1985

A Comparison Of The Career Assessment Inventory And The Strong-Campbell Interest Inventory In A Minority, High School Drop-Out Sample

David Stanton Halferty
University of the Pacific

A COMPARISON OF THE CAREER ASSESSMENT INVENTORY AND THE STRONG-CAMPBELL INTEREST INVENTORY IN A MINORITY, HIGH SCHOOL DROP-OUT SAMPLE

A Dissertation

Presented to

the Faculty of the Graduate School

University of the Pacific

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

by

David S. Halferty

May 1985

This dissertation, written and submitted by

DAVID S. HALFERTY

is approved for recommendation to the Committee on Graduate Studies, University of the Pacific

Dean of the School or Department Chairman:

Dissertation Committee:

Chairman

Dated April 18, 1985

A COMPARISON OF THE CAREER ASSESSMENT INVENTORY AND THE STRONG-CAMPBELL INTEREST INVENTORY IN A MINORITY, HIGH SCHOOL DROP-OUT SAMPLE

Abstract of Dissertation

PROBLEM: The Strong-Campbell Interest Inventory (SCII), an inventory with some validity, was directed at the professionally oriented client. The Career Assessment Inventory (CAI) appeared in 1976 as an inventory normed on the non-professional, blue-collar worker, directed at the non-baccalaureate student. There had been little research on minority, non-college oriented youth.

PURPOSE: The purpose of this study was to compare the predictive and concurrent validity of these two inventories for a drop-out, non-college oriented population. These inventories were compared for predictive validity to short-term occupational outcome, and for concurrent validity to Expressed Interest. Also, the distribution of interests across the six RIASEC themes was compared.

PROCEDURE: For the years 1977-1981, participants in the High School Equivalency Program, University of the Pacific, Stockton, CA, were interviewed to ascertain their Expressed Interests and were given either the SCII or the CAI during the first three weeks of program attendance. Following graduation, short-term occupational outcome data, or college major (if there was no occupation) were recorded. Chi-square was used to compare the inventories on hit-rates for short-term occupational outcome.

FINDINGS: No significant differences were found in the predictive validity of the CAI and the SCII to short-term occupational outcome, using inventory scale scores, expressed interest, consistency, differentiation, and cross-scale congruence, with this specific population. The distribution of interests across the six RIASEC themes of the inventories showed significant differences at the .05 level. The distributions of RIASEC categories were significantly different (.01 level) for men versus women. On the CAI, a greater proportion fell in the Conventional theme for males; the Social and Enterprising themes for females. For the SCII, a greater proportion fell in the Artistic theme for males; the Realistic and Conventional themes for females.

RECOMMENDATIONS: This study should be replicated using long-term follow-up data with minority, non-professionally oriented populations.

ACKNOWLEDGMENTS

I wish to express my deepest appreciation to the dissertation committee for specific expertise and critical analysis. Each committee member provided unique assistance: Dr. Hopkins, a dean of statistical research; Dr. Anastasio, an individual who could translate theoretical concepts into machine language and data analysis; Dr. Perry, a person who provided the natural science viewpoint plus the much needed emotional support; Dr. Phillips, for the lengthy forays into the broader social science perspective; and, to Dr. Pohlman, the person who somehow led me through the maze of requirements, indirectly teaching the subtlety of a master reseacher.

Furthermore, I wish to acknowledge my wife, Marilyn, for the continuous sacrifice of the past years as she cared for the three children. They waited patiently, without complaint, as the dissertation evolved.

And the purpose of the dissertation was to provide recognition to the HEP staff and students for their commitment to the development of broad academic skills for migrant farmworker youth.

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

TABLE OF CONTENTS
(continued)

LIST OF TABLES

LIST OF TABLES
(continued)

CHAPTER 1

THE PROBLEM, HYPOTHESES AND DEFINITION OF TERMS

There are four major ways to ascertain an individual's interests: (1) direct questioning, (2) direct observation, (3) tested interests, and (4) interest inventories (Super & Crites, 1962, pp. 377-379). For estimating in general how individuals may be expected to function in various educational and occupational settings, mechanical methods seem more promising than clinical techniques (Goldman, 1971, p. 210). When measuring a person's interest, interest inventories have proven the most fruitful, encouraging and valid approach (Mehrens & Lehmann, 1975, p. 224).

The Strong-Campbell Interest Inventory--An Inventory for the Professional Aspirant

One of the best known and most carefully researched of these inventories is the Strong-Campbell Interest Inventory (Campbell & Hansen, 1981). It appeared in its original form for men in 1927, called the Strong Vocational Interest Blank (SVIB). The women's form was published in 1933. The forms were revised in 1966 and 1969, repsectively. Due to severe criticism leveled at

interest tests in general, and at the SVIB in particular, regarding sex bias (Johansson & Harmon, 1972, pp. 404-410) there was a merger of men's and women's forms in 1974.

The Strong-Campbell Interest Inventory (SCII), in its new form, utilized Holland's theory of occupational choices (Holland, 1973) and included occupational scales normed on both men and women of all subcultures and socio-economic status groups within the same occupation (Campbell & Hansen, 1981). The SCII was rated as the best available interest inventory by Dolliver (1978) and was viewed as being as well constructed and as reliable and as valid as its predecessor versions by Johnson (1976). Only the SCII has demonstrated empirically that the results are quite reliable (in terms of long term stability) for individuals around age 25 (Mehrens & Lehmann, 1975, p. 238).

Yet there are limitations in the use of the SCII, specifically in terms of its target population. Campbell recognized the limitations of the SVIB when stating that the inventory worked best when needed least (Campbell, 1971, p. 287). The SVIB (and now the SCII) is not demonstrably useful for the individual who is unclear as to his aspirations, or who is seeking a non-professional career. The SCII is specifically suitable for older adolescents and adults considering higher levels of

professional or skilled occupations (Mehrens & Lehmann, 1975, p. 225).

The Career Assessment Inventory--An Interest Test for the Non-Professional Aspirant

In order to fill this void for an empirically based interest inventory with the strengths of the SCII, yet geared to a population for which the SCII is not suitable, the Career Assessment Inventory (CAI) was developed. As stated in the manual, the CAI was designed for individuals seeking immediate career entry or careers requiring some post-secondary education such as a technical/business school or some college training. For more professionally oriented groups, the SCII seems more appropriate (Johansson, 1976, p. 66).

The CAI was intended to be more useful for an individual with aspirations directed toward working after high school or training at the technical and community college level.

Minority Youth and Occupational Choice

A number of studies have documented the relationship between minority populations and aspiration levels in American society. In one study with a high school sample, Orta (1973) reported that the Mexican-American student expressed lower aspirations than the Anglo-American.

Cultural bias and restricted environmental opportunities depress the occupational interests and aspirations of minority groups (Berman & Haug, 1975; Cooper, 1977; Esposito, 1975). Because vocational aspirations are related to self-concept, in the sense that interests develop as a result of successful experience, it follows that if the minority student does poorly in school he is likely to hold lower career aspirations (Darley & Hagenah, 1955). The minority individual, who has not performed effectively in the educational setting, seems to be an appropriate candidate for career exploration with the CAI.

Overview of this Study

The participants in this study were farmworker youth, primarily of Mexican American background, who attended the High School Equivalency Program (HEP) at the University of the Pacific in order to attain their General Educational Development examination (GED). For this limited, specific minority population, the study will compare validity of the SCII and the CAI. Five predictor variables to the criterion, short-term outcome, will be used. One of these variables, occupational scale scores, will also be used to compare the two inventories for concurrent validity, using Expressed Interest as the criterion.

The Criteria:

Short-term outcome data in terms of jobs or further academic majors is the criterion used to measure predictive validity. Predictive studies typically used occupational entry as the criterion for prediction (Dolliver, Irvin, & Bigley, 1972; Spokane, 1979); other studies have used college majors as the criterion (Borgen, 1972; Hansen & Swanson, 1983) of prediction for the SCII. The present study replicates the predictive criteria of past studies, with the additional dimension of a second interest inventory for comparison.

There are three reasons for interpreting this short-term outcome data with extreme caution:

a) A majority of students show a sporadic and inconsistent occupational record because of low availability of job choices, hence jobs chosen may reflect necessity of doing something rather than interest expression.

b) A number of students have high aspirations and low basic skills. The majority of students enroll at the community college or other specialized training programs specifically targeted for farmworker youth. While expectations may have improved markedly, academic skills and appropriate levels of discipline may not match up. Thus, the students enroll in the community college only to

once again experience failure--a familiar pattern to the high school drop-out before entering HEP.

c) The youthfulness of the sample (primarily in the 17 to 19 age range) suggests that career plans may not be crystallized. Holland and Campbell have both warned of the fluidity of career stability before age 25. Historically, the major use of the Strong has been with 17 and 18 year olds (SVIB-SCII Manual, 1981).

Expressed Interest is the criterion used to measure concurrent validity. It is hypothesized that with this unique population, EI may more clearly reflect the interest patterns and aspiration levels of the respondents. Thus, there should be a better match up of occupational scale scores and EI on the CAI than on the SCII.

Having explored the limitations on the use of short-term outcome data and Expressed Interest as the criteria for comparison of the two inventories, we shall now define and discuss the predictor variables. (Expressed Interest is used in this study as both a criterion measure and a predictor variable [see TABLE 2, page 13].)

The Predictor Variables

Occupational scale scores and Expressed Interest, two of the most commonly used predictor variables to

occupational outcome, will be defined and discussed. Three additional variables (consistency, differentiation, and cross-scale congruence) will be defined, thereafter.

1) Occupational scale score - this is the occupational scale score appearing on the individual profile. A score of 45 or more has been defined as being 'similar in likes and dislikes to those in the career' and generally treated in the literature as a score of accurate predictive validity -- termed a 'hit'. This variable will be used as a predictor of occupational outcome and as a measure of concurrent validity to EI.

2) Expressed Interest (EI) -- when the EI matches up with the occupation one enters following graduation from HEP it is recorded as a 'hit'. In this study we will compare the predictive validity to occupational outcome when EI/occupational scale scores are congruent (the occupational scale score is 45 or more).

EI is the response given by the student to this question: "If the education or training were available what would you consider to be an interesting occupation for yourself?" The stated first choice is used in this study, though, one, two, or three choices may have been suggested. A variety of approaches has been taken in eliciting 'expressed' interest (Dolliver, 1969), whereas

we have chosen to emphasize aspirational choice rather than realistic expectations.

The superiority of an individual's expressed interest over inventory prediction has gained support by consistent findings across studies using different interest inventories, samples, methods and timespans (Borgen & Seling, 1978). The present study wishes to replicate these studies, adding the dimension of a specific population that is not college oriented and a second inventory that is designed for this type of sample.

EI must be viewed with caution, for these choices may primarily reflect popular trends of the time, peer pressure, limited occupational awareness, or a generally poor self-image in line with a history of academic failure. Campbell and Hansen (1981) report on the shift of interest with age for the inventory (SCII). Young people tend to be more adventurous and enjoy physically risky activities. The young register less "likes" than do older adults, also. Yet, expressed interests may reflect valued occupational goals and add support to inventory findings.

Borgen and Seling (1978) reported high predictive rates (70%) when measured interest and EI were congruent. They further cautioned against the predictive confidence

of measured inventory results when congruence was lacking between the two measures.

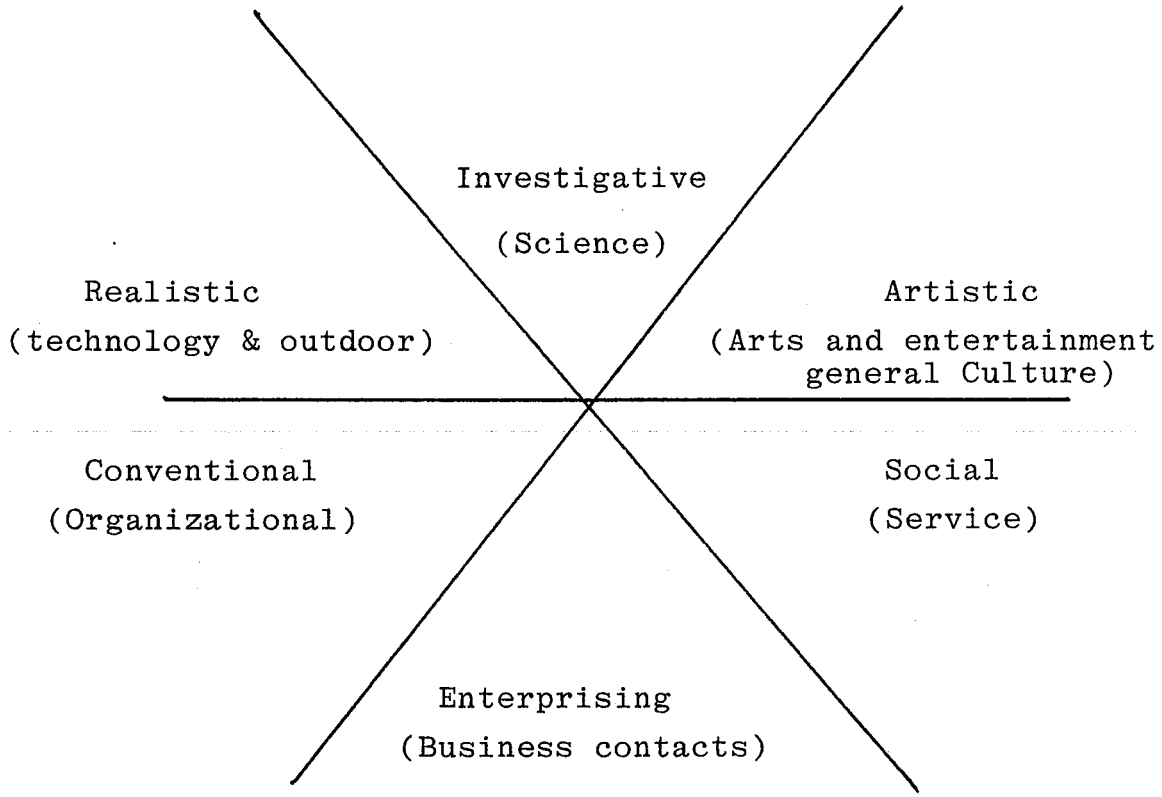
Holland's six-fold theoretical system. Consistency, differentiation, and cross-scale congruence were other predictors of occupational outcome. As a background to understanding these predictor variables, we review briefly Holland's theoretical system which underlies both the CAI and SCII profile. The six general interest themes within which the specific occupational scales were classified are: (a) Realistic theme R, (b) Investigative theme I, (c) Artistic theme A, (d) Social theme S, (e) Enterprising theme E, (f) Conventional theme C. Placed in a hexagonal configuration in the above order, adjacent themes are most highly correlated with one another while alternate and opposite themes are progressively less correlated with one another, respectively (TABLE 1). The predictor variables are to be evaluated within this framework.

3) Consistency -- a consistent pattern is one that reports an integration of similar interest, competencies, values, traits, and perceptions. An SCII or CAI pattern is judged 'consistent' to the degree that the high scores on the six broad interest themes are in proximity.

Holland, et al. (1973), cited in the SCII Manual (Campbell & Hansen, 1981), have shown that the consistency

TABLE 1

Holland's Six General Interest Themes and the Corresponding Ordering of Roe's Categories



*These major themes of vocational interest are considered to be interrelated in a circular fashion (Roe, 1956; Holland, Whitney, Cole and Richards, 1969; Roe and Klos, 1969).

of the occupational code of a man's first job predicts the category of his job five and ten years later.

4) Differentiation - a 'well-differentiated' profile consists of peaks and valleys (highs and lows) on the occupational scale scores and is more predictive of outcome (Campbell, 1974). Holland and Gottfredson (1976) reported that consistency and well-defined types are more predictable. Consistency and differentiation taken together were defined by Holland (1973) as a measure of vocational maturity.

5) Cross-scale congruence - is defined as the match-up between the Basic Interest Scales and the more specific occupational scale scores. The SCII Manual (Campbell & Hansen, 1981) cites research (Johnson & Johansson, 1972) on the increased predictive validity to occupational outcome when Basic Interest Scales and Occupational Scales are congruent. Johnson (1972) further reported that approximately 20 percent of the SVIB profiles were inconsistent. Figures for the present sample will be analyzed and compared for inconsistent responses.

Later findings (Spokane, 1979) supported these findings when reporting that highly predictable students (good 'hit' rates) were more differentiated, consistent and congruent than their less predictable peers.

Relating the Predictor Variables to the Criteria

The ways in which the five predictor variables relate to the criteria across the two interest inventories are shown in TABLE 2 (p. 13).

Scorings to Short-Term Occupational Outcome

1) When the short-term occupational outcome (or college major) can be located on the inventory as a score of 45 or more on the occupational scale, then the prediction is considered a 'hit'. If there are no scores of 45 or above on the occupational scale, then the 1st, 2nd, or 3rd highest score on the occupational scale will be examined for match-up with outcome.

2) When there is congruence between inventory and expressed interest, the predictive power to short-term outcome will be increased (Borgen & Seling, 1978). The predictive validity of EI/Inventory congruence to occupational outcome will be compared for the two tests.

3) Three predictors will be correlated with occupational outcome (occupational scale score for that occupation) to measure the degree of variance accounted for by the joint linear influence of this set of variables.

4) In addition to predictive validity comparisons, the two inventories will be compared for concurrent

TABLE 2

Relating Predictor Variables to the Criteria

Five predictor variables to short-term outcome	Criteria	
SCII and the CAI	-EI- Concurrent Validity	-Outcome- Predictive Validity
1) Occupational scale scores		X
2) EI/occupational scale scores		X
3) Consistency		X
4) Differentiation		X
5) Cross-scale congruence		X
One predictor variable to Expressed Interest		
SCII and the CAI		
1) Occupational scale scores	X	

validity to EI. The same scoring method will be used as that measuring predictive validity (EI appearing on the occupational scales as a score of 45 or more).

5) The two inventories will be examined incidentally for the dispersion of interest across the six general interest themes. Of interest is the degree to which interests are bunched into specific themes on the two tests, implying the degree of traditional interest present in the population and possibly reflecting test bias.

Significance of the Study

The SCII has been a useful instrument for counselors in exploring with counselees the many questions involved in career planning. Yet little research has been done toward evaluating the usefulness of inventoried interest for the minority, non-college oriented individual. The CAI is relatively new, and unexplored as to its claims toward being helpful in counseling the non-professionally oriented youth. This study is designed to measure the relative merits of the SCII and the CAI for a non-traditional student population. The predictive validity of the two inventories will be compared, to indicate the confidence one might place in inventoried interest patterns with a highly select minority population.

This study will also investigate the correlation between expressed vocational interests and indicated interests on the two inventories. It is anticipated that expressed interests of individuals from a minority, non-college oriented population will correlate more frequently with CAI results than with SCII scales. This would provide added confidence for the appropriateness of CAI data when counseling this population.

Lamb (1976) reported a lack of evidence for the appropriateness of interest inventories for use with younger members of certain minority groups. He stated that unfortunately, in contrast to the voluminous research on the appropriateness of using aptitude measures with minority groups, there has been little research on this topic.

One explanation for the limited inventory research with minority students is the limited participation of this group in institutions of higher education. The California Post-secondary Education Commission (1983) reported that in 1982-83 the largest percentage of students (38.8%) took less than six units, and were composed of white students (70%), with women outnumbering men (60% to 40%). The educational attainment of minority students is low, with Hispanics accounting for 22 percent of students in California high schools, and only 12

percent of the state's higher education population (California Higher Education, 1983). Hispanic students have a low high school completion rate (45%), with four of 10 of those who drop-out doing so before reaching the 10th grade (National Commission on Secondary Schooling for Hispanics, 1984). The Hispanic population accounted for only nine percent of the A.A. degrees, seven percent of the B.A. degrees (at the State Universities) and five percent of the B.A. degrees at the University of California system according to the California Post-secondary Education Commission (cited in California Higher Education, 1983).

In summary, these facts point out that the Hispanic population is not highly represented at the post-secondary level of education. Many of these young people, then, are seeking careers requiring no post-secondary training or training at a vocational-technical school. A flyer describing the Career Assessment Inventory by National Computer Systems, Inc. (1985) states that the inventory is directed at the special needs of the majority of students and adults seeking guidance in training programs; such as, vocational-technical schools, human resource programs, and training programs under the new Job Training Partnership Act (JTPA). Many of the graduates from the HEP program are participants in these programs. With this in mind, the CAI is generally welcomed. This study is designed to

provide research on some of the merits and limitations of the Career Assessment Inventory and the Strong-Campbell Interest Inventory with this specific population.

Summary Definition of Terms and Abbreviations

Two interest inventories were compared in this study:

a) the Strong-Campbell Interest Inventory (SCII), and

b) the Career Assessment Inventory (CAI).

HEP - the student sample was drawn from the High School Equivalency Program at the University of the Pacific, Stockton, California. This program was a residential GED preparation program for high school drop-outs with a farmworker background.

General Interest Themes - these are the six themes developed by Holland for interpreting the work world: Realistic, Investigative, Artistic, Social, Enterprising, Conventional.

There are five predictor variables in the study:

1) Occupational scale scores on the inventory profile . A scale score of 45 or more on the occupational scale was considered a good predictor to future occupational stability.

2) Expressed Interest (EI) - This was the stated first choice of the student to the question: "If the

education or training were available what would you consider to be an interesting occupation for yourself?"

3) Consistency - the degree to which the two highest theme scores are side by side on the 6 general interest themes.

4) Differentiation - the degree to which the highest and lowest general interest themes are on opposite scales.

5) Cross-scale congruence - a high scale score of 45 or more on both the occupational scale and the Basic Interest scale is classified as congruent and considered a good predictor.

Hypotheses

I) The predictive validity of occupational scale scores to short-term outcome is greater for the CAI than the SCII.

II) The predictive power of occupational scale score/EI congruence to occupational outcome will be greater for the CAI than the SCII.

III) The concurrent validity of occupational scale scores to EI will be greater for the CAI than the SCII.

IV) Consistency, differentiation, and cross-scale congruence will be greater for the CAI than the SCII.

V) The correlation levels of consistency, differentiation, and cross-scale congruence to

occupational outcome will be greater for the CAI than the SCII.

VI) The dispersion of interests across the six general interest themes of the R I A S E C model will be greater for the CAI than the SCII.

Procedures

Sample Description

The sample for this study was drawn from the students enrolled in the HEP program in the years 1977-1981 at the University of the Pacific, Stockton, California. Criteria of selection into HEP followed the Department of Labor guidelines, Title III, Section 303 of the Comprehensive Employment and Training Act (CETA) of 1973. The HEP program was transferred to the Department of Education in 1981, which retained the general guidelines of selection stated by the Department of Labor. The program, one of 20 HEP's in the country, was designed to provide educational services and appropriate supportive services to young people of farmworker parents. These youth were provided the opportunity to return to an academic environment, having dropped out of high school, in order to prepare for the GED tests. Further, they were to receive career planning assistance in order to gain a meaningful placement.

The HEP population was drawn from 33 counties throughout Northern California, and thus represented a geographically diverse population. In the interview process they were screened for motivation (committed to the completion of the GED) and reading level (a score on the Stanford Diagnostic Reading Test of 5.0 to 6.0 being acceptable). Nearly ninety percent of HEP students were of Mexican-American heritage.

The educational program was individualized, with open entry and open exit, from September through June of each year. The average stay for students was 12 weeks, with 8 weeks the minimum and nine months the maximum time of enrollment.

Students selected for the sample comprised approximately 300 students chosen over five academic years. The male/female split of the sample was approximately 50/50 percent.

Data and Instrumentation

In the years 1977-1981 each student was given an initial interview during the first two weeks of his stay at HEP. His or her first and second career choices were recorded. Approximately 300 of these same individuals were given the SCII or the CAI to complete during the first few weeks of their stay at HEP. The inventories

were not administered randomly; results should be viewed with caution. In three of the years one of the inventories was administered exclusively, in two of the years the two inventories were divided equally among the students. All interest inventories were sent to National Computer Systems for machine scoring.

Limitations

The study will not attempt to predict occupational success or happiness in given occupations. Prediger (1976) believed that the most valid purpose of interest inventories is to provide career options rather than to predict occupational entrance, since such inventories can do an excellent job of determining occupational compatibility. Campbell and Hansen (1981) state that the main purpose of the inventory is to stimulate the counselees to consider occupations. They emphasize the importance of considering all relevant occupations, those with similar code types. They warn against limiting choices due to lack of exposure, or preconceptions that the jobs were not open on the grounds of sex, social class, or ethnic background.

Follow-up data with the HEP population suggests that aspirations and eventual career outcomes are often

dissimilar with change being the most consistent characteristic of the career path.

The study was limited to a small minority sample, primarily of Mexican-American heritage, enrolled in HEP at the University of the Pacific. Individuals who come to the program have typically done poorly in an educational setting, yet have shown the motivation to return to an academic environment in order to gain their GED (High School Equivalency Certificate). The population may not be representative of minority youth in general nor of their more successful counterparts who have graduated from high school.

CHAPTER 2

REVIEW OF THE LITERATURE

Chapter 2 contains a review of the literature and research pertinent to this study. The chapter is organized into five sections. In the first section those interest inventories relevant to the later development of the Career Assessment Inventory are presented. Section two contains an historical overview of the field of interest inventory development, refinement, and measurement. Sections three and four examine the Strong-Campbell Interest Inventory and the Career Assessment Inventory, including their validity and limitations. Section five presents Expressed Interest validity, examining its position in relation to interest inventory validity. Its appropriateness as a criterion for comparing the two inventories, the SCII and the CAI, is reviewed.

Interest Inventories - Groundwork for the CAI

There are a number of well-established interest inventories available in the field of career counseling. The CAI, a relatively new entrant into the field of interest

measurement, drew on the research efforts of four widely used and researched measures of vocational interests: the Kuder series (Kuder DD; Kuder OIS; Kuder E), the Strong series (Strong Vocational Blanks for men and women; Strong-Campbell Interest Inventory, the Holland tests (Vocational Preference Inventory; Self-directed Search), and the Minnesota Vocational Interest Inventory--the later inventory being directed at the client seeking immediate career entry as is the CAI (Johannson, 1976).

These and other interest inventories have been developed and refined over the last five decades in attempts to improve their general usefulness to be more global in interpretation and to increase their predictive validity.

Much controversy has arisen since the early development of the Strong Vocational Interest Blank (SVIB) and the recent arrival of the CAI. To gain a perspective on these developments and revisions a historical review will be presented. Issues bearing on this study will be highlighted, to include: 'empirical' and 'homogeneous' test construction models and their eventual convergence; validity studies with the SVIB, Holland's global model and its promise, and the eventual merging of the empirical and the global model in the SCII.

Interest Inventories - An Historical Perspective

An Overview

Each of these points will be discussed within a historical framework (see: TABLE 3). In a sweeping overview of historical developments in Vocational Psychology, Crites (1969) labelled four periods of development; the observational period from the early 1900s to 1914, noting the contributions of Parsons and his classic study, Choosing a Vocation in 1909; the Empirical period from 1914 to 1940, with empirically based interest inventories on the ascendance; the theoretical period from 1940 to 1970, with emphasis on formulating and testing hypotheses, and finally; the experimental period, a time to come consisting of laboratory and field work. Miller (1974) provided interpretation to this transition - from the 'empirical' to the 'theoretical' - stating that the decade of the fifties found the theory of 'matching men and jobs' on the wane, largely because of its static nature, while the 'trait and factor' mode of analysis retained vitality as a means of empirical research. Crites (1974) maintains that both of these approaches carry the same theme, that is, if people go into a work environment congruent with their personality orientation, then they will enjoy greater satisfaction, success and

TABLE 3

Vocational Psychology - Interest Inventory Chronology

	INTEREST INVENTORIES		
	(structural)		(process)
	Empirical	Homogenous	
1920s and 1930s	SVIB (1927) Matching men and jobs Thurston's factor analysis of SVIB (1931)	Kuder: Form C (1934) Kuder Preference Record General Interest Survey	
1940s			Psychodyanamics
1950s			Roger's - (client-centered)
	Kuder OIS (Form DD) 1956	Roe's Occupational Classification (1956)	
1960s	McArthur & Stephens (1954) Darley & Haganah (1955) Strong's Follow-up (1955)	Trait and factor approach Holland's inventories VPI (1963) SDS	Vocational Development Theory
1970s	(merging of trends) SCII (1974) CAI (1976) ACT II (1974)	Kuder: Career Development Inventory (1974)	

stability in their vocation. Though the theme of the two approaches was similar, the method of measurement, and the potential outcome, was quite different. It was not until much later with the development of the SCII that the enormous contributions of the two methodologies were fully accepted and appreciated.

Zaccaria (1970) remarking on the simplistic mode of thought inherent in the 'trait and factor' approach emphasized that this approach perpetuated the 'status quo' and did not explore the process by which people develop their careers. The controversy over the static nature of interest inventories will be taken up in the section: limitations on generalizability of the SCII.

This broad framework was presented as a backdrop for the sequential developments in interest inventory evaluation.

Inventory Construction - 'Empirical' and 'Homogeneous'

The interest inventory first came on the scene in the 1920s with the Strong Vocational Interest Blank being among the first of the entrants in 1927. Shortly thereafter came the Kuder General Interest Survey (the first of a series of inventories and revisions) in 1934. An early review of these tests by Bordin (1953) stated that the revised versions of these two inventories are

highly regarded today and probably are the most frequently considered choices for interest measurement. Yet their method of test construction is quite different and has been a topic of considerable evaluation. The SVIB approached the measurement problem by developing scales representing the constellation of preferences which distinguish one occupational group from another, the Kuder purported to isolate the independent dimensions of vocational interests. The SVIB was constructed empirically with the Kuder General Interest Survey being constructed with homogeneous scales. Empirical construction results in scales for specific occupations. Homogeneous construction results in broad general scales for types of occupations. Harmon (1978) assessed the two inventory types as quite compatible, each being useful at different stages of career development. Inventories of the homogeneous type were generally at a disadvantage when comparison was made; the SVIB being the logical instrument for predictive validity studies, the Kuder being most valuable in early career exploration of occupational clusters.

Early research on the SVIB by Wrenn (1935), frequently cited in recent research, provided evidence that brighter students might be better candidates for exploration with the SVIB than duller ones. Concurrent

validity to the criterion Expressed Interest was 45% for the brighter students and only 22% for the duller ones. This study was one of the first of many designs directed at isolating the significant variables affecting validity with interest inventories. The next section shifts to the predictive validity studies of the 1950s with the SVIB.

The 'Empirical' Period - Predictive Validity with the SVIB

Predictive validity requires that the scores must be stable over considerable periods of time and there must be agreement between them and subsequent vocations. Two main sources of fuzzy validity statistics are: 1) men choose occupations for reasons other than interests, and 2) men choose occupations that they eventually find do not interest them but where they feel locked in and cannot leave (Campbell, 1971). Campbell (1974) later states that the general use of the inventory is in helping people make long-term decisions. (General purposes of interest inventories, with qualifications and additional uses will be discussed in the next section - interest inventories of the 1970s.)

Strong in his earliest works with predictive validity, made it clear that final occupational choice cannot be accepted as a perfect criterion, for then there would be little need for vocational tests (Strong, 1935).

He eventually listed four propositions that if fulfilled, would provide persuasive evidence of validity:

1) People continuing in an occupation should obtain a higher interest score on it than on any other occupation.

2) People continuing in an occupation should obtain a higher interest score on it than people entering some other occupation.

3) People continuing in an occupation should obtain higher scores on it than people who change from that occupation to some other.

4) People changing from some other occupation to occupation X should score higher on X prior to the change than they did on the other occupation.

Strong's 18 year follow-up study, Vocational Interests 18 Years After College (1955) is, indeed, a classic study in the field of empirical research on interest measurement. His work with Stanford University seniors reported fairly good predictive power of the SVIB from the original testing in 1928 to the follow-up in 1955. Eighty percent of the students who received 'A' ratings on the physician scale either became physicians or entered occupations whose interests correlated .50 or higher with other physicians. Strong concluded that the

odds were 3.6 to 1 that a man would enter an occupation where he had a 'A' rating.

McArthur (1954) in a major longitudinal study of Harvard students over a 14 year period, isolated out the variable private vs public school background as a significant factor affecting predictive validity. As predicted, public school students provided a validity figure of approximately 75% (similar to Strong's earlier reported findings) with private school students registering only a 50% 'hit' rate.

Darley and Hagenah (1955) furnished a theoretical schema for augmenting the validity of the SVIB in their book, Vocational Interest Measurement. They suggested the analysis of occupational clusters on the inventory profile using the terms: primary, secondary, and tertiary patterns. Though little predictive efficiency was reported in empirical studies, these clusters might be seen as a forerunner of the global models appearing in the 1960s.

Inventoried Interests vs Expressed Interests - An Early Assessment

Super, in presenting his theory of vocational development (1957), ultimately sided with Inventoried Interests over Expressed Interests in his review of the research. He concluded that EI was unreliable in early

childhood and early adolescence and had only a moderately high relationship to inventoried interests. And, with the exception of sons of members of the upper classes, EI had a lower relationship to the occupation eventually entered than did inventoried interests.

Strong, in his early writings (1943) distinguished between expressed interests and measured. He stated that any single expression of interest is not relied on, knowing that on the whole such expressions are quite unreliable and lacking in permanence. When "vocational interest" is defined not as a single choice but as "the sum total of many interests that bear in anyway upon an occupational career," then we find surprising permanence. In unequivocal terms he stated that EI must be replaced by carefully considered measures of the individual's abilities and interests.

The Rise of the 'Theoretical' School

Borgen (1978), commenting on recent trends in interest measurement, noted the major contributions of John Holland to both: (a) the development of simplified taxonomies of people and careers, and (b) the increasing acceptance of self-directed tools for career exploration. Each of these trends will be discussed in turn.

1) The 'global' model of Holland.

Holland's hexagonal model has been developed and interpreted several times (Holland, 1966; Holland, 1973; Holland and Gottfredson, 1976). Cole and Hanson (1971) have demonstrated that the model is useful in organizing the relationships among the scales of the SVIB, the Kuder Occupational Interest Survey, and the Vocational Preference Inventory. (The six general themes of the RIASEC model have been presented in Chapter 1.)

Earlier work contributing to the Holland structure included developments by Thurston, Guilford, and Roe. The development of the factor analytic technique brought about the opportunity to examine interest and personality dimensions from a new perspective. Thurston (1931) in an early factor analysis study of the SVIB located four major dimensions: science, language, people, and business. Guilford (1954) provided original work on interest dimensions in his valuable factor analytic study of human interests. Roe (1956) found a circular classification of interest groups. This schema was drawn on and was nearly identical to Holland's later taxonomy (Holland, 1973).

Holland and Gottfredson (1976) summarized key points of the Holland typology in a recent clarification paper. The classification of persons and environments provides an efficient, organized method of understanding the complex

theories of psychological characteristics as well as occupational data. The six theoretical personality types can be assessed through a variety of techniques (Self-Directed Search, VPI, SCII, or vocational preferences). The supplementary concepts of consistency (the degree of compatibility of primary disposition) and differentiation (clarity of an individual's personality pattern) can then be assessed. Consistent and well-defined types are more predictable (their expected behavior is more likely to occur) than those lacking these qualities. A third concept cross-scale congruence (the match-up of high scores on a BASIC interest theme and on occupational scale) is considered important in predicting occupational stability.

Holland reported in his major theoretical work, Making Vocational Choices: A Theory of Careers (1973) that the research on personality patterns had not indicated strong support. He further cautions that the system was derived from the choices of college students, rather than the occupations of employed adults, and consequently may be more applicable to the former than the latter (Crites, 1969). In an up-date of the Holland framework, Holland and Gottfredson (1976) outline its strengths and weaknesses. The face validity is excellent, the research support is good, and the system is easily

applied to practical problems. The weaknesses lie not in the theory but in the lack of comprehensive research involving the entire package of theoretical constructs rather than designs selecting one or two specific constructs for measurement.

2) Self-directed tools for career exploration.

Interest inventory research was strongly affected by other strands of developments within the field of vocational counseling, yet, outside of the more traditional trait-and-factor arena. These emerging trends influenced traditional research direction with interest inventories; ultimately leading to the revision and merging of trends in the 1970s. Crites (1976) identified five distinct schools within career counseling in an attempt to sift through the trends and coordinate a comprehensive model. He selected out as a major trend of the '60s the call for engaging the client more directly in the career counseling process. This more interactive interpretation of tests might even require the 'interpretation of tests without the tests'.

In rebuttal, and in an attempt to integrate testing strategy into Crites' comprehensive model, Holland suggests that in the career counseling process, the first step might be to rely on self-directed materials where

possible - an activity found highly effective with many clients - with the interactive stages of career counseling reserved for later evaluation to be used with those most in need of assistance. Paper materials, such as the Vocational Interest Survey and the Self-Directed Search, and computer programs show great promise. These tools allow for standardized models of assistance with the advantages of reduced cost, time, and attempts to standardize counselors (Holland, 1976).

A leading spokesman for new directions in career counseling was Ginsberg (1979) who, in reformulating his theory postulated that occupational choice is a lifelong process of decision-making in which the individual seeks to find the optimal fit between his career preparation and goals and the realities of the world of work. Other spokesman for these trends include Mishel (1977) who has argued that people are the best experts on themselves and that they ought not be treated like "assessees" when making decisions concerning themselves. Holland and his associates (1975) have attempted to show empirically that the Holland personality factors predict more successfully to decision-making ability than other predictors - age, social class, personality varibles. Katz (1979) suggested that future trends will assist the client in strategies

for rational behavior and successful decision-making, with computer assistance.

Critics of inventories directed at the self-directed approach to career planning have reservations. Crites (1978b) has strongly protested the lack of appropriate psychometrics in scoring the Self-Directed Search and the sample size used by Holland in evaluating evidence. Crites termed the Self-Directed Search inventory, 'simplistic'. He further stated that the linear translation of summary codes into occupational codes is incorrect. And, from a practical standpoint, he seriously questioned the ethics of indiscriminantly making the inventory available to the public. Prediger and Cole (1975), assessing the relative value of raw vs normed scores, state that the Self-Directed Search conforms to the socialization dominance hypothesis; these interest inventories simply tally the effects of one's life history and heredity. Inventories which report same-sex norms, such as the SVIB and the Kuder General Interest Survey, meet the minimum standards for opening up occupational options, referred to as the opportunity dominance hypothesis.

In summary, varied approaches to career counseling were being proposed. Theory building was accented with the process of career development and decision-making

playing a larger role. Prediger (1974) stated that testing constitutes only one of the tools that can be used in a career guidance program. He further commented that there were limits of testing particularly with the disadvantaged.

Interest Inventories vs Expressed Interests - A Re-evaluation

The controversy over the relative weight placed on the interest profile data vs EI did not escape the trends of the 60s. The importance of self-directed instruments of evaluations and the concerns about involving the client more directly when interpreting career information led to a reconsideration of the value of client input in the assessment process. Interest inventories were to be challenged on many fronts: 1) charges of 'sex-bias' or 'sex-limitations' were being voiced, 2) the value of raw score vs normed reports was being clarified, with 3) the relevant populations for inventory validity, such as minority clients and the 'undecided' individual being tested empirically. The above concerns contributed to revisions and newly developed inventories of the next decade discussed in the section, Interest Inventories of the 70s.

A major article of Dolliver (1969) entitled, Strong Vocational Interest Blank Versus Expressed Vocational

Interests: A Review, may have been the catalyst for the empirical studies to appear in the 1970s, confirming the superiority of EIs over inventoried interests in predictive power. Dolliver (1969b) re-computed the 'hit' rate recorded by Strong in assessing validity with the SVIB. He stated that the proper validity ratio was more like 1-to-1 rather than the 3.6-to-1 suggested by Strong. In the article mentioned above Dolliver clarified weakness in methodology and the selectiveness of samples reported in predictive validity studies with the SVIB. His review of the findings was summarized:

> The predictive validity of expressed interests is at least as great as the predictive validity of the SVIB. In no study where direct comparison was made (Dyer, 1939; Enright and Pinneay, 1955; McArther and Stevens, 1955) was the SVIB as accurate as the expressed interests in predicting occupation engaged in...there is no evidence to show that the SVIB is superior to expressed interests. Counselors and others have apparently supposed a body of experimental evidence which does not exist (Dolliver, 1969, pp. 103-104).

This article singled out an issue that became a priority concern in empirical research of the 70s. Crites (1969) was not in agreement with this position at the time stating that it has become increasingly clear that EI, because of its unreliability, was not an adequate criterion for an interest inventory. Holland (1968) concluded that the Vocational Preference Inventory

predicted students' actual vocational choice after graduation at better than chance levels, but this was only half as effective as the student's own prediction.

Dolliver (1969), placing his findings in perspective, noted that despite the results, EI has yet to receive recognition as a method in vocational counseling which is in any sense equivalent to the various inventoried interest methods.

Interest Inventories of the 1970s

While predictive validity levels for interest inventories may have reached their zenith, broader uses for the inventory information were being proposed. In summation of the major research projects designed to test validity with the SVIB, Dolliver (1969b) stated that the chances were about 1-to-1 that a person with an A score (a score of 45+) on an individual occupational scale of the SVIB would end up in that occupation. Campbell (1974) in the SCII Manual, similarly concluded that the SVIB was stated to have a predictive validity rate of approximately 50%.

Holland et al. (1981) concluded that over a wide range of samples, the prediction of occupations entered appears to have reached its limit. In the six category system, most inventories have a hit rate of about 40%,

plus or minus 5%. Prediger and Noeth (1979) argue for the similarity of impact on the taker of these inventories regardless of norms, scaling procedures, and interpretative materials. Yet, speaking for the robustness of the field, Holland remarks that, "interest inventories remain perhaps the most popular form of vocational assistance. This popularity is manifested in the publication of new inventories, the rapid revision of old inventories and manuals (Gottfredson & Brown, 1978; Holland, 1979; Kuder & Diamond, 1979; Lamb & Prediger 1979; Lunneborg, 1979), and the stimulation of much research, speculation and controversy." Worthington and Dolliver (1977) question the emphasis on validity data recognizing that validity at a point in time is somewhat temporary because individuals often change occupations, job duties, and job titles.

Diamond (1975) recommends that the results of any interest inventory be considered as only a part of vocational counseling and that they be interpreted by counselors who are sensitive to their clients and the current issues concerning interest inventories. Others have added potential uses of the interest inventory beyond predictive validity: identifying career possibilities (Borgen and Seling, 1978), providing confirmation of what seems an appropriate choice (Dolliver and Will, 1977),

providing advance assessment of compatibility with potential careers to be used in the decision-making process (Grotevant and Durrett, 1980), and as a valuable tool for the undecided client or the uniformed who can learn of the range of occupations (Gade and Soliah, 1975).

Hanson (1974) has stated that interest inventories are able to stimulate, broaden and provide focus to career exploration. Campbell, in the SCII Manual (1974), lists two principal functions of the inventory: 1) helping people to decide about themselves, and 2) helping people to make decisions about others. Diamond (1981) highlighted the exploratory experiences into hitherto unexplored areas available with the interest inventory. This information is to be combined with other relevant data: achievement, activities, and aspirations to suggest new directions and options and to encourage rather than limit exploration.

The SCII - A Merging of Trends

The 1970s saw the coalescing of major issues in the field of interest measurement. The SVIB for men and women was revised to reflect the issues of the time; specifically, 1) the merging of 'empirical' and 'homogeneous' scales, and 2) the combining of the men's and women's individual norms onto one inventory. The SCII

was developed in 1974 to reflect the contributions of many years of work and refinement of the 'empirical' structure of interest inventories (the SVIB, both for men and women; the Kuder Occupational Interest Survey (Form-DD), Minnesota Vocational Interest Inventory), as well as the contributions of the 'homogeneous' structure (Kuder: General Interest Survey and General Preference Inventory; the Vocational Preference Inventory and the Self-Directed Search of Holland). Holland's global model of occupations focused on the interplay of interests and general personality, drawing on Strong's data for much of his research. Campbell incorporated the theory of Holland into the SCII, acknowledging the significance of this framework and commenting in the preface to the SCII Manual that he was not sure how Strong would have viewed this theoretical underpinning (Campbell, 1974). This new inventory format provided rich potential for additional research and theory building. The combining of men and women's independent and 'twin-scales' also provided new research opportunities and clearer guidance for counselors.

Limitations on Generalizability

The SCII receives high marks as an instrument of interest measurement as evaluated by Crites (1978):

> Recognized as the paragon of applied behavior measures and widely acclaimed as the bellweather of career counseling and personal selection, the several editions of the SVIB have a venerable history and reputation, dating back to the late 1920's and spanning the subsequent decades to its most recent revision in 1974.

Yet the usefulness of the inventory and in particular the generalizability of findings must be viewed with caution. For Crites is just as restrictive in his qualifications of the SCII as he was in his general acclaim of its merits:

> In summarization, if a counselor decides to use an interest inventory with a client, without expecting it to necessarily influence his/her career decision making or planning, and if the primary purpose of the counseling is to eliminate higher level sex restrictive occupational options appropriate to the client's sex, and if the client is relatively bright (in order to qualify for upper range occupations) and is neither a "yeasayer nor a naysayer" then the SCII may be the best available.

For purposes of this study, four topics have been isolated out for review in terms of their potential limitations when using the SCII: 1) sex-bias, 2) minority group generalizability, 3) the young, 'undecided' client, and 4) the non-professional aspirant.

1) The 'sex-bias' dilemma.

The controversy over 'sex-bias' was carefully considered in the development of the SCII. One of the main goals in developing the SCII, then, was to eliminate

completely any differential treatment of the sexes (Campbell, 1974). Primarily in response to criticism of Johannson and Harmon (1972) the merging of men and women scales on the same instrument was carried through. The issue of 'sex-bias' is far from resolved with Crites (1976) contending that the final verdict has not come in on the degree of 'sex bias' particularly because 'sex bias' has not been adequately defined. Prediger and Cole (1975) have argued for the restrictive and sex-biased nature of raw scores (the primary method of scoring the self-directed inventories; the Self-Directed Search and the Kuder series), yet, O'Neil (1979) found no support for this hypothesis. Prediger and Cole (1975) state that in the assessment of human interest, major interest inventories, SVIB, Kuder General Interest Survey, and the Ohio Vocational Interest Inventory, agree that the same-sex norms represent the minimally desirable standard of assessment. Hanson (1974) laying the groundwork for scaling of sex-differences for a new entrant into the interest inventory field, the ACT Interest Inventory (which uses college majors as the criterion measure) states: "the desired goal of counseling with students considering various educational majors without reference to sex can be accomplished through the scaling of scores separately by sex."

Campbell, in order to neutralize the effects of sex differentiation in the occupational arena, listed the following changes in the updated version of the SVIB, the SCII (Manual, 1974): 1. The men's and women's test booklets have been combined into a single form. 2. Items that appear to have sexual bias have been eliminated. 3. References to gender have been eliminated from the inventory by changing policeman to police officer, and so forth. 4. New scales have been developed to increase the number of scales normed on each sex. 5. New empirical scales have been added to reflect changes in the pattern of traditional male-female vocational separations. 6. New theoretical scales have been added to the profile, with the profile layout stressing them over the empirical scales.

Current research has focused on the effectiveness of the SCII to neutralize sex-bias response sets. Fitzgerald and Crites (1980) have highlighted sex-bias as probably the most controversial area in career counseling with women. Dolliver and Worthington (1981) found that overall there was no difference in the rate of accuracy between the same-sex and the other-sex scales and SCII twin occupational scales. When both the same-sex and the other-sex scales for the same occupation are above a T score of 45 the rate of concurrent prediction is

significantly greater than when there is a high score on either the same-sex or the other-sex scale singly. Fitzgerald and Crites (1980) stated that, in general, the interest inventories have restricted the career choices of women and reinforced traditional female career patterns. Dolliver (1981) has cautioned that counselors will need to know average female and male test-taker scores of other-sex occupational scales on the SCII to make accurate predictions.

2) Minority populations

Lamb (1976) focused on the generalizability of interest inventory data with minority youth. Minority youth seeking higher education are among those who might profit from the use of interest inventories. They are less likely to have direct exposure to professional role models and to have looked at careers which require college training.

Interest inventory effectiveness with the minority population has been challenged. Empirical evidence both in support of and against the generalizability of results has appeared in the literature. Qualifications such as ethnic/racial breakdown, the interactive variable socio-economic-status, and the age of the population under study are all examined.

Miller (1974) has cautioned against generalizing from inadequate samples. He stated that it may be asking too much to seek a theory that applies to the diverse cultural groups, the Australian city dweller, the Japanese farmer, the migrant Mexican worker in the United States. And, we must cease to generalize from middle class, white Anglo-Americans to these groups.

Thoresen and Ewart (1976) believe that present inventories are inadequate in being able to measure the capacity of minority groups to enjoy a wide variety of occupations. Nevas (1976) agreed when observing that current inventories tend to focus on cultural preferences, thus being less effective with minorities. Cooper (1977) isolated out socio-econ-status as being the major variable in explaining different responses to Holland's six category model. With white and black high school students, lower socio-econ-status students chose 'realistic' occupations more frequently. McLaughlin, et al. (1976) report similarly that traditional career choices tend to decline as socio-econ-status increases. Theme score differences between blacks and whites were located by Doughtie and Chang (1976), with blacks scoring higher on three scales; the 'social', 'conventional' and 'enterprising'. Strong's (1955) findings found that non-whites respond with more 'likes' than whites, with blacks

expressing a stronger preference for social service types of occupations (Hager & Elton, 1971).

Stated differently, Cole and Hansen (1971) have concluded that there is considerable agreement that different patterns or processes of socialization are dominant for various groups of people. Empirical findings by Epperson and Hammond (1981) give persuasive evidence for the development of local norms where the population under study is considered quite different from the dominant cultural patterns measured by major interest inventories. This study on Zuni Indians shows that without local norms, the use of the Kuder-E Inventory could easily restrict career exploration of Zuni adolescents by channeling them into traditional or stereotypic areas, based on interpretations of the profile with the accompanying national norms:

	SCIENCE	ART
RAW scores	38	38
National norms	50%	80%
Local norms	90%	70%

National norms would not reflect how far the individual client responses deviate from the dominant norms of his cultural group. This clarification might lead to the opening up of new career options.

When focusing on the Hispanic cultures, very little meaningful research has been done. Harrington and O'Shea

(1980) state that very few studies have examined whether vocational development theories and interest inventories researched primarily with white samples have relevance to Spanish-speaking individuals. Disadvantaged Mexican-American students were significantly lower in occupational aspirations than those from the same cultural group whose family incomes were beyond the poverty level, while the overall occupational aspirations of Mexican-American students were significantly lower than those of the Anglo-American (Orta, 1973). Lafitte's study (1974) suggested that Mexican-Americans valued security, a factor likely intertwined with interests in eventual occupational choice.

Champions of the CAI and the SCII have addressed the issue of race and ethnic cultures when evaluating their respective inventories. Johansson summarized his limited research findings with the CAI to suggest that the data do not indicate that the scales were biased against individuals who were of different race than the majority of the criterion occupational sample. Though virtually all the criterion occupational samples consist of over 90% Caucasion individuals, the data points to the use of the inventory for different racial populations (Johannson, 1976). Campbell (1974) makes a categorical statement that racial differences have not been a problem with interest

inventories, because no differences have been identified. Yet, one has to consider first the paucity of research directed toward this significant issue.

A relatively new inventory, the ACT interest inventory, was assessed by Hanson (1974) with the racial/ethnic issue carefully discussed. All non-white groups were lumped into one category, due to the small n-count. Controlling for sex, only two of the sex scales - scales closely resembling the Holland categories - showed an average difference of 10% in the 'like' responses between whites and non-whites. For men, the responses for social service (social) and business contact (enterprising) were higher for non-whites. For women, responses for non-whites were higher for business detail (conventional) and business contact (enterprising). This evidence suggests that both whites and non-white racial groups responded to the ACT interest inventory items in a similar fashion.

A follow-up analysis on the ACT Interest Inventory by Lamb (1976) pointed out that interest measures have been found accurate with certain groups and certain fields, usually on black males, involving criterion-related validity (Strong, 1955; Borgen & Harper, 1973). He hypothesized further, that these inventories may be inaccurate for certain fields or groups. Looking at the

structure of measured interests for various cultural groups (black, Native American, Spanish surname, and Oriental American) few differences were found.

Yet, he stops short of generalizing these findings to younger minority populations. The analysis done in Lamb's study was based on college seniors, who have had the advantage of four years of cultural enrichment. He suggested that subsequent research might determine that inventory profiles are not appropriate for use with younger members of certain minority groups. The generalizability of interest inventory data to a young, minority population is a central issue of the present research paper.

3) The young and the 'undecided' client

Slaney (1983) has shown the potential value in using SVIB profile findings with the 'undecided' client. Predictability for the 'undecided' reached as high (approximately 35%) as for the 'decided' client to later occupational outcome. This finding, also, supports the usefulness of inventoried interests when Expressed Interest is lacking.

It has been demonstrated empirically that the young and 'undecided' client is likely to produce a flat, less differentiated profile (Holland, 1973). Yet, Athelstan

(cited in Campbell, 1971) after reviewing the findings, stated that low profiles may be used in vocational counseling much as any others would be. The chief indication that this may be warranted is the tendency of the profiles to rise over all on retest, while their shape remains relatively stable. Campbell (1971) accepted Athelstan's position on profile interpretation, adding two qualifications when examining the variable - age. Most research with the Strong has been based on 17 year-olds plus and, secondly, interests of young people tend to fluctuate until the individual reaches the age of 25 or so.

Krumboltz (1976) challenges the significance of test-retest reliability statistics with the Strong, questioning the accuracy of student knowledge, when saying, "Students can respond with a high degree of reliability but are their impressions about those occupations based on accurate facts? I doubt it?"

Grotevant and Durrett (1980) concluded from a national sample of high school students that these students tend to be making decisions of major consequence in the area of occupational knowledge with less than adequate information.

Lamb (1976), cautioned that research with the ACT Interest Inventory has not answered the question of

generalizability of findings to younger, minority populations.

4) The non-professional aspirant

Critics of SVIB research have noted that generalizability of findings is limited when samples are drawn from professional, elicit populations. Campbell (1974) has commented that the inventory works best with those who need it least, referring to those clients with definite, professional aspirations. Dolliver (1969) reminds us of the selectiveness of SVIB research - with Stanford and Harvard students, and National Merit Scholars, being representative of unusually bright and apt students. He cautions that many of the studies reviewed would be of doubtful application to the general college population. In an updated review, Fitzgerald and Crites (1980) defined the 'sample' characteristics of much interest inventory research: "Existing theories of vocational development and their accompanying technologies largely evolved from observation of male, Caucasion, middle-class adults and students." Borgen (1972) has shown empirically that interests play a larger part in career choice for high ability men than they do for the typical college student. Crites (1978) cautions that the SCII is largely useless with the modal client. Borrow

(cited in Miller, 1974) extends the limitations of the inventory studies which have supplied normative data, saying that for many investigations, college students offer a convenient, built-in pool of subjects, but they are hardly representative of youth in general.

The criterion groups for the Strong inventories, and for interest inventories in general, and subsequent interest measurement grew up around the upper reaches of the occupational hierarchy - higher skilled trades, professional and business executives - covering about 20% of the gainfully employed (Darley & Hagenah, 1955). The rationale for test development strategy aimed at the upper strata occupations was generally supported. Research by Clark (1961) and Clark and Campbell (1965) established that the interests of several semiskilled occupations can be contrasted with those of a tradesmen-in-general group, but below this level little differentiation can probably be made between occupations. Cochran (1974) commented on the societal myth that perpetuates this emphasis on the professional aspirant. It is assumed that a college degree is the best and surest route to occupational success, yet, statistics show that less than 20% of all occupations existing in this decade will require a college degree.

Gottfredson (1979) calls for the re-examination of the use of counseling resources and a shift in client priority. The most advantaged populations receive most of the help (including interest inventory data) though they may need it least in the competition for jobs. She further suggests more research on employment experience of non-whites and women, for these groups face more obstacles to fulfilling their aspirations. Statistics support the need for shifting additional resources in career planning to the young, the non-college oriented and the non-white population. In the summer of 1980, unemployment rates stood at 7.6%, for teen-agers (16-19 years) it was 19%, for non-whites 37% (Dayton, 1980). The National Advisory Council on Vocational Education (1972) reported that over 750,000 youths drop out of high school each year, with 850,000 dropping out of college.

Thus, there was mounting evidence for the appropriateness of a new interest inventory directed at the non-baccalaureate seeker, with criterion groups from the 'blue-collar' occupations.

The CAI - An interest inventory for the non-professional aspirant

An interest inventory developed in 1976, designed to address some of the validity concerns of existing inventories was the Career Assessment Inventory

(Johannson, 1976). The CAI was intended to be a 'blue-collar' version of the SCII and should prove especially valuable to counselors in areas where a minority of students typically attend college; and it may be used in conjunction with the SCII (Bodden, 1978). Lohnes (1978) adds that it is intended for the non-baccalaureate seeker and will be of assistance with a population that is indecisive about vocational aspirations.

Johansson (1976), drawing on the research efforts of similar interest inventories (the Kuder series, the SCII, and the Vocational Preference Inventory, the Self-Directed Search, and the Minnesota Vocational Interest Inventory) expresses the CAI's aim as being that of helping people assess their vocational preferences and to help high school students and adults in their career decisions.

Considering the age variable, Johannson recommends that use of results from occupational scales in a definitive career-decision mode probably is best with high school juniors and seniors and adults.

In contrasting the CAI with the SCII, Johannson makes the sharpest distinction:

> For more professionally oriented groups, the SCII should work better and for non-professionally oriented groups, the CAI should work better. Item content is such that we would have little confidence in developing a physician scale or a mathematician

> scale; in the same vein, we have less confidence in the SCII instrument assembler or beautician scale than in its more professionally oriented scales. Both inventories should have their best validity for those populations for which they are intended.

EI - An appropriate criterion for comparing the SCII and the CAI

A consensus began to emerge in the 1970s for the valuable contribution of EI in predicting occupational outcomes. Holland and Gottfredson (1975) stated that EI cannot be ignored as superficial and unreliable. Borgen and Seling (1978) reported that there were consistent findings across studies using different interest inventories, samples, methods and timespans for the conclusion that predictive validity is superior for EI over inventoried interests. When expressed and inventoried interests are not in agreement, EIs are more predictive (Borgen & Seling, 1978; Dolliver & Will, 1977; Holland & Gottfredson, 1975; Toughton & Magoon, 1977). When EI and inventoried interests are in agreement, predictive ability is higher than when they are not in agreement (Bartley & Hood, 1981; Borgen & Seling, 1978; Dolliver & Will, 1977; Holland & Gottfredson, 1975; Touchton & McGoon, 1977). Findings are tentative, however, with only one study (Dolliver & Will, 1977) extending the interval of examination beyond the

college years. A 55% predictability for EI was reported in this study.

The superiority of EI over inventoried interest seems apparent with the joint use of vocational aspirations (EI) and inventoried interests as the dominant theme (Holland, McGoon & Spokane, 1981). Spokane (1979) demonstrated the relevance of congruence between these measures and later college major stability. Bodden (1978) adds the qualification that when EI is 'firmly' expressed, it remains the best predictor of the field in which vocational placement is eventually achieved.

Wiggins and Weslander (1977) found that EI was a better predictor than the Holland and Kuder systems only for males and was about equal to inventory results with females.

Considering the evidence and the high interest in this issue, Noeth and Jepsen (1981) have suggested some direction for future research: 'Expressed vocational choice seems to tap a coherent psychological domain worthy of further investigation. The vocational choice process may be understood in greater detail through research using additional measures to supplement the expressed choice.'

Summary

Research indicates that the SCII is one of the most highly regarded interest inventories for occupational exploration and for predictive validity to later occupational outcome. However, it has gone through many revisions in order to deal with shortcomings and its general applicability is still in question. Its scales have been extensively reworked, extended, and updated in response to charges of sex bias. Its predictive validity is lower than Expressed Interest measures, though when both are congruent the predictive power is considerably enhanced. Most research on the SVIB was done with 17 and 18 year olds, even though the crystallization of interests is around 25 (Campbell & Hansen, 1981). And, finally, the inventory is specifically geared to the professional aspirant with the bulk of research being done on the four-year college student.

The present paper is designed to compare the predictive validity of the SCII and the CAI with a sample atypical of inventory validity studies. The sample consisted of a minority population (89% of Mexican-American heritage), 17 to 19 years of age, of parents with farmwork occupations, and being high school drop-outs.

The assumption underlying our hypotheses was that the CAI, an inventory normed on a criterion group of blue-collar workers, would be more useful to the students within the sample, than the SCII.

The two inventories were compared for predictive and concurrent validity. Both occupational outcome and EI/inventory congruence were measured. Both male and female comparisons were made. Also, the breadth of occupational options provided by the two inventories was explored.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

This chapter presents a general description of the sample, the instruments, and the research methodology used to collect the data for this study. This study compared the predictive validity of two interest inventories, the Strong-Campbell Interest Inventory (SCII) and the Career Assessment Inventory (CAI), with a specific population of non-college oriented youth.

Description of the Study

A review of the related literature revealed a current need for an effective interest inventory measurement for non-college oriented youth. The CAI, introduced in 1975, was designed to improve predictive validity for the majority of young people seeking career guidance toward those occupational fields not requiring a four year college degree. The purpose of this study was (1) to compare the predictive validity of two interest inventories on 'hit' rates to short-term occupational outcome. The two inventories were further compared for: (2) the predictive validity to occupational outcome

when there was Measured/EI congruence, (3) the concurrent validity of measured interest to Expressed Interest, and (4) the correlational levels of consistency, differentiation, and cross-scale congruence to occupational outcome. There were five predictor variables to occupational outcome (or academic major) - occupational scale scores, expressed interest, consistency, differentiation, and congruence.

The study concerned itself with six hypotheses. Hypotheses I and II focused on a comparison of the predictive power of the two interest inventories to occupational outcome. Hypothesis III compared the concurrent validity of occupational scale scores to EI for the two inventories. Hypotheses IV and V compared the profile patterns of consistency, differentiation, and cross-scale congruence. The variance attributed to these variables in predicting outcome was, also, compared. Hypothesis VI compared interest dispersion across the six interest themes of the two inventories.

Three main objectives of this study were established:

1) the predictive power of two major interest inventories was compared, using inventory scale scores and EI as the predictors, with short-term occupational outcome (or college major) as the criterion.

2) the correlational levels of three predictor

variables--consistency, differentiation, and cross-scale congruence--to occupational outcome was compared for the two inventories.

3) the distribution of interests across the six general interest themes - R I A S E C - was compared for the two inventories. Differences between proportions were analyzed.

Population and Sample

The population for whom this study may have implications is vast, with over 750,000 high school drop-outs per year. The migrant population that completes high school is, indeed, small at 11 percent (National Child Labor Committee, 1978). Specific criteria of selection for the sample and sample description are presented below.

Method and Criteria of Sample Selection

The target population is the totality of Hispanic high school drop-out youth of low income from migrant and seasonal farmwork background in 33 counties of Northern California. Of this larger population, the High School Equivalency Program (HEP) at the University of the Pacific, Stockton, California has enrolled 130-140 students per year since 1969. These students are recruited to the HEP program to prepare for and to

successfully pass the General Educational Development (GED) test battery and to gain meaningful placement.

The criteria for selecting students followed the Department of Labor guidelines, title III, Section 303 of the Comprehensive Employment and Training Act (CETA) of 1973. (These guidelines have been superseded by the Department of Education, Section 418A of Title IV of the Higher Education Act,1980, but remain essentially the same). Students are certified as eligible under the following criteria:

1) is a member of a migrant or seasonal farmworker family.

2) meets the poverty eligibility criteria. This criteria has been replaced by the ruling that over one-half of the family income must be gained from farmwork or farmwork related activity.

3) is single.

4) is between the ages of 17 and 34.

5) is a legal resident of the United States.

In the interview process they were screened in two additional areas - motivation to return to an educational setting in order to prepare for GED tests; and reading level (a grade equivalent score of 5.0 or 6.0 on the Stanford Diagnostic Reading Test was acceptable).

Sample Description

The HEP sample is not a random sample of the high school drop-out population nor of the target population discussed above. The research sample consisted of students who attended HEP during the years 1977-1981. The total sample size was 328. The age range was 17 to 24 and had a mean, median, and mode of 17.6, 17.5, 17.0 (TABLE 4). Males and females were equally represented (48.2% to 51.8%). Nearly 90% of the students were Hispanic, 5% were white, 3% black, and 3% other. The educational level of the population ranged from the 8th to the 11th grade completed with a mean grade level of 10.3%. Reading grade levels as measured by the Stanford Diagnostic Reading Test ranged from 6.0 to 11.9 with a mean grade equivalent of 6.7.

Research Instrument

This was a descriptive study which utilized two standardized tests for which the validities and reliabilities have been previously established. A summary of these validations is presented below.

Strong-Campbell Interest Inventory (SCII)

The SCII, as a measure of current occupational interest patterns based upon past experience (D. Campbell,

TABLE 4

Academic and Demographic Composition of the Sample

Academic Variables	Range	Mean
Reading levels	6.0 - 12.0	6.7
GED averages	45.0 - 64.0	47.7
Highest Grade Completed	8 - 11	10.3

Demographic Variables	%
Sex	
Male	48%
Female	52%
Ethnic	
Hispanic	89%
White	05%
Black	03%
Other	03%

	Range	Mean
Age	17-24	17.6

1974), was chosen because it is a relevant occupational interest inventory (Harmon, 1976) for this study. It is considered the paragon on inventory validity and reliability by Crites (1978). Reliability, through test-retest methods, has shown correlations of between .80 and .90. As for validity, Dolliver et al. (1972) revised Strong's estimates and restated the validity ratio as follows:

> Thus, statements about SVIB A scores would be accurate and easily understood if the wording were changed to the chances are about 1-to-1 that a man would end up in an occupation for which he received an A score.

Campbell included the above quotation in the updated Manual for the SVIB-SCII (1981) and again restated the validity by stating that over many years and by many researchers the predictive validity for the SVIB has shown a 50% 'hit' rate.

The SCII has been extensively evaluated in Buros (1978). Dolliver rated it as the best available inventory. Johnson viewed it as well constructed and as reliable and valid as its older versions. Crites was extremely positive toward the use of the SCII, while also being one of the harshest critics for its limitations.

Career Assessment Inventory

The CAI is purported to be an appropriate interest

inventory for testing predictive validity with non-college oriented youth. Bodden (1978), commenting on the CAI, noted that the organizational format was essentially the same as that of the SCII. He stated further that the reliability and validity figures in the CAI manual were quite acceptable as well as being comparable with SCII correlations. Test-retest correlations for reliability are at or above the .90 level. Bodden goes on to suggest that the CAI is needed and should prove especially valuable to high school counselors at schools where a minority of students attend college.

Lohnes (1978), a second reviewer in Buros (1978), sees two particular uses for the CAI: 1) for non-college youth, and 2) for youth that are indecisive about their vocational aspirations. Lohnes, however, is not convinced that the elaborate multicolor profile sheet of the Holland categories is useful to this clientele.

It should be noted that the CAI is a relatively new instrument with little evidence available as yet on predictive validity. It has the solid foundation of the more successful SCII in structure, yet with undetermined predictive value when dealing with this clientele. Only two reviews were available in the Buros Mental Measurements Yearbook of 1978. Though Lohnes makes the point that the inventory may be a little extensive for the

clientele for which it is designed, one must question the differences in awareness levels between those students considering professional careers and 'others'. The Holland typology seems to be potentially valuable for career exploration with both the college oriented and the non-professional aspirant.

Data Collection

Data for this study were collected from three sources: 1) SCII and CAI interest inventory profiles; 2) Expressed Interests recorded in individual counseling sessions; and 3) short-term occupational outcome data (or college majors).

Interest Inventory Data

For the years 1977-1981 approximately 31 percent of the students were given the SCII; 23 percent were given the CAI. Both the CAI and the SCII were offered in 1977 and 1980. In 1977 the CAI was introduced to students on a selected basis. If a student sought information on a career specifically requiring non-college training, the CAI was administered. Of the accessible population described, 328 students (54.6%) were measured from a total population of 601 students for the years 1977-1981 (Table 5).

TABLE 5

The number and percentage of the total population and sample that took either the CAI or the SCII for the years 1977-1981.

Date	Total Student Population	Students Excluded	Sample Tested	CAI N	CAI %	SCII N	SCII %
1977	109	21	88 (81%)	42	(48)	46	(52)
1978	115	64	51 (44)	5	(10)	46	(90)
1979	119	72	47 (40)	0	(00)	47	(100)
1980	122	30	92 (75)	47	(51)	45	(49)
1981	136	86	50 (37)	50	(100)	0	(00)
	N = 601	273	328	144		184	

Expressed Interest Data

EI information was obtained from 161 (49%) students in the sample. First and second choices were recorded during the first weeks an individual was enrolled in the program. The question asked was, "If the education and training were available, what would you consider to be an interesting occupation for yourself?"

Occupational Outcome Data

Short-term occupational outcome data (educational major, if in college) were obtained on 193 (59%) students in the sample. Placement data were recorded through several methods:

1) A letter with return postcard was mailed to all graduates in the Spring of their graduation year - asking for placement data.

2) An intensive placement effort was made through the summer of each year -assisting students in securing placement.

3) Placement assistance was available to students at any time following graduation from HEP, thus a large number of placement data were gained from student initiated contacts. GED transcript requests were recorded with the educational facility noted.

4) In the years 1980 and 1982, a follow-up letter with enclosed, self-addressed postcard was sent to graduates of the past two years. Forty-seven of these graduates were part of the present sample, with only four providing responses.

5) In 1984, a questionnaire was developed and sent to a sampling of 600 students between the years 1971-1983. There were 49 responses, with only seven sample respondents.

Those students included in the short-term occupational outcome analysis, approximately 60 percent of the total sample, consisted of those who took the initiative to communicate with the program. Those students not located were likely to represent lesser aspirations and/or occupational success.

Scoring Methods

In this section, scorings for the inventories and for the criteria - short-term occupational outcome (or college major) and Expressed Interest are defined. Scorings for the predictor variables - occupational scale scores, expressed interests, consistency, differentiation, and cross-scale congruence - are delineated.

SCII and CAI Scorings

Scorings of the SCII and the CAI were accomplished by sending the optical scan form to N.C.S. systems in Minneapolis for computer scoring and profiling. The CAI (1975, 1978, 1980) and the SCII (1974, 1981) revisions were used.

Predictive validity to short-term Occupational Outcome

'Hit' rate to occupational outcome was measured in two ways:

1) The occupational scale scores were categorized in terms of 'hit' rates. Standard scores on the subject's occupational scale which matched his or her occupation were used to determine 'hit' levels. Spokane (1979) relabelled the 'hit' categories as Excellent (scores of 45 or higher), Moderate (scores of 40-44) and Poor (scores of 39 or below). This position was recommended by Campbell and Hansen (1981) in the recent Manual for the SVIB-SCII. In the case of 'flat' profiles, with no occupational scales scores above 45, the three highest occupational scores were used. In the present study, 13 (4%) subjects had flat profiles; similar to the average range, 3 to 6% flat profiles reported by Hanson and Swanson (1983). The McArthur (1955) method of categorizing occupations onto

the inventory scales was adhered to (Hanson and Swanson, 1983; Worthington and Dolliver, 1977).

2) Occupational scale score/EI congruence to later occupational outcome was categorized in terms of 'hit' rates. It was hypothesized that when there is correspondence between high inventory interests and EI, the predictive power to outcome would be increased (Borgen and Seling, 1978). This percentage congruence was anticipated to be higher and more accurate for the CAI than for the SCII.

Concurrent Validity to Expressed Interest

Occupational scale scores were categorized in terms of 'hit' rates. Standard scores on the subject's occupational scale which matched his or her EI were used to determine a 'hit'. Scorings were the same as used for predictive validity analysis. When occupational scale scores of 45 or more matched-up with EI it was classified as an Excellent 'hit'.

Supplementary measures of predictive validity

Three variables -- consistency, differentiation and cross-scale congruence -- were compared for predictive power to occupational outcome. If the occupational outcome could be located on the occupational scale of the inventory, then this score was correlated with the

predictor variables for CAI/SCII comparison. If no score on the inventory scale was above 45, the 1st, 2nd, and 3rd highest occupational scale scores were considered.

The CAI, normed on a population more similar in occupational interest to the population under study, should register a more consistent, differentiated profile pattern with higher cross-scale congruence.

Predictor Variable Scorings

Scorings were developed for three of the variables - consistency, differentiation, and cross-scale congruence - to measure their relative predictive power to occupational outcome. The first two of these variables (consistency and differentiation) were hypothesized by Holland (1973) to be strong indicators of later occupational choice and stability. Holland labelled the factors a measure of vocational maturity. The third factor, cross-scale congruence, was reported in the literature as a strong predictor of later occupational outcome (Johnson and Johannson, 1972).

The scoring procedures used to measure these variables are here listed:

Consistency -- A consistent pattern was one that represented an integration of similar interests, competencies, values, traits, and perceptions. An SCII or CAI pattern was judged 'consistent' to the degree that the scores on the six broad interest themes for one student were located side by side. When highest general interest

themes were separated by one intervening theme they were judged 'alternate' themes. When highest general interest themes were separated by two intervening themes they were judged 'opposite' themes. Holland, et al. (1973) have shown that the consistency of the occupational code of a man's first job predicts the category of his job five and ten years later.

Differentiation -- This was the distance between opposing interests. Highs and lows on the individual profile are termed 'well-differentiated' and are more predictive to outcome (Campbell, 1974). An SCII or CAI pattern was judged 'differentiated' to the degree that the scores on the six broad interest themes for one student were located on opposite scales on the R I A S E C model. When highest general interest themes were separated from the lowest themes by one intervening theme they were judged 'alternate' themes. When the highest general interest theme and the lowest theme were located side by side on the scale they were judged 'opposite' themes.

Cross-scale Congruence -- This measured the degree of match-up between 'high' basic interest themes and 'high' occupational scale scores. A profile with a 'high' basic interest theme score and a 'high' occupational scale score (45 or more) in the same R I A S E C theme area was judged congruent. When two 'high' scores were located one

theme apart, they were judged 'alternate' themes; if two themes apart they were judged 'opposite' themes. Both the CAI manual and the SCII manual emphasize the confidence gained in predictive validity when congruence is considered:

> Generally, one should look for consistant patterns of interests on the General theme, Basic Interest area, and Occupational scales. Research on the Strong Blanks (Johnson and Johannson, 1972) indicated that the best predictive validity occurs when an individual has high scores on both an Occupational scale, such as Life Insurance Agent, and its related Basic scales, such as Sales (p. 84, CAI Manual, 1976).

Holland and Gottfredson (1976) remind us, however, that the occupational structure in our society does not currently allow everyone to be employed in congruent jobs. Thus, the predictive validity of this factor may be directly affected by the structural aspects of the marketplace, particularly with this specific, high school drop-out population.

The predictive validities of the three factors, consistency, differentiation, and cross-scale congruence, are, as yet, of unknown magnitude. The SVIB-SCII Manual (1974) provides support for the Holland hypotheses that consistency and differentiation are valuable predictive measures to occupational outcome. The revised SVIB-SCII Manual (1981), however, omits direct discussion of these factors. The CAI Manual (1976) appears neutral in its

position on these factors. With this specific population, one with potentially high levels of uncertainty and undecidedness, it seemed important to measure the comparable contribution of these factors toward predictive validity on the two inventories.

Hypotheses

All hypotheses refer to the particular population studied; for other populations, quite different patterns might be expected. Six statistical hypotheses were delineated in Chapter 1 and are here presented in a directional format:

Hypothesis I

The 'hit' rate of occupational scale scores to short-term occupational outcome for the CAI is greater than for the SCII.

Hypothesis II

When EI and occupational scale scores (45 or more) match, the 'hit' rate to occupational outcome for the CAI is greater than for the SCII.

Hypothesis III

The concurrent validity of occupational scale scores to EI is greater for the CAI than the SCII.

Hypothesis IV

Consistency, differentiation and cross-scale congruence (measures of vocational maturity) are greater for the CAI than for the SCII.

Hypothesis V

Consistency, differentiation and cross-scale congruence correspond more frequently to occupational outcome (the occupational scale score for that occupation) for the CAI than the SCII.

Hypothesis VI

The CAI presents a more equally dispersed pattern across the six R I A S E C General Interest Themes than the SCII.

Statistical Procedures

The responses were coded according to the scoring method previously indicated. The data were processed at the Computer Services Department, University of the Pacific, Stockton, California. The Statistical Package for the Social Sciences was utilized for the statical evaluation. It was hypothesized that significant differences existed between the predictive efficiency of the two interest inventories under study, with this specific population.

Hypotheses I and II compared the predictive power of the two inventories. Occupational scale scores and EI were the predictors. Short-term occupational outcome was the criterion. The chi-square test of association was the statistical test used.

Hypothesis III compared the concurrent validity of the two inventories. Occupational scale score was the predictor. EI was the criterion. The chi-square test of association was the statistical test used.

Hypothesis IV and V compared profile patterns of the inventories. Consistency, differentiation, and cross-scale congruence served as the predictor variables, short-term occupational outcome was the criterion. The chi-square test of association was the statistical test used. Multiple correlation procedures were used to determine the degree of relationship between the predictors (consistency, differentiation, and cross-scale congruence) and the criterion 'hit' rate as indicated by occupational outcome.

Hypothesis VI examined the differences between proportions for each of the six general theme scales of R I A S E C . Chi-square test of association was computed to examine the proportions comprising the six general theme areas.

A .05 significance level was the standard on which the chi-square findings were evaluated.

Summary

The purpose of the study was to compare the validities of two interest inventories, the Strong-Campbell Interest Inventory and the Career Assessment Inventory, using a non-college oriented sample; i.e., Hispanic, high school drop-out, migrant and seasonal farmworker youth.

The criteria used to assess validities were short-term occupational outcome (or college major) and Expressed Interest. Predictor variables included: occupational scale scores, EI, consistency, differentiation, consistency, and cross-scale congruence.

CHAPTER 4

ANALYSIS OF THE DATA

The purpose of this study was to compare the predictive validities of two interest inventories with a non-college oriented population. Short-term occupational placement (or college major for those who enrolled in an institution of higher education) and Expressed Interest served as the criteria. The predictor variables to occupational outcome included "high" occupational scale scores (scores of 45 or more) and Expressed Interest. The degree of predictability to occupational outcome was examined using three other predictor variables - consistency, differentiation, and cross-scale congruence. The spread of interests across the six occupational categories, as developed by Holland, was contrasted for the two inventories. The instruments used in the study were the Strong-Campbell Interest Inventory (an inventory normed on a professional clientele) and the Career Assessment Inventory (an instrument normed on blue-collar, non-baccalaureate career persons).

Details of procedures on the validities and

reliabilities of the instruments used in this study were presented in Chapter II and III. Six hypotheses were tested and are presented in this chapter.

Hypothesis I tested for the predictive validity of the inventory scale scores. Hypothesis II tested for the predictive validity when there was Expressed Interest/Inventory match-up. Hypothesis III tested for concurrent validity to Expressed Interest. Hypothesis IV compared the levels of consistency, differentiation, and cross-scale congruence for the two inventories. Hypothesis V examined the degree of linear dependence of occupational outcome on these same three predictors - consistency, differentiation, and cross-scale congruence. Hypothesis VI examined the spread of interests across the six General Interest Themes - R I A S E C - for the two inventories. Each of these hypotheses was subjected to statistical analysis. Descriptive data and the results of the statistical procedures are reported below.

Numbers and percentages of the sample that provided EI and short-term occupational outcome data for the two inventories is shown in TABLE 6. The total sample consisted of 328 students. Of this total, expressed interests were recorded for 161 students; 51% of the CAI sample, 48% of the SCII sample. Occupational outcome data

TABLE 6

EI and Occupational Outcome numbers and percentages for the sample on either the CAI or the SCII.

		EI		No EI		
		N	%	N	%	
CAI		73	51	71	49	N=144
SCII		88	48	96	52	N=184
	N =	161		167		

		Occupational outcome		no Occupational outcome		
		N	%	N	%	
CAI		94	65	50	35	N=144
SCII		99	54	85	46	N=184
	N =	193		135		

was reported by 193 students; 65% of the CAI sample, 54% of the SCII sample.

Results

SPSS computer programs were used for the analysis of the data (Nye et al., 1975). Hypotheses I, II, III, IV, and VI were tested using the subprogram Crosstabs. The chi-square test of association was the statistic used to determine whether the two inventories were statistically associated with outcome measures. Hypothesis V used the subprogram Regression statistic to determine the linear relationship between the dependent variable, occupational scale score, and the set of independent variables -- consistency, differentiation, and cross-scale congruence.

The .05 level of significance was adapted as being the most appropriate to balance the probabilities of Type I and Type II errors (Roscoe, 1975).

The hypotheses are directional in nature, stating the research question. The statistical analysis, however, provides evidence on the retention or rejection of the null hypothesis. Thus, when a test of significance proves positive, the directionality of the relationship is unknown. Further analysis is required for clarification.

Predictive validity of the two inventories

Hypothesis I. The 'hit' rate of occupational scale scores to occupational outcome is greater for the CAI than the SCII.

As shown in TABLE 7, the null is tenable, therefore, research Hypothesis I was not supported. There was not a significant difference at the .05 level. For the Excellent 'hit' category, the CAI (48%) and the SCII (45%) were similarly effective in predicting outcome. When Excellent and Good 'hit' rates were combined for the two inventories, similar 'hit' rates (60% and 57%) were attained.

Predictive validity of the two inventories when there is Expressed Interest/Inventory Congruence

Hypothesis II. When there is EI/occupational scale score congruence, the 'hit' rate to occupational outcome for the CAI is greater than for the SCII.

As shown in TABLE 8, the null is tenable, therefore, research Hypothesis II was not supported. The difference between the two inventories was not significant at the .05 level.

A comparison of the Excellent 'hits' shows the CAI (71%) to be non-significantly higher than the SCII (54%). When the Excellent and Moderate 'hit' rates are combined,

TABLE 7

Hypothesis I. Predictive Validity to short-term occupational outcome for the CAI and the SCII.

Short-term Occupational Outcome	CAI N	CAI %	SCII N	SCII %
Excellent[a] Hit	45	47.9	45	45.5
Moderate[b] Hit	11	11.7	11	11.1
Poor[c] Hit	38	40.4	43	43.4
Totals	94		99	
$\chi^2 = 1.74$		$p = .42$		

[a] A 'hit' is defined as Excellent when the occupational scale score of the occupation entered is a score of 45 or more.

[b] A 'hit' is defined as Moderate when the scale score is between 40 and 44.

[c] A 'hit' is defined as Poor when the scale score is 39 or below.

TABLE 8

Hypothesis II. Predictive Validity to short-term occupational outcome when there is Inventory/EI congruence for the CAI and the SCII.

Short-term Occupational Outcome	CAI N	CAI %	SCII N	SCII %
Excellent[a] Hit	29	70.7	24	54.5
Moderate[b] Hit	4	9.8	5	11.4
Poor[c] Hit	8	19.5	15	34.1
Totals	41		44	
$\chi^2 = 2.61$		$p = .27$		

[a] A 'hit' is defined as Excellent when EI and Occupational outcome match-up and this occupation is located on the respective inventory occupational scale scores as 45 or above.

[b] A 'hit' is defined as Moderate when the scale score is between 40 and 44.

[c] A 'hit' is defined as Poor when the scale score is 39 or below.

the differences in 'hit' rates are well within chance limits; 80% for the CAI, 66% for the SCII.

One should view the above evidence with the appropriate caution. These findings are based on a small number of cases where match-up occurred. Of the original short-term placements (N=193) an identical 44% of the CAI and the SCII had match-ups with EI.

Concurrent validity of the two inventories

Hypothesis III. The match-up between inventory interests and expressed interests (a measure of concurrent validity) is higher for the CAI than for the SCII.

As shown in TABLE 9, the hypothesis was not supported. Looking at the Excellent 'hit' rate category, the CAI (56%) showed a validity level non-significantly higher than the SCII (43%), using Expressed Interest as the criterion. When Excellent and Good 'hit' rates were combined for the two inventories, the CAI (68%) was only slightly more predictive than the SCII (55%). The differences between the two inventories were not significant at the .05 level.

It was predicted that the interests of this specific population (a non-college oriented sample) would have expressed interests more consistent with the occupational scales of the CAI than the SCII.

TABLE 9

Hypothesis III. Concurrent Validity to EI for the CAI and the SCII.

Expressed Interest	CAI N	CAI %	SCII N	SCII %
Excellent[a] Hit	41	56.2	38	43.2
Moderate[b] Hit	9	12.3	10	11.4
Poor[c] Hit	23	31.5	40	45.4
Totals	73		88	

$\chi^2 = 3.39$ $p = .18$

[a] A 'hit' is defined as Excellent when EI is located on the inventory occupational scale scores as a score of 45 or above.

[b] A 'hit' is defined as Moderate when the scale score is between 40 and 44.

[c] A 'hit' is defined as Poor when the scale score is 39 or below

Vocational maturity pattern comparison for the two inventories

Hypothesis IV. The vocational maturity pattern (consistency, differentiation, cross-scale congruence) is greater for the CAI than for the SCII.

As shown in TABLE 10, the hypothesis was not supported. Profile patterns for the CAI and the SCII were similar overall. High consistency occurred rather frequently on the SCII (63%) and on the CAI (55%), with both inventories recording few patterns of low consistency - CAI (10%), SCII (11%). The differences between the two inventories was not significant at the .05 level.

High differentiation profiles occurred for less than one-third of the sample for both inventories; CAI (28%), SCII (29%). This finding may reflect the youthfulness of the sample and the general lack of clear likes and dislikes in interests and occupational preferences.

Cross-scale congruence was present on over fifty percent of the profiles for both the CAI (60%) and the SCII (53%).

Predictive Validity of the two inventories using three variables - consistency, differentiation, and cross-scale congruence - as predictors

Hypothesis V. The predictive validity of

TABLE 10

Hypothesis IV. A Comparison of Consistency, Differentiation and Cross-Scale Congruency levels for the CAI and SCII.

Vocational Maturity	N	High[a]	Moderate[b]	Low[c]	χ^2
Consistency					
CAI	134	55.2	35.1	9.7	3.50
SCII	186	63.2	25.4	11.4	
Differentiation					
CAI	134	28.1	40.7	31.1	2.38
SCII	186	28.6	47.6	23.8	
Cross-scale congruence					
CAI	134	60.0	17.8	22.2	1.42
SCII	186	53.5	19.5	27.0	

[a] High - Consistency: the scores on the two highest occupational scales are adjacent.
Differentiation: the highest and lowest occupational scale scores are on opposite themes.
Cross-scale congruence: the highest Basic Interest Theme and highest occupational scale score are on identical themes.

[b] Moderate -
Consistency: the two highest theme scores are one theme apart.
Differentiation: the highest and lowest theme scores are one theme apart.
Cross-scale congruence: the highest basic theme and occupational scale score are one theme apart.

[c] Low - Consistency: the two highest theme scores are two or more themes apart.
Differentiation: the highest and lowest scores are on adjacent themes.
Cross-scale congruence: the highest Basic theme and occupational scale are on themes two or more apart.

consistency, differentiation, and cross-scale congruence to occupational scale scores is greater for the CAI than the SCII.

As shown in TABLE 11, the hypothesis was not supported; R^2 scores showed that only a small percentage (8 percent for the CAI and 7 percent for the SCII) of the variation in Occupational Scale Scores was explained by consistency, differentiation, and cross-scale congruence operating jointly.

Dispersion of Interests Across the Six RIASEC Themes

Hypothesis VI. The distribution of interests across the six R I A S E C themes of Holland will be greater for the CAI than the SCII.

This wording refers to the one single highest interest of each subject. As shown in TABLE 12, the hypothesis was supported with significance at the .05 level. As implied by this .05 level with an N as large as this, the overall difference was not great. The social theme showed the largest discrepancy between the two tests. For the CAI, the proportion of responses was less than for the SCII. There was little difference in the responses for the other five themes on the two inventories. For the CAI, 65.5% of the responses fell in the two more traditional categories: realistic and

TABLE 11

Hypothesis V. Comparison of Multiple Regression for three factors (consistency, differentiation, and cross-scale congruence) to occupational scale scores for the CAI and the SCII.

The Multiple R and R^2 are presented for the criterion - Occupational Scale Score.

	CAI	SCII
Multiple R =	.278	.269
R^2 =	.077	.072

The Multiple R is the composite of the three predictor variables:

Consistency = the highest themes were adjacent to each other.
Differentiation = the highest and lowest theme scores were on opposite scales.
Cross-scale congruence = the highest basic interest scale scores matched-up with an occupational scale score of 45 or more.

TABLE 12

Hypothesis VI. The dispersion of interests across the six interest themes for the CAI and the SCII.

Theme	CAI frequencies obs f	CAI frequencies exp f	$\frac{(O-E)^2}{E}$	SCII frequencies obs f	SCII frequencies exp f	$\frac{(O-E)^2}{E}$
Realistic	80	75	.33	52	57	.44
Investigative	9	8	.12	6	6	.00
Artistic	15	12	.75	6	9	1.00
Social	13	22	3.68	25	16	5.06
Enterprising	7	10	.90	11	8	1.12
Conventional	60	56	.29	39	43	.37
TOTALS	184	184		139	139	

$\chi^2 = 14.06$ $\quad$ $\underline{p} < .05$

conventional. For the SCII, 76.1% of the responses were in these two categories.

One factor potentially contributing to the variation found between the two tests was in the placement of occupational titles within the themes on the inventory. On the CAI, the occupation 'beautician' was categorized under the theme Realistic; the same occupation was located under the Enterprising theme on the SCII. The occupation 'flight attendant' was categorized under the Artistic theme on the CAI, the Enterprising theme on the SCII. The CAI categorized the occupation 'waitress' under the Conventional theme, whereas, this occupation was unlisted on the SCII.

It is important for the reader to keep in mind that the chi-square statistic helps us determine whether the variables are related or independent. It does not tell us how strongly they are related. With a rather large sample, a weak relationship may show statistical significance. Thus, the findings must be viewed with caution; the relationship, though significant at the .05 level, is not strong.

Dispersion of Interests, Across Six RIASEC Themes Broken by Gender

When the data shown in TABLE 12 are analyzed by sex

group separately, somewhat different patterns emerge for men and for women. That is, the CAI-SCII differences, in R I A S E C themes, that men show are somewhat different from those that women exhibit. TABLE 13 shows this. The p level becomes more significant, being .01 for each group.

Detailed elaborations of the findings in each sex group are tenuous because of smaller N's. One of the assumptions for Chi Square is that the expected frequencies in each cell must be larger than 5; though recently contradicted by Camilli and Hopkins (1978). For both the male and female breakdown, expected frequencies of less than 5 were present in 25% of the cells for the theme areas.

For males, the discrepancy between the two tests appeared on two themes; the Conventional and Artistic. The CAI showed a greater response rate on the Conventional theme. The SCII showed a greater response rate on the Artistic theme. In general, the CAI provided a narrow range of interest, with 84.3% of the high interest choices falling in either the Realistic (65.7%) or Conventional (18.6%) categories. The SCII provided a somewhat different pattern for males, with 65.0% choosing Realistic, 12.5% choosing Artistic, with no responses in the Conventional theme. The other categories,

TABLE 13

Hypothesis VI. The dispersion of interests across the six interest themes for the CAI and SCII, broken down by gender.

	Males					
	CAI			SCII		
Theme	obs	exp	$\frac{(O-E)^2}{E}$	obs	exp	$\frac{(O-E)^2}{E}$
Realistic	47	47	.00	52	52	.00
Investigative	4	4	.00	5	5	.00
Artistic	2	6	2.67	10	6	2.67
Social	3	5	.80	7	5	.80
Enterprising	2	4	1.00	6	4	1.00
Conventional	13	6	8.17	0	7	7.00
Totals	71	71		80	80	
	$\chi^2 = 24.11$			$p < .01$		

	Females					
	CAI			SCII		
Theme	obs	exp	$\frac{(O-E)^2}{E}$	obs	exp	$\frac{(O-E)^2}{E}$
Realistic	5	12	4.08	25	18	2.75
Investigative	2	2	.00	4	4	.00
Artistic	4	4	.00	5	5	.00
Social	21	11	9.09	6	16	6.25
Enterprising	9	4	6.25	1	6	4.17
Conventional	25	34	2.38	60	51	1.58
Totals	66	66		101	101	
	$\chi^2 = 36.52$			$p < .01$		

Investigative, Social, and Enterprising, had a 6 to 9% interest range. The CAI profile, showed a concentration of interests in two area, whereas, the SCII profiles showed a singular concentration.

For females, four themes showed differences. The CAI showed a greater response rate on the Social and the Enterprising themes. The SCII showed a greater response pattern on the Realistic and the Conventional themes. For females, the CAI provided a broad range of interests across three themes; Conventional (40.0%), Enterprising (13.3%) and Social (28.3%). The SCII, for females, followed the more traditional pattern, with 84.0% of the responses falling into the categories Conventional (59.4%) and Realistic (24.8%). No other theme registered a response pattern above 10%. Thus, the CAI showed two highly regarded theme preferences, as did the SCII.

Summary

In order to obtain the results for the study, the following statistical analyses were used: 1) Chi square test of association to determine the concurrent and predictive validity of Expressed Interests and Occupational scale scores to short-term occupational outcome (or college major), and 2) Multiple Regression to determine the variability in occupational outcome

attributable to the combined effects of consistency, differentiation, and cross-scale congruence acting jointly.

It was hypothesized that the CAI would provide higher predictive validity to outcome data for this sample population than would the SCII. Overall, there were no significant differences found between the two tests in their ability to predict to outcome. Nor were there differences to concurrent validity, using EI as the criterion.

Significant differences did not appear between the two tests as to levels of consistency, differentiation, and cross-scale congruence. For both tests, vocational maturity factors were quite high.

The correlational levels to occupational scale scores of three measures - consistency, differentiation, and cross-scale congruence - were low for both inventories, accounting for very little of the variance in score differentiation.

When analyzing the distribution of interest across the six General Interest Themes of the profile, significant differences did appear between the two tests, these differences being accentuated when male/female patterns were examined separately. The differences in

proportions registered in the chi-square analyses do reflect that the distribution of interests for the two tests accent different themes for the CAI and the SCII.

In conclusion, Hypotheses I through V were not supported, showing no significant differences between the CAI and the SCII. Hypothesis VI was partially accepted as showing significant differences in the distribution of interests across the six themes of the R I A S E C model.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

INTRODUCTION

Interest inventories, particularly the SCII and its predecessor versions of the SVIB have proven over time to provide good predictive validity to later occupational outcome. This inventory has been researched with many populations and has measured many factors--EI/Inventory congruence, direct-indirect occupational classifications, private/public school populations, decided and undecided majors, male/female comparisons--and, overall, the predictive validity has remained steady with approximately 50 percent accuracy (Campbell & Hansen, 1981).

The inventory has been revised to deal with criticisms about sexual bias, to add occupational categories, and to provide a broader occupational perspective by incorporating the Holland dimensions to classify occupations by personality types (Hanson, et al., 1974). Yet Campbell (1974) cautions about the general use of the inventory, stating that the SCII works best for

the client who needs it the least. It is normed on and directed toward clients who have a professional orientation (see Chapter 2 for the broader discussion of the restricted samples used with much of the SVIB-SCII research on predictive validity).

In 1975, the Career Assessment Inventory was developed. The author stated in the CAI Manual (Johansson, 1976) that the purpose of the inventory was to meet the needs of a clientele that is non-college oriented; the non-baccalaureate student who is seeking occupational entry or who plans to pursue a technical institute/community college program directed at a trade. The inventory copied the format of the highly regarded SCII inventory, with a similar profile based on the Holland dimensions, adapted by the SCII in 1974. The major difference between the two inventories was that the CAI was normed on a non-professional, blue collar criterion group, so as to more adequately reflect the interests of those in the trades and short-term technical fields. This would offer a clear choice to the potential inventory recipient, based on his occupational interests.

Only 28 of the 610 students (4.6%) that attended HEP the years 1977-1981 went on to a four year college or University following graduation. Thus, the HEP sample

seemed to, in general, represent interests compatible with the CAI.

Summary of the Study

This study compared predictive validity rates to occupational outcome for the CAI and SCII. The study was based on a review of the related literature, a comparison of short-term occupational outcome data, and the analysis of six hypotheses. A sample of 320 participants was used.

The Problem

'Hit' rates to occupational outcome (or college major) were determined using occupational scale scores and Expressed Interest as the predictors, for the two inventories. These variables were further controlled for sex to examine the predictability of the inventories for both males and females. 'Hit' rates to Expressed Interest were, also, investigated to compare inventory interests with valued career goals, (expressed), even if not attained in the marketplace. The degree of variance in occupational outcome that was accounted for by three variables acting jointly, (consistency, differentiation, and cross-scale congruence), was determined using multiple regression for each of the inventories. The distribution of interests across the General Interest Themes was

compared for the two inventories, with further analysis, controlling for sex. This final comparison was presented as ancillary information toward the better understanding of the interest patterns of the research population and as a measure of the additional value of the specific inventory in broadening occupational awareness for the sample.

Design and Procedures of the Study

The present sample was comprised of students who attended the High School Equivalency Program, University of the Pacific, Stockton, California the years from 1977-1981. The Career Assessment Inventory or the Strong-Campbell Interest Inventory was administered to the sample during this time period. Of the accessible population for the study (601 students), the sample was comprised of 328 students (54.6%).

The HEP population came from 33 counties throughout Northern Califoria to live on the campus of the University and to study daily for the 5 test areas of the GED. Over 90 percent of the students were Hispanic, with eligibility requirements as follows: 1) from a farmworker family background, 2) between the ages of 17 and 24, 3) having dropped out of high school prior to entry, and, 4) being

motivated to seek preparation for the GED and further career planning and placement following graduation.

Students were encouraged to take an interest inventory as part of their Career Planning course. Both the SCII and CAI inventories were offered in 1977 and 1980. The SCII was offered in 1978 and 1979, with the CAI provided in 1981. Expressed Interest (EI) was the response given by the student to this question: "If the evaluation or training were available what would you consider to be an interesting occupation for yourself?"

Results of the Study

The results of the study are based on analysis of the six hypotheses tested. Two interest inventories, the CAI and the SCII were compared for overall validity in terms of: 1) Predictive validity to short-term occupational outcome, 2) Concurrent validity to Expressed Interest, and 3) General Interest Theme distribution for the two inventories.

Hypothesis One measured the predictive validity of occupational scale scores to later occupational outcome for the two inventories. Much of the validity research on the SVIB-SCII was done in this manner. Campbell and Hansen (1981) in the SCII Manual state in the section - 'interpreting the results' - that you should look for the

high scores - 40 and over. "Similar" or "very similar" columns (on the occupational scale) indicate that the person's interests match those of people happily employed in that occupation. Campbell cautions that the test won't tell you what to do, or where you will be happy or successful. It will only give you some detailed information about yourself and how your vocational interests compare with those of others.

The findings in this study state that 48 percent of the CAI and 45 percent of the SCII profiles registered scores "very similar" to later occupational outcome. Thus, the two inventories showed little difference in their ability to predict future outcome, with both inventories providing validity data comparable to past SVIB-SCII results.

These findings ran counter to the hypothesis that the CAI, normed on a population similar in occupational interests to the sample, should produce higher predictive validity. Controlling for sex, the pattern persisted, showing no significant difference between the two inventories.

Hypothesis Two compared the 'hit' rates for the two inventories when there was congruence between occupational scale scores (40+ scores) and EI. The predictive validity increased considerably over inventory scores alone. When

there was EI/Inventory congruence the 'hit' rate to Occupational outcome was 71 percent for the CAI and 54 percent for the SCII. The hypothesis was not supported as the CAI did not show significantly higher predictive power over the SCII.

Hypothesis Three compared the concurrent validity to EI for the two inventories. This variable was used as a criterion to examine the test validity to a highly valued career goal. Short-term outcome may have reflected the reality of the marketplace as well as the discrimination likely to face the minority, high school drop-out youth. The findings suggest that, once again, the two inventories were not differentially effective in validity levels, with 68 percent of the CAI and 55 percent of the SCII occupational scale scores registering 'similar' or 'very similar' interests to the Expressed Interest. EI validity was similar to Occupational outcome validity, providing no support for the contention that EI would reflect valued goals, and show high validity, whereas, occupational outcome would reflect the reality of the job market and show low validity.

Hypothesis Four was tested to compare the levels of consistency, differentiation, and cross-scale congruence for the two inventories. The hypothesis was not supported, as similar proportions were found for the three

factors on both inventories. (These factors were also measured as a cross-check of the vocational maturity levels for this youthful population. Holland (1973) warned that young people lacking consistent and differentiated profiles were likely to need vocational and personal counseling more than an interest inventory). Both inventories registered high cross-scale congruence for the sample; 60% of the CAI profiles and 53% of the SCII pofiles were congruent. Johnson and Johannson (1972) reported higher predictive accuracy when there was Basic Interest Scale/Occupational Scale Congruence.

Hypothesis Five tested the correlational levels between three predictor variables (consistency, differentiation, and cross-scale congruence) and occupational outcome for the two inventories. The hypothesis was not supported, with low correlations being found for both inventories. Using the multiple regression statistic, R^2 scores showed that only a small percentage (CAI = 8 percent; SCII = 7 percent) of the variation in occupational scale scores was explained by the three variables operating jointly.

Hypothesis Six tested the two inventories to see if a broader spread of interests was shown for students taking the CAI than the SCII. This analysis yielded a significant

difference (at the .05 level) with variation accented when sex was controlled.

In summary, the findings of the study indicated that (1) in terms of predictive validity, the two inventories did not discriminate at a significant level, (2) in comparing concurrent validity to EI, the inventories had similar results, (3) the factors consistency, differentiation, and cross-scale congruence did not show significant differences with the sample under study, and (4) there were significant differences in the spread of occupational interests across the six General Interest Themes of the inventories. This result is confounded by the following considerations: a) Some of the occupations were located under different themes on the two inventories, b) Some of the occupations were listed on only one of the inventories, thus requiring judgment of placement, and c) the two inventories, to some degree, measured different interests.

Conclusion

In the Review of the Literature it was noted that the SCII was an interest inventory specifically aimed at the college student with professional career plans. It was not clear as to its applicability to other groups: 1) the non-professional career candidate, 2) the young,

3) the uncertain occupational aspirant, and 4) minority populations.

The present study was designed to address itself primarily to the first of these concerns, using a sample population composed of the other three issues above. With a specific sample (young, minority, farmwork background, who had failed to complete high school successfully) which was non-college oriented, would the CAI show evidence of being more appropriate in terms of 1) concurrent and predictive validity, 2) a more differentiated and consistent profile, or 3) a broader range of occupational options, than the SCII.

Validity data for the CAI and the SCII ranged near 50%. Noeth and Jepsen (1981) shed some light on this issue when reporting the 'hit' rate of EI to later occupational outcome (2 years after high school) for a national sample of high school juniors. They speculated that the most successful students at early implementation of their choices may have been those who selected unskilled and semi-skilled jobs typically held by workers of their sex.

Findings from the present study suggest similar conclusions. Occupational outcome data for the sample are certainly limited by the job market reality. Those who successfully implemented their occupational plans may be

the students who selected traditional, unskilled jobs typically held by workers of their age, sex, and ethnic background. Thus, for this specific population the goals sought (aspiration levels) may accurately reflect the occupational opportunities available to them.

Noeth and Jepsen (1981) warn that the Holland typology may not be as powerful for explaining the early careers of semi-skilled and unskilled workers as for professional, managers, and skilled workers. The CAI does not provide additional discrimination on career interests for this select sample.

Levels of vocational maturity - measured by profile consistency and differentiation - and cross-scale congruence were compared for the two inventories. The CAI did not provide higher predictive power to occupational outcome using these variables than did the SCII. Holland (1973) equated high levels of maturity with a personality pattern characterized by high degrees of consistency and differentiation. The theory implied that if a person was young (15 to 20) or had an inconsistent or relatively flat profile, then clarification or experience or both were the principal needs.

Campbell, in the SVIB-SCII Manual (1974), incorporated these concepts, stating that: 1) profile consistency will be more predictive than a pattern with

equally high scores on less related themes, and 2) profile differentiation, the peaks and valleys of a profile, is more predictable than a flat or 'undifferentiated' profile. These characteristics of the patterns of the profile scores are important, along with the actual scores themselves, in understanding the person's interests.

The sample under study was young in age, with a mean age of 18 years old, and the findings must be assessed with caution. The profile patterns were examined to measure the degree of 'flat' profile patterns. Only 12% of the respondents did not register at least one score of 45 or more (no similar interests on the occupational scale scores).

Over 50 percent of the sample registered consistent patterns with cross-scale congruence. Thus, for the sample population, these concepts were present. But, the predictive value of these concepts has been re-evaluated by Campbell it seems. For, in the SVIB-SCII Manual of 1974 (Campbell) these concepts were incorporated into the general profile interpretation. In the 1981 Manual (Campbell & Hansen) these concepts were not included.

The CAI and the SCII registered significant differences in the proportions of responses that fell into each of the six General Interest Themes of the R I A S E C model.

The CAI pattern of dispersion did not turn out to be broader, as much as, different from the SCII pattern. Controlling for sex, the narrowness of focus on specific themes became apparent, with males concentrated in the Realistic theme and the females bunched in the Conventional and Realistic themes.

Thus, the inventory information reflects back the highly focused interests of the sample - suggesting that the students have interests similar to workers in a small range of occupations, and in only one or two themes. This pattern suggests that the sample has had little exposure to the broad range of careers, has had few role models, and is uncertain or has undeveloped interests. Others have suggested that narrowed interests, such as these, may represent interests not of the present work force, but of the younger workers coming into the career world - an area in transition, particularly for females (Noeth & Jepsen, 1981).

Recommendations

Recent research has sought to explore the value of the SCII and other interest measures with the counseling client and specific groups; i.e., the undecided client, levels of certainty, female clients, and the minority populations.

Slaney (1984) had drawn attention to some major considerations in the use of interest information - for research and for the career client. Future study should focus on those populations on which we have least data - females and the 'undecided' client. Also, methodology should be alert to occupational outcome/satisfaction discrepancies. Slaney reminds us that individuals stay in jobs for many reasons other than interest and maximum performance.

Noeth and Jepsen (1981) recommend that future research examine those variables affecting predictability, such as, congruence of expressed and inventoried interests, degrees of certainty and levels of choice preferences.

Bartling and Hood (1981) recommend that validity studies continue to be tested on women due to the fact that women's careers are in a state of transition, and the findings may not be applicable to women who are now entering the work world.

Lamb (1976), in one of the few studies measuring interests of minority populations, used the ACT interest inventory to compare 'hit' rates to college majors. He concluded that few differences were found between whites, blacks, Native Americans, Spanish surnames, and Oriental Americans. In the area of Fine Arts (the Artistic theme in Holland's model), however, the 'hit' rate for whites

was 53%, for Blacks 25%, and for Spanish surname (23%). Lamb observed that minority youth seeking higher education are among those who might profit from the use of interest inventories to gain the self-awareness and career suggestions gained from inventory results. He recommended from his findings that subsequent research be done to provide evidence of the appropriateness of inventory exploration with younger members of certain minority groups.

The value of using the SCII, an inventory directed toward the college graduate, with the Hispanic population has been a topic of increasing research. Campbell and Hansen (1981) developed a Spanish-language version of the Strong-Campbell Interest Inventory (SCII-S) stating that the first language of the client should be the most beneficial. Fouad et al. (1984) cite recent research recommendations calling for counselors to work with the Hispanic population at the high school and college level to widen the range of job possibilities and to narrow the discrepancy between aspirations and accomplished goals (Casas & Atkinson, 1981; Padilla, 1981). And, finally, they conclude that the view of the work environment held by Hispanic bilingual high school students is similar to the view held by the majority culture and that counselors

may use the SCII as an exploratory device, to help minority clients widen their occupational opportunities.

The present study, also, recommends the use of the SCII with the minority student, particularly if the inventory findings are explored in terms of the broad, occupational themes surrounding these interests. With the sample under study different inventories offered different options to the applicants. This may suggest that an individual seeking guidance on 'similarity' patterns to workers in various occupations will want to take at least two inventories to gain a broader awareness of his interests and their match-up with employed individuals.

REFERENCES

Bartling, W., & Hood, A. (1981). An 11 year follow-up of measured interests and vocational choice. Journal of Counseling Psychology, Vol. 28 No. 1., 27-35.

Berman, G.S., & Haug, M.R. (1975). Occupational and educational goals and expectations: the effects of race and sex Social Problems, 23(2), 166-181.

Bodden, J.L. (1978). Test review of the career assessment inventory. In O. K. Buros (ed.), The Eighth Measurement Yearbook (Vol. 11). Highland Park, N.J.: Gryphon Press.

Borgen, F.H. (1972). Predicting career choices of able bodied college men from occupational and basic interest scales of the Strong Vocational Interest Blank. Journal of Counseling Psychology, Vol. 19, 202-211.

Borgen, F.H. (1978). Test Review-Career Development Inventory. In O. K. Buros (ed.), The Eighth Mental Measurement Yearbook (Vol. 11). Highland Park, N.J.: Gryphon Press, p. 1556.

Borgen, F.H., & Harper, G.T. (1973). Predictive validity of measured vocational interest with black and white college men. Measurement and Evaluation in Guidance, 6: 19-27.

Borgen, F.H. & Seling, M.J. (1978). Expressed and inventoried interests revisited: perspicacity in the person, Journal of Counseling Psychology, Vol 25, 536-543.

Buros, O.K. (Ed.) (1978). The Eighth Mental Measurements Yearbook, (Volume II). Highland Park, N.J.: Gryphon Press.

California Higher Education Commission, (1983). California's 'Pipeline' Problem. Author Oct.

Camilli, G. & Hopkins, K.D. (1978). Applicability of chi-square to 2 X 2 contingency tables with small expected cell frequencies. Psychological Bulletin, Vol. 85, No. 1, 163-167.

Campbell, D.P. (1971). Handbook for the Strong Vocational Interest Blank. Stanford, Ca.: Stanford University Press.

Campbell, D.P. (1974). Manual for the Strong Campbell Interest Inventory, T 325. Stanford, CA: Stanford University Press.

Campbell, D.P., & Hansen, J.C. (1981). Manual for the SVIB SCII. (3rd Ed.) Stanford University Press.

Casas, J.M. & Atkinson, D.R. (1981). The Mexican-American in higher education: An example of subtle stereo-typing. Personnel and Guidance Journal, 59, 473-76.

Cole, N.S., & Hanson, G.R. (1971). An analysis of the structure of vocational interest. Journal of Counseling Psychology, Vol. 18, 478-486.

Clark, K.E. (1961). Vocational Interests of Non-Professional Men. Minneapolis: University of Minnesota Press.

Clark, K.E., & Campbell, D.P. (1965). Minnesota Vocational Interest Inventory. New York: Psychological Corporation.

Cochran, L.H. (1974). Counselors and the non-college bound student. The Personnel and Guidance Journal, 52, 582-585.

Cooper, S.L. (1977). A Test of Holland's Theory: A Comparative Study of the Expressed Vocational Choice of Black and White Students as Related to Race and Socio-Economic Factors. Dissertation Abstacts International, 37 (8-B), 4112.

Crites, J.O. (1969). Vocational Psychology. McGraw-Hill Book Co., N.Y.

Crites, J.O. (1974). Career counseling: A review of major approaches. Counseling Psychologist, Vol. 4, No. 3, pp. 3-23.

Crites, J.O. (1976). Career counseling: A comprehensive approach. Counseling Psychologist, Vol. 6, No. 3, p. 2-12.

Crites, J.O. (1978). Test Review-Strong Campbell Interest Inventory. In O.K. Buros (ed.), The Eighth Measurement Yearbook, (Vol. 11), Highland Park, N.J.: Gryphon Press.

Crites, J.O. (1978b). Test Review-The Self-Directed Search. In. O.K. Buros (ed.), The Eighth Measurement Yearbook, (Vol. 11). Highland Park, N.J.: Gryphon Press.

Darley, J.G., & Hagenah, T. (1955). Vocational Interest Measurement. Minneapolis: University of Minnesota Press.

Dawkins, M. (1980). Educational and occupational goals - male vs. female Black high school seniors. Urban Education, Vol. 15 No. 2, 231-242.

Dayton, C. (1980, October 3). NEWS, p. 8-9. Bureau of Labor Statistics, U.S. Department of Labor, Unemployment statistics.

Diamond, E.E. (1975). Overview. In. E.E. Diamond (Ed.), Issues of sex bias and sex fairness in career interest measurement. Washington, DC: National Institute of Education.

Diamond, E.E. (1981). Sex-typical and sex-atypical interest of Kuder occupational interest survey criterion groups: Implications for counselors. Journal of Counseling Psychology, Vol. 28, 229-242.

Dolliver, R.H. (1969). Strong Vocational Interest Blank versus Expressed Vocational Interests: A review. Psychological Bulletin, pp. 103-104.

Dolliver, R.H. (1969b). "3.5 to 1" on the Strong Vocational Interest Blank as a pseudo-event. Journal of Counseling Psychology, Vol. 16: 172-74.

Dolliver, R.H. (1974). An adaption of the Tylor Vocational Card Sort. Personnel and Guidance Journal, 916-920.

Dolliver, R.H. (1978). Test Review-Strong Campbell Interest Inventory. In O.K. Buros (ed), The Eighth Measurement Yearbook (Vol. II). Highland Park, N.J.: Gryphon Press.

Dolliver, R. (1981). A review of female-male score differences on the Strong Campbell twin occupational scales. Journal of Counseling Psychology, Vol. 28, July 1981.

Dolliver, R.H., Irvin, J.A. & Bigley, S.E. (1972). Twelve-year follow-up of the Strong Vocational Interest Blank. Journal of Counseling Psychology. Vol. 19, 212-17.

Dolliver R.H. and Will, J.A. (1977). Ten year follow-up of the Tyler vocational card sort and the Strong Vocational Interest Blank. Journal of Counseling Psychology, Vol. 24, 48-54.

Doughtie, E. et al. (1976). Black - white differences on the vocational preference inventory. Journal of Vocational Behavior, p. 41-44.

Epperson, D.L., & Hammond, D.C. (1981). Use of interest inventories with Native Americans: A case for local norms. Journal of Counseling Psychology, 28, 213-220.

Esposito, R.P. (1975). The Relationship Between the Motive to Avoid Success and Vocational Choice by Race and Sex. Dissertation Abstacts International 36 (3-A) 1302.

Fitzgerald, L.F., & Crites, J.O. (1980). Toward a career psychology of women: What do we know? What do we need to know? Journal of Counseling Psychology, Vol. 27, 44-62.

Gade, E., & Soliah, D. (1975). Vocational Preference Inventory of high point codes versus expressed choices as predictors for college major and career entry. Journal of Counseling Psychology, Vol. 22, 117-121.

Ginzberg, E. (1979). Toward a theory of occupational choice: a restatement. Career Counseling, p. 127-134.

Goldman, L. (1971). Using Tests in Counseling (2nd ed.). Pacific Palisades, Ca.: Goodyear Publishing Company, Inc.

Gottfredson, G.D. (1979). Aspiration-Job match: Age trends in a large nationally representative sample of young white men. Journal of Counseling Psychology, Vol. 26, 319-28.

Gottfredson, L.S., & Brown, V.C. (1978). Holland codes for the 1960 and 1970 censuses: Detailed occupational titles. JSAS Catalog of Selected Documents in Psychology, MS 1660.

Grotevant, H. D., & Durrett, M.E. (1980). Occupational Knowledge and career development in adolescence. Journal of Vocational Behavior, 17, pp. 171-182.

Guilford, J.P. (1954). Psychometric Methods. (2nd ed.) New York: McGraw-Holt.

Hager, P.C. & Elton, C.F. (1971). The vocational interests of black males. Journal of Vocational Behavior, 1, 153-158.

Hanson, G.R. (1974). Assessing the career interests of college youth: Summary of research and applications. The American College Testing Program No. 67.

Hanson, Gary, Lamb, R., & English, E. (1974). An analysis of Holland's interest types for women: a comparison of the Strong-Holland and the ACT vocational interest profile scales for women. Journal of Vocational Behavior, 4, 259-269.

Hansen, J.C., & Swanson, J.L. (1983). Stability of interests and the predictive and concurrent validity of the 1981 SCII for college majors. Journal of Counseling Psychology, Vol. 30, 194-201.

Harmon, L.W. (1976). Sex stereotyping in interest items: Occupational titles versus activities. Measurement and Evaluation in Guidance, 8(4), 215-220. (ERIC EJ 134 213)

Harmon, L.W. (1978). Test Review--Kuder Preference Record Vocational. In O.K. Buros (ed.), The Eighth Measurement Yearbook (Vol. II). Highland Park, N.J.: Gryphon Press.

Harrington, T.F., & Oshea, A.J. (1980). Applicability of the Holland (1973) Model of vocational development with Spanish-speaking clients. Journal of Counseling Psychology, Vol. 27, 246-251.

Holland, J.L. (1965). Manual for the Vocational Preference Inventory. Palo Alto, CA: Consulting Psychologists Press.

Holland, J.L. (1966). The Psychology of Vocational Choice. Waltham, Mass: Blaisdell.

Holland, J.L. (1968). Explorations of a theory of vocational choice: VI. A longitudinal study using a sample of typical college students. Journal of Applied Psychology, 52, 1-37.

Holland, J.L. 1973. Making Vocational Choices: A Theory of Careers. Englewood, N.J.: Prentice Hall.

Holland, J.L. (1976). The Occupations Finder. Palo Alto, CA: Consulting Psychologists Press.

Holland, J.L. (1976b). A new synthesis for an old method and a new analysis of some old phenomena. Counseling Psychologist, Vol. 6, 12-15.

Holland, J.L. (1979). The self-directed search: Professional manual. Consultant Psychologist Press, Palo Alto, CA, 96pp.

Holland, J.L., & Gottfredson, G.D. (1975). Predictive Value and Psychological meaning of vocational aspirations. Journal of Vocational Behavior, 6, 349 - 363.

Holland, J.L., Whitney, D.R., Cole, N.S., Richards, J.M. Jr. (1969). An empirical occupational classification derived from a theory of personality and intended for practice and research. The American College Testing Program, No. 29.

Holland, J.L., Sorenson, A.B., Clark, J.P., Nafziger, D.H., & Blum, Z.B. (1973). Applying an occupational classification to a representative sample of work histories. Journal of Applied Psychology, 58, 34-41.

Holland, J.L., & Gottfredson, G.D. (1976). Using a typology of persons and environments to explore Careers: some extension and clarifications. Counseling Psychologist, 6:20-29.

Holland, J., Magoon, T., & Spokane, A. (1981). Counseling Psychology: Career Interventions, Research & Theory. Mark R. Rosenweig and Lyman W. Porter (ed.), Annual Review of Psychology, Vol. 32.

Hollender, J. (1971). Development of Vocation Decisions during Adolescence. Journal of Counseling Psychology, Vol. 18.

Johansson, C.B., & Harman, L.N. (1972). Strong Vocational Interest Blank: One form or two? Journal of Counseling Psychology, Vol. 19, 404-410.

Johansson, C.B. (1976). Manual for the Career Assessment Inventory, National Computer Systems, Inc.

Johnson, R.W., & C.B. Johansson. (1972). Moderating effect of basic interests on predictive validity of SVIB occupational scales. Proceedings of the 80th Annual Convention of the American Psychological Association, pp. 589-590.

Johnson, R. (1976). Test Review - Strong Campbell Interest Inventory (Form T325). Measurement and Evaluation in Guidance, Vol. 9, No. 1, 40-45.

Katz, M.R. (1979). Career Decision-making: A computer based system of interactive guidance and information (SIGI), S.G. Weinrach (Ed.). Career Counseling Theoretical and Practical Perspectives. New York: McGraw-Hill Book Co. pp. 207-30.

Kuder, F., & Diamond, E.E. (1979). Kuder DD: Occupational Interest Survey, General Manual. Chicago: Science Research Associates, 64pp.

Krumboltz, J.D. (1976). This Chevrolet can't float or fly. Counseling Psychologist, Vol. 6, NO. 3, 17-19.

LaFitte, C.C. (1974). Work values of university students: an analysis by ethnic groups and sex. Austin, Texas: University of Texas, Master's Thesis, 1974, (ERIC ED 144 849).

Lamb, R.R., & Prediger, D.J. (1979). Criterion-related validity of sex-restrictive and unisex interest scales: A comparison. Journal of Vocational Behavior, 15: 231-46.

Lamb, R.R. (1976). Validity of the ACT interest inventory for minority group members. The American College Testing Program, No. 72.

Lohnes, P.L. (1978). Test Review of the Career Assessment Inventory. In O.K. Buros (ed.), The Eighth Mental Measurement Yearbook (Vol. II). Highland Park, N.J.: Gryhon Press.

Lunneborg, P.N. (1979). The Vocational Interest Inventory: Development and validation. Educational and Psychological Measurement, 39: 445-51.

McArthur, C. (1954). Long Term validity of the Strong Vocational Interest Test in two subcultures. The Journal of Applied Psychology, Vol. 38. No. 5.

McLaughlin, G.W., Hunt, W. K., & Montgomery, J.R. (1976). Sociometric status and the career aspirations and perceptions of women seniors in high school. Vocational Guidance Quarterly, 25(2), 55-62.

Mehrens, W.A., & Lehman, I.J. (1975). Standardized Tests in Education. (3rd. ed.) New York: Holt, Rinehart, and Winston.

Miller, C.H. (1974). Career Development Theory in Perspective. In E. L. Herr (ed), Vocational Guidance and Human Development. Boston: Houghton Mifflin Co.

Mischel, W. (1977). On the future of personality measurement. American Psychologist, 32, 246-254.

National Advisory Council on Vocational Education, (1972). Sixth Report - Counseling and guidance: A call for change. Washington, D.C.: Author, 1972.

National Computer System. (1985). Describing the Career Assessment Inventory. Author.

National Commission on Secondary Schooling for Hispanics, (1984). Making something happen. Hispanic Policy Development Project, Washington, D.C.

Nevas, S.R. (1976). A definitional challenge: Interest and work itself satisfactions. Vocational Guidance Quarterly, 8(4), 245-251.

Nie, N.H., & others. (1975). Statistical Package for the Social Sciences. (2nd ed.) New York: McGraw-Hill.

Noeth, R., & Jepsen, D. (1981). Predicting field of job entry from Expressed vocational choice and certainty level. Journal of Counseling Psychology, Vol. 28, 22-26.

Orta, S.L. (1973). Occupational Aspirations of Mexican American and Anglo American senior high school students. Dissertation Abstracts International, 73,34(5-A) 2342.

Padilla, A. (1981). Pluralistic counseling and psychotherapy for Hispanic Americans. In A. J. Marsella and P. B. Pedersen (eds.), Cross-Cultural Counseling and Psychotherapy. New York: Pergamon Press.

Prediger, D.J. (1974). The Role of Assessment in Career Guidance. Vocational Guidance and Human Development. Edwin L. Herr (Ed.) Boston: Houghton Miffin Company, pp. 325 - 349.

Prediger, D.J. (1976). Alternatives for Validating Interest Inventories against group memebership criteria. American Collegest Testing Program, No. 76.

Prediger, D.J. and Noeth, R.J. (1979). Effectiveness of a brief counseling invervention in stimulating vocational exploration. Journal of Vocational Behavior, 14: 352-68.

Prediger, D.J. & Cole, N.S. (1975). Sex role socialization and employment realities: Implication for vocational interest measures, The American College Testing Program, No. 68.

Richard R. (1976). Validity of the ACT Interest Inventory. The American College Testing Program, No. 72.

Roe, A. (1956). The Psychology of occupations. New York: Wiley.

Roscoe, J.T. (1975). Fundamental Research Statistics for the Behavioral Sciences. New York: Holt, Rinehart and Winston, Inc.,

Slaney, R.B. (1978). Expressed and Inventoried vocational interests. Journal of Counseling Psychology, Vol. 25,520-529.

Slaney, R.B. (1983). Influence of career indecision on treatments exploring the vocational interests of college women. Journal of Counseling Psychology, Vol. 30, 55-63.

Slaney, R.B. (1984). Relation of career indecision to changes in expressed vocational interests, Journal of Counseling Psychology, Vol. 31, 349-355.

Slaney, R.B. & Russell, J.E. (1981). An investigation of different levels of agreement between expressed and inventoried vocational interests among college women. Journal of Counseling Psychology, Vol. 28, No. 3.

Spokane, A.R. (1979). Occupational preference and the validity of the Strong-Campbell Interest Inventory for college women and men. Journal of Counseling Psychology, Vol. 26: 312-18.

Strong, E.K., Jr. (1935). Predictive value of the Vocational Interest Test. Journal of Educational Psychology, 26:332.

Strong, E.K., Jr. (1943). Vocational Interests of Men and Women. Stanford, CA: Stanford University Press.

Strong, E.K., Jr. (1955). Vocational Interests 18 Years After College. Minneapolis: University of Minnesota Press.

Super, D.E. (1949). Appraising Vocational Fitness. New York: Harper and Row.

Super, D.E. (1957). The Psychology of Career. New York: Harper and Row.

Super, D.E., and Crites, J.O. (1962). Appraising Vocational Fitness. (Rev. ed.) New York: Harper and Row.

Thoresen, C.E., & Ewart, C.K. (1976). Behavioral self-control and career development. Counseling Psychologist, Vol. 6, No. 3.

Thurston, L.L. (1931). A multiple factor study of vocational interests. Personnel Journal, 10, 198-205.

Touchton, J.G., & Magoon, T.M. (1977). Occupational daydreams as predictors of vocational plans of college women. Journal of Vocational Behavior, 10, 156-166.

Worthington E.L., & Dolliver, R.H. (1977). Validity studies of the SVIB. Journal of Counseling Psychology, Vol. 24, 208-216.

Wrenn, C.G. (1935). Intelligence and the vocational choices of college students. Educational Record, 16, p. 217-219.

Wiggins, J. D., & Weslander, D. (1977). Expressed vocational choices and later employment compared with Vocational Preference Inventory and Kuder Preference Record--Vocational scores. Journal of Vocational Behavior, 11:158-65.

Zaccaria, J. (1970). Theories of occupational Choice and Vocational Development. Guidance Monograph Series. Boston: Houghton Mifflin, pp. 31-33.

Zytowsky, D.G. (1974). Predictive Validity of the Kuder Preference Record, Form B, over a 25-year span. Measurement and Evaluation Guidance, 7 (2): 122-9.