01153
2.	Symphony Conductor	.00294	.70555	.09489	.13675	.11419	.04221
3.	Musician	.01424	.66229	.00640	.13009	.00072	.09050
4.	Author	.05222	.64753	.19952	.16603	.10005	.06665
5.	Commercial Artist	.00818	.56852	.22524	.16157	.20657	.12849
6.	Free-lance Writer	.04598	.64110	.09416	.02347	.01887	.04441
7.	Musical Arranger	.09778	.63270	.05937	.00696	.07553	.04843
8.	Art Dealer	.90947	.60165	.15722	.05595	.34090	.02268
9.	Dramatic Coach	.03409	.62810	.02728	.13577	.01269	.08178
10.	Concert Singer	.02742	.79617	.15378	.03082	.01942	.08929

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TABLE 14--Continued

V.P.I. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
11. Composer	.11573	.63932	.06997	.08075	.19213	.05416
12. Stage Director	.03340	.71074	.13413	.12327	.19039	.09752
13. Playwright	.06868	.60891	.05121	.06491	.17683	.09384
14. Cartoonist	.10260	.08633	.02051	.03772	.03438	.12370
Factor III--Investigative						
1. Meteorologist	.03128	.02086	.66701	.14959	.01295	.02431
2. Biologist	.08676	.10791	.57642	.16503	.12321	.00239
3. Astronomer	.09050	.29401	.54819	.10856	.04236	.10720
4. Aeronautical Design Engineer	.03282	.09668	.56052	.41058	.22153	.11497
5. Anthropologist	.03181	.30684	.59367	.02812	.13910	.00173
6. Zoologist	.20714	.13802	.54502	.13345	.13310	.08564
7. Chemist	.03532	.04413	.73137	.16943	.01786	.05573
8. Independent Research Scientist	.04417	.02668	.78713	.00196	.00823	.09369
9. Writer of Scientific/Technical Articles	.09723	.08114	.59475	.05553	.01053	.07271
10. Editor of a Scientific Journal	.18361	.18254	.51399	.04878	.06517	.03023
11. Geologist	.04458	.20396	.70503	.16684	.03204	.00653
12. Botanist	.03979	.24522	.61477	.05843	.03961	.10844
13. Scientific Research Worker	.06379	.03081	.71016	.04662	.06575	.00611
14. Physicist	.04081	.04148	.73353	.12121	.02608	.13560
Factor IV--Realistic						
1. Airplane Mechanic	.01823	.08851	.17529	.66285	.20415	.00985
2. Fish and Wildlife Specialist	.19040	.02292	.32211	.43281	.10874	.04984
3. Power Station Operator	.05769	.06310	.11725	.67193	.02322	.09968
4. Master Plumber	.06321	.16770	.01233	.71891	.02830	.12686
5. Power Shovel Operator	.08585	.11981	.06632	.81425	.00628	.00181

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TABLE 14--Continued

	V.P.I. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor IV
6.	Surveyor	.17669	.08721	.14943	.64328	.12494	.09013
7.	Construction Inspector	.10869	.15640	.09608	.70904	.01944	.10972
8.	Radio Operator	.13403	.14773	.22635	.41571	.17189	.05652
9.	Filling Station Attendant	.15601	.05084	.09909	.65417	.16272	.01571
10.	Tree Surgeon	.01018	.06919	.13111	.53635	.00309	.07240
11.	Tool Designer	.00131	.06585	.26725	.58621	.09029	.04329
12.	Locomotive Engineer	.00617	.01753	.13357	.71013	.06834	.13749
13.	Photographer	.03054	.31747	.18130	.30059	.03751	.03694
14.	Electrician	.09808	.14998	.21486	.62503	.17377	.03423
	Factor V--Social						
1.	Foreign Missionary	.09648	.16817	.03378	.08257	.31788	.03832
2.	High School Teacher	.00027	.02387	.01739	.05075	.31129	.35994
3.	Juvenile Delinquency Expert	.04363	.03102	.13745	.06710	.69671	.14653
4.	Speech Therapist	.04665	.18866	.22319	.16523	.54814	.16275
5.	Marriage Counselor	.08430	.11707	.02916	.16170	.62399	.01183
6.	Physical Education Teacher	.02036	.03656	.10388	.20160	.29332	.37040
7.	Playground Director	.00635	.10318	.00511	.08047	.43578	.11525
8.	Clinical Psychologist	.05860	.19565	.36408	.20065	.48946	.10390
9.	Social Science Teacher	.00039	.23111	.08570	.00685	.44993	.14756
10.	Director of Welfare Agency	.21011	.08983	.00054	.04498	.53645	.15952
11.	Assistant City School Superintendent	.01082	.03450	.06296	.06072	.51349	.41963
12.	Personnel Counselor	.21293	.18264	.00602	.08949	.09608	.07829
13.	Psychiatric Case Worker	.02507	.17827	.11772	.10976	.71248	.03102
14.	Vocational Counselor	.05830	.11008	.08431	.07647	.67395	.15489
	Factor VI--Enterprising						
1.	Speculator	.22190	.02544	.14535	.11653	.10604	.61558

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TABLE 14--Continued

V.P.I. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
Factor VI--Enterprising						
1. Speculator	.22190	.025.44	.14535	.11653	.10604	.61558
2. Buyer	.30897	.11877	.10982	.01632	.03438	.42054
3. Stock and Bond Salesperson	.30524	.04106	.15221	.02658	.09205	.54854
4. Manufacturer's Representative	.11422	.11756	.09806	.17266	.04955	.56607
5. Television Producer	.12282	.46766	.11225	.03150	.22613	.28486
6. Hotel Manager	.41099	.12491	.07033	.18990	.19272	.26914
7. Business Executive	.43558	.06205	.10719	.06652	.01176	.51159
8. Restaurant Manager	.16351	.17259	.08449	.33012	.15961	.16512
9. Master of Ceremonies	.05343	.40417	.13732	.07137	.17412	.40794
10. Traveling Salesperson	.04440	.04008	.08626	2.7153	.05835	.38127
11. Real Estate Salesperson	.26741	.01004	.03088	.19287	.08031	.57952
12. Industrial Relations Consultant	.20300	.09570	.03749	.04657	.32933	.48442
13. Sports Promoter	.03729	.07869	.15745	.22272	.23409	.49721
14. Political Campaign Manager	.23134	.18444	.07543	.01323	.19803	.53123
Eigenvalues	10.80589	9.25042	6.93466	4.05788	3.39722	2.55316
Proportion of Total Variance	.12864	.23877	.32132	.36963	.41007	.44047

*Cut-off = .33.

V.P.I. items are the individual values for each factor. When they are read from left to right they describe the numerical loadings for each factor. The variables are grouped in terms of common factors that define categories for specific groups of variables. For instance, Factor I, which has intuitively been called the conventional factor, accounts for the first grouped cluster of common factors for fourteen variables. Factor II, which has been named artistic demonstrates yet another group of variables that arranged themselves into still another common factor.

In the first factor, conventional, all items except numbers five and six load well above the required value of .33. The second factor, artistic, loads adequately on all factor items with the exception of the last item. The third factor, investigative, loads adequately on all items. In the fourth factor, realistic, all but item thirteen meet the value conditions of .33. Factor 5 accounts for eleven out of fourteen variables. (These variables are described in the table.) The factor called enterprising has all but two of the values grouped under the sixth factor with acceptable loading.

The results of the factor analysis of the Vocational Preference Inventory resulted in six factors (lowest eigenvalue of 2.55316) and account for .44047 per cent of the total variance. An inspection of the cumulative proposition of the total variance for eight factors shows a value of .49023. This result is within ten percentage points of those values reported by DiScipio.

Factor analysis results for the V.I.S.I.O.N. survey. The

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factor analysis for the items of the V.I.S.I.O.N. survey is given in table 15. An investigation of the results for table 15 shows the results of a principal component analysis with a varimax rotation resulting in six factors for 120 variables.

As in the case of the last table, the extreme left displays the dependent variable items that interact with the independent variables of the factor scores. To the right of the items are the individual values for each factor for the individual item. When they are read from left to right they describe the numerical loadings for each factor in the V.I.S.I.O.N. analysis.

In the case of the V.I.S.I.O.N. analysis, survey construction produced two sets of like groupings for six types. Therefore, in reporting the analysis in table 15, the two groupings of ten items for each type are combined under one grouping. For example, the first items for Factor I (realistic) include items 51 through 60, 111 through 120. The items for investigative include items through 50 and 111 through 120.

The first factor, which has been designated Realistic, accounts for grouped items displayed for that designation. The second factor, artistic, accounts for the next group of items. As with the analysis for the V.P.I., a pre-agreed-upon cutoff score of .33 is an acceptable value level for consideration. All values were scrutinized for their contribution to the total analysis. All loadings are reported so that the individual reader may compare each item's value dissemination with each of the six factors. A review of the factors and their subsequent loadings demonstrates

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TABLE 15

PRINCIPAL FACTOR SOLUTION FOR ITEMS ON THE V.I.S.I.O.N. SURVEY*

	V.I.S.I.O.N. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
	Factor I--Realistic						
1.	Forester	.37963	.12365	.28580	.24568	.03118	.07621
2.	Instructor-Auto Mechanic	.43426	.14459	.07656	.13038	.05422	.06504
3.	Mechanical Engineer	.35838	.18656	.27702	.36442	.21243	.25167
4.	Radio Operator	.42394	.00506	.15150	.12727	.36310	.00158
5.	Civil Engineer	.67679	.11770	.19649	.02173	.02648	.18859
6.	Aircraft Mechanic	.65958	.03347	.13600	.23769	.09382	.02796
7.	Policeman	.23945	.20032	.10043	.23289	.30489	.06686
8.	Firefighter	.47605	.13161	.03146	.11217	.40246	.05738
9.	Automobile Body Repairman	.65767	.10688	.03851	.01596	.10409	.19343
10.	Drill Press Operator	.70030	.12192	.07415	.06083	.06716	.05234
11.	Compositor	.00665	.28091	.32855	.03247	.04183	.23361
12.	Baker	.25766	.12667	.37184	.23649	.01168	.01853
13.	Welder	.70755	.18513	.11677	.06255	.06834	.09676
14.	Automobile Mechanic	.64959	.16573	.06660	.00069	.04672	.01281
15.	Upholsterer	.44028	.36517	.03194	.00434	.00040	.22529
16.	Heavy Equipment Operator	.49357	.03676	.01560	.09243	.25806	.04772
17.	Carpenter	.56200	.02158	.13181	.01785	.09025	.02541
18.	Truck Driver	.50938	.19138	.18167	.00994	.25968	.10532
19.	Fork Lift Operator	.59928	.09667	.04817	.05470	.14920	.09451
20.	Butcher	.58387	.06292	.70211	.14903	.12948	.07651
	Factor II--Artistic						
1.	Artist	.08920	.61364	.25241	.02153	.11967	.01280
2.	Architect	.25476	.18160	.36625	.14716	.07563	.16946
3.	English Teacher	.32370	.19489	.00877	.26458	.05697	.11749
4.	Advertising Man	.08564	.38106	.19832	.18346	.22318	.24062

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TABLE 15--Continued

	V.I.S.I.O.N. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
5.	Musician	.09954	.28164	.03490	.09928	.01295	.00734
6.	Women's Garment Designer	.07492	.40902	.19063	.19346	.07389	.02970
7.	Model	.17332	.60788	.21144	.06188	.05205	.01398
8.	Sculptor	.08155	.63661	.17899	.13063	.14038	.07387
9.	Furrier	.02865	.38585	.32496	.07094	.19525	.04794
10.	Photograph Retoucher	.18392	.72168	.10575	.08539	.07856	.00470
11.	Artist	.06078	.58268	.25145	.05804	.07855	.10458
12.	Costume Designer	.14595	.73648	.16293	.01761	.10247	.05768
13.	Hat Designer	.00234	.58999	.04117	.05547	.03992	.11521
14.	Dancer, Near Eastern	.19647	.45945	.28972	.04830	.02414	.10301
15.	Popular Singer	.19321	.23718	.06511	.16435	.25787	.14534
16.	Cameraman	.20570	.34894	.12690	.15074	.36031	.13167
17.	Dancing Teacher	.14031	.35972	.06267	.17039	.19196	.04477
18.	Video-Recording Engineer	.29031	.00989	.12884	.24232	.02378	.36879
19.	Sketch Portraitist	.06777	.69555	.10179	.04741	.07420	.02465
20.	Dancing Instructor	.16055	.6449	.33106	.01934	.03321	.11821
	Factor III--Social						
1.	Home Economics Teacher	.21892	.50307	.22949	.04330	.13800	.01829
2.	Elementary Teacher	.13757	.27313	.08424	.24493	.02964	.10889
3.	Counselor	.16910	.15399	.03673	.20937	.37064	.12050
4.	Restaurant Manager	.58582	.12077	.07324	.05215	.26420	.01659
5.	Clothing Salesperson	.16694	.00227	.12292	.07993	.18242	.13917
6.	Hair Stylist	.20593	.33132	.36925	.01683	.02524	.02524
7.	Hostess	.14401	.12003	.35287	.05468	.03233	.02542
8.	Cosmetologist	.10909	.51477	.42177	.04575	.04895	.10230
9.	Dietitian	.04750	.27654	.11944	.52168	.06049	.10079
10.	Counselor	.22889	.21281	.15097	.00180	.33392	.08290
11.	Manicurist	.13345	.47014	.46060	.03984	.02454	.07813

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TABLE 15--Continued

	V.I.S.I.O.N. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
12.	Nurse	.13948	.13054	.24280	.04608	.53373	.10122
13.	Inhalation Therapist	.00367	.09293	.13507	.72771	.08805	.06967
14.	Food Service Manager	.08857	.03583	.44019	.06921	.21388	.12515
15.	Group Worker	.26754	.16639	.05197	.40490	.32666	.09928
16.	Saleswomen, Cosmetics	.05564	.33360	.46896	.02781	.01864	.04403
17.	Foreign Language Teacher	.00102	.05108	.27263	.09978	.70496	.06386
18.	Inhalation Therapist	.05507	.13208	.33367	.36135	.14817	.05610
19.	Ticket Agent	.13535	.12586	.26184	.20482	.41659	.10023
20.	Emergency Vehicle Attendant	.01714	.20060	.26814	.40137	.01144	.29330
	Factor IV--Investigative						
1.	Optometrist	.28342	.00401	.09585	.55021	.01927	.10068
2.	Botonist	.24899	.04521	.11090	.29179	.12313	.02047
3.	Weather Forecaster	.12582	.03715	.09927	.25064	.34892	.08997
4.	Geographer	.23271	.04826	.08760	.19107	.09702	.20232
5.	Dentist	.11991	.04405	.26359	.45600	.10874	.14088
6.	Laboratory Technician	.04654	.03162	.11889	.57071	.15214	.03672
7.	Electrical Technician	.25348	.21856	.29557	.11696	.27712	.21228
8.	Lab Technician	.23378	.09934	.27752	.48674	.04194	.09009
9.	Horticulturist Flowers Assistant	.13883	.44793	.08874	.81160	.16112	.04704
10.	Engineer Standards Tester	.37627	.02686	.34434	.35970	.20563	.04916
11.	Computer Operator	.17599	.09829	.22420	.17451	.11977	.51315
12.	Oceanographer	.28964	.02864	.26316	.15280	.25098	.09895
13.	Mathematician Statistician	.06578	.11674	.18335	.26497	.05116	.26938
14.	Engineering Technician	.37830	.04431	.46139	.25093	.04045	.03626
15.	Laboratory Technician	.03323	.01852	.19370	.68669	.06246	.13077
16.	Naturalist	.01328	.31383	.15583	.29092	.15036	.19161
17.	Astronomer	.04572	.19809	.17193	.48997	.03468	.03654

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TABLE 15--Continued

	V.I.S.I.O.N. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
18.	Airplane Pilot	.35477	.06876	.31718	.18122	.01445	.08241
19.	Geologist Assistant	.14072	.33316	.28490	.26814	.09582	.01631
20.	Anthropologist	.21210	.12631	.06987	.64405	.04928	.03688
	Factor V--Enterprising						
1.	Manager Steel	.02512	.24021	.00458	.15218	.37987	.23551
2.	Customer Service Manager	.19799	.07070	.06499	.15008	.56847	.13455
3.	Gas Station Manager	.57744	.08287	.17795	.05574	.10741	.07460
4.	Life Insurance Salesman	.04945	.03115	.00442	.29034	.45940	.25267
5.	Auctioneer	.21138	.23893	.01167	.14011	.37256	.16496
6.	Salesperson	.10883	.40692	.14489	.05518	.27485	.10974
7.	Lunch Truck Attendant	.27611	.12928	.40363	.07790	.14207	.03479
8.	Shoe Store Manager	.00747	.05810	.28812	.01914	.44212	.07237
9.	Buyer	.25111	.06546	.13926	.03106	.20872	.10188
10.	Salesman, Office Machines	.02947	.02879	.12421	.04223	.54005	.29456
11.	Securities Trader	.06098	.01830	.16006	.29201	.32660	.51543
12.	Sales Manager	.00165	.06459	.02556	.02034	.47973	.17363
13.	Auctioneer	.56100	.06546	.18803	.04542	.18644	.03585
14.	Director, Transportation	.51636	.00442	.06950	.08730	.37413	.02008
15.	Judge	.00976	.05390	.27899	.06477	.50730	.05399
16.	Grocer	.40609	.01448	.17135	.03683	.13089	.26092
17.	Real Estate Salesman	.07083	.06577	.01803	.15453	.59693	.22386
18.	Florist	.05298	.31844	.27724	.03566	.15355	.03225
19.	Encyclopedia Salesperson	.06497	.05147	.15877	.07688	.42417	.02447
20.	Sporting-Goods Salesperson	.19278	.04529	.09981	.11703	.65137	.05498

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TABLE 15--Continued

	V.I.S.I.O.N. Items	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
	Factor VI--Conventional						
1.	Product Coordinator	.30053	.14957	.11355	.07334	.13482	.09664
2.	Accountant	.04010	.04458	.16065	.04565	.11745	.49394
3.	Treasurer	.14693	.02736	.02545	.08365	.23121	.43245
4.	Finance Expert	.20621	.21113	.11632	.04520	.13837	.42956
5.	Computer Operation	.00838	.18398	.01286	.31416	.03166	.29939
6.	Secretary	.33092	.07275	.47106	.07130	.00499	.22142
7.	Mail Clerk	.33296	.08253	.22820	.05550	.16892	.01305
8.	Bookkeeper	.00596	.10670	.10349	.17132	.13885	.58927
9.	File Clerk	.91858	.07684	.34333	.18218	.00736	.32628
10.	Telephone Operator	.09317	.24635	.35461	.15884	.18498	.05453
11.	Printer Operator	.21302	.01773	.12480	.28243	.10730	.20719
12.	Receptionist	.18598	.06791	.52239	.01838	.03401	.26542
13.	Proof Reader	.06383	.41804	.00342	.00227	.01977	.20012
14.	Travel Bureau Clerk	.09174	.07262	.20326	.28225	.35079	.11372
15.	Adding Machine Operator	.22638	.04978	.33726	.24342	.09340	.27584
16.	Teller	.07633	.04115	.35516	.06445	.31470	.45535
17.	Food Checker	.06491	.06648	.35109	.07498	.19160	.27338
18.	Adding Machine Operator	.01805	.09853	.24313	.17825	.12654	.63634
19.	Tester	.12150	.18739	.21666	.03651	.03770	.60971
20.	Court Reporter	.19464	.10001	.09742	.23313	.24586	.21336
	Eigenvalues	11.57854	9.24445	6.64780	5.35543	4.52582	3.73468
	Proportion of Total Variance	.09649	.17353	.22892	.27355	.31127	.34239

*Cut-off = .33

a pattern of intuitive reasoning that will be reported in chapter V.

Examining the first group of variables shows all the items with the exception of 111 and 112 load adequately on the first factor. The first factor accounts for 11.57864 of the total variance. The second factor, artistic, shows items 32, 33, 94 and 96 failed to meet the minimum value. Approximately 8 per cent of the remaining items load adequately on the factor. The next factor, social, is less well defined than the preceding two. However, when compared with the other factors, it still remains dominant. The investigative factor shows adequate loadings for the fourth factor. Even though items 43, 44, 47, 49, 101, 102, 104, 106, 107 and 108 did not meet the minimum requirements of .33, the factor still held dominant over the remaining five variables. The enterprising factor displayed twelve items that met the .33 cut-off requirement for the minimum value. This accounted for about 60 per cent of the items that loaded adequately on Factor V. The sixth factor, conventional, shows a group of items that are distinctive for that factor and meet the minimum value.

The results of the factor analysis of the Visual Imagery Selector for Indexing Occupational Needs resulted in six factors (lowest eigenvalue of 3.73468) which accounted for .34239 per cent of the total variance. An inspection of the cumulative proportion of the total variance for eight factors displays a value of .39056. This is within twenty percentage points of the average value reported by DiScipio.

A comparison of the items with like names or designations

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for both the V.P.I. and V.I.S.I.O.N. survey is displayed in table 16. The table displays those items that are generically compatible between the two separate surveys. The comparison is done regardless of the individual factor loading for each separate analysis.

The first category, realistic, shows six items that are compatible between the two surveys. Each item for both surveys loads well over the .33 value. The most substantial loadings for each survey in the realistic category were on the items "construction inspector" and "car maintenance worker."

The next category, investigative, displays eight items which are similar for both surveys; however, there are differences. On this particular category, values vary for each survey item. For example, under the item "meterologist" the V.P.I. survey loaded much more vigorously than did the V.I.S.I.O.N. survey. Other examples, such as aeronautical designer, geologist, and botanist followed the same pattern. The remaining items held stable in their loadings for both surveys.

Under the artistic category, six items were selected from both surveys due to their similarity. Not all of the items loaded adequately on similar or common factors. In only one case did an item "artist" (for the V.I.S.I.O.N. survey) load with more consequence than it did for the V.P.I.

The social items for both surveys were very dissimilar in their classification. There were only two items that could be identified from both surveys that were compatible. Neither item showed a relationship to each other; however, the V.P.I. did

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TABLE 16

COMPARISON OF ROTATED FACTOR LOADINGS FOR SELECTED ITEMS ON LIKE CATEGORIES FOR BOTH V.I.S.I.O.N. AND V.P.I.

Item	V.P.I.	V.I.S.I.O.N.	Similar	Dissimilar
	Realistic			
Airplane Mechanic	.58621	.65958	X	
Forester	.43281	.37953	X	
Heavy Equipment Operator	.81425	.49367	X	
Tool Designer	.64328	.70030	X	
Construction Inspector	.70904	.67679	X	
Car Maintenance Worker	.65417	.64959	X	
	Investigative			
Meteorologist	.66701	.25064		X
Biologist	.57642	.68669	X	
Astronomer	.54819	.48997	X	
Aeronautical Designer	.56052	.25093		X
Anthropologist	.59367	.64405	X	
Independent Research Scientist	.78713	.48574	X	
Geologist	.70503	.26814		X
Botanist	.57642	.29179		X
	Artistic			
Orchestra Leader	.70555	.28164		X
Musician	.66229	.2578		X
Commercial Artist	.56852	.49892	X	
Artistic Drama Coach	.79617	.64449	X	
Artist	.08633	.69555		X
Stage Arranger	.71074	.34894	X	

TABLE 16--Continued

Item	V.P.I.	V.I.S.I.O.N.	Similar	Dissimilar
	Social			
High School Teacher	.31129	.22949		X
Personnel Counselor	.69608	.15097		X
	Enterprising			
Speculator	.61558	.32660	X	
Buyer	.42054	.20872		X
Stock and Bond Salesperson	.54854	.32660	X	
Customer Service Representative	.56607	.56847	X	
Salesperson	.38127	.45940	X	
Business Executive	.51159	.54005	X	
Real Estate Salesperson	.57952	.59693	X	
Industrial Relations Consultant	.48442	.37413	X	
Sports Promoter	.49721	.65137	X	
	Conventional			
Bookkeeper	.72677	.63634	X	
Quality Control Expert	.36872	.09664	X	
Budget Reviewer	.70775	.43245	X	
Bank Teller	.45535	.57429	X	
Statistician	.63049	.60971	X	
Computer Operator	.52448	.29939		X
Finance Analyst	.66927	.42956	X	
Court Stenographer	.28714	.21336	X	
Inventory Controller	.54137	.32628	X	
Bank Examiner	.73327	.49394	X	

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register an acceptable value for "personal counselor." The other items not listed for the table did register acceptable values.

The enterprising items that were similar for both surveys were nine in number. Seven of the items loaded adequately for both surveys. One of the items, "buyer" loaded adequately for the V.P.I. but did not show enough value for the V.I.S.I.O.N. survey.

The conventional category produced eleven items that were similar between the V.P.I. and V.I.S.I.O.N. surveys. Three of the items on the V.I.S.I.O.N. survey failed to reach the accepted value for comparison. The remaining items were within an acceptable value range.

Of the forty-two items that were compared between the two surveys, twenty-nine items achieved an acceptable value with their counterpart on the other survey. This resulted in approximately 70 per cent compatibility between surveys. Only one item for the V.I.S.I.O.N. survey (out of twenty-nine items that failed to meet the cut-off value) loaded with more authority than did the V.P.I. Two items failed to reach the acceptable value for either survey. These were the items "high school teacher" and "court stenographer." Both of these items were part of the social factor.

A comparison of the high factor scores with individual raw scores. Table 17 shows the relationship between significant values for high factor scores and the raw score typology that resulted for both the V.P.I. and V.I.S.I.O.N. surveys.

The results for the V.P.I. survey show thirty-two out of sixty-eight people in the realistic sample received factor scores

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that matched their raw score results. This accounted for 47 per cent of the people in this category as having a factor score that was compatible with their survey raw scores. The investigative sample registered seventeen out of thirty people who had a factor score that matched their raw score results for the V.P.I. The rest of the table is read in a similar manner for each category. A total of 57 per cent of the high score factor values matched the raw score results for the V.P.I.

The results are similarly read for the V.I.S.I.O.N. results. The realistic variable registered twenty out of sixty-eight people that received factor scores that matched their raw score results. This accounted for 29 per cent of the people in this category as having a factor score that was compatible with their survey raw scores. The investigative sample registered fifteen out of thirty people who had a factor score similar to their raw score results for the V.I.S.I.O.N. survey. As with the V.P.I., the rest of the table is read in a similar manner for each category. A total of 48 per cent of the high score factor values matched the raw score results for the V.I.S.I.O.N. survey.

The remaining percentages in each category for both surveys (for each variable) were divided among the remaining five variables. This is true for the total percentage for each survey. An example of this situation would be the case of the realistic variable for the V.P.I. The remaining 53 per cent would be dispersed among investigative, artistic, social, enterprising, and conventional categories.

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TABLE 17

COMPARISON OF HIGH FACTOR SCORES FOR INDIVIDUAL SUBJECTS AND RAW SCORE RESULTS FOR THE SAME SUBJECTS

Variable	Number of Agreements out of Total Sample for Each Group	Percentage
V.P.I.		
Realistic	32 out of 68	47
Investigative	17 out of 30	57
Artistic	9 out of 16	56
Social	22 out of 38	58
Enterprising	20 out of 30	67
Conventional	11 out of 20	55
V.I.S.I.O.N.		
Realistic	20 out of 68	0
Investigative	15 out of 30	50
Artistic	13 out of 16	81
Social	15 out of 38	39
Enterprising	13 out of 30	43
Conventional	9 out of 20	45

Comparison of means of factor scores for both the V.P.I. and V.I.S.I.O.N. surveys. Table 18 displays the results for the calculation of the means for factor scores reported by the analysis. These factors are arranged in the order of their relationship to the Holland order and not to their appearance in the analysis.

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TABLE 18

MEANS OF FACTOR SCORES FOR THE V.P.I. AND V.I.S.I.O.N. SURVEYS

Group		Realistic Factors	Investigative Factors	Artistic Factors	Social Factors	Enterprising Factors	Conventional Factors
V.P.I.							
Realistic	(N=68)	.89	.31	.69	.70	.72	.79
Investigative	(N=30)	.75	1.05	.72	.89	.75	.88
Artistic	(N=16)	.55	.12	1.54	.72	.61	.50
Social	(N=38)	.86	.71	.75	1.02	.72	.61
Enterprising	(N=30)	.80	.83	.71	.87	1.24	.94
Conventional	(N=20)	.81	.70	.78	.82	.74	.93
V.I.S.I.O.N.							
Realistic	(N=68)	.94	.79	.62	.71	.79	.73
Investigative	(N=30)	.75	1.06	.70	.68	.75	.74
Artistic	(N=16)	.54	.72	1.93	.95	.57	.42
Social	(N=38)	.82	.80	.76	.92	.69	.90
Enterprising	(N=30)	.81	.92	.61	.67	1.23	.97
Conventional	(N=20)	.79	.64	.88	.94	.73	1.08

The resulting means are seen as correlative values between the various existing factors (Williamsen, 1974, p. 167). This yields a better understanding of the relationship of the entries in table 18.

The results of the means for the V.P.I. show values for types corresponding with designated factors. The principal values are underlined for identification. The strongest value to be registered for the V.P.I. is the artistic factor with a value of 1.54. The weakest value for the V.P.I. was the realistic factor with a value of .89.

The results for the factor means for V.I.S.I.O.N. show the correlation data that relate to the appropriate factors. The strongest single value resulted (as it did with the V.P.I. survey) in the artistic factor. The weakest variable for the V.I.S.I.O.N. survey resulted in the social factor with a value of .92.

Factor means results for the V.P.I. and the V.I.S.I.O.N. survey show similar results. Both show appropriate mean values for the expected factors. This satisfies one of the criteria for comparison between the analysis accomplished for the Vocational Preference Inventory and the Visual Imagery Selector for Indexing Occupational Needs.

The decision to accept or reject the fifth null hypothesis is based upon suggestions by Kerlinger (1976). Kerlinger states:

> First, factors are "discovered." Their nature is inferred from the tests that are loaded on them. This "nature" is set up as a hypothesis. New tests are constructed and given to new samples of subjects. The data are factor analyzed. If the factors emerge as predicted, the hypothesis

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> is to this extent confirmed. The factor would seem to have "reality" (p. 276).

Kerlinger continues that more data gathering has to be accomplished for each analysis, but the rule of hypothesis testing is the "discovery" and "comparison" of factors.

A comparison of the relation of the factor analysis for both the V.P.I. and the V.I.S.I.O.N. surveys shows both analyses have displayed variables common to factors and common to each other. Both surveys would seem to have the "reality" consideration referred to by Kerlinger. Comparisons between the two analyses demonstrate a close relationship between factors and results. Therefore, the fifth hypothesis would be rejected and the alternate hypothesis accepted. There is a similarity between a factor analysis performed on the Vocational Preference Inventory and a factor analysis performed on the Visual Imagery Selector for Indexing Occupational Needs.

Comparison of Photographic Selections by Three Independent Judges

Hypothesis six posits that given a list of both specific occupational titles and corresponding photographs of workers performing some typical work task, there will be no significant difference between judgments by three experienced raters regarding their independent matching of each photograph to its intended occupational title.

The results of the chi-square analysis for the independent raters sample are displayed in table 19. An examination of the results for the chi-square analysis for the rater sample reveals a

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TABLE 19

RESPONSES OF THREE INDEPENDENT RATERS MATCHING PHOTOGRAPHS TO OCCUPATIONAL TITLES

Judges	Frequency of Selection for Each Type						Totals
	Realistic	Investi-gative	Artistic	Social	Enter-prising	Conven-tional	
1	48	33	33	38	34	39	225
2	45	30	34	36	36	33	214
3	46	34	37	37	36	32	222
Totals	139	97	104	111	106	104	661

Note: $\chi^2 = 1.269007968$; df = 10; $p > .000$ N.S.

chi-square result of 1.269007968 with ten degrees of freedom. The results indicated that there was no significant difference between the expected and observed judgments by three experienced raters. Any difference among the judgment by the three judges regarding their matching of photographs to occupational titles would have to be attributed to chance. Consequently, the sixth null hypothesis was accepted and the alternative hypothesis was rejected.

Summary of the Findings and Analysis of the Research

This chapter has provided the reader with an objective report of the analysis of the data. First, the data for the V.I.S.I.O.N. survey for the professional, secondary, and post-secondary samples were subjected to a chi-square analysis. This was done to determine the similarity or difference between the expected and observed frequencies produced by the results for each sample. The null hypothesis was rejected for each of the first four hypotheses, and the alternate hypothesis was accepted. In each analysis, there was a difference between the observed and expected frequencies for the professional, secondary and post-secondary samples.

Next, results for both the Vocational Preference Inventory and the Visual Imagery Selector for Indexing Occupational Needs was subjected to a principal component factor analysis with varimax rotation. The results for each survey were examined separately and were scrutinized for emerging common factors. The results of each factor analysis were compared to each other for similarity. The

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outcomes of this comparison demonstrated a similarity existed between the results for the V.P.I. and the results for the V.I.S.I.O.N. survey. This resulted in the rejection of the fifth null hypothesis and the acceptance of the alternate hypothesis.

The last analysis was performed to measure the similarity of independent observers' selections of pictures and their corresponding selections of occupational titles. The expected and observed frequencies for the selection process resulted in no significant difference among the selections made by the three judges. Therefore, the null hypothesis was accepted for the last hypothesis.

The next chapter will give definition to the data reported in this chapter. It will offer some explanation and conclusions to the research and suggest some further considerations in exploring the use of pictorial interest inventory testing.

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CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Introduction

The principal purposes of chapter V are to review the background and intent of the study, discuss the research findings, and offer specific recommendations on how the study may benefit occupational exploration.

Summaries

Summary of the problem. Contemporary literature in the field of vocational guidance and testing has urged practitioners to search for alternatives to present ways of assessing youngsters (Ebel, 1975; Prediger, 1974; Figler, 1974).

Among the criticisms associated with most contemporary vocational interest surveys has been their exclusive reliance on reading proficiency (Wallace and Larsen, 1978). This exclusive mode of presenting choices has questionable results. For example, because of an inability to associate job title with job task, indecisions about preferences would arise (Prediger, 1974). Understandably, some job qualifications will require reading proficiency, but the primary purpose of occupational interest surveys should be to identify occupational interest. Initial job exploration by youngsters should not be inhibited by an inability to associate job

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titles with work tasks. The important result of this understanding is that an interest test has the potential of being a motivating force in seeking career information. It is often the first step in occupational self-discovery.

Another reason for seeking alternatives to contemporary interest testing is the way they are presently managed. Vocational interest tests in today's schools are often poorly managed and have questionable benefit for the students. They are often considered by test administrators as being the least important to the total testing program and receive only token funding support. This situation is changing with the advent of career education programs' impact on school curriculum, but the possible array of testing strategies that could be developed still needs to unfold.

Prediger (1973) maintains that the concerns mentioned above are not the fault of the tests but of how they are managed. He urges more appropriate timing in testing youngsters' interests in order to maximize exploratory activities. While this study concurs with Prediger's view, it also suggests that an array of strategies must be developed in occupational assessments to complement the testing experience.

Interpreting test results can become a confusing experience for both the counselor and the counselee. A youngster faced with only scores from a test will find them of little use in career decision making, especially if the results are from interest surveys administered in the last years of high school with little opportunity for reflection on the results.

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Career planning needs to be well thought out; longitudinally programed for school-aged youngsters. It needs to cover areas of personal interests, abilities, and goals in relation to work. It needs to compare interest, abilities, and goals to personal needs and to occupational direction. It needs also to have an easily managed system of occupational information and media resources retrieval. This type of planning demands years of planning for the student to participate, and the use of appropriate learning tools for accurate information dissemination.

In addition to those already shared, some of the following concerns were discussed by this study:

1. For too many segments of our population, testing (any kind of testing) is synonymous with failing (Ebel, 1964, p. 134).

2. Too many occupational assessment instruments provide youngsters with narrowly interpreted results and equally narrowly interpreted vocational choices.

3. There appears to be a common, sterile, mechanical process associated with traditional testing environments. This could inhibit an individual's motivation to seek more information about careers.

4. Often the time lag between testing and interpretation lessens the educational advantage of immediate feedback.

5. There is a disadvantage with test results that fail to provide ease of exploring individual interest and occupational interest (Shertzer and Stone, 1944, p. 314).

6. The lack of self-interpreted results fails to involve students in their own career planning.

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7. Often tests fail to suggest relationships or education opportunities.

While some of the above concerns were considered for the construction of the research instrument, not all were addressed. The major purpose of this study was to develop an essentially non-verbal interest survey and to test the similarity of the results of this audio-visual survey and a reliable, printed technique for assessing occupational interest. One of the most impressively researched occupational interest inventories in the field is the Vocational Preference Inventory. It was selected as the comparison instrument for the research design.

Summary of methodology. Holland's rationale was selected as the chief construct for the research design, because of its organizational qualities and its validated research. Holland proposed a theory of personality structure in the early part of the nineteen fifties. The theory enhanced earlier theories of trait-factor approaches in vocational selection and added new dimensions to theories of personality structure. It states that people are attracted to certain occupational environments which are congruent with their personality type. The Holland personality theory is divided into six categories which describe an array of personality and occupational constructs. Inherited factors, according to Holland, combined with environmental factors such as school, home, and significant others influence occupational selections. From this kind of influence the individual develops a hierarchy of preferences in dealing with his environmental and personal needs. For each of these preferences the individual has in dealing with the

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environment, there is a matching orientation in the environmental structure. Holland maintains that the individual will gravitate toward a particular environmental structure and select occupational orientations that are congruent with his personality pattern.

The methodology used to research the study design dealing with the nature of occupational stereotypes was the Holland model. This occupational model orientation of Holland has been well documented (Holland, 1958, 1964, 1966, 1973). The orientation of the research model is structured on Holland's theory of personality and occupations. Holland views successful occupational choice as a matching process between personality construct and job characteristics. The terms used to describe these personality and occupational types are: realistic, investigative, artistic, social, enterprising, and conventional. According to the theory, these typologies are universally determined by people's preferences schemes. These schemes also explain the sub-types of personal characteristics, educational and career patterns, and coping techniques. The sampling of these characteristics has been accomplished by the use of a vocational preference inventory which ranks people's preferences as a consequence of their responses.

Holland has authored two such instruments relating to his theory: The Vocational Preference Inventory (1965) which has been the mainstay of the vocational selection theory by Holland, and The Self-Directed Search (1972), which was designed principally as an exploratory instrument. The Self-Directed Search has introduced several unique ideas to counseling methodology. It is self-administered, self-scored, and self-interpreted. Validity studies

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of the results of the S.D.S. have been very favorable (Edward and Whitney, 1972).

For this study, photographs of people working at jobs in categories similar to the Holland typology were distributed under the six Holland titles: realistic, investigative, artistic, social, enterprising, and conventional. Twenty photographs were assembled for each title. The photographs were then arranged in a specific pattern and processed into slides.

At the top of each slide there is a graphic drawing and an actual photograph of a specific job activity. The job activity in both the drawing and the photograph is descriptive of one of Holland's occupational types. This classification remains the same for ten successive slides and then changes to another classification. The bottom part of the slide also shows both a photo and a graphic drawing of an occupational type which is different from the activity and type of occupations depicted at the top of the slide. These contrasting drawings and photographs at the bottom change with each slide. This pattern of photo placement remains the same for all six Holland types. The entire process proceeds through sixty slides and then repeats itself with different pictures. The students or clients view the slides, choose which job they would prefer, and mark their selections on an answer sheet. (See appendix G.)

The answer sheet was constructed to provide a place to mark responses and interpret results (see Appendix C). It is divided into a front and back section. The front section is where the responses are marked. On the top half of the page are six columns.

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Each column allows ten possible choices, either a, b or ?. The bottom half of the front page is marked off into six columns, like the top half. It also allows ten responses per column. The back section of the survey has six corresponding columns that match the six combined columns on the front section. Each of the columns on the back section is further divided into an "Occupations" section and a "Field of Study" section. Combined answers from both response halves on the front page are counted and referred to on the back page. Respondents match their high score answers on the front page with the occupational and educational selections on the back page. For example, an individual takes the highest combined count of "a"s from one of the six columns on the front page and matches that response with a corresponding column on the back page. The occupations and educational opportunities registered in that column on the back page describe the possible career options for the individual. The answer sheets along with the slides were used by 613 persons for this study. These people made up the sample population for the research.

The sample population was divided into three parts. The first sample group was the professional worker sample. These people were employed in a job whose title was similar to one of the occupational types described by Holland. The next sample group was secondary students whose vocational major title was similar to one of the occupational types described by Holland. The last sample group was composed of post-secondary students pursuing two-year programs in a vocational technical school. Their two-year vocational

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major title was similar to one of the occupational types described by Holland.

Another sample that was tested in relation to the research problem was the rater sample. Three independent raters were selected to judge the accuracy of the photographic representation used for the survey. Each rater was given 240 photographs plus a list of job titles for each photograph. The task of the raters was to match the photographs with the job titles. The three selections were then compared for relationships.

Summary of Findings

Significance between sample groups and Holland types. The significant differences among the three sample groups and the six Holland types was confirmed for all samples by a chi-square analysis. Tests used to measure the difference between the two variables and their accompanying nominal categories show a moderate to strong relationship. The magnitude of the relationships suggests that people responded to photos much as they do to printed occupational titles. The proportional tables, while not taking into consideration references to sampling distribution, show a definite delineation of the Holland type categories for each sample group. The "diagonal edge" of the table describes (proportionally) a trend for expected type distributions. People who were typed realistic because of their job or course designation or classification responded more often to photos showing realistic activity. People typed as investigative by the Holland typology responded more often to photos showing investigative activity. This was true

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for each of the Holland types and for all categories for all samples.

A principal components factor analysis was accomplished for both the V.P.I. and V.I.S.I.O.N. surveys. The analysis resulted in six factors for both occupational inventories. It was predicted that the photo variables of the research survey would load similarly to the printed variables of the V.P.I. These expectations were confirmed for both surveys. Loadings for six factors were similar for both the V.P.I. and the V.I.S.I.O.N.

Items with generic names which were common to both surveys were compared and found in many cases to have similar variance between factor and variables types. This meant that both surveys shared specific variance for individual items. While this comparison of items was not conclusive, it did suggest a condition of internal consistency. The greatest difficulty in comparison was with the social category. Only two items could be identified as similar for the two inventories. An accurate picture of the true nature of the results for this section is difficult. Several of the items which were not easy to identify for analysis in this category are also mentioned by Gottfredson, Holland and Holland (1977). In their work on the seventh revision of the V.P.I., these same items eluded definition. An example of this elusiveness would be the job title of cosmetologist. In the V.I.S.I.O.N. analysis, the cosmetologist title loads first on the artistic factor and second on the social factor, as is expected. The values then fall to an indiscernible level in the remaining four factors. This result is very much like

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that reported by Gottfredson for the same job title on the seventh revised version of the V.P.I.

An examination was made to discover the relationship between the values for high factor scores of the analysis and the raw scores individuals received for the survey. These comparisons were done for the first job type only. An adequate comparison was obtained for both surveys; however, the V.P.I. described more adequately the compared types than did the V.I.S.I.O.N. survey. The mean value for the artistic value of the V.I.S.I.O.N. survey was significantly greater than the mean value for the V.P.I. This might be due to the photographic nature of the survey. In other words, the survey, by nature of its construction, might have produced a more effective means of describing artistic preferences.

The analysis of the judge's selections indicated that their differences were not due to chance variables, but could be due to different perceptions of the pictures. Calculations for the number of correctly matched photographs to printed occupational descriptors were numerically superior, but statistically not significant.

Conclusions Based on the Findings

Conclusions for hypothesis 1. Hypothesis 1 states: There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices of the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for the professional, secondary and post-secondary groups.

Frequencies of responses from all three samples for each

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group and type were combined and subjected to empirical analysis. The results of that analysis rejected the hypothesis at greater than the .001 level. A check for the strength of relationship between the two variables and their concomitant nominal categories demonstrated a moderately strong relationship for the Cramer ϕ and a strong relationship for a contingency coefficient. All calculations were subject to a Yates correction formulation for frequencies smaller than five. The results were verified with the correction and one degree of freedom beyong the .001 level. The proportional representation for the combined chi-square values demonstrate significant relationships between the people in the groups and the Holland types. The major contribution to this effect was the similarity between people in Holland's occupational classifications and his model typologies.

The conclusion, based on the analysis for the first hypothesis is that there exists a difference between the expected and observed frequencies for the sample tested.

Conclusions for hypothesis 2. Hypothesis 2 states: There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choice on the same survey for the professional worker.

Frequencies of responses from a professional worker population were subjected to a chi-square analysis. The results of that analysis rejected the null hypothesis at better than the .001 level. A test for strength of relationship between the variables was made utilizing a contingency coefficient and Cramer's ϕ. The results of

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these analyses were strong to moderately strong respectively. All calculations were subjected to Yates correction for frequencies smaller than five. The results of that calculation produced a chi-square analysis for one degree of freedom statistically significant beyong the .001 level.

A proportional representation for the professional worker chi-square values demonstrates significant relationships between people in full-time employment and Holland types. The major contribution to the results for the analysis was the relationship between people in Holland job classifications and Holland model categories.

The conclusion for the second hypothesis is that there exists a difference between the expected and observed frequencies for the professional worker sample.

Conclusions for hypothesis 3. Hypothesis 3 states: There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for a secondary student sample.

The data assembled from responses by secondary students for the research instrument were submitted to a chi-square analysis. The results of that analysis rejected the null hypothesis at better than the .001 level. A test for strength of relationship between the variables was made. The results of a contingency coefficient and Cramer's ϕ was strong to moderate respectively. As with previous analysis, all calculations were subject to a Yates correction for values less than five. The results of that analysis demonstrate a significance for one degree of freedom at better than the

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.001 level. A proportional representation of the chi-square analysis for the secondary student sample demonstrates a significant relationship between student's course work and Holland types. The major contribution to the results for the analysis was the interaction of relationships between student majors and Holland types.

The conclusion based on the analysis for the third hypothesis is that there exists a statistical difference between the expected and observed frequencies for the secondary student sample.

Conclusions for hypothesis 4. The fourth hypothesis states: There is no significant difference between the observed frequency of responses for occupational types receiving the most preferred choices on the V.I.S.I.O.N. survey and the expected most preferred choices on the same survey for a post-secondary student sample.

Data composed of frequencies of responses were gathered for the post-secondary sample. The responses were prepared for analysis and subjected to a chi-square test. The results of that analysis rejected the null hypothesis at better than the .001 level. Tests for strength of relationship between the variables were performed. The results of that procedure, utilizing a contingency coefficient and Cramer's ϕ, yielded a strong-to-moderate relationship. All values again were subjected to Yates correction for values smaller than five and yielded significant results for one degree of freedom.. The proportional representation for the chi-square values of the post-secondary sample demonstrated a significant relationship between people's vocational course work and Holland categories. The major contributor to the values was student's two-year majors and Holland types.

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The conclusion for the fourth hypothesis, based on the analysis, is that there exists a difference between the expected and observed frequencies for the post-secondary sample.

Conclusions for a factor analysis performed for the V.P.I. and the V.I.S.I.O.N. surveys. Hypothesis 5 states: There will be no similarity between a factor analysis performed on the Vocational Preference Inventory as reported in the professional literature and a factor analysis performed on the Visual Imagery Seclector for Indexing Occupational Needs.

Data collected from both the V.P.I. and the V.I.S.I.O.N. surveys were prepared for analysis. A principal components factor analysis was used with varimax rotation. A value of .33 was established as the accepted cut-off number for factor loadings (Williamson, op. cit.) Those factors failing to meet that criterion were retained to show all numerical contributions made to the entire analysis.

The analysis for the V.P.I. inventory was performed on the first six scales of the Holland survey. This included eighty-four items divided into fourteen items per scale. The respondents' high scores were profiled into one of six Holland typologies. This number accounted for approximately 53 per cent of all the items for the survey. The responses for all eighty-four items were subject to a factor analysis.

The results of the factor analysis for the eighty-four variables of the V.P.I. were six factors. Each factor was loaded with items that registered, in some cases, common values to each other and common values to the factor on which they loaded. These

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factors were named for the Holland typology (in order of their loadings) as conventional, artistic, investigative, realistic, social, and enterprising. The first six factors accounted for 45 per cent of the total variance for the analysis. An inspection of the cummulative percentage for the variance for eight factors produces a value of 49 per cent. As was mentioned previously, results are very similar to the analysis reported by DiScipio (1976). It should be noted that all items were factored by the DiScipio study.

An examination of the outcomes for table 14 shows the number of items for the V.P.I. that loaded on each factor. This matrix has been referred by Kerlinger (1973) as "correlations between tests and factors." The results are listed below in terms of actual numbers and percentage of items successful in attaining acceptable criteria:

1. Conventional. Twelve out of fourteen items loaded successful on the first factor. This accounts for 86 per cent of the items for the conventional scale.

2. Artistic. Thirteen out of fourteen items loaded successful on the second factor. This accounts for 3 per cent of the items for the artistic scale.

3. Investigative. Fourteen out of fourteen items loaded successfully on the third factor. This accounts for 100 per cent of the items for the investigative scale.

4. Realistic. Thirteen out of fourteen items loaded successfully on the fourth factor. This accounts for 93 per cent of the items for the realistic scale.

5. Social. Eleven out of fourteen items loaded

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successfully on the fifth factor. This accounts for 79 per cent of the items for the social scale.

6. Enterprising. Eleven out of fourteen items loaded successfully on the sixth factor. This accounts for 79 per cent of the items for the enterprising scale.

Eighty-eight per cent of the variables loaded on the expected factors.

The analysis for the V.I.S.I.O.N. survey was performed on all six scales of the instrument. This included all 120 variables. Each scale contained twenty items for each category. The responses for each individual for each item were subjected to a factor analysis. This was accomplished for all persons in the professional worker sample.

The results of the factor analysis for all 120 variables by 202 people resulted in six factors. Each factor was loaded with items that registered, in some cases, common values to each other and common values to the factor they loaded on. These factors were named because of their similarity to Holland's as realistic, artistic, social, investigative, enterprising, and conventional. The first six factors accounted for approximately 35 per cent of the total variance. An inspection of the cumulative per cent of the variance for eight factors showed a value of 39 per cent variance. This was approximately fifteen to twenty percentage points with the value reported by the DiScipio study.

An examination of the outcomes for table 15 shows the number of items for the V.I.S.I.O.N. survey that loaded for each factor. The results are listed below in terms of actual

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items loading adequately for each factor.

1. Realistic. Seventeen out of twenty items loaded successfully on the first factor. This accounts for 85 per cent of the items in the realistic scale.

2. Artistic. Fifteen out of twenty items loaded successfully on the second factor. This accounted for 75 per cent of the items in the artistic scale.

3. Social. Seven out of twenty items loaded adequately on the third factor. This accounted for 35 per cent of the items in the social scale.

4. Investigative. Nine out of twenty items loaded adequately on the fourth factor. This accounts for 45 per cent of the items in the investigative scale.

5. Enterprising. Twelve items out of twenty loaded adequately on the fifth factor. This accounts for 60 per cent of the items in the enterprising scale.

6. Conventional. Eight items out of twenty loaded adequately on the sixth factor. This accounts for 40 per cent of the items on the conventional scale.

Fifty-seven per cent of the items for all variables for the V.I.S.I.O.N. survey loaded on the expected factors.

There are 120 responses for the research survey. The responses are divided into two parts of sixty responses each. The sixty responses for each part include six Holland types--ten items per type. A comparison of these two correlated halves show a 60 per cent agreement between the two halves of the V.I.S.I.O.N.

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survey. This result is significant as a test of internal consistency for the V.I.S.I.O.N. survey.

Comparisons were made for items similar in occupational title between the V.P.I. and V.I.S.I.O.N. surveys. These results are reported in table 16. Of the forty-two items that were compared, thirty-one items were similar. This amounted to 74 per cent of the items compared for both tests.

Comparison of factor scores with raw score results are reported in table 17. Approximately 57 per cent of the high factor scores compared matched successfully with the raw scores of the V.P.I. for the V.I.S.I.O.N. survey; approximately 48 per cent of the high score factor results compared matched successfully with the raw score. Both results demonstrate that the factor scores and raw scores were adequate for both surveys. It must be remembered that the remaining percentage of responses for both surveys is distributed among the five remaining categories. This would figure to be approximately 8 per cent for each type remaining for the V.P.I. and 10 per cent remaining per type for the V.I.S.I.O.N. survey.

An analysis of the means for the factor scores was accomplished for the V.P.I. and the V.I.S.I.O.N. surveys. The results of the analysis are displayed in table 18. The matrix for that analysis shows the V.P.I. values between the factor means and the type designations to be significant. The strongest value recorded for the table was the artistic mean. The second highest value was the enterprising mean. The third, investigative.

The resulting matrix for the V.I.S.I.O.N. survey shows

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significant values between the factor means and the type designations to be significant. As with the V.P.I. table, the highest three V.I.S.I.O.N. means matched those of the V.P.I. The mean value placements differ for the remaining types for each survey, but remain significant for each type.

The conclusions for hypothesis 5, based on the related analysis, was the rejection of the null hypothesis and acceptance of the alternate hypothesis. That is, there exists a similarity between a factor analysis performed for the V.P.I. and the V.I.S.I.O.N. surveys. The V.I.S.I.O.N. survey demonstrates similar constructs of the Holland typology reported in chapter II.

The last hypothesis states that given a list of both specific occupational titles and corresponding photographs of workers performing some typical work task, there is no significant relationship among judgments by three experienced raters regarding their independent matchings of photographs to their intended occupational title.

The data collected from responses by three independent judges showed no statistical significance. Numerically, the responses of the three judges showed more correct matches of photos to occupational titles than non-correct matches; however, the difference remained non-significant.

The conclusions necessary for the last hypothesis are the acceptance of the null hypothesis and rejection of the alternate hypothesis.

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Specific Recommendations on the Use of the Visual Formated Research Interest Survey

The results of the findings for this study indicate that some of the anticipated outcomes were realized while others were not. The outcomes realized by this study that hold promise for career guidance procedures are the following:

1. The realization of a valid occupational interest survey with an audio-visual format was demonstrated. The survey provide an alternative way of exploring careers, especially for students unskilled in the use of printed material. Responses to the visual format seem to group themselves into occupations compatible with expressed occupational practice and preparation of professional people. This test product will provide the counselor a method by which to organize job and personality information for clients.

2. It was demonstrated that there is a relationship between the visual research instrument and a highly validated pencil-and-paper survey. The significance of that similarity is that the counselor now has both media options other than printed material for career interest.

3. The sample for the test cuts across a wide band of age and sex differences. The chi-square analysis for the three groups held stable at better than the .001 level. This makes the test, with modifications, useful for a very large population.

4. The variety of educational levels represented by the data demonstrates an ability of the survey to sample various levels of educational preparedness.

5. Because of the applicability of the survey for a variety

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of educational levels, the instrument is useful for staff development and teacher preparation.

6. The use of a non-reading format will eliminate the necessary skill of reading as a variable in measuring occupational interest. Work task recognition is all that is necessary for interest sampling.

7. Crochran, Vinitsky and Warren (1974, p. 659) stated that a successful career counseling process would help a student "conceptualize work." The research instrument presented by this study demonstrates the conceptualizing of work through photographs.

8. Because of the nature and construction of the picture survey, it can be modified or controlled for local needs. Local employing agencies could contribute individual photographs making the test more useful, although care must be taken to validate the photographs used.

9. The survey demonstrated stable relationships between sample groups and occupational types. Thus the pictorial survey is useful as an exploratory tool for elementary children.

10. The survey has the ability to be self-administered and self-scored.

Precautions to be used with the survey. The following precautions are to be considered carefully in using the research instrument:

1. As a general suggestion with any testing instrument, time should be allowed to discuss the pictured results with the student.

2. While the results for the V.I.S.I.O.N. survey showed

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significance, it did not register the same ability to identify occupational interest as did the more researched V.P.I. Caution should still be taken in making pronouncements of occupational interest.

3. The research survey is based on the Holland typology. Familiarity with the theory would be necessary to guide students toward helpful resources. Ancillary resources suggested by Holland (1973) would further extend the usefulness of the instrument.

4. Information concerning sex norming was not addressed by this survey. Therefore, pronouncements of probably success in various occupations based on sex would be invalid.

5. Guidance must be used in suggesting level aspirations of students taking the research survey. The survey does not address the question of ability; therefore, other assessments are necessary before considering ability-related questions.

Recommendations for Further Research

The reported study did not address all of the contingencies produced by the results. Some specific future research questions which need to be addressed include:

1. A research method based on other than an ex post factor model should be explored. The effect of students utilizing a visual instrument versus a non-visual instrument would shed more light on the claimed benefits of visual interest surveys.

2. The construction of the V.I.S.I.O.N. instrument offers two visual choices and three possible responses. The strength of

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these variables should be explored to determine their influence on the results of the instrument.

3. The exclusive utilization of a two-by-two slide format should be questioned in favor of a film strip format or single picture format. The present model has the disadvantage of lighting demands and materials handling.

4. There is a question as to the necessity of the time used in completing the survey. Experience gained during test administration suggests that a shorter version would suffice.

5. While the study alluded to the developmental nature of the picture survey, this was not explored by the research. A more definite statement needs to be made concerning the survey's usefulness with different ages of students.

6. Accompanying the photographs were visual clues which were to enhance the job designations of the pictures. Problems arose during the administration of the survey that questioned the worth of the graphic clue and this needs to be explored.

7. Although the intent of the study was to let the designation of sex be part of the error variance for the entire test, it is evident that it plays an important role in picture classifications. This should be studied for that influence.

8. The nature of the survey produced a timed occupational interest survey. The influence of this timing was not explored and should be addressed by further research.

9. The results of the chi-square analysis for the rater sample suggest an alternate way of selecting pictures should be explored.

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APPENDIX A

VOCATIONAL PREFERENCE INVENTORY

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THE VOCATIONAL PREFERENCE INVENTORY

Developed by John L. Holland, Ph.D.

This is an inventory of your feelings and attitudes about many kinds of work. Fill out your answer sheet by following the directions given below:

1. Show on your answer sheet the occupations which *interest* or *appeal to* you by blackening Y for "Yes."
2. Show the occupations which you *dislike* or find *uninteresting* by blackening N for "No."
3. Make *no marks* when you are undecided about an occupation.

---

1. Aviator
2. Private Investigator
3. YMCA Secretary
4. Detective
5. Post Office Clerk
6. Route Salesman
7. Electronic Technician
8. Humorist
9. Photographer
10. Interplanetary Scientist

11. Airplane Mechanic
12. Meteorologist
13. Foreign Missionary
14. Bookkeeper
15. Speculator
16. Poet
17. Deep Sea Diver
18. Newspaper Editor
19. Nursery School Teacher
20. Lawyer

21. Fish and Wildlife Specialist
22. Biologist
23. High School Teacher
24. Quality Control Expert
25. Buyer
26. Symphony Conductor
27. Wrecker (Building)
28. Narcotics Inspector
29. Elementary School Teacher
30. School Principal

31. Power Station Operator
32. Astronomer
33. Juvenile Delinquency Expert
34. Budget Reviewer
35. Stock & Bond Salesman
36. Musician
37. Prize Fighter
38. Diplomat
39. Experimental Laboratory Engineer
40. Crane Operator

41. Master Plumber
42. Aeronautical Design Engineer
43. Speech Therapist
44. Traffic Manager
45. Manufacturer's Representative
46. Author
47. Fireman
48. Army General
49. Interior Decorator
50. Novelist

51. Power Shovel Operator
52. Anthropologist
53. Marriage Counselor
54. Statistician
55. Television Producer
56. Commercial Artist
57. Wild Animal Trainer
58. U.N. Official
59. Sculptor
60. Automobile Mechanic

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61. Surveyor
62. Zoologist
63. Physical Education Teacher
64. Court Stenographer
65. Hotel Manager
66. Free-Lance Writer
67. Stunt Man (Motion Picture)
68. Criminal Lawyer
69. Professional Athlete
70. Carpenter

71. Construction Inspector
72. Chemist
73. Playground Director
74. Bank Teller
75. Business Executive
76. Musical Arranger
77. Jockey
78. Ventriloquist
79. Army Officer
80. Banker

81. Radio Operator
82. Independent Research Scientist
83. Clinical Psychologist
84. Tax Expert
85. Restaurant Manager
86. Art Dealer
87. Motorcycle Driver
88. Police Judge
89. Referee (Sporting Events)
90. Truck Gardener

91. Filling Station Attendant
92. Writer of Scientific or Technical Articles
93. Social Science Teacher
94. Inventory Controller
95. Master of Ceremonies
96. Dramatic Coach
97. Blaster (Dynamiter)
98. Mind Reader
99. English Teacher
100. Sales Manager

101. Tree Surgeon
102. Editor of a Scientific Journal
103. Director of Welfare Agency
104. IBM Equipment Operator
105. Traveling Salesman
106. Concert Singer
107. F.B.I. Agent
108. Prosecuting Attorney
109. Factory Foreman
110. College Professor

111. Tool Designer
112. Geologist
113. Asst. City School Superintendent
114. Financial Analyst
115. Real Estate Salesman
116. Composer
117. Mountain Climber
118. Congressional Investigator
119. Portrait Artist
120. Machinist

121. Locomotive Engineer
122. Botanist
123. Personal Counselor
124. Cost Estimator
125. Industrial Relations Consultant
126. Stage Director
127. Explorer
128. Supreme Court Judge
129. Draftsman
130. Judge

131. Photoengraver
132. Scientific Research Worker
133. Psychiatric Case Worker
134. Pay Roll Clerk
135. Sports Promoter
136. Playwright
137. Test Pilot
138. Criminologist
139. Children's Clothing Designer
140. Truck Driver

141. Electrician
142. Physicist
143. Vocational Counselor
144. Bank Examiner
145. Political Campaign Manager
146. Cartoonist
147. Racing Car Driver
148. Book Censor
149. Social Worker
150. Locksmith

151. Funeral Director
152. Counter-Intelligence Man
153. Architect
154. Shipping & Receiving Clerk
155. Criminal Psychologist
156. Insurance Clerk
157. Barber
158. Bill Collector
159. Ward Attendant
160. Masseur

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APPENDIX B

CONFIRMING LETTER

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INDIANA UNIVERSITY at SOUTH BEND
1825 NORTHSIDE BOULEVARD
SOUTH BEND, INDIANA 46615

UNIVERSITY DIVISION

TEL. NO. 219—282-2341

December 30, 1974

[redacted]

Edward T. Morton
Assistant Director
University Division

ETM/nn

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APPENDIX C

ANSWER AND INTERPRETATION FORM FOR V.I.S.I.O.N.

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INDIANA UNIVERSITY at SOUTH BEND
1825 NORTHSIDE BOULEVARD
SOUTH BEND, INDIANA 46615

UNIVERSITY DIVISION TEL. NO. 219—282-2341

December 30, 1974

Mr. Paul Elliott
1209 S. Greenlawn Avenue
South Bend, Indiana 46615

Dear Mr. Elliott:

I am pleased to confirm the use of your audio-visual presentation at the IUSB Career Planning Institute on April 4, 1972. Your incorporation of slide representations of the various occupational areas described by John Holland proved innovative and stimulating. I'm sure that the clustering of responses into the various occupational areas (realistic, enterprising, etc.,) was a very valuable tool for stimulating self insight among our students.

Thank you once again for your efforts to help us in our career planning program.

Sincerely,

Edward T. Morton

Edward T. Morton
Assistant Director
University Division

ETM/nn

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APPENDIX C

ANSWER AND INTERPRETATION FORM FOR V.I.S.I.O.N.

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VOICE

Visual Imagery Selector
for Indexing Occupational Needs

NAME _____

I.D. # _____

SEX ☐ MALE ☐ FEMALE

SCHOOL _____

GRADE LEVEL _____

OCCUPATION _____

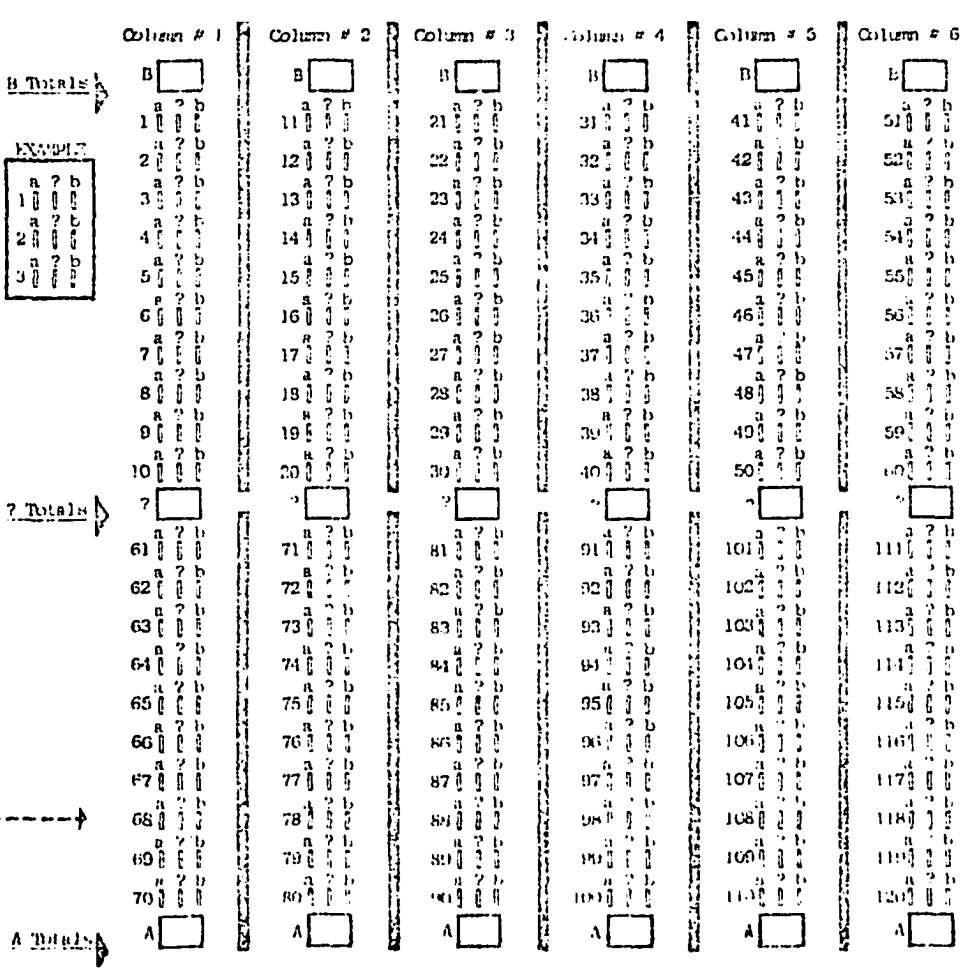
YEARS IN OCCUPATION _____

Age Group-Please circle

5 yrs. to 11 yrs. 12 yrs. to 18 yrs.

18 yrs. to 25 yrs. 26 yrs. to older

DIRECTIONS:



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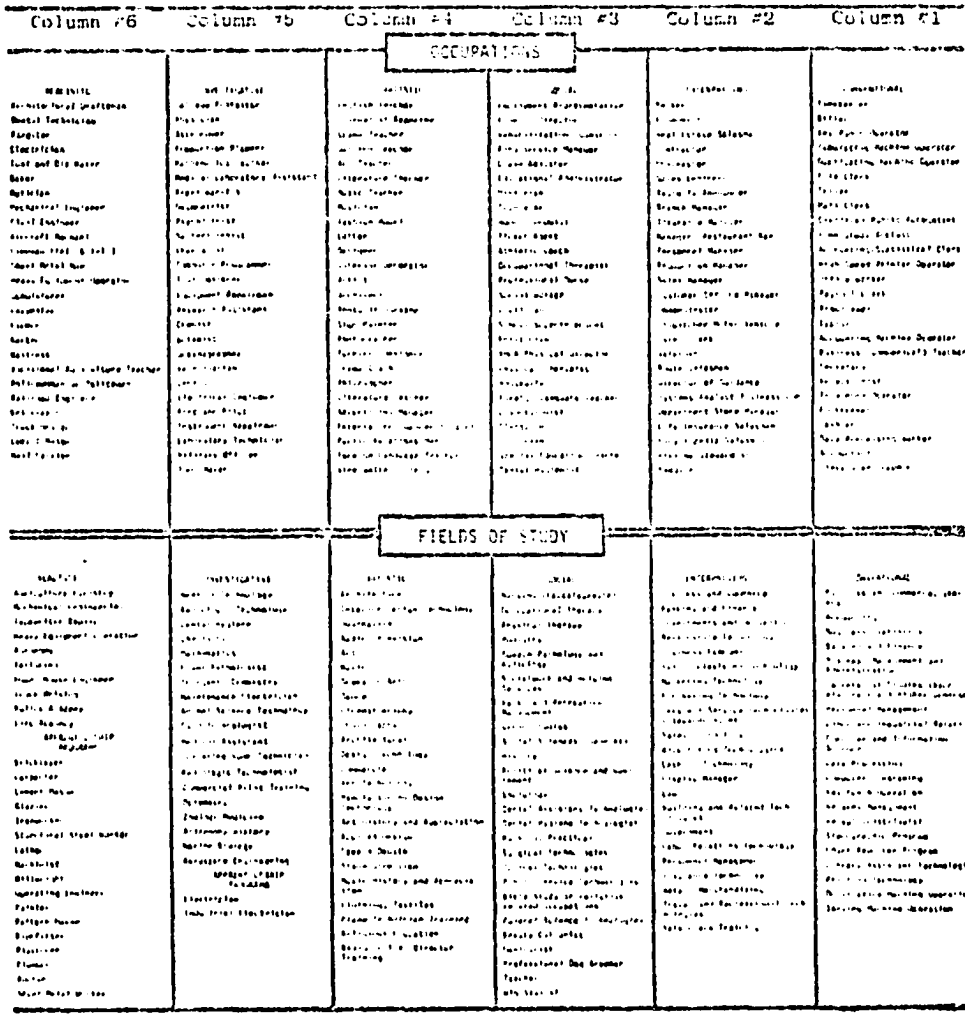
SCORING AND INTERPRETING DIRECTIONS:



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APPENDIX D

VALIDATION STUDY FOR THE PILOT PROGRAM

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VALIDATION STUDY OF V.I.S.I.O.N.

Paul G. Elliott

Introduction

A new technique for individuals or groups to test their occupational interest is being developed and evaluated by the Indiana Career Resource Center at South Bend, Indiana.

This occupational survey differs in several significant ways from the traditional pencil and paper test that are presently being used. The test, V.I.S.I.O.N. (which stands for Visual Imagery Selector for Indexing Occupational Needs) attempts to utilize a combination of the respondents' visual and auditory perceptions in making occupational selections.

The initial data grew from an attempt to provide a program for educational orientation of first-year students at Indiana University at South Bend. The program was designed and developed to assist students in their selection of college majors and related career options. The program was also used in a similar fashion with students participating in the Special Services program at the University. The technique helped to crystallize some career selections, or introduce the students to new possibilities for career choice. After each session, there was time given to discuss the survey in groups and later through individual contact with a counselor. These discussions are leading to related major course

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selections which parallel the student's principal interest.

Method

The V.I.S.I.O.N. program consists of two parts. Each part is similar in presentation, but differs in the manner for visualizing work. The program utilizes a 35 mm two be two slide presentation coupled with an audio-programmed taped machine. The entire program consists of 136 slides which appear on the sceen at eight- to 11-second intervals. Coupled with the visual appearance of the slide is an auditory signal. The entire presentation, plus scoring on the answer sheets by the respondents, takes between twenty-five to thirty minutes.

In the inventory there is no attempt to give the individual picture titles or labels relating to the work being performed. The respondent's reaction in the reported research is based upon the idea that the respondents will visually recognize their practicing vocational choice. It also expects that they will relate either positively or negatively to that choice, depending on their experiences to that choice. This, of course, forms the basis of the working hypothesis.

The decision was made to have the program structured on the career selection scheme suggested by Dr. John L. Holland's rationale.. In his latest work, Making Vocational Choices, A Theory of Careers, Dr. Holland sets forth additional clarification of the basic design in the assumption that people are characterized by their resemblance to each of six personality types: Realistic, Investigative, Artistic, Social, Enterprising and Conventional.

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The hypothesis is set forth that each individual, being a product of his environment, selects himself into a career similar to his personal orientation and preference.

The construction of the program under discussion seemed to lend itself to the format offered by Dr. Holland. This was done because of the simplicity of grouping visual stimuli under this approach and the ease of constructing the answer sheet used by the respondents. The survey features many of the advantages of Dr. Holland's Self Directed Search program, in that it is self-administered and self-scored. The participants record their reaction to a sequenced visual and audio presentation and respond to what would be a typical work task, environment, and/or experiences. The respondents are asked to make choices between pairs of selected scenes of people engaged in some work activity. These work situations or tasks are selected to show as much of the work activity as possible and as little of the person performing the task as practical. This eliminates bias that the respondents might have toward the facial and bodily features. The people that were surveyed for this report were workers, both professional and non-professional, engaged in a work activity listed by Holland, or described in the Dictionary of Occupational Titles. They had been engaged at their jobs for a period of at least six months, and were receiving a salary for their skills. Other types of demographic information relating to future research designs were asked relative to age, years of experience, and job satisfaction.

The sample of those surveyed are described in Table A. The

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survey was administered in the same manner as with other groups with one exception. The sample group was asked to record on their response sheets the two by two slide number of the work scene they preferred. This was done in anticipation of an item analysis at some later date.

The major null hypothesis selected for this research was that the sample groups of workers representative of the Holland typology will not be similar to those described by visual work selection.

The groups in the norming sample were given the test and were asked to respond and score their own answer sheets. These were checked for marking accuracy and either accepted or rejected.

The predictive validity was calculated using the test score and the worker's job titles as the variables. The evaluation of the instrument was made by sampling professionals in a number of job categories listed under the Holland classifications. These responses were then empirically analyzed to provide predictable validity statements useful with career counseling.

Results

The results presented in Tables 20 and 21 of this report seem to indicate that through the use of this chi-square analysis, the concept of visual discriminations of work descriptors is possible in a survey of vocational interest utilizing a Holland typology. These results are to be reconfirmed in a similar manner next year, utilizing a revised edition of the survey.

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Discussion

The idea of employing "pictorial psychology" as a device to measure responses to picture arrangement or picture completion is not new to the field of psychological assessment. Many tests such as the classical Rorschach, Thematic Apperception Test and the Wechsler Adult Intelligence Scale have as part of their interpretive format a section or sections devoted to pictorial perceptual data. There are many other like assessments, too lengthy to account in this report; however, the idea of having as part of their test validation gave rise for the first consideration of relating this technique to the area of vocational survey assessment. The fundamental hypothesis guiding the research presently under investigation at the Indiana Career Resource Center, "given the validity of past research and investigation utilizing pictorial perceptual assessment," is, "Will this type of assessment be useful to surveying vocational interest?" If this is possible can this description be used as a pictorial assessment of peoples' interests based on the theoretical structures of classification suggested by Dr. Holland.

The V.I.S.I.O.N. instrument has been developed specifically for use in an educational-vocational counseling setting. The instrument has demonstrated several advantages in administration. Among these are: (1) Ease of administration to both individuals and groups; (2) Immediate feedback to the respondent; (3) Visualization of environments of work for the respondent, therefore making his vocational selection more concrete and less abstract; (4) No

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verbal clues are necessary for recognition of job description. This may have several advantages with non-English speaking individuals.

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TABLE 20

CHI-SQUARE ANALYSIS

Workers Groups	N	df	χ^2	Sig
1. Realistic 11 Police Officers 1 Industrial Arts Teacher 1 Veterinarian Assistant	13	5	72.16	*
2. Investigative 9 Optometrists 6 Insurance Actuaries 2 Math Teachers 2 Nursing Instructors 1 Ph.D.	20	5	69.59	*
3. Artistic 7 Artist Instructors 2 English Teachers 1 Consultant--Foreign Language 1 Public Relations Man	11	5	111.83	*
4. Social 14 Nurses 11 Teachers 10 Counselors 3 Dean of Women 1 Minister 1 Personnel Worker 1 Employment Social Worker	39	5	255.18	*
5. Enterprising 24 Insurance Salesmen 7 D.E. Co-ordinators 1 Personnel Manager 1 Business Director of Chamber of Commerce	35	5	57.20	*
6. Conventional 9 Business Teachers 3 Administrators 1 Certified Public Acct.	13	5	92.77	*

*Significant at the .01 level.

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TABLE 21

CONTINGENCY TABLE

	R	A	C	I	E	S
Expected	92	92	92	92	92	92
Realistic	156	60	55	103	87	94

df = 5 χ^2 = 72.16

Expected	115	115	115	115	115	115
Investigative	146	86	66	175	101	113

df = 5 χ^2 = 69.59

Expected	59	59	59	59	59	59
Artistic	37	126	26	37	65	63

df = 5 χ^2 = 111.83

Expected	214	214	214	214	214	214
Social	131	255	116	215	167	399

df = 5 χ^2 = 255.18

Expected	204	204	204	204	204	204
Enterprising	218	208	130	201	280	190

df = 5 χ^2 = 57.20

Expected	56	56	56	56	56	56
Conventional	21	52	115	35	60	52

df = 5 χ^2 = 92.77

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APPENDIX E

LISTS OF PHOTOS FOR RATERS

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M E M O

TO: Photo Raters January 6, 1976

FROM: Paul G. Elliott

RE: Instructions for Rating Photographs

This photo album and Alphabetical Listing of Specific D.O.T. Designations for Pictures to Be Used with V.I.S.I.O.N. contains 240 photographs and occupational titles.

The photos have been randomized and numbered 1 through 240, while an equal number of occupational titles is listed alphabetically.

Our objective is to have you match photos to titles to determine concensus among independent raters. Each occupational title listed has a corresponding photo representative in the album; however, if you feel a title should be used more than once, do not hesitate to do so.

One way this matching might be done is to leaf through the photo album and see if you can find a matching title in the alphabetical listing that seems appropriate for the picture. If you do, please place the number of the photo in the blank to the right of the selected occupational title on the occupational lists sheet. Another way of accomplishing this same task might be to look at the occupational titles and then search through the album to see if one of the pictures matches the title. All answers should appear next to one of the occupational titles on the right hand side of the alphabetical listing sheet.

Thank you for your kindness in volunteering to be part of this program. The results will be used to build a new type of vocational interest survey and help complete my requirements for my doctoral dissertation at Andrews University.

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Alphabetical Listing of Specific D.O.T. Designations for Pictures to Be Used with V.I.S.I.O.N.

(Visual Imagery Selector for Indexing Occupational Needs)

1. Accountant..... _____
2. Actor, Technician..... _____
3. Adding Machine Operator..... _____
4. Advertising Layout Person..... _____
5. Aerospace Engineering Technician..... _____
6. Aircraft Mechanic, Engine Repair..... _____
7. Air Traffic Control Specialist, Tower..... _____
8. Airplane Pilot..... _____
9. Anthropologist..... _____
10. Architect..... _____
11. Artist I..... _____
12. Artist II..... _____
13. Art Goods Dealer..... _____
14. Art Teacher..... _____
15. Astronomer..... _____
16. Athlete..... _____
17. Athletic Coach, Wrestling..... _____
18. Auctioneer..... _____
19. Auctioneer, Livestock..... _____
20. Automobile Body Repairman..... _____
21. Automobile Dealer..... _____
22. Automotive Mechanic..... _____
23. Automotive Parts Salesperson..... _____

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24. Baker..... _____
25. Banker..... _____
26. Barber..... _____
27. Biller Machine Operator..... _____
28. Blacksmith, Anvil..... _____
29. Bookkeeper..... _____
30. Bookstore Salesperson..... _____
31. Botanist..... _____
32. Bricklayer, Block Setter..... _____
33. Bus Driver, Motor Transport..... _____
34. Butcher, Trimmer..... _____
35. Calculating Machine Operator I..... _____
36. Calculating Machine Operator II..... _____
37. Cameraman, Television..... _____
38. Carpenter, Construction..... _____
39. Cashier, Restaurant..... _____
40. Cataloger, Library Books..... _____
41. Chemist..... _____
42. Civil Engineer, Construction..... _____
43. Claim Adjuster, Auto..... _____
44. Clergyman..... _____
45. Clerk, Stenographer..... _____
46. Coin Salesperson..... _____
47. Collator, Binder Operator..... _____
48. Compositor, Typesetter..... _____
49. Computer Operator I..... _____
50. Computer Operator II..... _____

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51. Cosmetologist..... _____
52. Costume Designer..... _____
53. Court Reporter..... _____
54. Counselor..... _____
55. Crane Operator..... _____
56. Credit Manager, Department Store..... _____
57. Customer Service Manager, Automotive..... _____
58. Customs Inspector, Airport Security..... _____
59. Data Processing Worker..... _____
60. Dancer, Near Eastern (Belly)..... _____
61. Dancing Instructor, Classical..... _____
62. Decorator, Commercial I..... _____
63. Decorator, Commercial II..... _____
64. Demonstrator, Sweeper Sales..... _____
65. Demonstrator, Sewing Machine Sales..... _____
66. Dental Assistant, X-ray Technician..... _____
67. Dental Hygienist..... _____
68. Dentist..... _____
69. Dietitian, Therapeutic..... _____
70. Director of Transportation, Bus Company..... _____
71. Draftsman..... _____
72. Drill Press Operator..... _____
73. Duplicating Machine Operator..... _____
74. Electronic Technician..... _____
75. Elementary Teacher..... _____
76. Emergency Vehicle Attendant..... _____
77. Engineer, Standard and Analysis, Aircraft Mfg.... _____

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78. Equipment Repairman, Medical..... _____
79. Encyclopedia Salesperson..... _____
80. Fashion Illustrator..... _____
81. Fashion Model..... _____
82. File Clerk..... _____
83. Finance Expert..... _____
84. Firefighter..... _____
85. Florist, Retail..... _____
86. Food Checker..... _____
87. Food Service Manager I..... _____
88. Food Service Manager II..... _____
89. Foreign Language Teacher..... _____
90. Forester..... _____
91. Forklift Operator..... _____
92. Full Research Engineer..... _____
93. Funeral Director..... _____
94. Furniture Dealer, Retail..... _____
95. Furrier, Designer..... _____
96. Gas Station Manager..... _____
97. Geographer, Physical..... _____
98. Geologist, Mineralogist..... _____
99. Gift Shop Manager..... _____
100. Grain Sampler..... _____
101. Ground Instructor, Aviation..... _____
102. Group Worker I..... _____
103. Group Worker II..... _____
104. Grocer..... _____

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105. Guide, Sightseeing..... _____
106. Hair Stylist..... _____
107. Handbag Designer..... _____
108. Hat Designer..... _____
109. Heavy Equipment Operator..... _____
110. High-Speed Printer Operator..... _____
111. Home Economics Teacher..... _____
112. Horticulturist, Flowers..... _____
113. Hostess, Restaurant..... _____
114. Hydrographer, Water Treatment Plant..... _____
115. Inhalation Therapist..... _____
116. Instructor, Auto Driving..... _____
117. Instructor, Auto Mechanics..... _____
118. Instrument Repair, Radio..... _____
119. Jewelry Designer..... _____
120. Journalist Reporter, Interviewer..... _____
121. Judge..... _____
122. Junk Buyer, Seller..... _____
123. Key Punch Operator..... _____
124. Laboratory Technician, Medical..... _____
125. Laboratory Technician, Mechanical..... _____
126. Laboratory Tester, Water Purification..... _____
127. Librarian..... _____
128. Library Assistant..... _____
129. Life Insurance Salesperson..... _____
130. Lineman, Telephone..... _____
131. Light Technician, Television Studio..... _____

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132. Locomotive Engineer, Steam..... _____
133. Lunch Truck Driver..... _____
134. Machine Operator, Metal Fabrication..... _____
135. Magician..... _____
136. Mail Clerk, U.S. Postage..... _____
137. Male Ward Nurse..... _____
138. Manicurist..... _____
139. Manager, Restaurant..... _____
140. Marine Engineer, Boat Building, Recreational..... _____
141. Mathematician. Researcher..... _____
142. Mechanical Engineer, Designer..... _____
143. Medical Laboratory Assistant, Hospital Pharmacy.. _____
144. Medical Technologist, Chemical Sampling..... _____
145. Metallurgist Assistant, Metal Stress Testing..... _____
146. Musician, Folk Instrumental..... _____
147. Musical Instrument Salesperson..... _____
148. Naturalist, Water Conservation..... _____
149. Nurse, Industrial..... _____
150. Oceanographer, Diver..... _____
151. Office Worker..... _____
152. Optometrist..... _____
153. Orchestra Leader..... _____
154. Painter, Sprayer..... _____
155. Payroll Clerk..... _____
156. Pharmacist, Retail Drugs..... _____
157. Photolithographer..... _____
158. Photographic Retoucher..... _____

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105. Guide, Sightseeing..... _____
106. Hair Stylist..... _____
107. Handbag Designer..... _____
108. Hat Designer..... _____
109. Heavy Equipment Operator..... _____
110. High-Speed Printer Operator..... _____
111. Home Economics Teacher..... _____
112. Horticulturist, Flowers..... _____
113. Hostess, Restaurant..... _____
114. Hydrographer, Water Treatment Plant..... _____
115. Inhalation Therapist..... _____
116. Instructor, Auto Driving..... _____
117. Instructor, Auto Mechanics..... _____
118. Instrument Repair, Radio..... _____
119. Jewelry Designer..... _____
120. Journalist Reporter, Interviewer..... _____
121. Judge..... _____
122. Junk Buyer, Seller..... _____
123. Key Punch Operator..... _____
124. Laboratory Technician, Medical..... _____
125. Laboratory Technician, Mechanical..... _____
126. Laboratory Tester, Water Purification..... _____
127. Librarian..... _____
128. Library Assistant..... _____
129. Life Insurance Salesperson..... _____
130. Lineman, Telephone..... _____
131. Light Technician, Television Studio..... _____

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132. Locomotive Engineer, Steam..... _____
133. Lunch Truck Driver..... _____
134. Machine Operator, Metal Fabrication..... _____
135. Magician..... _____
136. Mail Clerk, U.S. Postage..... _____
137. Male Ward Nurse..... _____
138. Manicurist..... _____
139. Manager, Restaurant..... _____
140. Marine Engi...tional..... _____
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153. Oi.. _____
154. Paint..... _____
155. Payroll C..... _____
156. Pharmacist, Retai..... _____
157. Photolithographer..... _____
158. Photographic Retoucher..... _____

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159. Photographer, Motion Picture..... _____
160. Photographer, Portrait..... _____
161. Physician..... _____
162. Physical Education Teacher..... _____
163. Physical Therapist..... _____
164. Physical Fitness Director, Y.M.C.A..... _____
165. Plant Engineer, Industrial Marine Products..... _____
166. Plumber, General Maintenance..... _____
167. Podiatrist..... _____
168. Policeman, State Patrol..... _____
169. Popular Singer, Contemporary..... _____
170. Pottery Decoration Designer..... _____
171. Production Coordinator, Soft Drink Mfg..... _____
172. Proof Reader, Checker..... _____
173. Psychologist, Experimental..... _____
174. Puppeteer..... _____
175. Radio Announcer I..... _____
176. Radio Announcer II..... _____
177. Radio Operator, Aircraft Control..... _____
178. Real Estate Salesperson..... _____
179. Receptionist..... _____
180. Reducing Salon Attendant..... _____
181. Repairman, Copy Machine..... _____
182. Restaurant Proprietor, Manager..... _____
183. Reservations Agent..... _____
184. Retail Merchant, Dry Goods..... _____
185. Sales Manager, Automotive..... _____

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186. Sales Clerk, Dry Goods..... _____
187. Salesperson, Antiques..... _____
188. Salesperson, Cosmetics..... _____
189. Salesperson, Mobile Homes..... _____
190. Salesperson, Office Machines..... _____
191. Salesperson, Silver Products..... _____
192. Salesperson, Tennis..... _____
193. Salesperson, Water Skis..... _____
194. Salesperson, Photographic Supplies..... _____
195. School Crossing Guard..... _____
196. Sculptor..... _____
197. Secretary, Medical..... _____
198. Secretary, General..... _____
199. Securities Trader..... _____
200. Sewing Machine Operator..... _____
201. Shoe Repairman..... _____
202. Shoe Store Manager..... _____
203. Sign Painter..... _____
204. Sketch Portraitist..... _____
205. Speech and Hearing Clinician..... _____
206. Structural Steel Worker..... _____
207. Supervisor, Computer Operations..... _____
208. Surveyor..... _____
209. Tailor, Men's..... _____
210. Teacher, Business Commercial..... _____
211. Teacher, English, Writer..... _____
212. Teacher, Music..... _____

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213. Television Repairman..... _____
214. Telephone Operator..... _____
215. Teller, Commercial Bank..... _____
216. Tester, Computing Machine Operator..... _____
217. Tester, Electronic Systems..... _____
218. Tester, Electronic Systems Installer..... _____
219. Theater Manager..... _____
220. Ticket Agent..... _____
221. Ticket Seller, Booth Sales..... _____
222. Time Study Analyst..... _____
223. Tool Maker..... _____
224. Travel Bureau Clerk..... _____
225. Treasurer, Industrial Banking..... _____
226. Truck Driver..... _____
227. Veterinarian..... _____
228. Video Recording Engineer..... _____
229. Vocational Agriculture Teacher..... _____
230. Upholstery Cleaner, Furniture..... _____
231. Waitress, Restaurant..... _____
232. Warehouse Manager..... _____
233. Watch Repairman..... _____
234. Weather Forecaster..... _____
235. Welder, Arc..... _____
236. Wirewalker..... _____
237. Women's Garment Designer..... _____
238. X-ray Technician..... _____
239. Yard Master, Railroad..... _____
240. Zoologist..... _____

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APPENDIX F

PROGRAM PLANNER

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Frame 1			
C 5	168	Prod. Coordinator CRE 23	Coordinating Speaking & Signaling
I 5	381	Medical Technologist IRC 25	Compiling Precision Working

Frame 2			
C 5	188	Accountant CES 221	Coordinating
E 5	168	Manager-Restaurant ESC 178	Coordinating Speaking-Signaling

Frame 3			
C 5	118	Treasurer CES 147	Coordinating Negotiating
S 5	108	Clergyman SAI 199	Coordinating Mentoring

Frame 4			
C 5	188	Finance Expert CEI 134	Coordinating
R 5	081	Marine Engineer RIC 98	Synthesizing Precision Working

Frame 5			
C 5	138	Supervisor, Computer Operation CIS 64	Coordinating Supervising
A 5	081	Fashion Illustrator AES 140	Syntheizing Precision Working

Frame 6			
C 4	368	Secretary CSA 122	Compiling Speaking & Signaling
I 4	281	Equipment Repairman Medical ICR 13	Analyzing Precision Working

Frame 7			
C 4	268	Mail Clerk CRE 107	
E 4	158	Art Goods Dealer ECS 217	Coordinating Persuading

Frame 8			
C 4	388	Bookkeeper CSI 202	Compiling
S	168	Restaurant Proprietor SCE 75	Coordinating Speaking-Signaling

Frame 9			
C 3	388	File Clerk CRS 33	Compiling
R 3	878	Waitress RSE 226	Serving

Frame 10			
C 3	588	Telephone Operator CIR 44	Copying
A 4	081	Hand Bag Designer AIS 162	Synthesizing Precision Working

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Frame 11			
E 4	168	Guide: Travel SRI 74	Coordinating Speaking-Signaling
C 3	488	Calculating Machine Operator CIS 164	Computing

Frame 12			
E 4	138	Customer Service Manager ESC 12	Coordinating Supervising
I 4	381	Laboratory Technician IRA 235	Compiling Precision-Working

Frame 13			
E 4	168	Gas Station Manager ESI 216	Coordinating Speaking-Signaling
A 5	048	Actor AIS 193	Synthesizing Diverting

Frame 14			
E 4	258	Life Ins. Salesman ESI 68	Analyzing Persuading
S 4	128	Male Ward Nurse	Coordinating Instructing

Frame 15			
E 3	258	Auctioneer ESC 131	Analyzing Persuading
R 3	371	Barber RSE 125	Compiling Serving Precision Working

Frame 16			
E 3	358	Salesperson (Musical Instrument) ESA 212	Compiling Persuading
C 3	468	Ticket Seller CSI 229	Computing Speaking-Signaling

Frame 17			
E 4	168	Lunch Truck Attendant ESR 151	Computing Speaking-Signaling
I 4	382	Computer Operator ICR 196	Compiling Operating-Controlling

Frame 18			
E 4	168	Shoe Store Manager ESI 155	Coordinating Speaking-Signaling
A 4	081	Pottery-Decorator-Designer AIS 123	Synthesizing Precision Working

Frame 19			
E 4	158	Buyer, Junk ESC 24	Coordinating Persuading
S 4	108	Group Worker SIA 2	Coordinating Mentoring

Frame 20			
E 4	358	Salesman, Office Mach. ESC 49	Compiling Persuading
R 4	281	Watch Repairing RIC 191	Analyzing Precision Working

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Frame 21		Home Ec. Teacher	Analyzing Instructing
S 5	228	SAE 161	
		Painter-Spray	Manipulating
R 3	884	RCI 104	

Frame 22		Elementary Teacher	Analyzing Instructing
S 5	228	SAI 205	
		Radio/T.V. Announcer	Coordinating Diverting
E 5	148	EAR 95	

Frame 23		Counselor	Coordinating Mentoring
S 5	108	SEA 117	
		Zoologist	Synthesizing Precision Working
I 6	081	IRS 142	

Frame 24		Claim Adjuster	Coordinating Speaking-Signaling
S 5	168	SER 43	
		Library Assistant	Compiling Speaking-Signaling
C 4	368	CSA 15	

Frame 25		Funeral Director	Coordinating Speaking-Signaling
S 5	168	SEC 173	
		Teacher-Music	Synthesizing Instructing
A 5	028	ASI 214	

Frame 26		Hair Stylist	Analyzing Serving Precision Working
S 4	271	SAC 149	
		Plumber	Compiling Precision Working
R 4	381	RIE 57	

Frame 27		Hostess	Speaking Signaling
S 3	868	SEC 34	
		Demonstrator (Sewing Mach	Computing Persuading
E 3	458	ESC 222	

Frame 28		Cosmetologist	Analyzing Serving
S 4	271	SAC 66	
		Tester, Electronic Sys.	Compiling Precision Working
I 4	381	IRC 200	

Frame 29		Dietitian	Coordinating Speaking Signaling
S 4	168	SIE 115	
		Cashier	Compiling Speaking-Signaling
C 4	368	CSI 159	

Frame 30		Salesperson-Silver Prod.	Coordinating Mentoring
S 4	458	SEA 157	
		Magician	Synthesizing Diverting
A 4	048	AES 60	

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Frame 31			
A 5	081	Artist AIR 219	Synthesizing Precision Working
C 5	188	Time Study Analyst CIS 105	Coordinating

Frame 32			
A 6	081	Architect AIR 21	Synthesizing Precision Working
I 5	108	Veterinarian IRS 227	Coordinating Mentoring

Frame 33			
A 5	228	English Teacher AIS 58	Analyzing Instructing
E 4	358	Automotive Parts-Salesman ESR 184	Compiling Persuading

Frame 34			
A 5	068	Advertising Man AIS 32	Synthesizing Speaking-Signaling
S 5	378	Professional Nurse SAI 19	Compiling Serving

Frame 35			
A 5	048	Musician ASI 29	Synthesizing Diverting
R 5	228	Vocational Agriculture Teacher RSI 185	Analyzing Instructing

Frame 36			
A 4	081	Women's Garment Designer AIS 232	Synthesizing Precision Working
C 4	868	Reservations Agent CSR 181	Compiling Speaking-Signaling

Frame 37			
A 4	868	Model AES 18	Speaking Signaling
I 4	281	Repairman T. V. ISC 55	Analyzing Precision-Working

Frame 38			
A	081	Sculptor AIR 195	Sythesizing Precision-Working
E 4	168	Automobile Dealer ESI 204	Coordinating Speaker-Signaling

Frame 39			
A 4	081	Furrier AIS 39	Synthesizing Precision-Working
S 4	368	Dental Hygienist SAI 5	Compiling Speaking-Signaling

Frame 40			
A 3	281	Photograph Retoucher AIR 148	Analyzing Precision Working
R	883	Craneman RCE 56	Driving Operating.

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Frame 41		Optometrist	Coordinating Mentoring
I 5	108	ISR 103	
C 5	130	Supervisor-Pay Roll Division CIE 201	Coordinating Supervising Setting-up

Frame 42		Botanist	Synthesizing Precision Working
I 5	081	IRS 234	
A 5	028	Art Teacher AIS 156	Synthesizing Instructing

Frame 43		Weather Forecaster	Analyzing
I 5	288	IRA 238	
R 5	188	Surveyor RCI 53	Coordinating

Frame 44		Geographer	Synthesizing
I 5	088	IRS 40	
S 5	108	Speech and Hearing Clinician SAI 143	Coordinating Mentoring

Frame 45		Dentist	Coodinating Mentoring
I 5	108	IRE 76	
E 5	118	Banker ECI 4	Coordinating Negotiating

Frame 46		Laboratory Technician	Compiling Precision Working
I 4	381	IRC 166	
C 4	688	Data-Processing Working CER 110	Comparing

Frame 47		Electrical Technician	Coordinating Precision Working
I 4	181	IRE 65	
A	062	Photographer AIR 124	Synthesizing Speaking Signaling Operating Controlling

Frame 48		Hydrographer (Water-Treatment)	Analyzing
I 4	288	IRA 190	
R 3	868	School Crossing Guard RSC 237	Speaking Signaling

Frame 49		Horticulturist Flowers Assist.	Sythesizing Precision Working
I 4	081	RIS 10	
S 4	378	Dental Assistant SAI 16	Compiling Serving

Frame 50		Engineer Standards Tester	Sythesizing Precision Working
I 5	081	IRE 194	
E 4	158	Furniture Dealer ECS 215	Coordinating Persuading

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Frame 51		Forester	Synthesizing Precision Work
R 5	081	RIS 197	
S 5	228	Physical Education Teacher SRE 7	Analyzing Instucting

Frame 52		Instructor & Auto Mech.	Analyzing Instructing
R 5	228	RIS 30	
E 5	148	Radio/T.V. Announcer EAR 26	Coordinating Diverting

Frame 53		Mechanical Engineer	Synthesizing Precision Work
R 6	081	RIE 46	
I 6	108	Physician ISA 109	Coordinating Mentoring

Frame 54		Radio Operator	Coordinating Handling
R 5	187	RIS 108	
C 5	228	Business (Commercial) Teacher CSE 82	Analyzing Instructing

Frame 55		Civil Engineer	Synthesizing Precision Working
R 5	081	RIE 8	
A 5	048	Actresses AIS 14	Synthesizing Diverting

Frame 56		Aircraft Mechanic	Analyzing Pecision Working
R 4	281	RIE 153	
S 4	378	Physical Therapist Sir 35	Compiling Serving

Frame 57		Policeman (Patrolman)	Analyzing Speaking Signaling
R 3	268	RSE 41	
E 3	358	Coin Salesperson ESA 207	Compiling Persuading

Frame 58		Firefighter	Manipulating
R 3	884	RSE 61	
I 4	368	X-Ray Technician IRS 59	Compiling Speaking-Signaling

Frame 59		Automobile Body Repair-Man	Compiling Precision Working
R 3	381	RIE 96	
C 3	488	Calculating Machine Operator CIS 145	Computing

Frame 60		Drill PRESS Operator	Operating-Controlling
R 3	782	RIE 116	
A 3	868	Fashion Model AES 182	Speaking-Signaling

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Frame 61			
C 3	382	High Speed Printer Operator CIS 72	Compiling Operating-Controlling
R 3	463	Bus Driver RCS 86	Computing Speaking Signaling Driving-Operating

Frame 62			
C 3	368	Receptionist CSE 127	Compiling Speaking
S 4	228	Ground Instructor SRE 52	Analyzing Instructing

Frame 63			
C 3	688	Proof Reader CTE 176	Comparing
I 4	381	Tester, Electronic IRC 31	Compiling Precision Working

Frame 64			
C 4	368	Travel Bureau Clerk CSE 102	Compiling Speaking-Signaling
A 4	381	Light Technician AEI 111	Compiling Precision Working

Frame 65			
C 3	782	Duplicating Machine Operator CRI 239	Operating Controlling
E 4	358	Book Store Sales Person ESA 128	Compiling Persuading

Frame 66			
C 3	468	Teller CRS 218	Computing Speaking-Signaling
R 3	781	RSE 106	

Frame 67			
S 4	488	Food Checker I-(Operates Machine) CIR 121	Computing
S 4	228	Instructor-Auto Driving SRE 120	Analyzing Instructing

Frame 68			
C 3	488	Adding Machine Operator CIR 167	Computing
I 4	381	Medical Laboratory Assistant ISC 141	Compiling Precision Working

Frame 69			
C 3	488	Tester CIR 88	Computing
A 4	081	Sculptor AIR 79	Sythesizing Precision Working

Frame 70			
C 3	388	Court Reporter CIE 47	Compiling
E 4	478	Sales Clerk ESC 209	Computing Serving

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Frame 71		Securities Trader	Coordinating Persuading
E 5	158	ESC 87	
S 5	108	Podiatrist SIR 135	Coordinating Mentoring

Frame 72		Sales Manager	Coordinating Negotiating
E 5	118	ESC 63	
R 5	081	Railroad Engineer RES 165	Synthesizing Precision Working

Frame 73		Auctioneer Livestock	Coordinating Persuading
E 5	158	ESC 137	
A 4	381	Decorator AIE 114	Compiling Precision-Working

Frame 74		Director Transportation (Bus Company)	Coordinating Negotiating
E 5	118	ESC 27	
C 5	168	Credit Manager CES 83	Coordinating Speaking Signaling

Frame 75		Judge	Coordinating Negotiating
E 6	118	EAS 152	
I 5	181	Pharmacist IES 3	Coordinating Precision Working

Frame 76		Grocer	Coordinating Speaking Signaling
E 4	168	ESI 77	
S 5	168	Physical Fitness Dir. SIC 93	Coordinating Speaking Signaling

Frame 77		Real Estate Salesman	Compiling Persuading
E 4	358	ECS 9	
R 3	381	Shoe Repairman RIC 224	Compiling Precision Working

Frame 78		Florist (Dealer)	Coordinating Persuading
E 4	158	ECS 158	
A 4	062	Photographer (Portrait) AIR 89	Speaking Signaling Operating-Controlling

Frame 79		Encyclopedia Salesperson	Compiling Persuading
E 4	358	ESI 150	
C 3	582	Key Punch Operator CRI 126	Copying Operating-Controlling

Frame 80		Sporting-Goods Salesman-Tennis	Compiling Persuading
E 4	358	ESR 119	
I 4	281	Metallurgist Assistant IRE 189	Analyzing Precision Working

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Frame 81			
S 2	878	Manicurist SAC 203	Serving
E 3	458	Demonstrator (Sweeper) ESC 6	Computing Persuading

Frame 82			
S 3	348	Athlete SRE 100	Compiling Diverting
I 4	280	Tool Maker IRC 36	Analyzing Setting-up

Frame 83			
S 4	368	Inhalation Therp. SIR 230	Compiling Serving
C 3	782	Sewing Machine Operator CRE 132	Operating-Controlling

Frame 84			
S 4	138	Food Service Manager SEC 187	Coordinating Supervising
A 4	381	Sign Painter AIR 195	Compiling Precision-Working

Frame 85			
S 5	108	Group Worker SIA 23	Coordinating Mentoring
R 4	381	Lineman RIE 62	Compiling Precision Working

Frame 86			
S 3	358	Saleswoman Retail Cosmetics SEA 211	Compiling Persuading
E 4	168	Gift Shop Manager ESI 198	Coordinating Speaking Signaling

Frame 87			
S 4	368	Foreign Language Teacher SAE 70	Analyzing Handling
I 6	088	Psychologist Experimental ISA 48	Synthesizing

Frame 88			
S 5	168	Libraian SAI 116	Coordinating Speaking Signaling
C 5	687	Grain Sampler-Commodity Grader CRS 90	Comparing Handling

Frame 89			
S 4	368	Ticket Agent SCE 38	Compiling Speaking-Signaling
A 4	381	Decorator AIE 174	Compiling Precision-Working

Frame 90			
S 4	878	Emergency Vehicle Attendant SRI 130	Serving
R 4	168	Air Traffic Controller RIE 188	Coordinating Speaking-Signaling

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Frame 91		Draftsman	Analyzing Precision Working
A 4	281	RIC 213	
R 4	261	RCS 138	Analyzing Speaking Signaling Precision Working

Frame 92		Costume Designer	Analyzing Speaking-Signaling Precision Working
A 4	261	AES 240	
C 3	388	Clerk-Stenographer CES 179	Compiling

Frame 93		Hat Designer	Synthesizing Precision Working
A 4	081	ATS 84	
E 4	168	Warehouse Manager RSC 170	Coordinating Speaking-Signaling

Frame 94		Dancer Near Eastern	Synthesizing Diverting
A 4	048	ASE 183	
S 4	138	Food Services Manager SEC 210	Coordinating Supervising

Frame 95		Popular Singer	Sythesizing Diverting
A 4	048	~~SSE~~ 17	
I 4	281	Equipment Repairman Copy Mach. ISC 177	Analyzing Precision Working

Frame 96		Camerman Television	Speaking Signaling Operating-Controlling
A 4	062	AIR 144	
R 3	381	Bricklayer (Block Setter) RCS 160	Compiling Precision Working

Frame 97		Orchestra Leader	Synthesizing Diverting
A 5	048	ASI 22	
C 4	368	Library Assistant CSA 169	Compiling Speaking Signaling

Frame 98		Video-Recording Engineer	Compiling Operating-Controlling
A 4	382	AET 175	
E 4	168	Retail Merchant ESI 94	Coordinating Speaking-Signaling

Frame 99		Sketch Portraitist	Syntheizing Precision Working
A 5	081	AIR 208	
S 5	228	Athletic Coach SRE 228	Analyzing Instructing

Frame 100		Dancing Instructor	Synthesizing Instructing
A 5	028	ASE 96	
I 4	281	Instrument Repairman IRC 225	Analyzing Precision Working

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Frame 101		Computer Operator	Compiling Operating Controlling
I 4	382	ICR 20	
S 4	168	Theatre Manager SCE 91	Coordinating Speaking Signaling

Frame 102		Oceanographer	Synthesizing Precision Working
I 5	081	IRS 171	
A 4	348	Wire Walker AES 146	Compiling Diverting

Frame 103		Mathematician Statistician	Sythesizing
I 6	088	IRA 139	
E 4	358	Salesman-Mobile Homes ESR 163	Compiling Persuading

Frame 104		Aerospace Engineering Technician	Synthesizing Precision Working
I 4	081	IRE 236	
C 4	368	Secretary Medicare CSA 11	Compiling Speaking Signaling

Frame 105		Laboratory Technician	Compiling Precision
I 4	381	IRA 37	
R 3	781	Structural Steel Worker RIE 1	Precision Working

Frame 106		Naturalist	Synthesizing Precision
I 6	081	IRS 101	
S 5	168	Claim Adjuster SER 206	Coordinating Speaking Signaling

Frame 107		Astronomer	Synthesizing
I 6	088	IAR 28	
A 4	081	Jewelry Designer AIS 78	Synthesizing Precision Working

Frame 108		Airplane Pilot	Analyzing Driving-Operating
I 5	283	IRC 97	
E 4	478	Sales Clerk Sporting ESR 192	Computing Serving

Frame 109		Geologist Assistant	Synthesizing Precision Working
I 5	081	IRA 67	
C 4	168	Yard Master ESC 51	Coordinating Speaking Signaling

Frame 110		Authropologist Lab. Technician	Synthesizing
I 5	088	IAR 129	
R 5	187	Plant Engineer RIE 69	

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Frame 111		Compositor	Compiling Precision Working
R 4	381	RAI 113	
		Chemist Tech.	Synthesizing Precision-Working
I 5	081	IAR 233	

Frame 112		Baker	Precision Working
R 3	781	RIS 220	
		Salesman Antigues	Compiling Persuading
E 4	358	ESA 45	

Frame 113		Welder	Manipulating
R 3	884	RIS 42	
		Puppeteer	Synthesizing Diverting
A 4	048	AES 136	

Frame 114		Automobile Mechanic	Analyzing Precision Working
R 4	281	RIE 71	
		Customs Inspector (Airport)	Coordinating Speaking Signaling
S 4	168	SIE 186	

Frame 115		Upholsterer	Handling
R 3	887	RCS 163	
		Biller	Compiling
C 3	388	CRI 112	

Frame 116		Heavy Equipment Operator	Driving-Operating
R 3	883	RIE 231	
		Res. Engine Operator	Analyzing Precision Working
I 4	281	IRA 180	

Frame 117		Carpenter	Compiling Precision Working
R 4	381	RCI 81	
		Salesperson Photographic Supplies	Compiling Persuading
E 4	358	ESA 223	

Frame 118		Truck Driver	Driving Operating
R 3	883	RCE 54	
		Photolitho-grapher	Compiling Operating-Controlling
A 4	382	AIR 92	

Frame 119		Fork Lift Operator	Driving Operating
R 2	883	RCE 133	
		Reducing Salon Attendent	Serving
S 4	878	SEC 50	

Frame 120		Butcher	Compiling Manipulating
R 3	384	RSE 85	
		Office Worker	Computing
C 4	488	CES 172	

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APPENDIX G

PHOTOGRAPHIC EXAMPLES FOR V.I.S.I.O.N.

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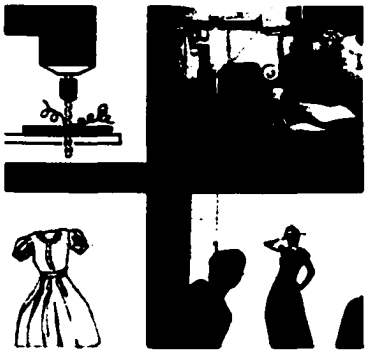
Pictorial Arrangement Sample for

V. I. S. I. O. N.

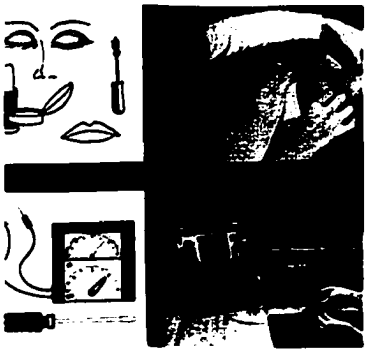
Realistic



Drill Press Operator

Fashion Model

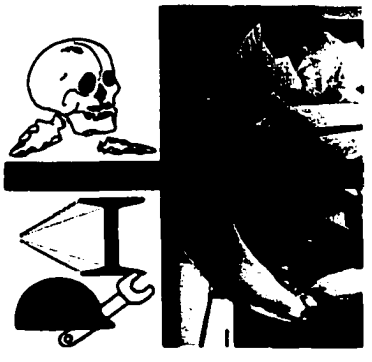
Social



Cosmotologist

Tester, Electronic Systems

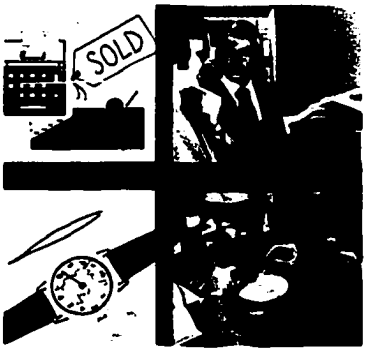
Investigative



Anthropologist

Plant Engineer

Enterprising



Salesman Office Mach.

Watch Repairing

Artistic

Artist

Time Study Analyst

Conventional

Accountant

Manager-Restaurant

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VITA

Name:	Paul G. Elliott
Address:	718 - 32nd Street South Bend, Indiana 46615
Telephone:	Home--(219) 289-4171 Business--(219) 289-7904
Business Address:	635 South Main Street South Bend, Indiana 46601
Born:	July 7, 1935
Family:	Wife--Marilyn (married, 1956) Daughter--Cynthia (born, 1961) Son--Michael (born, 1972)
Education: June, 1973- August, 1977	Graduate School--Andrews University. Presently a Doctoral Candidate, expected completion date August, 1978.
June, 1971	Graduate School--Indiana University at South Bend. Work on Master's with primary emphasis on "Socially and Emotionally Disturbed Child." Completion date--August, 1978.
Summers: 1969-1970	Graduate School--work on second Master's, "Socially and Emotionally Disturbed."
1967	University of Cincinnati--Received Master's Degree in Education with guidance major and psychology minor. Related study in school administration.
1959	Indiana State University--Received Bachelor of Science Degree, major area in social studies, minor area in business.
1954	John Adams High School, South Bend, Indiana. Diploma

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Non-Teaching Experience: 1976-1977	Indiana Department of Public Instruction, Northern Regional Service Center, Division of Pupil Personnel Services. Consultant, with major responsibilities to serve informational and in-service training needs for counselors in the State of Indiana. Duties also include contribution of ideas and suggestions to administrative and legislative leaders for consideration of laws that affect Pupil Personnel Services. Served as a member of the on-site visitation team for the Division of Special Education. Acted as grant and title application person to state and federal agencies.
1974-1976	Indiana Career Resource Center, South Bend, Indiana. Career Consultant.
1971-1974	Indiana Career Resource Center, South Bend, Indiana. Training coordinator with major responsibilities to serve training needs in career implementation in Indiana schools. Duties include organization of training staff, development of training phases and operations, and coordination with other components within the Indiana Career Resource Center.
Teaching Experience:	Indiana University at South Bend, South Bend, Indiana. Associate Faculty, Department of Guidance Counseling.
1967-1970	Wa-Nee School District, Nappanee, Indiana. Director of Guidance Services. Duties included coordination of guidance programs for grades K-12. Responsibilities also included individual testing and assessment in cooperation with Oaklawn Psychiatric Center, Elkhart, Indiana.
Summer: 1970	Bashor Home for Boys. Director of Vocational Guidance. Responsibilities included the organization and implementation of a vocationally oriented program for boys at the home under an ESEA Title I grant.
1961-1967	Northwest School District, Cincinnati, Ohio. Teacher in social studies and general business. Also served as counselor during practicum experience at the University of Cincinnati.
Military Service:	U.S. Army. Drafted upon completion of college. Received training at Fort Sill, Oklahoma, in Missile Training School. Attached to the Military Advisory Group in Turkey.

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Professional Activities:

National Educational Association
Indiana State Teaching Association
American Personnel and Guidance Association
Ohio Teachers Association
Served as Vice-President and legislative representative for local chapter.
Policy Council, Associate Faculty Representative, Indiana University at South Bend
Indiana Personnel and Guidance Association
Northern Indiana Personnel and Guidance Association
Served as chapter office--membership.

Other Activities:

Pi Omega Pi--National Social Studies Honorary
Indiana State Chapter
Pi Gamma Mu--National Business Honorary
Indiana State Chapter
Phi Delta Kappa--National Education Honoary
Cincinnati Chapter

Community Activities:

River Park United Methodist Church
Coordinator for youth activities, 1973
Teacher, high school class
Director of Education, 1977
Wa-Nee District Committee on Curriculum
Vocational Guidance, 1969
Drug Committee, Chairman, 1969
Human Growth and Development, Chairman, 1969
Nappanee United Methodist Church, 1968-1969
Council of Ministries
Ecumenical Affairs, Chairman
Social Concerns, Chairman
Elkhart Mental Health Association
Nappanee Kiwanis Club (charter member, 1968)
Board of Directors
Boys and Girls Committee, Chairman
Vocational Scholarship Committee
South Bend Round Table, 1973

Other:

Traveled in forty-two states in the United States, Mexico, and through six countries in Europe.
Educational Certification
Secondary Teaching (Indiana and Ohio)
Professional Guidance and Counseling (Indiana and Ohio) Life License

Hobbies and Recreation:
Travel, reading, wood carving, model building, music, photography

Publications:

Career Digest
Editor, 1975
Articles, 1971, 1972, 1973, 1974, 1975

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State Report--Training Mobile Unit, 1972
Acceptance for Presentation of Original Work--APGA, 1973, New Orleans Convention
Educational Resource Information Center Contributions
"A Total Community Approach to Career Education," RIE, Vol. 9, No. 6, June, 1974.

"Validation Study of V.I.S.I.O.N. (Visual Imagery Selection Inventorying Occupational Needs) original research, RIE, Vol. 10, No. 7, July, 1975.

Acceptance of proposal, "The Development and Validation of a Vocational Interest Survey Instrument with Audio-Visual Format," State of Indiana, State Board of Vocational and Technical Education (in development). Note: This original research will form the basis for completion of my doctoral dissertation. Proposed completion, December, 1978.
Pupil Personnel Services--Newsletter Articles, 1976, 1977

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