A COMPARISON OF THREE METHODS OF ADMINISTERING
INTEREST INVENTORIES TO STUDENTS WITH
VARIED READING ACHIEVEMENT

DISSERTATION

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BY

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The purposes of this study were (1) to ascertain the total absolute change scores between student basic interest scale scores on the Strong-Campbell Interest Inventory (SCII) and like scores on the audio interest inventory (AII), and the audio-visual interest inventory (AVII), which are based on the SCII; and (2) to ascertain if a statistically significant relationship exists between students with high reading ability and students with low reading ability, when different test-retest inventory administration methods are used.

Collection of the data involved 230 students from nine middle schools in two school districts. Students were assigned to one of four test-retest inventory administration method groups; Set A-SCII and SCII retest, Set B-SCII and AII, Set C-SCII and AVII, and Set D-AII and AVII. Initially, students participating in Sets A, B, and C were administered the SCII, while participants in Set D took the AII. After two weeks, the students were retested accordingly.

The study utilized 4 X 2 factorial designs with reading levels, determined by CAT or ITBS total reading scores in
relation to the national mean (Group I-high readers and Group II-low readers), as one of the independent variables. The other independent variable was the test-retest inventory administration method. The criterion was the mean total absolute change score for the twenty-three basic interest scale scores. Two-way analysis of variance procedures were used to test for significant main effects and interactions.

A significant statistical difference (p<.02) was found between the total means of the total absolute change scores of high and low readers. Students with good reading comprehension scores responded more consistently in test-retest situations than low readers.

Although students demonstrated preferences toward alternate administration methods, there was no statistically significant evidence that audio and audio-visual administration methods resulted in more consistent results by low readers. No statistically significant interactions were disclosed between high and low readers for the different modes of inventory administration.
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CHAPTER I

INTRODUCTION

Interest inventories have long been associated with career guidance as a tool for the exploration of interests (20). These inventories have had a two-fold purpose in that they can supply objective information about an individual in an organized way for assessment and also assist individuals in understanding the process of career choice (10, p. 13).

Exploration of interests using printed interest inventories are based on the assumption that people can read the instrument. Unfortunately, statistics released by the National Assessment of Educational Progress indicated that thirteen percent of seventeen-year-old students were functionally illiterate. These students could scarcely read or write (19, p. 61). Reading abilities also varied significantly between male and female students, students of different geographical regions and community types, and between the races (12).

Although it can be assumed that interest inventories cannot reflect a student's interests if the student cannot read, little has been done to address the problem. This study addressed this problem and obtained data to support or refute claims that alternative modes of presentation can
assist in obtaining more accurate interest information from students of low reading ability.

In order for career counselors to advise students in the most responsible manner, they need to have the best possible assessment tools available. Tools which make use of audio and audio-visual presentations should prove reliable in assessing the interests of students with low-reading ability (15, p. 2).

Statement of the Problem

The problem of this study was the inability of current interest inventories to accurately measure the vocational interests of individuals who have low reading ability.

Purposes of the Study

The purposes of this study were

1. To ascertain the total absolute change scores between students' basic interests scale scores on the Strong-Campbell Interest Inventory and like scores on the audio and audio-visual interest inventory;

2. To ascertain if a statistically significant relationship exists between the total absolute change scores exhibited by low reading ability students and total absolute change scores exhibited by students with high reading ability on the different modes of presentation;

3. To isolate and evaluate the effect of administering an auditory version in comparison to using a written or
audio-visual interest inventory with students of low reading ability;

4. To ascertain the validity of the audio interest inventory (AII), and the audio-visual interest inventory (AVII), which are based on the Strong-Campbell Interest Inventory (SCII).

Hypotheses

To carry out the purposes of the study, the following hypotheses were tested at the .05 level of significance.

1. There will be no statistical difference between the total means of Group I (high readers) and Group II (low readers) on the total absolute change scores for the twenty-three basic interest scale scores.

2. There will be no statistical difference between the means of Set A-SCII and SCII retest, Set B-SCII and AII, Set C-SCII and AVII, and Set D-AII and AVII, on the total means of the total absolute change scores.

3. There will be no significant interactions between reading levels and methods of test-retest inventory administration on the total change scores.

Background and Significance

Vocational interest inventories have proven to be a valuable tool to educational researchers in investigating how students develop specific vocational interest (1, p. 275). Prior to 1930, interest inventories were considered a
source of information for arriving at a career choice at a single point in time (14). This career choice was seen as a singularly important event, occurring only the one-time in a student's life. It was for this pressing decision point that interest inventories were designed (11, p. 2).

Today, career choice is not seen as a once-in-a-lifetime event, but a process repeated in response to the individual's on-going growth and changing self-image (10, p. 3). Therefore, it is considered more appropriate and desirable to use interest inventories to facilitate self-knowledge in regard to careers and to stimulate exploration of them (6).

Tests are also being used to develop hypotheses about self and careers, which can be tested in field research (10, p. 3). In this regard, the interest inventory can be particularly useful with adolescents. Research shows vocational choice, as a realistic process, can start as early as the third grade (2, p. 64). By administering vocational interest inventories to adolescents, students are being exposed to an effective method of enhancing their progress in career exploration (10, p. 11).

Vocational interest inventories are constructed to a readability level for the "average" student in a particular grade, where it is intended to be administered. The Strong-Campbell Interest Inventory (SCII), which was used in this
study, has a junior high reading level (4, p. 21). However, the typical eighth-grade class is likely to have a range of reading ability in students spanning eight or more grades—less than fifth-grade to college level (11).

The lower reading ability in students is recognized and, in most cases, students are enrolled in special education programs for the academically disadvantaged (15, p. 7). The diverse needs of these academically disadvantaged individuals require specially designed assessment instruments to assist them in planning (20, p. 139). Unfortunately, students with lower reading skills are expected to take interest inventories alongside students who have no appreciable reading problems. What often results is students with lower reading abilities indiscriminantly mark the score sheets out of frustration because of not being able to read the instructions or questions (16, p. 39).

Current vocational interest inventories that circumvent the need for reading achievement are designed for use with either the educatable mentally retarded or severely academically disadvantaged. They are neither designed for "average" students with reading difficulties nor students with average or above average reading ability. To date, there is neither a substantially validated audio-visual vocational interest inventory available in this group nor has there been research in this area (15, p. 28).
Computer searches of the Educational Resources Information Center (ERIC) educational and psychological databases found limited research findings reported in the use of audio or audio-visual vocational interest inventories with students having normal or low reading ability. The literature surveyed did show research in the use of the audio, visual, and audio-visual modes of presenting and disseminating information in a variety of areas. Results of these intermodal presentations are mixed.

Cochran (5) compared four methods of test reporting (counselor, audio-visual, combination, and control) results of the Strong-Campbell Interest Inventory (SCII) to high school students. There was significant difference between the control and the experimental group, but a lack of significant difference between the individual experimental groups (5, pp. 263-265).

In another research study, the use of printed text was compared with printed text with cartoons, audio-only presentations, visual-only presentations, and audio-visual presentations, and their effect on comprehension. It was found that comprehension was significantly higher when using the printed materials (17).

Both of the above researchers cited the work of Dwyer in their research. Dwyer has researched the effect in presenting visualized instruction including slides, photographs, and video recordings (9, pp. 437-451) and has also
compared the effectiveness of photographs and cartoons in inservice presentations (13). In the latter research study, it was found that cartoons were significantly more effective.

It should be noted that in the research of different modes of presenting materials, a minimal number of subjects were used and the researchers were not directly concerned with imparting information to students with low reading ability.

In 1980, Holve and Roberts independently conducted research studies which were closely related to the focus of this research study. Specific recommendations for further research study, as cited by these researchers in their conclusions, were pursued in this research study.

Holve's research study was designed to generate data, which could be used to determine the effects on comprehension as a result of using alternate modes (written, written with glossary, and auditory) of administration of the Kuder General Interest Inventory with eighth-grade students of varying reading levels. Using a self-designed vocabulary test to measure the comprehension of the three groups, it was found that the three treatment groups did not differ significantly in comprehension. There was a statistically significant (.05) correlation coefficient between reading level and comprehension of the KGIS. Recommendations for further research included using another interest inventory and further investigations of intermodal treatments (11).
Roberts developed an audio-visual interest inventory (AVII) based on the Strong-Campbell Interest Inventory (SCII), the most widely used and accepted inventory (3). The AVII was designed to be used with students with a wide range of reading levels. In field testing the AVII, the SCII was initially administered to a group of eighth-grade students who were given the AVII two weeks later. Using the Iowa Test of Basic Skills (ITBS) reading comprehension scores, students were divided into Group I (high readers) and Group II (low readers) according to whether their scores were above or below the fiftieth percentile. Statistical analysis of data found no statistically significant difference between the means of Group I correlations and Group II correlations. This rejected the directional hypothesis that Group II would be significantly higher, which would have indicated that the audio-visual significantly changed how students with low-reading ability responded. Recommendations for future research included an analysis of scores based on reading levels of adjacent deciles and quartiles. Additional studies should also be initiated using different statistical design, such as pretest, post test, control group design (15, p. 50).

This research study was an extension of Roberts' research. Using the Roberts' AVII and his recommendations, this research study involved additional testing sites, a larger sample, and the research study of an auditory-only
presentation as an additional treatment. Another difference between the studies was the composition of the reading-level groups. In one analysis of the data for this research study, Group I consisted of students who had scored at least one-half standard deviation above the mean, and Group II was composed of students scoring at least one-half standard deviation below the mean on the ITBS or CAT reading achievement test.

It was also the intent of this research study to provide data that would help substantiate or repudiate previous statements concerning the use of audio-visual treatments. It has been stated that the combination of visual and auditory presentations of materials will lead to more effective comprehension (7) and that low readers are thought to profit more from aural presentations than good readers (18). In response to these assertions, Duker argued that low readers may also be poor listeners (8).

This research study was significant in that it

(1) Determined the degree of concurrent validity the audio version and the audio-visual version of the SCII had with the printed version of the SCII, when administered to students of high reading ability;

(2) Ascertained the effect that the mode of interest inventory had on the responses of students with high or low reading ability;
(3) Provided the rationale for selecting a written, an audio, or an audio-visual presentation of an interest inventory for administration to students of a given reading ability.

Definition of Terms

For the purpose of this research study, the following definitions were formulated.

1. **AII** - The audio counterpart to the standard Strong-Campbell Interest Inventory as developed by Roberts, which is to be used in the research study.

2. **AVII** - The unpublished audio-visual version of the standard Strong-Campbell Interest Inventory as developed by Roberts, which will be utilized in this research study.

3. **Average student** - A person able to progress in or to complete a regular education program, that is neither classified as having physical or mental handicaps, nor as being disadvantaged.

4. **Basic interest scale scores** - consist of a set of twenty-three scores derived from the basic interest scale area of the Strong-Campbell Interest Inventory profile sheet.

5. **CAT** - California Achievement Test, which will be used to determine the reading level of students tested.

6. **Disadvantaged student** - A person unable to progress in or to complete a regular education program because of:
academic underachievement; difficulties with the English language; socioeconomic and cultural background which negatively affects the individual; and who, therefore, requires a modification of a regular program or special services.

7. Educable mentally retarded (person) - Individuals functioning at a mild mental retardation level, having intelligence scores that range two and three standard deviations below the norm (52 to 66 on the Stanford-Binet and 55 to 69 on the Wechsler Scales). Individuals maintain themselves independently or semi-independently in the community.

8. High reader ability - students recording scores a minimum of one-half standard deviation above the mean on ITBS or CAT.

9. Interest inventory - An instrument, consisting of a list of activities, occupations, subjects, or other vocationally related items that an individual responds to by indicating preferences or likes and dislikes.

10. ITBS - Iowa Test of Basic Skills, which will be used to determine the reading level of students tested.

11. Low reader ability - Students recording scores a minimum of one-half standard deviation below the mean on ITBS or CAT.

12. SCII - Strong-Campbell Interest Inventory, the revised unisex edition of Strong Vocational Interest Blank for Men and Strong Vocational Interest Blank for Women, is a
test of vocational interest published by Stanford University Press, Stanford, California.

Delimitations

The delimitations of this research study include the following.

1. The research study was delimited to the total absolute change scores between selected students' interest scale scores on SCII and like scores on the AII and AVII interest inventories.

2. The research study was delimited to the statistically significant relationship between the total absolute change scores from low reading ability students and the total absolute change scores from high reading ability students.

3. The research study was delimited to an evaluation of the effect of administering an auditory version of the SCII with printed or audio-visual interest inventory with students of low reading ability.

4. The research study was delimited to establishing the validity of the audio interest inventory (AII) with the audio-visual interest inventory (AVII).

Assumptions

It was assumed students taking the test would respond to the best of their ability and that their responses would
be generalizable to a population of similar socio-economic makeup. It was also assumed that students taking this test possessed normal vision and auditory faculties.

Procedures for the Collection of Data

Nine middle schools in two independent school districts, in the Northeast Texas region, served as the test sites for the research study. The nine schools were selected because they had students, which were similar in socio-economic make-up, and a sufficient pool of students for statistical analysis. Data collected at the test sites were collapsed. Testing involved only those students who had taken the Iowa Test of Basic Skills (ITBS) or California Achievement Test (CAT) reading tests in the last one and a half years.

Two-hundred-thirty students enrolled in Occupational Investigation or Exploratory Industrial Arts participated in the research study. A minimum of thirty students were administered one of the following test-retest combinations of interest inventories: Set A - SCII and SCII; Set B - SCII and AII; Set C - SCII and AVII; and Set D - AII and AVII.

In the initial testing sequence, Sets A, B, and C were administered the Strong-Campbell Interest Inventory (SCII). Set D was administered the audio interest inventory (AII). Approximately two weeks later, the various interest inventories were administered to each of the sets as
follows: Set A, the SCII; Set B, the AII; and Set C, the AVII; and Set D, the AVII. Each student recorded his or her responses on score sheets, which were scanned in the Computer Center at North Texas State University.

Treatment of the Data

Both test score sheets for each student were scanned and the basic interest scores were isolated on the computer printout. A total absolute change score was calculated on each student using the basic interest scale scores on the printout of the first interest inventory taken and the like scores from the second interest inventory's printout, as variables. For each test set, these total absolute change scores were as follows: Set A - SCII and SCII; Set B - SCII and AII; Set C - SCII and AVII; and Set D - AII and AVII.

The resultant total absolute change scores were divided into two groups according to the reading ability of the students concerned. For each test set, Group I consisted of the total absolute change scores of students exhibiting recent ITBS or CAT reading scores, which were at or above the fiftieth percentile or national mean. Group II consisted of students with ITBS or CAT reading scores below the fiftieth percentile or national mean.

In testing the hypotheses, each hypothesis and its subparts were stated in the null form and tested. The level of
significance was reported for each test. The level of significance was determined by reference to a table of area for the normal curve. The decision as to level of significance below which an hypothesis was rejected, was set at the .05 level.

To test Hypotheses 1, 2, 3, and 4 and their subparts, analysis of variance (ANOVA) was used. A two-factor ANOVA in a four-by-two factorial design was constructed to determine whether the mode of inventory administration and the eighth-graders' reading level affected the outcome of mean total absolute change scores. Each subgroup or cell of this eight-celled factorial design contained a minimum of twenty-five students (n = 25).

A second analysis of the data was conducted using the procedure previously described. The only difference was the criteria used to determine the composition of Groups I and II. For each test set, Group I consisted of the total absolute change scores of students exhibiting recent ITBS or CAT reading scores, which were at least one-half standard deviation above the fiftieth percentile or national mean. Group II was composed of students with ITBS or CAT reading scores at least one-half standard deviation below the fiftieth percentile or national mean. Each cell contained seventeen students (n = 17).
CHAPTER BIBLIOGRAPHY


CHAPTER II

SURVEY OF RELATED LITERATURE

Introduction

The focus of this research study was to present a comparison of alternate modes of administering an existing vocational interest inventory to students with varied reading ability. A survey of related literature indicates only three studies which have addressed this particular research problem.

In 1980, Holve (69) used an auditory version of the Kuder General Interest Survey (KGIS) to assist in determining the effects of alternate modes of administration on student comprehension. Also in 1980, Roberts (90) developed an audio-visual version of the Strong-Campbell Interest Inventory (SCII) and correlated responses between this instrument and the standard SCII. Both of these studies considered low-reading ability as a factor in students' responses to the respective inventories. All students involved in the studies were at the eighth-grade level in public schools.

Previously in 1969, Blake (8) conducted a reciprocal to these studies by developing verbal forms to parallel published picture interest inventories. Using a test-retest
design, he compared the degree of reliability between verbal inventory results and those obtained from picture inventories.

These studies provide a background for the comparison of alternate modes of administering an existing vocational interest inventory to students with diverse reading abilities, the focus of this research study. A more complete discussion of these studies is found in the latter part of this chapter.

Although only a limited amount of literature directly related to this study was found, the literature did reveal an extensive amount of research and information that is indirectly related. This material provides both the rationale and developmental information for establishing and conducting this correlation study.

To fully utilize the literature in developing a significant background and developmental framework for the study, this chapter is organized into five major sections: (a) Vocational Assessment: Need and Methods, (b) The Measurement of Interests, (c) Reading Ability and Alternate Presentations of Tests, (d) Trends and Approaches in Vocational Interest Test, and (e) Research on Alternate Modes of Administering Existing Vocational Interest Inventories.

Vocational Assessment: Need and Methods

Vocational assessment as described in this study is the determination of importance, size, or value of the
strengths and limitations of an individual which facilitate or interfere with vocational outcomes...." (101, p. 86). It takes place throughout the public school experience, beginning in the elementary grades (89, p. 4).

Terms often used interchangeably are "vocational evaluation" and "comprehensive vocational assessment." These terms may be used synonymously as a subset of the more generic term "vocational assessment." As a subpart, "vocational evaluation" emphasizes the use of real or simulated work, such as work samples, job tryouts, and situational assessment, while "vocational assessment" is more general and not tied to specific methods (89).

Through ongoing and formal means, vocational assessment should be made. This process throughout a student's years in public schools includes: (1) assessment of students' interests, knowledge, and skills through academic class performance; (2) evaluation of aptitudes, interests, and achievement in career exploratory experiences and vocational skill courses; and (3) assessment of work aptitudes and behavior by observing student's on the job performance (51; 77, pp. 204-205).

Need for Vocational Assessment

The necessary components of career development are the specification of a career goal, the determination of both existing and needed skills and abilities an individual needs
for that career, and the formulation of a training plan to achieve career goals (89, p. 22). Comprehensive vocational assessment is the key to determining the degree to which these components exist.

Through working with an individual and using assessment tools, a clear picture of an individual's abilities, aptitudes, interests, and training needs for employment can be determined. Although vocational assessment is costly, the alternative of possible unemployment or underemployment is even more costly. Extremely intensive services for severely disabled persons have proven cost effective with a very high cost-benefit ratio (89, p. 23).

The need for comprehensive vocational assessment programs in the public schools is being recognized as a crucial part of the career development system. The lack of a systematic vocational assessment results in educational or job choices based upon subjective impressions or trial and error methods, which are inefficient at best. Currently, as the need for vocational assessment is increasingly recognized, it becomes necessary to provide the most cost-efficient techniques to provide the needed services (89, pp. 23-26; 107).

Vocational assessment may be used for a variety of purposes, including: (a) screening applicants for particular jobs or classes, (b) assessing performance of students or employed, (c) improving individuals' awareness of their
vocational strengths and weaknesses, and (d) aiding individuals in choosing the type of job or training they pursue as they capitalize on their better understanding of the world of work (54; 89). Various vocational assessment models consisting of different test batteries and techniques have been developed to aid in securing information in regard to these purposes.

In summary, Herr and Cramer (53) state that the fourfold purpose of assessment in career guidance is—prediction, discrimination, monitoring, and evaluation. In describing the uses: (a) predictive test serve to forecast success in educational and career behaviors; (b) test and inventories for discrimination permit individuals to discover what occupational and or educational group they resemble; (c) the monitoring function can help to identify the stage of an individual's career development and the process of choice or readiness for choice; and (d) evaluation function measures how well goals are being achieved (53, p. 329).

Methods of Vocational Assessment

Vocational assessment methodologies are based upon the assumption that skills and abilities can be identified, and measured or assessed. Information derived through these methods is assumed to be beneficial and useful in making vocationally related decisions (89, p. 38).
A comprehensive vocational assessment model comprises a variety of techniques and approaches for evaluation. Two broad forms of these measures, as commonly described in the literature are (a) work samples, and (b) paper-and-pencil tests. Several other designations or categories for assessment instruments, based upon specific approaches or techniques, are also found.

**Work sample techniques.** A work sample is defined as, "a well defined work activity involving tasks, materials, and tools which are identical or similar to those in an actual job or cluster of jobs (89; 103, p. 354; 107, p. 52). Work samples are most useful during preparatory and exploratory stages of career development, and are closely identified with the assessment of special needs groups.

There are four types of work samples based upon the degree of relationship they have with actual jobs. They are categorized as actual job samples, simulated job samples, single trait samples and cluster trait samples (13, p. 1).

Work samples are an important technique to vocational evaluation because of their more direct relationship to a particular criterion of job performance, without being highly dependent upon the reading ability and academic achievement of the client, as found in more typical psychological tests. For many students, such as the nonverbal and handicapped, using work sample techniques results in a more
direct and concrete measure of job potential, as well as providing knowledge of self-characteristics that can be evaluated (63, p. 202).

In 1976, Botterbusch (12) evaluated seven commercially prepared systems, which are in common use today. These systems include McCarron-Dial Work Evaluation System, Philadelphia Jewish Employment and Vocational Service (JEVS), Talent Assessment Programs (TAP), The Testing, Orientation, and Work Evaluation in Rehabilitation System (TOWER), Valpar Component Work Sample Series (VALPAR), Wide Range Employment Sample Test (WREST) (12). Other major, operational work sample systems are the Comprehensive Occupational Assessment and Training System (COATS), System Approach to Vocational Evaluation System (SAVE), Vocational Information and Evaluation Work Samples (VIEWS), Vocational Temperament and Aptitude System (VITAS), and Hester Evaluation System (3, pp. 46-47; 89).

Paper-and-pencil tests. The paper-and-pencil tests are standardized instruments, in which the primary means of performance evaluation are the client's responses to questions or stimuli; that have been recorded on paper (89, p. 45). These devices are noted for their low cost and speed of administration, which enables them to play an important, yet guarded role in preparing clients for meaningful career choices (63, p. 361).
The paper-and-pencil tests provide means for aptitude and or personality assessment. They also consist of vocational interest inventories, career planning inventories, career measurement inventories, and vocational measurements of mechanical and clerical abilities. Although, there are approximately 450 of these standardized vocational measures available in print in the United States, little research has been carried out on a majority of them (83, p. 432).

The key variable in the effective use of these tests is the appropriate selection of an instrument for the particular individual in a given vocational assessment program. The indiscriminant usage of test instruments can prove uninformative as a result of overuse and improper or poor test selection, (89, p. 46; 103, p. 361).

The first published tests introduced in the vocational testing movement were the vocational interest inventories. More recently, two other standardized testing instruments related to career development have been advanced. One type is the career planning inventories, which are comprehensive, standardized instruments designed to measure interest, abilities, knowledge, and attitudes in the cognitive, psychomotor, and affective domains. The second type is the recently developed career maturity instruments, which produce standardized measures of attitudes and knowledge that infer the client's level of maturity regarding careers.
The Measurement of Interests

Vocational interest inventories are used widely in vocational evaluation programs, and are invaluable resources in assessing clients and individuals in various occupational career fields (89, p. 59; 103, p. 362). Four different methods—expressed interest, manifested interest, tested interest, and inventoried interests—are applicable in measuring the eight basic interest groups—scientific, social welfare, literacy, material, systematic, contact, aesthetic expression and aesthetic interpretation—as defined by Super and Crites (1; 102).

The most direct method, "expressed (or stated) interest," involves asking individuals about their interests concerning various occupations. "Manifest interest" are obtained by observing an individual's behavior in various situations and how he or she actually spends his or her time. "Tested interests" are inferred from test instruments, e.g. the Michigan Vocabulary Test, or from an individual's scores on achievement test and from an individual's knowledge of special terminology related to specific occupations (63). The fourth, and more sophisticated and widely used of the approaches, is the inventoried interest method, in which an individual expresses his or her preference toward a wide variety of vocationally-related activities. The interest inventory provides both objective scores for individual and
group comparisons, as well as permitting a broader selection of behaviors and preferences (1; 89).

In discussing the measurement of interests, the following topics are addressed from the literature: (1) historical perspective of interest testing, (2) characteristics of interest, (3) expressed interest vs. inventoried interest, and (4) criteria for item selection in inventories.

**Historical Perspective of Interest Testing**

Although social scientists were making significant advances in general testing, only sporadic attempts to measure interest were made prior to World War I. In 1919, its real beginning took place when a seminar on interest measurement was held at Carnegie Institute of Technology, in which Edward K. Strong, Jr. was in attendance (1; 90).

In 1927, pursuing the research on interest measurement initiated by Miner, Moore, and Bingham at the Carnegie Institute of Technology, E. K. Strong of Stanford University published the first edition of the Strong Vocational Interest Blank (SVIB) (28). This broad-based empirical test, which utilized methods of "weighting" responses given on interest test and relating these weighted responses to various occupations, was used in comparing an individual's interest to the interest of persons in a specific occupational groups. The SVIB was accepted as the standard in vocational guidance and as a research tool (41; 90). In the
same year, Thorndike became the first to publish studies concerning interest measurement (41).

Frederick Kuder, in 1934, published the Kuder Preference Record, an interest test which forced an individual to make a choice from triads of items. The Kuder Preference Record differed from the Strong Vocational Interest Blank in that the individual was being compared to herself or himself rather than to another group (90).

During World War II, Army-Air Force psychologists conducted research on objective interest measures. Many noteworthy inventories have been developed since World War II, however, modifications of the Strong and Kuder inventories continue to be the prominent research measure in the area (1), as indicated in the Eighth Mental Measurement Yearbook (17, pp. 1614-1631).

Characteristics and Development of Interest

Definition. Crites (28) notes, "there is not one generally accepted conceptual definition of interest, but several, each of which emphasizes a slightly different aspect of the trait." In 1931, Fryer (52) made a distinction between "subjective interest" or feelings of pleasantness and unpleasantness, and "objective interests" or observable reactions to these experiences. Both forms are defined as "acceptances or rejections of stimulation." Similarly,
Strong has interpreted interest and states it in the following two ways:

Interest is present when we are aware of an object or, better still, when we are aware of our set or disposition toward the object. We like the object when we are prepared to react to it; we dislike the object when we wish to let it alone or get away from it (28, p. 29; 99, p. 7)

What are interest? ...They remind me of tropisms. We go toward liked activities, go away from disliked activities (28, p. 29; 101, p. 12)

Interests are classified as motivational variables that are directional in nature, which are seen by Strong (100) as a means of differentiating between members and non-members of a given group. Therefore, it has been proposed that the needs, value systems, and the motivations of individuals are reflected by interest, in the vocabulary of the world of work (28, p. 29; 32, p. 191). Darley and Hagenah's (32) more modern conception of interest is that they are reflections or expressions of deep-seated individual needs and personality traits, rather than being developed by chance (1, p. 196).

Assumptions regarding interests. There are several assumptions regarding interests which are basic to its study in relation to vocational choice. Common assumptions include: (a) interests are learned as a result of individuals being engaged in activities; (b) there appears to be a relationship between the age of the clients and the stability of their interests, with little change beyond age twenty-five; (c) between individuals, there is variance in
intensity of interests; (d) one's interests are the motivators to one's actions (83, p. 433); and (e) individuals are more likely to be satisfied and remain in a given occupation if their interests match those of people working in the same occupation—for example, in changing jobs, people tend to move toward those more consistent with their interest (16, p. 398).

**Characteristics and considerations.** The previously listed assumptions are based in part upon characteristics and considerations associated with the study of interest of individuals. For example, several research studies have made use of inventoried instruments to measure stability of interests at various ages, and the effects of heredity and environment on the development of interests.

Grotevant (58) studied the relationships of parent and child interest by comparing correlations between father-son, mother-daughter, father-daughter, and mother-son groupings. The results of the study indicated more significant positive correlations between father-son and mother-daughter than between father-daughter and mother-son pairings.

In a 1977 study examining biological parent-child correlations and adoptive parent-child correlations, Grotevant, Scarr and Weinberg (59) found that the parent-child correlations had fourteen of twenty-four scales achieving significance, whereas only two of twenty-four scales reached significance for adoptive parent-child correlations. The
findings led the investigators to conclude what is done by parents after their children are born has little effect on the interests of the children (1, pp. 96-97; 64, p. 19).

Strong's (100) research shows that although individual patterns of likes and dislikes develop long before occupational experiences, children's interests are relatively unstable until becoming fairly constant in their late teens. Therefore, caution should be exercised in interpreting interest inventories administered below the tenth-grade (1). Because of peculiarities of interest inventories in the measurement of interests, it is possible for likes and dislikes to change but for interests to stay the same (28, p. 31).

In regard to interests and the use of interest inventories in counseling, Flanagan, Tiedeman, and Willis (49) point out that young men and women are often very unrealistic about their career plans, with women continuing to be less realistic than men in their career choices. Also, an individual's knowledge of what particular occupations involve and his or her pattern of interest affect occupational choice (1, p. 194-195).

DeCsipkes and Rowe (35) researched the influence of institutional and community-based residential settings on vocational and community-based residential settings on vocational interests of the mentally retarded. The results suggest that interests of participants in the institutional setting are narrowed and in an unrealistic direction. This
apparent trend indicates a need for occupational information programs in the institution prior to counseling and subsequent placement efforts (35, p. 61).

Expressed Interests vs. Inventoried Interests as Predictors

Several research studies indicate that interest inventories are valid predictors of career choice. However, more recent research in the use of expressed interests measures have shown that they may be equally valid predictors (69, p. 13). Before presenting research arguments on the merits of expressed vs. inventoried interest, these types of interests are described in the following narrative.

Expressed interests. Expressed interests, sometimes termed as specified, claimed, stated, professed, or designated interests in earlier studies, became known as verbalized career preferences. Through questionnaires, interviews, and instruments such as the Tyler Vocational Card Sort, an individual's values, goals, motivations, self-concept, and knowledge of the world of work are elicited to determine verbalized career preference—expressed interests (18, p. 343; 33; 40).

Inventoried interests: The inventoried approach requires test takers to respond either by ranking items in order of preference or by indicating their likes or dislikes for each activity. The stimuli (items) should be familiar
to people taking the test, but need not be specifically vocationally related (15, p. 397). The Strong-Campbell Interest Inventory, revised form of the Strong Vocational Interest Blank, and the various Kuder inventories are the most widely used and researched instruments for assessing inventoried interests (17).

Expressed vs. inventoried interests research. In surveying the literature, it was found that both methods of measuring interests are valid but research concerning the ability to predict career choice is inconclusive. Several of the research articles appeared to be biased in favor of either the inventoried or expressed interest approach, as they proceeded to cite only those studies and related information which supported their particular approach. The following discussion presents research findings and conclusions in regard to the issue.

Many studies comparing the use of these two interest measuring approaches with both normal and special need populations, have favored the inventoried interest approach and its results. These studies included: Strong, 1943 (99); Sinnett, 1955 (96); Nunnally, 1959 (84); Cronbach, 1960 (29); Craven, 1961 (27); Darley and Hagenah, 1966 (33); and Becker, 1973 (4). Citing previous research in expressed interests and inventoried, Becker (4, p. 128) noted:

...in assessing a person's interest the accumulated evidence shows that expressed interest have
somewhat less permanence than inventoried interest—
inventoried interests, on the other hand, are more
stable and provide useful data for prediction.

In the late 1960's Holland and Lutz (68) and Dolliver
(37) voiced criticisms in regard to inventoried interests
being the better approach to interests measurement. Holland
and Lutz noted that when disagreements between the results
of these measurement approaches occurred that researchers
tended to depreciate expressed interests. Dolliver (37, p.
96), following his extensive review of the literature, con-
curred with Holland and Lutz (67), and noted:

When expressed interests agree with the Strong
Vocational Interest Survey (SVIB), the expressed inter-
est have been accorded the status of criteria. When
high scores are received on the SVIB for occupations
which are not expressed as interests; this has been
viewed as evidence that the SVIB can identify actual
occupational interest of which the subject is unaware.
When there is an expression of interest in occupations
for which low scores are received on the SVIB, it has
been seen as evidence that the SVIB can indicate the
presence of errors in the subjects thinking about his
vocational interests.

Dolliver noted that several previously mentioned
researchers, who favored the inventoried approach, exhibited
bias in their works as they used inventoried interests as
the criterion to judge the effectiveness of expressed
interests.

Predictive accuracy. The debate concerning the degree
to which inventoried interests and expressed interests are
accurate predictors has been the subject of continued
research. Holve (69) notes that although some research
results have been inconsistent—e.g. Madaus and O'Hara, 1967 (78), Shann, 1972 (94)—it is generally conceded that interest inventories do predict career choice, persistence, and satisfaction in a job (29; 110). Cronbach (29) stresses that interest inventories should not be used to predict career choice but satisfaction in a career choice. However, if one is seeking to predict success, ability tests combined with interest inventories provide excellent measures (109, p. 70).

Several predictive-validity longitudinal studies used with the Strong Vocational Interest Blank—e.g. McArthur, 1954 (80), Strong, 1955 (100), Brandt and Hood, 1968 (14), Dolliver, 1972 (38)—ranged from seven to eighteen years. The good hit rate, a scale used to determine accurate prediction, was approximately fifty percent. In continued research, Dolliver and Kunce (39) found that individuals in intellectual occupations and those with the more accurate SVIB scores were more likely to drop out of the longitudinal studies. Therefore, the predictive accuracy from these studies is conservative (22, p. 67).

In other studies related to prediction, Land (75) found that the SVIB yielded significant improvement in accuracy of prediction of grade-point average and the potential dropping out of students in electrical and mechanical engineering technology programs, as compared to the use of achievement tests as predictive measures. Borgen and Harper (10) found
that using an interest inventory to predict membership in career groups was equally effective for both white and black populations.

Expressed interests' predictive validity was questioned in early research. Becker, Campbell and Schull (7, p. 350) note:

Early researchers [Lehman and Witty, 1932] (76) reported that vocational interest inventories were unreliable. There evidence, however, was based on expressions of interest, and they did not consider inventories of interest.

Super and Crites (28, p. 30) made the same observation in regard to this early research and noted, "this conclusion was based upon the stability of "expressed" interests, which it is true, fluctuate considerably from one occasion to another."

Recent studies, however, have provided considerable evidence that expressed interests are at least as accurate as measured instruments in predicting occupational membership. Dolliver and Will (40) compared the predictive accuracy of expressed interest elicited by the Tyler Vocational Card Sort to the results from the SVIB, and found the former slightly more accurate. A 1978 study by Borgen and Selig (11), using National Merit Scholars in a three-year longitudinal study, showed expressed interests were better predictors than measured (inventoried) interests.

Several studies such as: Holland and Lutz, 1967 (68); Goddfredson and Holland, 1975 (56); O'Neil and Magoon, 1977
and Touchton and Magoon, 1977—compared Holland's Self-Directed Search and or the Vocational Preference Inventory to measured instruments. The results indicated that expressed interest are slightly better predictors of occupational membership (18, p. 343-44). Zytowski's (110) 1976 study of the Kuder Occupational Interests Survey (KOIS), in a twelve to nineteen year follow-up, showed substantial values of predictive validity (9, p. 211).

In 1982, Cairo (18) published the results of a study which compared the predictive accuracy of measured versus expressed interests over a twenty-one year period using occupational membership at age thirty-six as a criterion. Results indicated that at each point, ages 18 and 25, at which responses were elicited, expressed interests were slightly better predictors of age thirty-six occupational membership (18, p. 343).

Conclusion. Both inventoried interest measures and expressed interest measures have proven to be important to the study of interest measurement and an important component in today's career guidance system. Cairo (18, p. 352) concluded with other investigators that:

Expressed preferences can be a valuable source of information for helping the client explore occupational choices, particularly when compared to the results of inventories. Combining these two sources of information about interests could improve the scope and appropriateness of occupations.
Similarly, Craven (27, p. 11) noted the benefits of integrating these two approaches when he wrote:

\[\ldots\text{measured interests usually tap only affective responses—likes and dislikes and preferences. Expressed interests may have the same affective components, but they also represent conscious efforts to integrate pressures, needs, hopes and dreams }\ldots\]

Both measures can be utilized to provide beneficial information to individuals involved in self-awareness and careers.

**Purposes and Applications of Interest Inventories**

Campbell (22, p. 1) notes two principal functions of which an interest inventory should address at least one. The first function involves providing self-awareness information to the individual and one’s relationship to the work world. And also it should lead one to greater self-understanding and better decisions about life directions. Secondly, interest inventories should provide information to personnel—counselors, teachers, administrators, et al.—so they can make decisions that reflect the unique qualities of each individual.

There is an extensive number of applications of interest inventories in counseling and research. In counseling, some of the most documented and effective applications observed by Campbell (22, pp. 1-4) are the use of an interest inventory as an aid in making occupational and educational choices (60); a vehicle in discussions between students and counselors and also students and parents; a
selection device for those who must make employment decisions; a guide to aid in the modification of a self-development plan already begun; and as an aid in helping people understand their lack of job satisfaction. Related to these applications, Cronbach (29) sees scores derived from interest inventories as useful beginning points for individual vocational counseling since students do not perceive anything threatening about these interest "tests."

In recent years interest inventories, as well as other interest measuring devices, have been seen as useful instruments in stimulating career exploration. These instruments broaden clients' options by providing them with information identifying alternative occupations that are satisfying to them (29; 69).

Research by O'Neil, Price, and Tracey (86) and Cooper (26) compared the ability of different assessment instruments to stimulate career exploration. In 1976, Cooper compared the stimulus value of the Strong-Campbell Interest Inventory (SCII) with the Vocational Card Sort, while O'Neil, Price and Tracey did a subsequent study, in 1979, comparing the SCII and Holland's Self-Directed Search. Both the Vocational Card Sort and the Self-Directed Search were perceived to have greater value than the SCII in stimulating thoughts about career planning, though no significant differences were obtained between groups on certainty about career plans (64, p. 14). Tittle (104) advocates the idea
that inventories should be gauged on the basis of their ability to generate career exploration options and behaviors --exploration validity-- for clients rather "[than by its predictive and concurrent validity]" (9, p. 211). Aiken (1, p. 195) notes:

Perhaps even more important [than predictive validity], they [interest inventories] can serve as a means of introducing students to the range of possible occupations and stimulate them to think about their vocational goals.

Vocational interest inventories are not confined solely to use with individuals, but also in the study of groups. Campbell (22, pp. 2-4) provides a partial list of research opportunities with groups as well as specific examples. Research areas, in the study of group, include: changes in groups--e.g. study of medical school students (71); changes in institutions--e.g. freshman classes at Dartmouth College over a 20 year period (20); general societal trends--e.g. changes between the 1930's and the 1970's (19); cross-sectional influences--e.g. study of Irish students (61); and the characteristics of particular occupations--e.g. study of women Army non-commissioned officers and their selection of administrative and clerical fields.

Criteria for Instrument Construction and Item Selection

Two fundamental decisions must be made in regard to the construction of an instrument for measuring interests. The
first decision involves whether to measure interests in specific occupations—real estate sales, law, medicine, elementary school teacher—or in broader vocational areas—scientific, artistic, sales (16). The second decision relates to the method of item keying and scale construction. Brown (16, p. 389) notes:

The approach may be logical, with items assigned to scales on a rational, a priori basis; empirical, with items assigned to scales on the basis of their relationship to some criterion; or homogenous, with items assigned to scales on the basis of their intercorrelations.

The SCII, which is being used in this study, measures interests in both specific occupations and broader vocational areas, and utilizes empirical scale construction.

In regard to item selection, Campbell (22) recommends items should: (a) be free of sex role bias; (b) cover a wide range of occupational content; (c) not be culture-bound; (d) up to date; (e) each elicit a wide range of responses among occupations; (f) not be ambiguous so everyone who reads them should interpret them the same way; (g) be in good taste; (h) have predictive as well as concurrent ability; (i) easy to read; and (l0) interesting and perhaps entertaining to respond to.

Reading Ability and Alternate Presentations of Test

The reading ability of a client is a key component in obtaining accurate assessment results from the test taken. Holve (69, p. 18) notes, "The interest inventory is an ineff-
fectual instrument for stimulating career exploration if it is incomprehensible to the population using it."

Botterbusch (13) points out that test taking should be determined, after deciding whether a client should be tested and if so what test should be administered. The initial question to be asked concerning test taking ability deals with the client's ability to read the items and understand what he is reading. Since most of the commonly used psychological tests used in vocational evaluation require clients to read at the sixth to eighth-grade level, Botterbusch (13, pp. 6-7) observes:

If a client can understand the instructions (as evidenced by the practice items), can read the items with comprehension, and can use the appropriate answering format, then he can take most standardized tests. The client who has this test taking ability will not need any low literate tests or special modifications in the instructions or answering methods.

The converse to this statement is that if he cannot take a standardized test, a low literate or modified version is necessary. Botterbusch also proposes that the most straightforward approach to ascertain client's ability to take tests is to use an established reading or achievement test to determine reading level and comprehension. It should also be noted that a school grade level, as a result of social promotion policies of some school, is an inadequate measure of test taking ability since some high school graduates are functionally illiterate. After establishing a
client's literacy level, appropriate testing instruments should be determined by the evaluator (13).

**Readability Level of Interest Inventories**

Although the readability level of an instrument is one of the factors to determine its appropriateness for a client, a review of the literature indicates very little research on the readability of interest inventories (69, p. 18). Interest inventories commonly indicate approximate reading levels in their literature but do not elaborate on how they derived their figures. For example, Campbell (33) notes in the 1981 revised SCII manual, "....the SCII [test] booklet reads at about the sixth-grade level, though a few specific examples (e.g. Physiology, Botany, Calculus) are unfamiliar to some students at that level...." No information is provided describing how this reading level was derived for the SCII.

Studies conducted by Coomb, 1946 (25), Stefflre, 1947 (97), Roeber, 1948 (92), and Johnson and Bond, 1950 (72) investigated word difficulty in the Kuder Preference Record (KPR), reading difficulty of interest inventories, and compared seven interest inventories with respect to word usage, and the reading ease of commonly used test, respectively. Coomb (25) found high school sophomores understood words better than freshman on the KPR, and concluded that valid results were not obtained for students who did not under-
stand a great number of the words. Similarly, Roeber (92), by computing the percentage of difficult words on each inventory, found a large number of words exceeding a ninth grader's understanding, and therefore recommended the construction of a glossary to accompany specific tests.

Stefflre (97) and Johnson and Bond (72) utilized the Flesch formula, which was primarily designed to assess the readability of materials in text, to determine reading levels of inventories. Forbes and Cottier (50) would later claim that the Flesch and similar formulas were too limited and inappropriate for assessing the readability of an inventory or other standardized tests. The general conclusion of Stefflre (97) and Johnson and Bond (72) dealt with the reading levels of many of the standardized tests being too difficult for many of the people undertaking them.

As a result of their study, Johnson and Bond (72) recommended that (1) counselors reevaluate their practices in regard to the selection, administration, and interpretation of inventories; (2) counselors should not assume that clients comprehend the contents of an inventory on the basis of clients' ability to comprehend directions; and (3) an inventory with a reading comprehension level suitable for junior high school is needed (69, p. 19). In recent years, these recommendations have been expanded to include the need for acceptable instruments to use with the disadvantaged, handicapped, and special needs populations.
In Holve's (69) 1980 study, students' reading level was found to significantly affect their comprehension of the Kuder General Interest Survey (KGIS). Following Roeber's (92) recommendation, she provided a glossary to students for use with difficult reading materials found on the inventory. No significant difference was found between these students and those who did not have the glossary.

Interest inventories are becoming an integral part of occupational orientation and career exploration programs in the middle and junior high schools. Therefore, counselors and instructors need to be sensitive to the use of such measurements in regard to reading levels of students. To be effective instruments in expanding a student's knowledge of one's self and one's career opportunities, students must be able to read and understand the instruments' contents and directions. Interest inventories may also be used in an expanded counseling role in school systems which are considering "tracking" students into academic, vocational, or general emphasis programs.

Reading Comprehension

In order for interest inventories to be valid instruments, reading comprehension is necessary (69, 74, 110). In an attempt to insure validity of scale scores, Kuder developed the v-score on the Kuder Occupational Interest Survey (KOIS) to indicate questionable survey results from possible
faking, carelessness, or poor reading ability (109, p. 81). This latter cause of questionable survey results can be better understood in light of research in reading comprehension in test taking.

During the last twenty years, researchers in reading comprehension have addressed it from the perspectives of (a) the meaningful interpretation of printed materials, (b) the process of decoding, (c) the process—auditory, visual or both, and (d) the skills of reading. Research from these various perspectives is inconclusive in regard to reading comprehension. For example, no agreement exist in regard to reading comprehension being primarily auditory, visual, or both (69).

Researchers, such as Gray (57) and Robinson and Clymer (91), have proposed comprehension models emphasizing reading skills. The models developed by these researchers are similar, and differ mainly in semantics. In Gray's model, reading skills were classified under four levels: (a) word perception, including meaning or pronunciation—similar to decoding; (b) comprehension, grasping the author's meaning; (c) reaction to and evaluation of the author's ideas; and (d) assimilation, resulting from combining previous ideas and information obtained from reading with what is being read (69).

For one to comprehend the SCII contents, it is necessary to have acquired only the first two skills—word
perception and literal comprehension—in order to recognize words and relate meanings to them. In using the interest inventory for career exploration purposes, it would be advantageous for the test taker to be able to assimilate—relate information read and relate it to self and experiences (69).

Alternate Presentations and Their Effects on Comprehension

Three methods of test administration were used in this study—standard, audio, and audio-visual—to ascertain the interaction effects of reading level and treatment mode. Therefore, a survey of research dealing with the effects of alternate presentations—audio, visual, and audio-visual—on reading comprehension is fundamental to this study.

As noted earlier, an individual requires at least the first two reading skills—word perception (decoding) and literal comprehension—in order to benefit from a standard form of interest inventory. Decoding skills are fundamental to the success of clients in acquiring functional reading ability to take a test (69). Harris and Sipay (62) observed when individuals are not able to recognize words it is because they do not know the meaning of the word, do not know how to pronounce the word, or can do neither.

In administering the standard SCII instrument in this study, it was assumed that people with acceptable Iowa Test
of Basic Skills (ITBS) reading scores had the needed decoding skills to recognize and understand the inventory. The processes—auditory, visual, or both—used are incidental in light of Gibson and Levin's (55, p. 454) observation that, "there are as many reading processes as there are those who read."

**Cognitive styles.** One factor which merits consideration, prior to the discussion and use of verbal, audio, and audio-visual examinations, is individual differences in cognitive style of the learner. Cognitive style, often used synonymously with learning or teaching style, concerns itself with how an individual acts, reacts, and adapts to the environment. An aspect of cognitive style applicable to this study is the sensory style of learning and its affect on reading comprehension. A sensory specialist, an individual who depends primarily upon one sense to form meaningful ideas, is commonly identified as either a visual or auditory learner.

Dunn and Dunn (43) found students at all levels become increasingly motivated and achieve better academically when their learning characteristics—visual or auditory—are complimented. They also claim that only 20-30% of school age children appear to be auditory—learn better by listening, while 40% are visual learner, and the remaining 30-40% tactual-kinesthetic, visual-tactual, or some combination of the four senses (69).
This research information is significant to the study of modes of interest inventory administration. If the method of administration compliments the cognitive style, more accurate responses, and therefore a more accurate assessment, could be realized.

Auditory. Beginning with the learning theories of Huey (70), in 1908, some researchers have conjectured that learning by listening precedes the acquisition of skills in learning by reading. Brown (15) set forth two assumptions about poor readers appropriate to this study, which are: (a) poor readers actually learn materials better with reading demands removed, and (2) they rely more heavily on listening skills than reading for obtaining occupational information.

In a 1972 study, Sticht (98) conducted a survey with 400 men in Army training courses to examine the relationship of reading ability to preference for learning by reading or by listening. The results showed that reduced reading ability led to a greater preference for learning by listening. There is still no evidence that poor readers actually learn better by listening (69). The assumptions made by Brown (15) and the apparent preferences indicated by Sticht's (98) survey should be tempered with Duker's (42) conjecture that poor readers may also be poor listeners.

Day and Beach (34), following their analysis of thirty-five studies concerning the effectiveness of written and
oral instruction, reported half the studies favored oral instruction and half favored written. Holve (69) found no significant differences in test comprehension between students given an auditory examination versus a standard verbal examination.

Audio administration of standardized interest inventories are currently being used with individuals with low reading abilities, disadvantaged youth, and or youth with vision handicaps. For example, the Minnesota Interest Questionnaire (MIQ) users have utilized tape recorded administrations of the MIQ with individuals possessing low reading skills—less than fifth-grade level (13, p. 69; 88; 103, p. 363).

The Program for Assessing Youth Employment Skills (PAYES) consists of three separate test booklets, with the third being a vocational interest inventory. PAYES is administered orally to small groups of disadvantaged youth in an informal manner (3). Oral directions may also be given to students who have less than a sixth-grade reading level when taking the Career Maturity Inventory (103).

When administering the Ohio Vocational Interest Survey (OVIS), the manual permits the examiner to read aloud the first part of the survey, the Student Information Questionnaire, which asks about the examinee's stated interests, educational status, and future career plans. The reading level for the OVIS is approximately fifth-grade level (13).
The above examples cite the use of audio administrations as a viable alternative in standardized test administration with special reading disadvantaged groups.

**Audio-visual.** Several studies have utilized the audio-visual method of presenting and disseminating information in a variety of areas. The results of this method of presentation, as compared to other methods, are inconclusive.

Day and Beach (34) generalized that a combination of auditory and visual presentation of material is a more efficient method of obtaining comprehension, on the part of the student, than either an auditory or a visual presentation. In 1969, Dale (31, p. 50) indicated that audio-visual materials can convey significant information to certain pupils who may be less proficient than others in reading skills (69, p. 31).

Miller and Cochran (81) compared four methods of test reporting—counselor, audio-visual, combination, and control—the SCII to determine equally-effective economical alternatives to individual counselor interpretations with high school students. They found a significant difference between control and experimental groups, but a lack of significant difference between individual groups (24, pp. 263-65).

In Sewell's (93) study, the use of printed text was compared to printed text with cartoons, audio-only presentations, and their effects on comprehension. Comprehension
was found to be significantly higher when using the printed materials.

The research work of Dwyer was cited in the studies conducted by Sewell (93) and Miller and Cochran (81). Dwyer researched the effect of presenting visualized instruction including slides, photographs and also compared the effectiveness of photographs and cartoons in inservice presentations (44, pp. 437-451; 73). In the latter study, it was found that cartoons were significantly more effective.

It should be noted that in the research of different modes of presenting materials, a minimal number of subjects were used and the researchers were not directly concerned with imparting information to students with low reading ability.

Examples of other studies utilizing audio-visual presentations include research by Peterson (87), Eversoll (47), and Crozier (30). Peterson investigated the use of slide-audio tape as a substitute for a performance test and found a statistically significant positive correlation between them. Eversoll studied the effect of career information in a slide-tape program, with and without audio distraction, on the attitudes and knowledge of students. From the analysis of data, it was concluded that the slide-tape program can be used to alter attitudes and transmit knowledge, and that information without audio distractors was the more effective of the two methods (47).
A study was also conducted by Crozier (30) as to the effect of three modes of test orientation on standardized achievement test. The three experimental treatments, which utilized slide-tape presentation did not achieve significantly different results from the control group which was untreated.

Trends and Approaches in Vocational Interest Tests

Over the last twenty years, several factors have affected the development and use of vocational interest measurement instruments. These include many of the influences that impacted career guidance and education programs such as (a) the economic and psychological environment of America, (b) federal legislation, i.e. Vocational Education Act of 1963 and amendments in 1968 and 1976, (c) government publications, i.e. Dictionary of Occupational Titles, and the Occupational Outlook Handbook, and (d) psychological classification systems such as Holland's theoretical occupational classification system.

Recent Trends in Interest Measurements Development

The economic and psychological environment in the United States indicated a need for career guidance and orientation programs. Status, self identity, and job satisfaction are representative of the psychological concerns. These, coupled with the changes brought on by the technological society, i.e.: a workforce consisting of a greater
number of minority members and women; changing jobs and occupational obsolescence brought on by new technology; economic inflation and depression; increased mobility of the workforce; and the vision of educational and labor leaders to bridge the gap between education and the world of work, all demonstrated the need for career guidance and orientation. In part, the government has addressed these issues with legislation. This has subsequently impacted interest tests and their forms today.

Handicapped and disadvantaged. The Vocational Amendments of 1968 made provisions for students with special needs—the handicapped and disadvantaged. Consequently, a host of interest instruments, i.e. the AAMD Reading-Free Vocational Interest Inventory (R-FVII), the Wide Range Interest-Opinion Test (WRIOT), the PRG Interest Inventory for the Blind, and other tests, were developed or pressed into service to meet the career guidance needs of these students.

Sex bias. Legislation regarding the issue of sex bias prompted the National Institute of Education's (NIE), Issues of Sex Bias and Sex Fairness in Career Interest Measurement (36). In compliance to the NIE guidelines, David Campbell merged and revised the male and female forms of the Strong Vocational Interest Blank to develop the 1974 edition, the Strong-Campbell Interest Inventory (21). An additional change in regard to sex bias was made in the 1981 SCII
revision, where the term "drafting technician" was substituted for "draftsman" (23).

Several inventories have maintained separate male-female forms. These include the Geist Picture Interest Inventory (GPII), Vocational Interest and Sophistication Assessment (VISA) instruments.

Government publications. The Dictionary of Occupational Titles (DOT), first published in 1939, provided a means of classifying and standardizing occupational information (63, p. 62). The Ohio Vocational Interest Survey (OVIS) is based on the cubistic model—people, data, things—of the third edition of the DOT (13, pp. 70-71; 63, p. 340). The Picture Interest Exploration Survey's (PIES) career cluster system is based on the Occupational Outlook Handbook and cross-referenced to the DOT (46, pp. 1-2). Backer (3) notes research by the United States Employment Service (USES) being carried out to develop an interest inventory oriented toward the fourth edition of the DOT and to the new Guide for Occupational Exploration (a supplement to the DOT). Similarly, the fifteen career clusters identified by the United States Office of Education are the basis of the Comprehensive Career Assessment Scale (82, p. 56). These examples are evidence of the impact government publications have had on interest measurement instruments.
Holland's classification system. Holland (66) categorized most persons in our culture in terms of six occupational types—realistic, investigative, artistic, social, enterprising, or conventional—such that each person is characterized by one, or a combination of these types. Holland's occupational types are the basis of the Strong-Campbell Interest Inventory's (SCII) General Occupational Themes Scales, which is one type of analysis made of a person's responses to the test booklet (21). The Vocational Preference Inventory and the Self Directed Search, both developed by Holland, and Johanson's Career Assessment Inventory make use of Holland's occupational types in their design.

Approaches in Testing Students With Special Needs

Vocational assessment of individuals with special needs—mentally retarded, low literate, handicapped, and academically disadvantaged—is particularly difficult because many vocational assessment instruments are not applicable to this clientele. The examiner encounters problems in the form of time limitations and students with low reading levels, short attention span, and difficulties in following instructions with the group if specifically designed instruments are not used.

Attention and interest span can be somewhat controlled by introducing a variety of tests into the assessment
process. In many cases, when students are administered instruments not requiring them to read or do academic work, they frequently develop a more positive and receptive attitude with much lower test anxiety levels (2, pp. 128-129).

It should also be apparent that if an examinee cannot read at the level the directions and items are written, their performance and subsequent results and assessment will be inaccurate and not indicative of their actual characteristics (3, p. 9). Therefore, several approaches or techniques have been developed to obtain information commonly gathered by conventional paper-and-pencil tests. These approaches include using: (a) tests with lowered reading levels; (b) oral or audio administration; (c) visual or picture administration; and (d) audio-visual administration. These techniques with examples of each are discussed in the following narrative.

**Tests with lowered reading level.** This approach involves taking an existing instrument and lowering its reading level so the revised version can be accurately administered to a larger population. An example of this approach to testing was the development of the lowered reading version of the Rational Behavior Inventory (LRBI).

The original form, the RBI, was constructed using data from college students. Its administration assumed a high school reading comprehension level for test items. Consequently, this form of the test was not appropriate for adolescents or
clients with reading difficulties. The thirty-seven items of the RBI were rewritten to a fourth-grade reading level, using the Miller Sight Word List and the Dolch Basic Sight Word List. Four subsequent research studies showed the LRBI scores significantly correlate with scores on the RBI (95, pp. 95-99).

The lowered reading level approach has also been utilized in occupational interest testing, e.g. the Kuder General Interest Survey (KGIS): Form E. The KGIS: Form E is a downward extension of the Kuder Preference Record-Vocational: Kuder Form C. Both tests measure the same areas of occupational preference but the KGIS: Form E is designed for use with students in grades six to twelve, instead of above ninth-grade as for the Kuder: Form C.

Oral or audio administration. As discussed previously in regard to comprehension, oral and audio administration is a viable means of administering tests to students with special needs. Certain aspects of oral presentation need to be considered. Alcorn and Nicholson (2) point out that certain tests—aptitude, achievement, etc.—are standardized for a timed presentation with subjects reading their own materials. An audio presentation would violate this procedure because it would set a pace for item completion. In many other cases, it is not practical and may not be of benefit to low literate clients.
The audio presentation has proven to be a reliable method of administering untimed occupational interest test, various inventories, and surveys. For example, a very high positive correlation between the total test scores of the previously discussed LRBI and the orally administered RBI was found with a $r=0.89$, significant at 0.01 level (95).

Audio administration has been used effectively with students having vision impairments, including blindness. Examples of occupational interest tests, which permit partial or complete oral or audio-taped presentations, are the Minnesota Interest Questionaire, PAYES, OVIS, and PRG Interest Inventory for the Blind.

Audio-visual and visual or picture inventories. Geist and McDaniel (53) acknowledged problems associated with the use and administration of conventional inventories and designed a picture interest inventory, the Geist Picture Interest Inventory. Since that time, several other inventories have been developed that use some form of pictures. These utilize line drawings, photographs, or slides to portray occupations or related career information. Students respond by circling items of interest, replying verbally, or marking responses on separate answer sheets. Several of these interest inventories and other instruments lack normative data or sufficient research for validation and reliability data (3, 13). Some tests reviewed recently in
the literature and being used in research are noted in the following narrative.

The Picture Inventory of Careers (PIC) utilizes ten slides for each of twenty-one career clusters, shown at eight-second intervals without commentary. Westbrook (108: p. 243), in his review of PIC, discusses the claims of the test developers, the assumptions associated with the pictorial approach, and his assessment of PIC. He notes:

The pictorial approach to assessing an individual’s interest purportedly has an advantage over traditional inventories because "the person taking this inventory must respond directly to occupational scenes rather than to verbal statements that he might 'embellish' with his own imagination." An individual cannot, however, give a meaningful response to many of the occupational scenes in the PIC either because the scenes are ambiguous or unfamiliar to the respondent.

The reviewer did not recommend the PIC for operational use because its manual lacked evidence to substantiate its claims to certain advantages and its ability to accomplish its purposes. Neither did the manual supply data as to norms, reliability or validity. The PIC utilizes the visual (picture) approach in the strictest sense.

The Reading-Free Vocational Interest Inventory (R-FVII) consists of a series of three illustrations for each of the forty to fifty-five test items. Students indicate their interest preferences by circling one picture per test item. Each of the test items, like those of VISA, is within the realistic occupational range for the mentally retarded. This instrument is therefore not recommended for use with
people who could be trained for skilled positions (4, 6, 13). Although the R-FVII has been used in several studies, e.g. job placement of TMR adults (7), Botterbusch (13) cautions its use because of its almost complete lack of validity and reliability data.

The **Wide Range Interest - Opinion Test (WRIOI)**, like the R-FVII, is lacking in norms, reliability, and validity data. It also utilizes a triad of illustrations, which the examinee indicates the most liked and least liked pictures per item. The inventory's format and activities cover the entire occupational spectrum, allowing it to be used with a large range of normal, handicapped and disadvantaged students (13). For example in 1982, Farrugia (48) used the WRIOI to determine the manner in which deaf persons aged sixteen to nineteen differed from hearing persons of the same age group, when comparing vocational interests and attitudes.

The **Picture Interest Exploration Survey (PIES)** utilized 160 slides with titles and one audio tape for cueing purposes to assess career interests information from adolescent students. Eubanks (46) assessed validity using concurrent measures (comparison with other vocational interest test scores). Backer (3, p. 16) notes, "there is to date no concrete evidence as to the actual efficiency of PIES in predicting career selection or facilitating the career counseling process."
Elliot (45) developed a vocational interest survey instrument with audio-visual format that consisted of 120 slides depicting two types of work tasks, as described by Holland (66). The instrument, entitled Visual Imagery Selection for Indexing Occupational Needs (VISION), was used with 613 subjects. A comparison between this instrument and the Vocational Preference Inventory (VPI) showed a similarity between their test elements.

The Occupational Interests Inventory (OII) was the only instrument found in the literature of which there is a similar instrument in pictorial form, commercially available. The Picture Interest Inventory, first published in 1958 as the California Picture Interest Inventory, yields nine scores and is designed to define the interests of students in grade seven and above (63; 82).

The commercially available visual or picture inventories, e.g. the Geist Picture Interest Inventory (GPII), PIC, R-FVII, WRIOT, PIES, and VISA, were designed to stand on their own merit. Consequently, many of the publisher's claims of validity and reliability are not substantiated (90). For example Botterbusch (13), in describing the validity of the WRIOT, noted:

The only validity information presented are correlation between the WRIOT and the old Geist Picture Interest Inventory. Given the size of the groups and the faults of the Geist, these results are almost meaningless. Rather than presenting data, the manual takes the approach that the WRIOT is valid because its developers say it is valid.
Also, the R-FVII used the GPII to obtain concurrent validity data (4).

The picture inventories, in general, are lacking in quality technical data—norms, validity, and reliability (13). In comparison with the conventional interest tests, e.g. the SCII and KOIS, only limited research and reviews were found in the literature. Several of the commercially available picture and standard verbal interest measuring instruments are listed and described in Appendix A.

Research on Alternate Modes of Administration of Existing Interest Inventories

Three studies—Blake (8), Holve (69) and Roberts (90)—have compared alternate methods of administering existing vocational interest inventories. A brief synopsis, featur-ting description and findings for each of these studies, is found in the accompanying narrative.

Blake: Comparative Reliability of Picture and Verbal Forms

Blake (8) tested the hypothesis that picture items in occupation inventories result in higher reliability than those using verbal items. After developing verbal forms to parallel the Geist Picture Interest Inventory (GPII) and the California Picture Interest Inventory (CPII), the verbal form and picture form tests were administered using a test-retest experimental design to randomly divided subgroups of high school boys and Manpower and Development Training Act
(MDTA) men. Pearson product-moment correlations for each group of subjects' scale scores was obtained, and the difference between correlations obtained by picture and verbal form groups was tested for significance. Blake found that, "a possible tendency for picture forms to yield higher reliabilities was considered not strong or consistent enough to support claims for picture item superiority."

The results of the study indicated that in all but one instance [1 of 11] where significance in reliability was found, the differences favored the picture form. The one instance that favored the verbal form was with the MDTA men. However, the testing and retesting of the MDTA group involved oral administration of verbal form items because of the men's known reading deficiencies. Only three of twenty of the scales showed a significant difference (.05) with this group compared to eight of twenty scales for the high school boys' group. This audio administration aspect of the study could lend support for the use of audio or audio-visual administration of interest inventories instead of standard or picture-only forms.

Holve: Alternate Modes of Administering the KGIS

Holve (69) randomly assigned 153 students with known reading abilities to three treatment groups--standard administration, administration with glossary, auditory administration--to ascertain how comprehension of the
Kuder General Interest Survey (KGIS) was affected by these administration methods and or the reading levels of eighth graders. A two-factor analysis of variance was used to analyze data to determine whether reading level, administration method, or the interaction of these two had significant effect on the eighth-graders' comprehension of the KGIS.

The findings indicated reading level, previously determined by the California Test of Basic Skills vocabulary test, had a significant effect on comprehension of the KGIS, but treatment mode and the interaction of treatment mode with reading ability were not significant.

Recommendations for further study included a similar study using a different test and with more students. Using alternative methods of administering the SCII to students with varied reading abilities addresses Holve's recommendations, in part.

**Roberts: Audio-Visual Form of SCII**

This study involved the development and field testing of an audio-visual version of the Strong-Campbell Interest Inventory (SCII) suitable for use in group testing situations where students with known or suspected reading deficiencies are present.

In field testing, Roberts (90) tested the null hypothesis, "there would be no statistically significant difference between the means of Group I (good readers) and Group II
(poor readers) audio-visual interest inventory and Strong-Campbell Interest Inventory basic interest scale scores." To test the hypothesis, fifty-seven students were initially administered the SCII and retested with the audio-visual interest inventory two weeks later. A Pearson product-moment correlation coefficient was then calculated between the two sets of the twenty-three basic interest scale scores on the students' profile sheets for these tests. The students were divided into two groups based upon ITBS reading scores, with students achieving below the fiftieth percentile in Group II (poor readers) and the remaining students in Group I (good readers). The findings indicated by a directional t-test were no significant difference at the .05 level between the means of Group I and Group II.

For further study, Roberts recommended the use of a larger sample, a different experimental design, and different statistical analysis, e.g. analysis of scores based on reading levels of adjacent deciles and quartiles. These recommendations were major considerations in the development of this study.

Summary

The review of literature indicated a need for further research on the comparison of alternate modes of administering an existing vocational interest inventory to students with varied reading ability. Since only three
studies related to this study were found, the literature was reviewed additionally for material that would provide theoretical and background information in the development of a framework for this study. The review of the literature was organized into five major sections: (a) vocational assessment: need and methods, (b) the measurement of interest, (c) reading ability and alternate presentations of tests, (d) trends and approaches in vocational interest tests, and (e) research on alternate modes of administering existing vocational interest inventories.

The first section, the need for and methods of vocational assessment, provided the overall context of which interest testing with inventories is a part. The importance of vocational assessment in identifying the strengths, limitations, aptitudes, and interests of clients to enable the making of more-informed choices was established. Methods of assessment, e.g. work samples and paper-and-pencil tests, were discussed in terms of characteristics, appropriateness, and role in a comprehensive vocational assessment model.

The measurement of interest section addressed the historical perspective of interest testing, characteristics of interest, expressed vs. inventoried interest, purpose and application of interest measurement, and criteria for item selection. The research showed significant advances in the study of interest since its earlier beginnings in the
1920's, as well as controversy. Studies were found to support both sides of the controversy concerning the predictive validity of expressed vs. measured interest, with the research being inconclusive. Also, interest inventories were researched and discussed in terms of various counseling applications, research with groups, and more recently, its usefulness in occupational orientation and exploration.

The research in the third section examined the readability level of interest inventories, theories of reading comprehension, and alternate presentations and their effects on comprehension. The literature firmly established the need for instruments to be written at the reading level of the clients for which the instrument is intended. Unfortunately, the only research on reading levels found was done in the 1940's and 1950's, therefore no research on current instruments was discovered. Research on reading comprehension focused on the necessary skills—word perception (decoding) and literal comprehension—for obtaining valid results in interest testing. Also cited was research that supported the use of alternate presentations—auditory, visual, and audio-visual—that enhance one's comprehension, especially if it compliments their cognitive (learning) style.

In the trends and approaches in interest testing section, research investigated the impact on interest testing
by recent legislation, government publications, and psychological theories. More specifically, these factors included: (a) legislation supporting the handicapped and disadvantaged, (b) legislation for the elimination of sex bias, (c) the structure of the Dictionary of Occupational Titles, and (d) Holland's occupational classification system. The literature also provided descriptions, research reports, and reviews of several alternate interest tests, e.g. PIC, PIES, R-FVII, VISA, WRIOT, PII, and GPII.

The final section dealt with the research studies most closely associated with the study. The studies by Blake, Holve, and Roberts compared alternate methods of administering existing vocational interest inventories. Recommendations and insight, gleaned from these studies, formed the basis of this research study.


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CHAPTER III

METHODS AND PROCEDURES

Initially, 272 eighth-grade students from nine three-year middle schools in the Northeast Texas region were involved in the study. Due to schedule changes, class absences, and school transfers, forty-two students were unable to complete the research study's testing program. This resulted in a net sample size of 230 students (N=230), who were considered in the study's statistical analysis of the data.

The 230 participants consisted of 187 males and forty-three females, ranging in ages from thirteen to fifteen years. Ten per cent of this sample (n=23) were from a minority population. The reading achievement scores from the previous year's administration of either the Iowa Test of Basic Skills or California Achievement Test were available for each of the 230 participants. The reading score data were a prerequisite for participation in this study.

The students attending the middle schools were generally from middle socioeconomic families; few came from families of great wealth and few lived in poverty. All students were part of an one-semester career exploration oriented course; eighty-nine students were enrolled in Occupational Orientation, and 141 were in Exploratory Industrial
Arts. Both of these courses list career exploration and investigation by students as a primary goal. Therefore, the administration of a vocational interest inventory as a class activity was integrated readily into the curriculum of these courses.

Description of Instruments

Five instruments were used to gather data in this research study. Two achievement test were used to determine reading levels of students and three versions of an interest inventory were utilized to collect student interest data. Each of these five instruments are described in the following narrative.

Interest Inventories

Strong-Campbell Interest Inventory (Form T 325). The SCII is the 1974 combined-sex edition of the men's and women's blanks of the Strong Vocational Interest Blank, an interest inventory that has the longest history of any psychological test in widespread use today (4). The inventory is intended to aid in making educational and vocational choices and in identifying occupations of greatest job satisfaction.

The SCII test booklet consist of 325 items, grouped into the following seven sections or subtests: Part I, Occupations (131 occupational titles); Part II School Subjects (thirty-six titles); Part III, Activities (fifty-one
items); Part IV, Amusements (thirty-nine items); Part V, Types of People (24 items); Part VI, Preference between Two Activities (30 items); and Part VII, Characteristics (fourteen items). A set of instructions proceed each of these sections. For parts I through V, the examinee indicates like (L), indifferent (I) or dislike (D) to each of the items. The examinee indicates preferences between paired statements in Part VI by marking left (L), if the left statement is preferred; right (R); or equal (=), if can't decide or if both statements are equally liked. Part VII requires a yes (Y), undecided (?), or no (N) answer to each of the personal characteristic items (5).

The examinee responds to each of the 325 items by "bubbling" in responses on a machine-scored answer sheet. A computer scans the answer sheets and generates a profile sheet for each examinee. An examiner can administer the tests and answer sheets to a group or an individual.

The responses result in the following types of scores: (a) six general occupational themes, based on Holland's classification system; (b) twenty-three basic interest scales; (c) 124 occupational scales, for both sexes; and (d) nine administrative and special indexes. These scores are presented on a profile sheet with standard scores and percentile bands, which indicate the percent of agreement between the examinee's responses and the responses of individuals in particular occupational fields.
Campbell states the reading level for the SCII is at about the sixth-grade level, but recommends it not be administered below the eighth-grade level (4, p.21). Botterbusch notes the occupations covered in the inventory are of a semi-professional and professional nature and the test should be used with individuals having potential for advanced training. He also notes the Strong has been used for years in counseling and has stood the test of time so it has become so widely accepted that it is the standard by which other interest measures are judged (1).

The SCII manual (4) presents test-retest data for the basic interest scales and occupational scales for two weeks, thirty days and three years. The median correlation ranges were mostly in the high .80's and low .90's. The SCII was said to be valid because it is based on the Strong Vocational Interest Blank, for which there is substantial validity data. See Appendix B.

Audio-visual interest inventory. The AVII, patterned after the SCII (Form T 325), was developed originally by Roberts (15) as part of his 1980 research study. This instrument consisted of 325 slides considered the most appropriate for the representation of each SCII statement, selected from a collection of 800 slides by a panel of judges. For statements in Part VI. Preference Between Two Activities, the slides were constructed using a split-screen
technique to enable slides representing the left (L), equal (=), and right (R) response choices to be depicted in a single slide. Slides with headings and instructions, in block-lettered form and identical to SCII content, preceded each part of AVII.

Prior to the initial administration of the AVII, Roberts submitted the slides to a panel of judges. The panel, consisting of authorities in photography and journalism, determined that ninety-five percent of the slides were good graphic representations of the items described in the SCII booklet.

In field testing the AVII, Roberts found no significant difference at the .05 level between the AVII and SCII. It was conjectured from this limited field test that the AVII was comparable to the SCII test-retest reliability. The content validity of the AVII should be equal to the SCII since the content is the same.

The AVII instrument used in this study was a modified version of Roberts' original AVII. The slide and visual content remained the same. The modifications were in the length of administration time and in the audio presentation.

Originally, Roberts divided the AVII into four segments, each consisting of a slide and audio-cassette with running times of twenty-two, seven, twenty, and eleven minutes, respectively. The net total administration time was sixty minutes. Each of the slides in the carousel were cued
to advance automatically so each slide would project approximately ten seconds or seven seconds after the completion of the verbal statement. Slides with titles and instructions were advanced immediately following their narration.

In Roberts' study, the AVII was administered over two days. The first half of the AVII took twenty-nine minutes to administer in class the first day and the remaining part of the AVII ran for thirty-one minutes the following day.

For permission to conduct the present study to be secured, the school districts required each administration of the AVII to be limited to a single fifty to fifty-five minute class period. Roberts' AVII was modified to meet this time constraint by making the following three changes: (a) the projection time of each slide was reduced from a total of ten seconds to seven seconds, accounting for a fourteen minute reduction in administration time; (b) slides were placed in three carousels instead of four, eliminating a tray change; and (c) a single audio-cassette replaced the four separate tapes, eliminating cassette change time.

The justification for the modification of projection time for each slide was found in the literature. Three findings which supported the modification were: (a) Roberts' anecdotal notes showed comments by students as to their preference for slides to be advanced more quickly (16); (b) commercial inventories, e.g. Picture Inventory of Careers (PIC), advance slides at eight-second intervals
without commentary (18); and (c) the SCII test booklet asked participants to work rapidly, not to think over possibilities, and to give the first answer that comes to mind (5).

The audio-cassette tape, which accompanied the visual portion of the AVII, contained a verbatim verbalization of the instructions and items in the SCII test booklet. An adult male was used to produce the narrative on the tape. Prior to the actual study, the audio of the AVII was pilot-tested to ensure that the clarity, diction, and inflection of the narrators' voice facilitated listening and auditory comprehension. The audio-cassette was then synchronized to the carousels by embedding an inaudible 1000 Hz tone which would cue the slide carousels to advance.

The final modified AVII used in this study consisted of a single audio cassette and three slide carousels. The three carousels were composed in the following manner: Carousel I contained Part I. Occupations, (136 slides); Carousel II consisted of Part II. School Subjects, Part III. Activities, and Part IV. Amusements (130 slides); and Carousel III contained Part V. Types of People, Part VI. Preferences Between Two Activities, and Part VII. Your Characteristics, (seventy-two slides). The total administration time for the AVII was forty-six minutes.

The students recorded responses to the AVII on score sheets identical to those used for the SCII. The computer scanned the answer sheets and generated student profile sheets.
Auditory interest inventory. The AII was a verbatim verbalization of the SCII. Essentially, the audio-cassette tape used in the AVII was the same tape used to administer the AII. Like the AVII, the total administration time was forty-six minutes. Students used the same type of answer sheets used for the SCII. Likewise, the sheets were computer-scanned and a profile sheet generated.

Achievement Tests: Reading

Reading ability of the student was one of the factors considered in this research study. To ascertain the reading ability of the students involved in study, total reading scores for each student were obtained from school records. The students' total reading score was equal to his or her national percentile ranking for vocabulary and reading comprehension scores on achievement tests. Within the previous year, students were administered either the California Achievement Tests or the Iowa Test of Basic Skills, depending upon the school district enrolled in. Both of these batteries of achievement tests have considerable amounts of normative data and technical reports testifying to their validity and reliability. Each of these tests are described in the following text.

California Achievement Tests (CAT). The CAT, Form C (CAT/C), level 18 is used for grade ranges 7.5 to 9.9. The reading tests include: (a) reading vocabulary--same
meaning, opposite meaning, and multi-meaning; and (b) reading comprehension—literal, interpretive, and critical. The scores from these tests are used to compute the total reading score. These scores represent only three of the twelve scores supplied by CAT/C level 14. Other areas evaluated are spelling, language, and mathematics. For each of these areas, total scoring included the following representative scores: raw score, obtained grade equivalent, anticipated achievement grade equivalent, obtained scale score, national percentile rank, and national stanine (17). The national percentile rank of the student's total reading score was used to determine one's placement in high or low reading groups in this study. The test was administered within the previous year prior to the study.

The validity of the CAT is based upon earlier versions, which have been tested and reviewed since its 1943 edition. Criterion validity has been established in conjunction with the Prescriptive Reading Inventory. Several curriculum specialist have participated in the development and evaluation of the CAT.

Iowa Test of Basic Skills (ITBS). The ITBS, Form 8, level 9-14 is used for grades three through nine. It yielded fifteen scores for each student in six categories, i.e. vocabulary, reading comprehension, language, work-study skills, mathematics skills, and composite. The total scores for each area included; raw score, grade equivalent,
national percentile rank, national stanine, local equivalent rank, and local stanine, (13). Students administered the ITBS within the previous year were placed in either Group I (high readers) or Group II (low readers), on the basis of their individual total reading national percentile ranking.

The validity of the ITBS is based on forty years of continuous research by curriculum and test and measurement specialist. The composite reliability of all the grades measured is is a very high .97 to .98. Internal consistency reliability coefficients for the main areas range from .89 to .96.

Procedures for Collecting the Data

In this study, each of the twelve participating classes were placed in one of four treatment groups—Set A, Set B, Set C, or Set D. Two factors were considered prior to treatment group selection. These were: (1) the time a class was scheduled; and (2) the number of good readers and poor readers in a class. In order to ensure a balance of administration times, a minimum of one morning class and one afternoon class were included among the three classes composing each treatment group. The total reading scores for each student were obtained from the ITBS or CAT computer printout found in the school's permanent record file. These were used to ascertain the reading ability of students enrolled in each class. After the composition of the
classes was determined, each class was assigned so an
approximately equal distribution of good readers and bad
readers composed each treatment group.

Initially, students in Set A, B, and C were adminis-
tered the SCII in a fifty or fifty-five minute class
period. Students requiring additional time to answer the
SCII were allowed to complete it after class. Set D was
administered the AII.

After two weeks, each of the treatment groups was
administered one of the interest inventories, as follows:
Set A, the SCII; Set B, the AII; Set C, the AVII; and Set D,
the AVII. Students absent during the initial administration
were either excused from the second administration or
allowed to take it. The scoring results of students who
participated in only one administration were excluded in
the analysis of data.

Procedures for Treating the Data

Prior to being computer-scanned and scored, the answer
sheets for both interest inventories taken by the student
were coded with additional information. This included:
date of administration, mode of administration, sex of
student, student's ITBS or CAT total reading score, school,
class period, and student number. The blanks provided on
the answer sheet for specific information were used to code
information other than what was originally intended. For
example, "Sophomore" recorded under "Classification" was code for the type of test administration, i.e. All.

North Texas State University Computer Center computer-scanned the answer sheets and generated two laser-printed profile sheets (original and copy) for each of two inventories administered to the student. As the answer sheets were scanned, the raw data were stored in the computer and a data file containing student information and scale scores was created and stored on a magnetic tape.

The demographic information and basic interest scale scores, for both inventories completed by each student, were isolated into a separate file. The Statistical Package for Social Sciences (SPSS) was used to compute the absolute change score between the twenty-three basic interest scale scores of the two interest inventories taken by each student. The total absolute change score for each student was then determined.

A third computer file was created that contained only the demographic information and the total absolute change score of the twenty-three basic interest scale scores of each student. Using the information recorded in this file, a two-factor analysis of variance (ANOVA) in a four-by-two factorial design was constructed to determine whether mode of inventory and eighth-grader's total reading scores, and the interaction of the two, had a significant effect on the total absolute change score of the student's basic interest.
scale scores. Each eighth-grade student, depending upon the class in which he participated and therefore the types of inventories administered, was assigned to one of four treatment (test-retest) groups: Set A--SCII-SCII; Set B--SCII-AII; Set C--SCII-AVII; and Set D--AII-SCII (6,10). The total reading scores of each student, as recorded in the data file, were then examined. Students with total reading scores at or above the fiftieth percentile in the national norms of the ITBS or CAT were assigned to Group I (high readers) and the remaining students to Group II (low readers). Thus, eight subgroups or cells were constructed for the purpose of comparison; (a) high readers of Set A, (b) low readers of Set A, (c) high readers of Set B, (d) low readers of Set B, (e) high readers of Set C, (f) low readers of Set C, (g) high readers of Set D, and (h) low readers of Set D. Ferguson (7, p.227) notes, "in the design of factorial experiments the groups should be either of equal size or proportional." In order to equalize the groups for statistical analysis, students were randomly dropped from the larger cells using the table of random numbers and procedures outlined by Ferguson (7, 8). Each subgroup or cell contained twenty-five students (n=25).

These same procedures were repeated for constructing a second two-factor ANOVA. The only difference between this two-way ANOVA and the first one was the criteria for Group I
(high readers) and Group II (low readers) selection. Students comprising these groups were a minimum of one-half standard deviation above or below the fiftieth percentile ranking (mean), respectively. Each subgroup or cell consisted of seventeen students (n=17).
CHAPTER BIBLIOGRAPHY


CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Initially, students participating in this research study were assigned to one of the four test-retest groups and were administered either the Strong-Campbell Interest Inventory (SCII) or audio interest inventory (AII). After two weeks, the students in each of the four groups—Set A, Set B, Set C, and Set D—were retested using the SCII, AII, AVII, and AVII, respectively. The students' answer sheets used in these test-retest inventory administrations were computer-scanned. The responses were interpreted by the computer to generate interest profile sheets for each of the interest inventories completed by the testing participants. The twenty-three interest scale scores and demographic information were isolated for statistical analysis. See Appendix C for an example of an interest profile sheet.

A computer program using the Statistical Package for the Social Sciences (SPSS) was written to analyze the data which included: student identification; student sex; ITBS or CAT total reading score; method of test-retest inventory administration; and each of the twenty-three basic interest scale scores. An absolute change score for each of the
twenty-three basic interest scale scores was computed between each student's two interest profile sheets. These absolute change scores for each of the basic interest scores were totaled to produce a total absolute change score for the entire twenty-three basic interest scale scores of each student. The computer program is found in Appendix D. Appendix E contains the data which were analyzed in this research study.

This research study employed 4x2 factorial designs with test-retest inventory administration methods (Set A-SCII and SCII retest, Set B-SCII and AII, Set C-SCII and AVII, and Set D-AII and AVII) as one variable and reading level (Group I-high readers, and Group II-low readers) as the other. The dependent variable or criterion was the mean total absolute change score. The results of separate two-way analysis of variance procedures disclosed a significant difference between the two reading levels, with high readers producing much lower absolute change scores, thus indicating less change between their responses on inventory administrations. For example, one analysis of the data found this significance of reading levels: \( F = 6.316, \text{df}=1/128, p < .02 \). There was no significant difference between test-retest administration methods (Set A......Set D) on the criterion nor was there significant interaction between the reading level of students and test-retest inventory administration methods.
Results of Two-Way Analysis of Variance on 4 x 2 Factorial Designs

The procedures for this research study outlined two statistical procedures for analyzing the data to test the hypotheses. Each of these statistical procedures utilized 4 x 2 factorial designs with equal cell frequencies. The composition of the reading level groups and the number of group participants represented the difference between the procedures. Students comprising the reading level groups were selected on the basis of their CAT or ITBS total reading score in relationship to the fiftieth percentile (national mean). The results of two different analyses are disclosed in the following discussion.

Two-Way ANOVA for Group I- High Readers (> 50) and Group II- Low Readers (< 50)

Diagram of factorial design. Table 1 shows a 4 X 2 factorial design in which the two reading levels are: Group I (high readers), who scored at or above the fiftieth percentile on the CAT or ITBS; and Group II (low readers), who scored below the fiftieth percentile on the CAT or ITBS total reading tests. Each of the eight cells has a sample size of twenty-five (n=25) resulting in a total population of 200 (N=200). The mean total absolute change scores for each test-retest inventory administration method are
indicated at the bottom of each column—103.62, 120.24, 125.02, 111.48, respectively. The total mean for Group I

| TABLE I |
| DIAGRAM TO CORRESPOND TO 4 X 2 FACTORIAL DESIGN |
| USING GROUP I - HIGH READERS ( > .50 ) AND GROUP II - LOW READERS ( < .50 ) |

<table>
<thead>
<tr>
<th>Test/Retest Inventory Administration Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Level</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Group I- (High)</td>
</tr>
<tr>
<td>n = 25</td>
</tr>
<tr>
<td>Group II- (Low Readers)</td>
</tr>
<tr>
<td>n = 25</td>
</tr>
<tr>
<td>X = 103.62</td>
</tr>
<tr>
<td>n = 50</td>
</tr>
</tbody>
</table>

(high readers) is 107.01 and for Group II (low readers), 123.17. The overall grand mean for this factorial design is 115.09.

**Summary table.** The results of the two-way analysis of variance, used to test the effects of reading levels and test-retest inventory administration methods and the interaction between these on the total absolute change scores of the basic interest scales, are found in Table II. Reading levels were found to be significant, with Group I (high
readers) indicating more similar responses on the twenty-three basic interest scale scores ($F=6.316$, $df=1/192$, $p<.02$). There was no significant difference at the .05 level between the four test-retest inventory administration methods on the criterion ($p>.09$), nor was there a significant interaction between reading level and test-retest inventory administration methods ($p>.16$).

Two-Way ANOVA for Group I-High Readers (> .55) and Group II- Low Readers (< .45)

In this analysis procedure, students with reading scores within one-half standard deviation of the mean of the
CAT or ITBS total reading score were deleted from the data file. This was done to create more distinct high and low reading level groups by eliminating students whose scores could possibly fluctuate within that range on a given test day.

Table III shows the means of the cells with seventeen participants per cell (n=17) and a total population of 136 (N=136). The means for each test-retest method and the

<table>
<thead>
<tr>
<th>Table III</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIAGRAM TO CORRESPOND TO 4 X 2 FACTORIAL DESIGN USING GROUP I - HIGH READERS ( &gt; .55 ) AND GROUP II - LOW READERS ( &lt; .45 )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test/Retest Inventory Administration Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Level</td>
</tr>
<tr>
<td>Group I- (High)</td>
</tr>
<tr>
<td>n = 17</td>
</tr>
<tr>
<td>Group II- (Low Readers)</td>
</tr>
<tr>
<td>n = 17</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>n = 34</td>
</tr>
</tbody>
</table>

means for reading score levels are recorded on the table. The grand mean for this analysis was 113.43.
Summary table. Table IV reiterates the analysis discussed earlier for Table II. Reading levels (p<.03) are the only variable that is significant at the .05 level of significance. There was no significant difference at the .05 level between the test-retest inventory administration methods on the total absolute change scores for the basic interest scales (p>.41), nor was there significant interaction between reading level and test-retest administration methods (p>.57).

**Additional Statistical Analysis and Results**

In addition to the statistical analysis outlined in the procedures and described previously, two other 4 X 2 factor-
ial designs with unequal cell frequencies were analyzed. In these designs, Group I (high readers) and Group II (low readers) contained all available cases which met the criteria for group selection (N=230). In the first of these analyses, Group I consisted of all students achieving a minimum of fifty percent on either the CAT or ITBS total reading scores and Group II consisted of students receiving a maximum score of forty-nine percent. The second analysis deleted all students who had scored within one-half standard deviation of the mean (.45 to .55). The regression approach for the two-way analysis of variance was used because it adjusted for the interaction effects. See Appendix F, Table V for the first factorial design with unequal cell frequencies, and Appendix F, Table VII for the second factorial design.

The results of these two 4 X 2 factorial designs with unequal cell frequencies disclosed that reading levels were significant at the .01 level (p<.01). There was no significant difference at the .05 level between the four test-retest inventory administration methods nor a significant interaction between the test-retest inventory administration methods and reading levels on the total absolute change scores of the twenty-three interest scales. See Appendix F, Table VI for the summary table of the analysis of the first factorial design with unequal cell frequencies, and Appendix F, Table VIII for the second factorial design.
Summary of Data Analyses and Implications on Hypotheses

The hypotheses were tested at the .05 level of significance. The first hypothesis stated there would be no statistical difference between the total means of Group I (high readers) and Group II (low readers) on the total absolute change scores for the twenty-three basic interest scale scores. The analysis of the data showed levels of significance ranging from \((p<.02)\) to \((p<.01)\) for the two-way ANOVAS conducted on the four \(2 \times 4\) factorial designs. The level of significance was below the .05 level, so the null hypothesis was rejected. Thus it was found that reading level had a significant effect on the total absolute change scores on the basic interest scales. The data indicated Group I (good readers) had more similar responses on retest than Group II (low readers).

The second hypothesis that stated there would be no statistical difference between the means of Set A-SCII and SCII retest, Set B-SCII and AII, Set C-SCII and AVII, and Set D-AII and AVII, on the total means of the total absolute change scores, was retained. The levels of significance found during analysis of the data ranged from \((p<.10)\) to \((p>.41)\), which were insufficient for the rejection of the null hypothesis.

The analysis of the data disclosed no significant interactions at the .05 level. Therefore, the third hypoth-
esis that there would be no significant interactions between reading levels and methods of test-retest inventory administration on the total absolute change scores, was retained. The analysis of the data showed levels of significance ranging from \( p < .17 \) to \( p > .57 \), thus the null hypothesis was retained.

Subjective Data

While administering the interest inventories to the students, the test administrator recorded anecdotal notes of observations. Additional subjective data were received from classroom instructors, who polled students concerning the inventories administered to them. The accumulated subjective data offers a wealth of comparative information for evaluating the merits of the various interest inventory administration methods. A summary of this subjective data is listed below.

1. The AII and AVII interest inventories established a pace which required students to follow in order to complete the answer sheets properly. This was seen as an advantage because the students did not have to be conscious of time limits and the pace they must maintain to complete the inventory. Also, these instruments required the students to work on the inventory for an entire forty-five minute period. One student remarked, "If we're all going to have to
work on this for the entire class, I might as well do it right."

2. Both the AII and AVII allowed students to hear, or hear and see a particular test item at the same time. In the classes which were predominantly boys, students had to be occasionally reprimanded for reacting to occupations or activities typically sex-stereotyped as being female. The eighth-grade students sex-stereotyped certain occupations and activities. Oral reactions to the audio and audio-visual stimuli were discouraged. There was less of a problem in classes where there was a higher representation of females. One instructor suggested administering the AII in a language laboratory where students could sit in individual study carrels and wear head phones. This would help limit the influence of peer pressure on student responses.

3. Students in each of the test-retest groups were polled by instructors as to their preference of inventory administration methods. These polls took place the day after students completed the retest. Eighty-six percent of the students, in Set B-SCII and AII, preferred the audio interest over the printed SCII. In Set C-SCII and AVII, ninety-four percent of the participants preferred the audio-visual interest inventory as opposed to six percent who preferred the SCII. Eighty-nine percent of the students participating in Set D-AII and AVII preferred the audio-visual interest inventory to the audio interest inventory.
4. A poll in one school district showed that eighty-five percent of the participants believed the interest inventory administered as a retest provided results most representative of their interests. The two reasons given for this phenomena were: (a) the students knew more of what to expect the second time around, and (b) preference for the AII and AVII interest inventories.

5. Students and instructors made many favorable comments concerning the use of the audio-visual interest inventory (AVII) as a career awareness activity.
SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

In recent years, there has been an increased emphasis placed on educators and counselors in preparing individuals in career decision-making. Career guidance programs have been developed to address this concern. One of the integral components of these career guidance programs is the vocational interest inventory.

The problem addressed by this research study was the inability of current interest inventories to accurately measure the vocational interests of students who have low reading ability. Although it can be assumed that interest inventories cannot reflect a students' interests if they cannot read or comprehend the inventory, little research and development have been done to address the problem.

The purposes of this study were (1) to ascertain the total absolute change scores between student' basic interest scale scores on the Strong-Campbell Interest Inventory and like scores on the audio and audio-visual interest inventories, (2) to ascertain if a statistically significant relationship exists between students with high reading ability and students with low reading ability, when different
test-retest inventory administration methods are used, (3) to isolate and evaluate the effect of the auditory administration method versus the standard and audio-visual administration methods, and (4) to ascertain the validity and reliability of the audio interest inventory (AII), and the audio-visual interest inventory (AVII), which are based on the Strong-Campbell Interest Inventory (SCII).

The review of the literature revealed a need for further research in the comparison of different methods of interest inventory administration and their relationship to students with varied reading abilities. Only three studies were found that addressed the problem of comparing different methods of administering an existing vocational interest inventory. The review of literature was organized into five major sections in order to provide theoretical and background information to develop and execute this research study. The literature disclosed inconclusive research results concerning (1) the predictive validity of expressed versus inventoried interests, (2) the value of audio, audio-visual and other alternative methods of presenting information for comprehension by students of low reading ability, and (3) the validity and reliability of recently developed inventories which use alternate methods of inventory administration.

The literature soundly supported (1) the need for reading comprehension on the part of individuals being admin-
istered an interest inventory, (2) the value of vocational interest inventories in vocational assessment and career guidance programs, and (3) the need to research and develop vocational interest inventories that are valid and reliable in assessing the interest of students with low reading ability. In addition, the literature provided a historical perspective as well as recent trends in the use and development of interest inventories.

The procedures for the collection of the data involved using 230 students from nine middle schools in two independent school districts in the Northeast Texas region. The students from an entire classroom were assigned to one of four test-retest inventory administration method groups; Set A-SCII and SCII retest, Set B-SCII and AII, Set C-SCII and AVII, and Set D-AII and AVII. Initially, students participating in Sets A, B, and C were administered the SCII, while participants in Set D took the AII. After two weeks, inventories were administered to the students in the test-retest sets as follows: Set A, the SCII, Set B, the AII, Set C, the AVII; and Set D, the AVII. The answer sheets used in the inventory administrations were coded to provide student identification, sex of student, ITBS or CAT total reading score (percentile), and test-retest inventory administration group. A computer scanned the answer sheets, generated interest profile sheets reflective of student responses, and created a file consisting of demographic information and the
interest scales for each student's interest inventory results.

The research study utilized, a 4 X 2 factorial design with reading levels, determined by CAT or ITBS total reading scores in relation to the national mean (Group I-high readers and Group II-low readers), as one of the independent variables. The other independent variable was the test-retest inventory administration method (Set A-SCII and SCII, Set B-SCII and AII, Set C-SCII and AVII, and Set D-AII and AVII). The criterion or dependent variable was the mean total absolute change score for the twenty-three basic interest scale scores.

A two-way analysis of variance procedure was used to test for significant main effects and interactions between the independent variables in the 4 X 2 factorial designs with equal cell frequencies. Two sets of analyses were conducted with the differences being (1) the composition of Group I (high readers) and Group II (low readers), and (2) the number of participants per cell. In the first data analysis, Group I consisted of students who achieved a minimum of fifty percent on the ITBS or CAT total reading score while students achieving less than fifty percent composed Group II. Twenty-five students (n=25) were in each of the eight cells of the 4 X 2 factorial design. The second statistical analysis was similar, but all students achieving forty-five to fifty-five percent on the total reading score
were deleted from analysis. Each cell contained seventeen students (n=17). A random delete procedure was used to obtain equal cell frequencies.

Findings

Three null hypotheses were formulated for this study. Each of the hypotheses was tested at the .05 level of significance using a two-way analysis of variance.

The first hypothesis formulated for the study stated there would be no statistical difference between the total means of Group I (high readers) and Group II (low readers) on the total absolute change scores for the twenty-three basic interest scale scores. Separate analyses of the data produced significance levels ranging from p<.02 to p<.01. For example, one analysis produced the following results: (F=6.316, df=1/192, p<.02). This was sufficient to reject the null hypothesis and accept the alternate hypothesis: there would be a significant difference between the total means of Group I (high readers) and Group II (low readers) on the total absolute change scores for the twenty-three basic interest scale scores. Students in Group I (high readers) exhibited significantly less change between the initial administration and subsequent retest than did Group II (low readers).

A second null hypothesis stated there would be no significant difference between the means of Set A- SCII and
SCII retest, Set B-SCII and AII, Set C-SCII and AVII, and Set D-AII and AVII. The analysis of the data disclosed levels of significance ranging from p<.10 to p>.41, for example (F=2.174, df=3/192, p=.092). The null hypothesis was retained, since it was insignificant at the .05 level.

A third hypothesis stated there would be no significant interactions between reading levels and methods of test-retest inventory administration on the total absolute change scores. The analysis of the data disclosed levels of significance from p<.17 to p>.57, as an example (F=1.734, df=3/192, p=.161). The analysis of the data indicated the null hypothesis should be retained.

Conclusions

Based on an extensive review of the literature, observations noted during the data collection procedure, and an evaluation of the findings in light of the assumptions and delimitations of the study, the following conclusions were drawn.

1. Only limited research has been done using alternate administration methods of known and validated conventionally administered interest inventories.

2. A large percentage of the participants in the study preferred the audio and audio-visual administration methods over the conventional inventory administration method. A majority of the students to whom were administered both the
audio interest inventory (AII) and audio-visual interest inventory (AVII), preferred the audio-visual administration. For all three methods of inventory administration, the most common complaint by the eighth-grade participants was the length of the inventory. Less complaints were voiced for the AVII than the AII, and the AII than the SCII.

3. The audio-visual interest inventory was noted by both instructors and students as a good activity for developing career awareness.

4. The audio interest inventory and audio-visual interest inventory set a pace for participants to record their responses. This was advantageous because all students within a group recorded answers simultaneously. This did not provide an opportunity for disruptive behavior by students who completed answer sheets earlier, as in a self-paced conventionally-administered inventory. A disadvantage was peer pressure could possibly affect an individuals response to the audio or audio-visual stimuli.

5. Contrary to the efforts of educators to eliminate sex bias and sex-stereotyping in occupational information, the eighth-grade students exhibited verbal and nonverbal reactions to activities and occupations which were typically sex-stereotyped as being masculine or feminine. It was concluded that efforts to eliminate sex-bias in education do not outweigh the impact of sex-bias and sex-stereotyping influences outside the classroom environment.
6. It was concluded that students in career-oriented courses with good reading comprehension scores would respond more consistently in test-retest situations than low readers.

7. Although students of both high and low reading ability demonstrated preferences toward alternate administration methods, there was no statistically significant evidence that the use of audio and audio-visual administration methods compared to conventional administrations resulted in more consistent results by low readers. There was no statistically significant interactions disclosed between good readers and low readers on any of the different modes of inventory administration. These results were contrary to the works of Day and Beach, and also Dale, who assumed students with low reading ability would comprehend more effectively those materials presented in an audio-visual format. The results were supportive of arguments by Duker that poor readers are poor listeners.

8. Since there was no significant difference between the results of the test-retest inventory administration method groups, it was conjectured that the AII and AVII are comparable to one another, and the SCII, in test-retest reliability and content validity.

Recommendations

Based on the findings and conclusions, the following recommendations are presented.
1. A split-screen slide presentation technique could be used to present both a male and female representative in each occupation and activity depicted in the audio-visual interest inventory. This could possibly offset the participants preconceived sex-stereotyping of occupations and activities.

2. An additional research study should be conducted using a test-retest design; e.g. the SCII-SCII, the AII-AII and the AVII-AVII with students of low and high reading ability.

3. A research study comparing the responses of students using an audio or audio-interest inventory in a group classroom environment versus group testing in an audio or audio-visual carrel environment (e.g., foreign language laboratory).

4. The development of an audio-visual interest measuring instrument that would coincide with the average attention span, and reading level of the eighth-grade student. It should be based preferably upon an existing instrument that has well established normative data as well as known validity and reliability.

5. Counselors should become aware of the reading level of students so they can exercise care in the selection and interpretation of interest measuring instruments and results. Meaningful vocational assessment is not possible if participants do not understand or comprehend an instrument's instructions and contents.
APPENDIX A
# REVIEW OF VOCATIONAL INTEREST INVENTORIES

<table>
<thead>
<tr>
<th>NAME/ADDRESS</th>
<th>COST</th>
<th>DESCRIPTION</th>
<th>DISABILITY POPULATION</th>
<th>ADMIN. SCORE</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative Career Search</td>
<td>Sound film strip</td>
<td>150.00</td>
<td>Include 200 answer sheets, 38x ea.</td>
<td>All, especially 14 and older except blind</td>
<td>X 40 min. X X</td>
</tr>
<tr>
<td>AAMD Reading-Free Vocational Interest Inventory</td>
<td>$1.25 per form</td>
<td>Separate male/female forms. Most liked of three pictures is circled</td>
<td>MR 14+</td>
<td>X 10-15 min. X 10 min.</td>
<td></td>
</tr>
<tr>
<td>Geist Picture Interest Inventory</td>
<td>Kit (10)</td>
<td>Separate male/female forms. Selects 1 out of three pictures showing jobs on activities. Read questions under pictures</td>
<td>LD, ED; 4th grade reading level</td>
<td>X 10-20 min. X 5-10 min.</td>
<td></td>
</tr>
<tr>
<td>Picture Interest Exploratory Survey</td>
<td>Initial: $150.</td>
<td>Series of slides showing hands working. Student circles number of pictures they like on answer sheet.</td>
<td>LD, ED, High EMR, Deaf</td>
<td>X 10 min. X</td>
<td></td>
</tr>
<tr>
<td>Vocational Interest and Sophistication Assessment (VISA)</td>
<td>Initial: $7.00</td>
<td>Measures interest and job knowledge of retarded persons. Pictures are presented in booklet and examiner asks questions of student about the picture</td>
<td>MR 14+</td>
<td>X 15 min. X 15 min.</td>
<td></td>
</tr>
<tr>
<td>Program for Assessing Youth Employability Skills (PAYS)</td>
<td>Package of 10 for $32.00</td>
<td>Measuring 3 attitudes (job-holding skills, attitudes towards supervision, self-confidence), 3 cognitive (job knowledge, job-seeking skills, reasoning vocations interest). Pictures, 4th &amp; 5th grade reading level.</td>
<td>High EMR, Deaf, LD, ED, Blind (mod), Disadv, 14 yrs, 4th &amp; 5th gr, reading level</td>
<td>X 1.2 hr. X 15 min.</td>
<td></td>
</tr>
<tr>
<td>Vocational Education Special Education (VESEP): Interest Scramble Board</td>
<td>App. $25.00</td>
<td>Parts of several resources designed for teacher use. Two packets of 50 pictures are arranged on a board (5 squares by 10 squares) from most liked to least liked.</td>
<td>EMR, Deaf, ED, LD, OH</td>
<td>X 30-60 min. X 18-20 min.</td>
<td></td>
</tr>
</tbody>
</table>

*Machine Scored*
<table>
<thead>
<tr>
<th>NAME/ADDRESS</th>
<th>COST</th>
<th>DESCRIPTION</th>
<th>DISABILITY</th>
<th>POPULATION</th>
<th>GP</th>
<th>TIME</th>
<th>HAND</th>
<th>M^*</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational Interest Screening: VALPARTHY VALPAR Corporation 3801 E. 34th Street Tucson, AZ 85721</td>
<td>Initial cost approx. $3,100.00</td>
<td>Pairs of color slides. Student circles liked picture in booklet with same picture on slide.</td>
<td>EMR, TMR</td>
<td>X</td>
<td>X</td>
<td>30-40 min.</td>
<td>X</td>
<td>X</td>
<td>20 min.</td>
</tr>
<tr>
<td>Wide Range Interest Opinion Test (WRIOT) Jacak Assessment Systems, Inc. 1526 Gilker Avenue Wilmington, DE 19806</td>
<td>Initial cost approx. $75.00</td>
<td>Students pick pictures in a spiral booklet - most liked and most disliked &amp; circle on answer sheet. Profile on 18 occupational groups and 2 attitudes.</td>
<td>Age 6+, EMR, TMR, Deaf, LD</td>
<td>X</td>
<td>X</td>
<td>40-60 min.</td>
<td>X</td>
<td>X</td>
<td>10-15 min.</td>
</tr>
<tr>
<td>Ohio Vocational Interest Survey The Psychological Corp., 751 Third Avenue New York, NY 10017</td>
<td>Initial cost approx. $2.90 specimen set.</td>
<td>Designed to help high school students respond to job activities on a scale ranging from &quot;like very much&quot; to &quot;dislike very much.&quot;</td>
<td>Deaf, LD, ED, Blind, OH, Grades 8-12</td>
<td>X</td>
<td>X</td>
<td>90 min.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive Career Assessment Scale Learning Concepts 2551 Lamar Austin, TX 78705</td>
<td>(1) Test booklet $1.95 ea 25 profiles for $2.75</td>
<td>75 job titles on which students indicate degree of familiarity and interest on a 1-7 scale.</td>
<td>Deaf, LD, ED, Grades 3-12</td>
<td>X</td>
<td>X</td>
<td>15 min.</td>
<td>X</td>
<td></td>
<td>15 min.</td>
</tr>
<tr>
<td>California Occupational Preference System (COPPS) Educational and Industrial Testing Service P.O. Box 7234 San Diego, CA 92107</td>
<td>Manuals $2.00, 25 booklets for $13.00 Cluster Charts of 14 for $9.95</td>
<td>3 forms: COPPS-ICOPPS-R. Students asked to rate degree of interest in listed job activities.</td>
<td>LD, ED</td>
<td>X</td>
<td>X</td>
<td>90 min.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minnesota Importance Questionnaire (MIQ) Vocational Psychology Research Elliot Hall University of Minnesota Minneapolis, MN 55455</td>
<td>Around $2.00 per student, computer scored.</td>
<td>Measures vocational reinforcer needs &amp; compares to reinforcers available in job computer profile, ranking occupational groups in order of preference.</td>
<td>LD, ED, Deaf, Blind (mod), EMR (mod), Stnd. reading level</td>
<td>X</td>
<td>X</td>
<td>40-60 min.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Career Exploration Scholastic Testing Service 480 Meyer Road Bensenville, IL 60106</td>
<td>Initial: $26.00 20 for $7.50</td>
<td>Choice of pictures showing activities. Evaluates 8 career groups and 5 decision levels.</td>
<td>EMR, Deaf, LD, Grade 6-12</td>
<td>X</td>
<td>X</td>
<td>20 min.</td>
<td>X</td>
<td></td>
<td>10 min.</td>
</tr>
<tr>
<td>Career Awareness Inventory (CAI) Scholastic Testing Service 480 Meyer Road Bensenville, IL 60106</td>
<td>$13.00</td>
<td>Written statements respond to pictures. Part 1 identifies jobs &amp; workers from pictures; Part 2-awareness of edu. requirements; Part 3-juniopecific workers, etc.</td>
<td>Deaf, LD, ED, EMR (mod)</td>
<td>X</td>
<td>X</td>
<td>60-90 min.</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Directed Search Consulting Psychologist's Press 577 College Fitchburg, CA 94306</td>
<td>25 for $17.50</td>
<td>Self-administered vocational exploration. Fill out booklet &amp; obtain code. Look up jobs in an &quot;Occupations Finder&quot; booklet.</td>
<td>LD, ED, OH, Deaf, EMR (mod)</td>
<td>X</td>
<td>X</td>
<td>40-60 min.</td>
<td>X</td>
<td></td>
<td>NA</td>
</tr>
</tbody>
</table>
APPENDIX B
This inventory is used to help you understand your work interests in a general way, and to show you some kinds of work you might be comfortable in. The following pages list many jobs, activities, school subjects, and so forth, and you are asked to show your liking or disliking for each. Your answers will be compared with the answers given by people already working in a wide range of jobs, and your scores will show how similar your interests are to the interests of these people. But this is not a test of your abilities; it is an inventory of your interests. Your scores will be presented to you later, on a special sheet called a profile, with information on how to understand the scores.

Directions:
1. With this booklet, you should have a special answer sheet on which to mark your answers.
2. Please make no marks on this booklet; it will be used again by other people.
3. Use any soft, black, lead pencil (such as a No. 2) to make your marks on the answer sheet.
4. Fill in your name and other information on the answer sheet. Follow carefully the instructions for filling in your name.
5. Instructions for marking your answers are given on the next page of this booklet and also on the answer sheet.
6. Make a heavy, dark mark for each answer—not a cross or a check mark.
7. If you make a mistake or change your mind, erase carefully and thoroughly.
8. Your answer sheet will be processed by computer. Please keep it free from wrinkles or stray marks, so that it will be scored correctly.
9. Try to answer each question. Work quickly; first impressions usually give the best results with this inventory. Turn the page and begin.
Part I. Occupations

Many occupations are listed below. For each of them, show how you would feel about doing that kind of work.

Mark on the answer sheet in the space labeled "L" if you think you would like that kind of work.

Mark in the space labeled "I" if you are indifferent (that is, if you think you wouldn't care one way or another).

Mark in the space labeled "D" if you think you would dislike that kind of work.

Don't worry about whether you would be good at the job or about not being trained for it. Forget about how much money you could make or whether you could get ahead. Think only about whether you would like to do the work done in that job.

Work fast. Answer every one.

1. Actor/Actress
2. Advertising executive
3. Architect
4. Art museum director
5. Art teacher
6. Attorney
7. Astronomer
8. Astronaut
9. Author of children's books
10. Author of novels
11. Author of technical books
12. Auto mechanic
13. Auto racer
14. Auto sales
15. Bank teller
16. Beauty and haircare consultant
17. Biologist
18. Bookkeeper
19. Building contractor
20. Business teacher
21. Buyer of merchandise
22. Carpenter
23. Cartoonist
24. Cashier in bank
25. Chemist
26. Children's clothes designer
27. Church worker
28. City or state employee
29. City planner
30. Civil engineer
31. College professor
32. Computer operator
33. Corporation lawyer
34. Costumemaker
35. Criminal lawyer
36. Dancing teacher
37. Dental assistant
38. Dentist
39. Design engineer
40. Dietitian
41. Draftsman
42. Dressmaker/Tailor
43. Editor
44. Electrical engineer
45. Electronics technician
46. Elementary school teacher
47. Employment manager
48. Factory manager
49. Farmer
50. Fashion model
51. Fashion designer
52. Foreign correspondent
53. Foreign service officer
54. Free-lance writer
55. Governor of a state
56. High school teacher
57. Home economics teacher
58. Hospital records clerk
59. Housekeeper
60. Hotel manager
61. Illustrator
62. Income tax accountant
63. Interior decorator
64. Inventor
65. Jet pilot
66. Judge
67. Labor arbitrator
68. Labor relations officer
69. Laboratory technician
70. Landscape gardener
71. Librarian
72. Life insurance agent
73. Machine shop supervisor
74. Machinist
75. Manager, Chamber of Commerce
76. Manager, child care center
77. Manager, women's style shop
78. Manufacturer
79. Mechanical engineer
80. Mechanical engineer
81. Mechanical engineer
82. Minister, priest, or rabbi
83. Musician
84. Newspaper reporter
85. Nurse
86. Nurse's aide/Orderly
87. Office clerk
88. Office manager
89. Operating room nurse
90. Orchestra conductor
91. Photographer
92. Pharmacist
93. Physician
94. Physical therapist
95. Playwright
96. Poet
97. Police officer
98. Politician
99. Private secretary
100. Professional athlete
101. Professional dancer
102. Professional gambler
103. Psychologist
104. Public relations director
105. Rancher
106. Real estate broker
107. Receptionist
108. Retailer
109. Sales manager
110. School principal
111. Scientific illustrator
112. Scientific research worker
113. Sculptor
114. Secret service agent
115. Social worker
116. Special education teacher
117. Sports reporter
118. Statistician
119. Flight attendant
120. Stockbroker
121. Surgeon
122. Teacher
123. Traveling salesperson
124. Travel bureau manager
125. Typist
126. TV announcer
127. Vocational counselor
128. Waiter/Waitress
129. Wholesale buyer
130. X-Ray technician
131. YMCA/YWCA staff member

Work fast. Answer every one.
## Part II. School Subjects

Show in the same way whether you are interested in these school subjects, even though you may not have studied them. Mark "L" for Like. Mark "I" for Indifferent (when you don’t care one way or the other). Mark "D" for Dislike.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mark</th>
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<tbody>
<tr>
<td>Agriculture</td>
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<tr>
<td>Algebra</td>
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<td>Arithmetic</td>
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<tr>
<td>Ancient languages (Latin, Sanskrit, etc.)</td>
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<tr>
<td>Art</td>
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<tr>
<td>Bible history</td>
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<td>Bookkeeping</td>
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<td>Botany</td>
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<td>Calculus</td>
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<td>Chemistry</td>
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<td>Civics (government)</td>
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<td>Dramatics</td>
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<td>Economics</td>
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<td>English composition</td>
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<tr>
<td>Geometry</td>
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<tr>
<td>Home economics</td>
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<tr>
<td>Industrial arts</td>
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<tr>
<td>Journalism</td>
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<tr>
<td>Literature</td>
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<tr>
<td>Mathematics</td>
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<tr>
<td>Mechanical drawing</td>
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<tr>
<td>Military drill</td>
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<tr>
<td>Modern languages (French, German, etc.)</td>
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<tr>
<td>Nature study</td>
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<tr>
<td>Philosophy</td>
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<td>Physical education</td>
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<td>Physics</td>
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<td>Physiology</td>
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<tr>
<td>Political science</td>
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<td>Psychology</td>
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<td>Public speaking</td>
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<td>Sociology</td>
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<tr>
<td>Statistics</td>
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<tr>
<td>Zoology</td>
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</table>

## Part III. Activities

Show your interests in the same way as before. Give the first answer that comes to mind.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mark</th>
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<tbody>
<tr>
<td>Making a speech</td>
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<tr>
<td>Doing research work</td>
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<tr>
<td>Repairing a clock</td>
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<tr>
<td>Cooking</td>
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<tr>
<td>Operating machinery</td>
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<tr>
<td>Writing reports</td>
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<tr>
<td>Discussing politics</td>
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<td>Taping a sprained ankle</td>
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<td>Adjusting a carburetor</td>
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<td>Going to church</td>
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<td>Heading a civic improvement program</td>
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<tr>
<td>Raising flowers and vegetables</td>
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<tr>
<td>Interviewing job applicants</td>
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<tr>
<td>Teaching children</td>
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<td>Teaching adults</td>
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<td>Meeting and directing people</td>
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<tr>
<td>Taking responsibility</td>
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<tr>
<td>Sewing</td>
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<tr>
<td>Making statistical charts</td>
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<td>Operating office machines</td>
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<tr>
<td>Giving first aid assistance</td>
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<td>Decorating a room with flowers</td>
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<tr>
<td>Interviewing prospects in selling</td>
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<tr>
<td>Drilling soldiers</td>
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<tr>
<td>Pursuing bandits in a sheriff's posse</td>
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<tr>
<td>Watching an open-heart operation</td>
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<tr>
<td>Checking typewritten material for errors</td>
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<tr>
<td>Repairing electrical wiring</td>
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<tr>
<td>Organizing cabinets and closets</td>
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<tr>
<td>Adjusting difficulties of others</td>
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<tr>
<td>Starting a conversation with a stranger</td>
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<tr>
<td>Cabinetmaking</td>
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<tr>
<td>Being a forest ranger</td>
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</tbody>
</table>

## Part IV. Amusements

Show in the same way how you feel about these ways of having fun. Work rapidly. Do not think about various possibilities. Give the first answer that comes to mind.

<table>
<thead>
<tr>
<th>Amusement</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golf</td>
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<tr>
<td>Fishing</td>
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<tr>
<td>Jazz or rock concerts</td>
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<tr>
<td>Looking at things in a hardware store</td>
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<tr>
<td>Boxing</td>
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<td>Poker</td>
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<tr>
<td>Bridge</td>
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<tr>
<td>Solving mechanical puzzles</td>
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<td>Planning a large party</td>
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<td>Religious music</td>
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<td>Drilling in a military company</td>
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<tr>
<td>Amusement parks</td>
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<tr>
<td>Conventions</td>
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<tr>
<td>Formal dress affairs</td>
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<td>Electrocution for office</td>
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<td>Art galleries</td>
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<td>Leading a scout troop</td>
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<tr>
<td>Writing a one-act play</td>
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<tr>
<td>Symphony concerts</td>
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<tr>
<td>Night clubs</td>
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<td>Church young people's group</td>
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<td>Sports pages in the newspaper</td>
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<td>Poetry</td>
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<tr>
<td>Skiing</td>
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<tr>
<td>Business magazines</td>
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<tr>
<td>Popular mechanics magazines</td>
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<tr>
<td>Reading the Bible</td>
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<tr>
<td>Magazines about art and music</td>
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<tr>
<td>Building a radio or stereo set</td>
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<tr>
<td>Attending lectures</td>
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<tr>
<td>Family pages in newspapers</td>
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<tr>
<td>Performing scientific experiments</td>
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<tr>
<td>Camping</td>
<td></td>
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<tr>
<td>Playing chess</td>
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<tr>
<td>Preparing dinner for guests</td>
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<tr>
<td>Entertaining others</td>
<td></td>
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<tr>
<td>Trying new cooking recipes</td>
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<tr>
<td>Being the first to wear the latest fashions</td>
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<tr>
<td>Organizing a play</td>
<td></td>
</tr>
</tbody>
</table>
Part V.
Types of People

Most of us choose jobs where we can work with people we enjoy. Show in the same way as before how you would feel about having day-to-day contact with the following types of people. Work fast. Don’t think of specific examples. Just give the first answer that comes to mind.

- Highway construction workers
- High school students
- Military officers
- Artistic persons
- Foreigners
- Ballet dancers
- Nonconformists
- People who assume leadership
- Religious people
- Aggressive people
- Physically sick people
- Babies
- Very old people
- Emotional people
- People who have made fortunes in business
- Thrifty people
- Musical geniuses
- Outspoken people with new ideas
- Fashionably dressed people
- Prominent business leaders
- Athletic persons
- People who daydream a lot
- Outstanding scientists
- People who live dangerously

Part VI.
Preference Between Two Activities

Here are several pairs of activities or occupations. Show which one of each pair you like better: if you prefer the one on the left, mark in the space labeled “L” on the answer sheet; if you prefer the one on the right, mark in the space labeled “R”; if you like both the same, or if you can’t decide, mark in the space labeled “=.”

- Airline pilot
- Taxicab driver
- Headwaiter/Hostess
- Selling things house to house
- Developing plans
- Doing a job yourself
- Dealing with things
- Taking a chance
- Drawing a definite salary
- Outside work
- Work for yourself
- Superintendent of a hospital
- Vocational counselor
- Physical activity
- Dog trainer
- Thrilling, dangerous activities
- Physical education director
- Statistician
- Technical responsibility (in charge of 25 people doing scientific work)
- Going to a play
- Teacher
- Salesperson
- Experimenting with new grooming preparations
- Being married to a research scientist
- Working in a large corporation with little chance of being president before age 55
- Working in an import-export business
- Music and art events
- Reading a book
- Appraising real estate
- Having a few close friends
- Work in which you move from place to place
- Work where you live in one place

Part VII.
Your Characteristics

Here are several pairs of activities or occupations. Show which one of each pair you like better: if you prefer the one on the left, mark in the space labeled “L” on the answer sheet; if you prefer the one on the right, mark in the space labeled “R”; if you like both the same, or if you can’t decide, mark in the space labeled “=.”

- Usually start activities of my group
- Have more than my share of novel ideas
- Win friends easily
- Make decisions immediately, not after considerable thought
- Prefer working alone rather than on committees
- Have mechanical ingenuity (inventiveness)
- Am concerned about philosophical problems such as religion, meaning of life, etc.

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### OCCUPATIONS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Occupations</th>
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<tbody>
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### SCHOOL SUBJECTS

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</tbody>
</table>
APPENDIX D
SPSS Computer Program

J. Iley

ANALYSIS ON SCII DATA

ID, SEX, READSCOR, TESTMODE, PREBIS1 TO PREBIS23, POSSIBS1 TO POSSIBS23

INPUT MEDIUM CARD

VAR LABELS

ID, STUDENT ID/

SEX, SEX OF STUDENT/

READSCOR, ITBS OR CAT READING SCORE/

TESTMODE, METHODS OF TEST ADMINISTRATION/

RECODE READSCOR (45 THRU 55=0) (56 THRU 100=1) (0 THRU 44=2)

MEDIUM READERS (1) HIGH READERS (2) LOW READERS/

DIFF1=ABS(PREBIS1-POSBIS1)

DIFF2=ABS(PREBIS2-POSBIS2)

DIFF3=ABS(PREBIS3-POSBIS3)

DIFF4=ABS(PREBIS4-POSBIS4)

DIFF5=ABS(PREBIS5-POSBIS5)

DIFF6=ABS(PREBIS6-POSBIS6)

DIFF7=ABS(PREBIS7-POSBIS7)

DIFF8=ABS(PREBIS8-POSBIS8)

DIFF9=ABS(PREBIS9-POSBIS9)

DIFF10=ABS(PREBIS10-POSBIS10)

DIFF11=ABS(PREBIS11-POSBIS11)

DIFF12=ABS(PREBIS12-POSBIS12)

DIFF13=ABS(PREBIS13-POSBIS13)

DIFF14=ABS(PREBIS14-POSBIS14)

DIFF15=ABS(PREBIS15-POSBIS15)

DIFF16=ABS(PREBIS16-POSBIS16)

DIFF17=ABS(PREBIS17-POSBIS17)

DIFF18=ABS(PREBIS18-POSBIS18)

DIFF19=ABS(PREBIS19-POSBIS19)

DIFF20=ABS(PREBIS20-POSBIS20)

DIFF21=ABS(PREBIS21-POSBIS21)
470. *COMPUTE   DIFF22=ABS(PREBI22-POSBIS22)
480. *COMPUTE   DIFF23=ABS(PREBI23-POSBIS23)
490. *COMPUTE   ABSDIFF=DIFF1+DIFF2+DIFF3+DIFF4+DIFF5+DIFF6+DIFF7+DIFF8+
500.           DIFF9+DIFF10+DIFF11+DIFF12+DIFF13+
510.           DIFF14+DIFF15+DIFF16+DIFF17+DIFF18+
520.           DIFF19+DIFF20+DIFF21+DIFF22+DIFF23
530. *ANOVA     ABSDIFF BY READSCOR(1,2) TESTMODE(1,4)/
540. *STATISTICS 1,3
550. *READ INPUT DATA
560. *<INSERT>DAT-8
570. *ANOVA     ABSDIFF BY READSCOR(1,2) TESTMODE(1,4)/
580. *OPTIONS      9
590. *STATISTICS   2
600. *ANOVA     ABSDIFF BY READSCOR(1,2) TESTMODE(1,4)/
610. *OPTIONS      10
620. *STATISTICS   1,3
630. *FINISH
640. */
650. */
EOF
| Code  | Description | ... | ... | ... | ... | ... | ... | ... | ... |
|-------|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 33117 | SI1592      | 43  | 35  | 35  | 48  | 46  | 55  | 47  | 46  | 44  |
| 33117 | SI1593      | 52  | 33  | 61  | 45  | 57  | 50  | 57  | 47  | 46  |
| ...   |             | ... | ... | ... | ... | ... | ... | ... | ... | ... |

(Same table continues for 53 columns)
### TABLE V

**Diagram to Correspond to 4 x 2 Factorial Design**

Using Group I - High Readers ( > .50 ) and Group II - Low Readers ( < .50 )

--- Regression Approach ---

<table>
<thead>
<tr>
<th>Test/Retest Inventory Administration Methods</th>
<th>Set A -SCII/SCII</th>
<th>Set B -SCII/AII</th>
<th>Set C -SCII/AVII</th>
<th>Set D -AII/AVII</th>
</tr>
</thead>
</table>

**Group I** (High)

- \( n = 30 \)
- \( n = 31 \)
- \( n = 29 \)
- \( n = 25 \)
- \( n = 115 \)

**Group II** (Low Readers)

- \( n = 28 \)
- \( n = 29 \)
- \( n = 27 \)
- \( n = 31 \)
- \( n = 115 \)

\( \bar{n} = 58 \)
\( \bar{n} = 60 \)
\( \bar{n} = 56 \)
\( \bar{n} = 56 \)
\( N = 230 \)

### TABLE VI

**Summary Table for Two-Way Analysis of Variance**

Using Group I - High Readers ( > .50 ) and Group II - Low Readers ( < .50 )

--- Regression Approach ---

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>( F ) Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Level</td>
<td>1</td>
<td>16134.383</td>
<td>16134.383</td>
<td>7.433**</td>
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<tr>
<td>Administration Method</td>
<td>3</td>
<td>11677.457</td>
<td>3892.486</td>
<td>1.796</td>
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<td>Two-Way Interaction</td>
<td>3</td>
<td>6907.238</td>
<td>2302.413</td>
<td>1.062</td>
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<tr>
<td>Within Error</td>
<td>222</td>
<td>481259.000</td>
<td>2167.833</td>
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</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>229</td>
<td>516506.125</td>
<td>2255.485</td>
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</table>

** Significant at the .01 level
TABLE VII

DIAGRAM TO CORRESPOND TO 4 X 2 FACTORIAL DESIGN
USING GROUP I - HIGH READERS ( > .55 ) AND
GROUP II - LOW READERS ( < .45 )
-- REGRESSION APPROACH --

<table>
<thead>
<tr>
<th>Reading Level</th>
<th>Test/Retest Inventory Administration Methods</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Set A - SCII</td>
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<tr>
<td>Group I - (High)</td>
<td>n = 26</td>
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<tr>
<td></td>
<td>n = 93</td>
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<tr>
<td>Group II - (Low Readers)</td>
<td>n = 22</td>
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<td></td>
<td>n = 99</td>
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<td></td>
<td>n = 48</td>
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<tr>
<td>Total</td>
<td>N = 192</td>
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TABLE VIII

SUMMARY TABLE FOR TWO-WAY ANALYSIS OF VARIANCE
USING GROUP I - HIGH READERS ( > .55 ) AND
GROUP II - LOW READERS ( < .45 )
-- REGRESSION APPROACH --

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
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<th>Mean Square</th>
<th>F Ratio</th>
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<td>5581.285</td>
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<td>436081.875</td>
<td>2283.151</td>
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**Significant at the .01 level
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