THE DEVELOPMENT OF A NON-READING INVENTORY: THE CANNON

PICTURE INTEREST

INVENTORY

Except where reference is made to the work of others, the work described in this dissertation is my own or was done in collaboration with my advisory committee. This dissertation does not include proprietary or classified information.

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THE DEVELOPMENT OF A NON-READING INVENTORY: THE CANNON PICTURE INTEREST INVENTORY

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THE DEVELOPMENT OF A NON-READING INVENTORY: THE CANNON

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DISSERTATION ABSTRACT

INITIAL RELIABILITY AND VALIDITY STUDIES OF A NON-READING INTEREST INVENTORY, THE CANON PICTURE INTEREST INVENTORY

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Dr. John Holland's theory of career development (1959, 1966, 1973a, 1985(a), 1985(b), 1997) is a developmental theory based on the fit of an individual's personality to the work environment. He has developed several instruments to test these personality types related to his theory, most notably the Holland Self Directed Search (SDS); however, all his tests require that a subject read at a 4th grade or higher reading level. There are 63 million Americans functioning at or below the basic level of literacy as defined by the National Assessment of Adult Literacy (NAAL; 2008). This paper presents the development of a non-reading interest inventory, The Cannon Picture Interest Inventory (CPII). The study was designed to develop both Form A and B of the CPII and analyze the test to determine whether it is a valid and reliable measure.

The study evaluated: (a) whether a significant positive relationship existed between the three highest occupational group scores obtained on Form A and the three highest occupational group scores obtained on Form B of the CPII when administered to the same group of individuals, and whether a significant positive relationship existed between the three highest occupational group scores obtained on the Summary code of the Holland Self Directed Search and Form A or Form B of the CPII when administered to the same group of individuals.

Results of this initial study confirm that the CPII is reliable and valid. An analysis of the raw data indicated strong positive correlation between the Cannon Picture Interest Inventory and the Holland Self Directed Search. Reliability was determined by correlating the CPII scores of Form A to the scores of Form B. A crosstabs analysis utilizing Cramer's V indicated a significantly strong positive relationship. Validity was determined by comparing scores on the CPII to the Holland Self –Directed Search. A strong relationship was shown between the scores obtained on Form A and Form B of the CPII when administered to non-readers. The scores obtained on Form A and Form B of the CPII when compared to the scores of the Holland Self Directed Summary Codes yielded a strong relationship.

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First of all, I want to thank my committee members, Dr. Randall Mc Daniel, Dr. Clarence Brown, Dr. Craig Darch and Dr. Peggy Shippen, of Auburn University, and Dr. Denise Green of Troy University for their endless support. There is no value that can be placed on your friendship, time, direction, leadership, effort and patience in guiding me toward the successful completion of this project.

Thanks are due to professional associates, friends and family who helped in the development of the CPII. This list includes Ms. Amanda Caulfield, Ms. Cheryl Bynum, Ms. April Turner, Ms Jill Flansburg, Ms Lori Kroger, Ms. Melissa Norred, and Mr. Dave Coleman, who helped with picture taking, picture/selection, item development and test administration Special thanks to Mrs. Janet Cannon, who spent countless hours reading about the Holland Self-Directed Search and editing the CPII when she had nothing to gain by doing this, but helped simply because she loved me.

A special thanks to Bonnie Crastenburg, Eloise Hayes, and Harold Todd who listened to me for endless hours but refused to let me quit. Of course to all my family—my mother, sisters, brothers, nieces and nephews thanks for their encouragement and priceless emotional support. This is dedicated with love and devotion to my children, their wives, and my grandchildren current and future. They represent the best of me. PS. THANKS, “DAD”.

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Computer software used: Windows 2000, Microsoft Word 2003, Statistical Package for the Social Sciences (SPSS), version 17.1

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I. INTRODUCTION

Since its inception, vocational rehabilitation services for individuals with disabilities has placed emphasis on providing services for individuals who are categorized as having the greatest barriers to employment (Rummil & Ressler, 1999; Wehyman, 2006). Vocational rehabilitation services are designed to prepare individuals with disabilities and to place them in employment consistent with each individual's choice, strengths, resources, priorities, concerns, abilities, and capabilities. This process of preparation and placement consists of numerous steps. However, a critical part of the rehabilitation process is the practice of "vocational assessment." This vocational assessment is a comprehensive, interdisciplinary process of evaluating an individual's physical, mental and emotional abilities, limitations and tolerances in order to identify an optimal outcome for the disabled (30^{th} Institute on Rehabilitation Issues, 2003).

Typically, vocational interest is measured through self-estimations, interview checklists, questionnaires, and testing. Vocational interest testing generally becomes the focus of this process and is in fact a key. The vocational assessment process employs interest testing as the beginning point (Powers, 2006).

Donald Super (1990) designates three types of interest: expressed interest, manifested interest and tested interest. The use of testing can often stimulate occupational options not otherwise identified. Interest testing was initially developed in the 1920s.

Holland expanded the conceptual idea that people see themselves in relationship to their "work." An individual's personality can be reflective of his/her occupational choice (Holland, 1997). The testing is just a part of the vocational evaluation process however; each part of this process is necessary. Individual choice is determined through vocational counseling and career development (Thomas, 1999).

Career development is an issue that must be addressed in future amendments to the Rehabilitation Act of 1973. As early as the mid-1950s, Hall and Warren emphasized the critical nature of career development for a low reading population (Rumrill, & Reossler, 1999). Brown and Brooks (1996**)** describe career development as a life-long process. This is a process of choosing occupations from among many various occupations available in the world of work. The process includes evaluation of one's environmental influences and circumstances, along with one's gifts, talents and abilities. The concept of career development, a process which develops over a number of years, was first recognized by Ginsberg, Ginsberg, Axelrod, and Herma in 1951 (as cited in Szyamnski & Parker, 2003). Generally speaking, the process of career development is one that assists individuals in making sense of life experiences to provide career direction; the process is considered valid when it results in realistic vocational choices (Holland, 1997). Career development relies on interest-testing results to begin the process, and then builds career options through counseling, and career exploration (Patton & McMahon, 1998). Therefore, in the career development process, the interest inventory is: (a) a method to determine vocational choice, (b) a method to determine the relationship between interest and other variables such as an individual's personality, and (c) a method to identify the role interest plays in the career development process (Hanson, 1995). Thus it is viewed as

critical in assisting individuals in developing options and in making-quality of life decisions (Hayes, 2001).

Historically, vocational rehabilitation counselor's effectiveness has been based on the number of job placements, typically known as "case closures." In the 1990s, Sandra Parriono stated that the overall effectiveness of a rehabilitation counselor could be best determined by the "quality" of the consumer's integration into society. The "quality" of this integration should be based on many factors including assisting in career and vocational guidance rather than on a one-time job placement. As such, job placement should be career focused rather than occupation focused (Rumrill, & Roessler, 1999).

Two processes that are fundamentally and foundationally important to vocational rehabilitation job placement are vocational evaluation followed by career development. Vocational evaluation uses different types of tests to identify jobs of interest, which can be explored in the career development process. These tests typically include a battery of various instruments used to evaluate a consumer's aptitudes, level of academic functioning, and personality type, as well as their occupational interest. These instruments help determine an individual's ability to work as well as their employment preferences. Vocational/career interest testing is recognized as an integral tool in this vocational evaluation process (Powers, 2006). As a result, rehabilitation counselors must have interest tests that will provide trustworthy, valid results.

Career development in rehabilitation counseling remains in the development stage. It typically utilizes the results of information gathered during the vocational evaluation, or a situation assessment for occupational choice or job placement (Powers

2006). However, this focus needs to be expanded to include aiding the consumer in the development of a career goal (30th Institute on Rehabilitation Issues, 2003; Rumrill & Roessler, 2008). Hess stated that job placement should result from career planning and be based on an individuals task preferences Therefore, the true framework of career development differs from the typical idea of occupational choice (Rubin & Reossler, 2008). Occupational choice is the process of selecting a specific job; while career development is a life-long process (Szymanski & Hershenson, 1998). True career assessment for this population needs to evolve into an independent yet well-defined method utilized by rehabilitation counselors to assist individuals in identifying career/life interests as they transition into the world of work and integrate into society (Abrams, DonaAroma, & Karen, 1994). Maximizing employment requires career exploration/counseling services and a critical need for an occupationally evolving method to exist, in which interest testing is essential (Wagner & Blackorby, 1996).

John Holland's theory of career development (1959, 1966, 1973a, 1985a, 1997) is based on the fit of an individual's personality to the work settings. Career counseling services worldwide have been changed because of his theory (Gottfredson, 1999). This hypothesis of career development is practical in research and functional in practice. The basis for a good career method assists individuals in the selection of realistic vocational choices (Holland, 1997). Holland developed a classification system based on each individual and their interaction with their work environment. John Holland's impact was vital to the practice of career counseling, since it provided a way to evaluate the person/environment fit (Weinrach, 1996). The theory is based on a hexagon typology(See Figure 1).

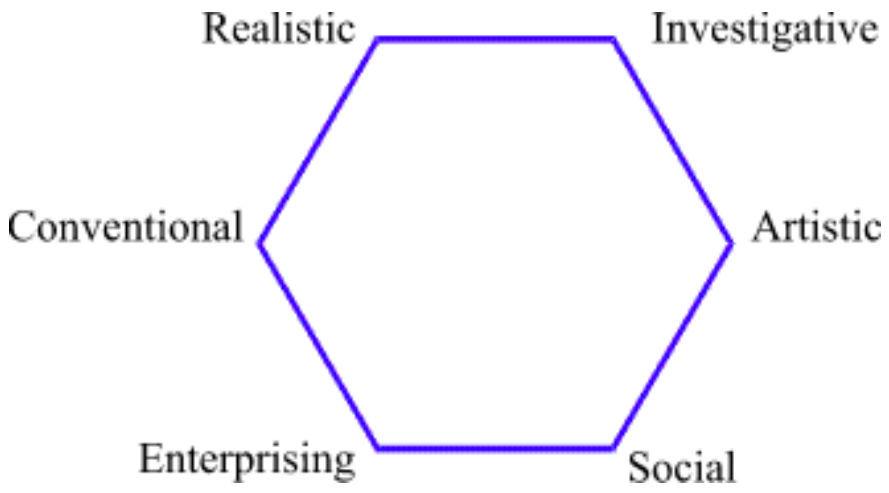

Figure 1. Holland's Hexagon Typology

The textbook explanation for this hexagon typology is a simple to understand, a three-letter code is used to describe an individual characteristics as it relates to the work milieu (Rayman & Atanasoff, 1999). The Holland theory is well defined yet broad in scope, allowing for utilization across cultures and the life span (Holland, 1997), which is a major strength of the theory. The hexagon's simplicity and visual design allows for an understanding of the basic makeup of the theory. There are six personality types and six work environments. A three letter personality code is developed by taking the individual's three highest measured personality types from the Holland's typology. The theory's philosophy that "birds of a feather flock together" holds true in the work milieu. Therefore, when an individual fits in his work environment, s/he is more likely to be productive and successful, and to feel satisfied with ones career choice (Rayman &

Atanasoff, 1999). The code allows for an accurate conceptual framework across the country for individuals and their employment "fit" (Shivy, Phillips, & Koehly, 1996).

As early as 1966, Holland himself developed this method of determining the degree of similarity between an individual's personality code and his work setting. An example of a three-letter code is SAI. An SAI code reveals that an individual primarily prefers social interaction (S), demonstrates an artistic tendency (A), and possesses an investigative nature (I). The social personality type is the dominant characteristic while the investigative characteristic is less dominant. The elements of personality types are named beginning at the upper left point of the hexagon. Beginning at the eleven o'clock position then proceeding clock-wise around the shape, the order is as follows: Realistic, Investigative, Artistic, Social, Enterprising and Conventional (Prince & Heinser, 2000). Theoretically, a high level of correlation is believed to occur when the first letter of the code of an occupation is the same as the first letter code of the person's choice. The moderate degree of correlation is thought to occur when the first letter of the code of an occupation is hexagonally adjacent to the first letter code of the person, while a low level correlation is believed to occur when the first letter code of the occupation is neither hexagonally adjacent nor identical to the person's code. There have been mathematical models which proposed to perform correlations (e.g., Kwak & Pulvino, 1982), some which used all three letters of the code Iachan, 1984 (Miller, 1999).

Holland states the career development process to be one of order (1997). He believes that the following are the reasons for career changes: (a) viewing or experiencing new vocational roles; (b) new or changes of certain job expectations; (c) specialty training which may limit the individual's vocational options; (d) an

occupational choice based on incomplete information; and (e) lack of study of both personal and settings (Holland, Davis, & Cooley, 1975). Since its inception, Holland's theory has been extensively researched and has been utilized for all populations except individuals with severe disabilities, and with the particular exception of those who are non-readers.

Statement of the Problem

Despite proactive advocacy, and the abundance of on-going legislation, research continues to document that people with disabilities have lower workforce participation rates than the general public (Siegel, Robert, Siegel, Waxman, & Gaylord-Ross, 1992; U.S. Bureau of the Census, 2002). The National Assessment of Adult Literacy (NAAL, 2008) administered tests which revealed that an estimated 14% of US residents would have extreme difficulty with reading and written comprehension. These people can legally be defined as illiterate (www.caliteracy.org/). A study conducted by the Washington Literacy Council (2007) documented that at least three out of four of those who are on welfare are illiterate (www.caliteracy.org/). Individuals who are functionally illiterate or severely disabled remain unemployed and/or underemployed higher than at the national of rates, 65%, despite professional rehabilitation efforts (US Disability Stats, 2009). This fact demonstrates the need for continued research and re-evaluation by the professionals who work within the rehabilitation community. Studies confirm the necessity for expansion of existing services, such as career counseling as well as the development of new tools and methods to address issues relating to these unemployment rates (Morgan & Ellerd, 2005; Palmer & Wehmeyer, 2003).

Interest inventories are limited for non-reading individuals, restricting their opportunity to make informed career choices (Agran & Morgan, 1991; Ferrara, Rudrud, Wendlegass, & Markve, 1985). The necessity for expansion of existing services, as well for new tools and methods for the vocational assessment of this population, is apparent to all who work within the rehabilitation community (Siegel, Robert, Waxman, & Gaylord-Ross, 1992). Currently, all picture interest inventories are stick drawings of individuals completing different work tasks. Researchers agree that current pictures inventories produce inconsistent results (Ferrara, Wendlegass, & Markve, 1985). Therefore, there exists a need for a vocational interest inventory that could be utilized in rehabilitation vocational evaluation with the non-reading consumer.

Purpose of the Study

The purpose of this study was three fold: (a) the test development, (b) test reliability and(c) test validity of a non-reading vocational interest inventory. The initial step was the development of a color picture prototype interest inventory for non-reading individuals based on John Holland's theory of Career Development, (i.e., the Cannon Picture Interest Inventory ,CPII). Ultimately, this measure will be appropriate for individuals who have any of the following : (a) are non-English speaking, (b) have limited reading ability, (c) have developmental delays, (d) have a learning disability, (e) have special needs, and/or (f) have limited education. The research process included: (a) selection of the initial items, (b) selection of the test pictures, (c) insuring the validity of the picture test item selection, and (d) insuring the reliability of selected pictures. Based on this purpose, several research questions were formulated.

Research Questions

Research Question 1: Reliability — Is there a positive relationship between the occupational group scores obtained on Form A and those obtained on Form B of the CPII when administered to the same group of individuals?

HØ There will be no significant relationship between the top three scores obtained on alternate forms of the Cannon Picture Interest Inventory (CPII).

Research Question: 2. Validity — Is there a positive relationship between the occupational group scores obtained on the Holland Self Directed Search and Form A or Form B on the CPII when administered to the same group of individuals?

HØ: There will be no significant relationship between the three letter occupational code score on the CPII and three letter occupational code from the Holland Self Directed Search for the same subjects.

Limitations of the Study

Limitations of this study included: (a) sample size, (b) item selection,(c) test design, forced choice answers, (d) length of time between test and re-test, (e) sample sub-groups size,(f) convenience sample; and (g) statistical method used lends for the probability of a Type I error. Anyone or all of these limitations could affect the usability, reliability, predictability and validity of the CPII.

Definition of Terms

The following are definitions of terms used within this dissertation. Each definition is provided to give the reader a better understanding of the key terms.

Career Development — the processes through which information is obtained about the individual, the individuals gains information about the world of work and the information utilized to assist the person in making a career choice (Szymanski & Parker 2003).

Convenience Sample — this kind of sampling is used when the researcher decides to select the units of study on the basis of their being readily available.

Disability — having a physical or mental impairment which sustainability limits one or more of the major life activities of such an individual, and having a record of such impairment, or begin regarded as having such impairment (Americans with Disabilities Act, 1990, Section 3: Definitions).

Holland Code — John Holland's theory of career development established the hexagon personality-codes for occupations. This is a three letter code interchangeable code. The three letter code identifies occupational groups of jobs which may be of interest.

Interest Inventories — inventories that are developed to measure the desire or motivation of an individual towards an occupation (Powers, 2006).

Non-reader — for the purpose of this study, anyone reading below the fourth grade is considered a non-reader as measured by achievement test given by or available to test administrator.

Vocational Assessment — a comprehensive process that uses works, real or simulated, to assist individuals with vocational development. It places focus on the entire individual's medical, psychological, social, educational, vocational and economic needs to establish a vocational goal (Powers 2006).

Summary

Chapter I introduced the reader to the purpose of this project; and the development of the CPII based on John Holland's Theory of Career Development. First, a historical over view of the of the vocational rehabilitation process, followed by, the importance of interest testing to the process of rehabilitation was discussed. Finally, a brief introduction of Holland Theory of Career Development was presented. Chapter II will follow with an in depth review of the John Holland's Theory of Career Development. This will be combined with a critique of current non-reading interest inventories. The chapter will close with a discussion on the CPII.

II. REVIEW OF LITERATURE

This chapter presents a basic overview of John Holland's Theory of Career Development, the history of its development; its key concepts, as well as relevant research supporting this theory. His theory is the basis for numerous career related inventories; the two which will be discussed are the Strong Interest Inventory and the Self-Directed Search. An analysis of each test, its development, usage, validity and reliability is reviewed. An in-depth review and discussion of research is presented which explains the longevity of the success of John Holland's instruments in theory, practice, and usage as a career assessment tools. The concluding section discusses the use of interest testing in the career development process, a critique of current non-reading measures, and the need for theoretically based measures for the non-reading population.

Introduction

Career development theories assist individuals in making sense of experiences. A theory is, in effect, a rationalized set of assumptions or hypotheses, which provide an explanation of the past and a prediction of the future. When tested and proven, theories are said to expand knowledge and become principles. As such, theories are typically utilized to provide direction. Two types of career development theories exist which are structural and developmental. Structural theories focus on an individual's characteristics

when relating to occupational tasks, while developmental theories focus on human development across the lifespan (Chen, 2003). John Holland's theory of career development (1959, 1966, 1973a, 1985b, 1997) is a developmental theory based on personalities and environment. Career development services worldwide have been altered as a result of the universal and monumental regard for his theory (Gottfredson, 1999).

A good career theory provides methods for assisting individuals in the selection of realistic vocational choices (Holland, 1997). John Holland's impact on the practice of career counseling is immeasurable, providing the key to personality and environmental fit (Weinrach, 1996). Holland developed a classification system, which is an array of theory-based interventions that has provided a method of career development research and practice. His theory of career development is practical in research as well as practice. The "hexagon typology" (see Figure 1) is a simple to understand, three letter-codes used to describe individual characteristics and work environments (Rayman & Atanasoff, 1999). There are six different types: Realistic (R), Investigative (I), Conventional (C), Artistic (A), Enterprising (E) and Social (S). Theses six themes represent different occupation groups. This theory is clearly defined yet broad in scope it can be utilized across cultures and the life span (Holland, 1997).

The major strength of this theory is its utility. Since the theory is extremely simple, most individuals can understand the basic makeup of the theory. It is based on six personality types and six work environments. The theory's philosophical belief that "birds of a feather flock together" holds true in the work setting. Therefore, when an individual fits in his work environment, he is more likely to be productive and successful and feel satisfied with his career choice (Rayman & Atanasoff, 1999).

John Holland's theory of career choice has been recognized for years as the most influential in the field of career counseling (Brown, 2002). Numerous studies support Holland's theory in that it purports to describe the interaction of an individual's environment to predict with validity the career choice of employed adults (Feldman, Smart & Ethington, 2004). The personality types are explained by a three-letter code used to predict vocational choice. Each three-letter code is a combination of an individual's top three personality types. The code produces an individual's specific occupational profile. Each profile falls into one of six personality types: Realistic, Investigative, Artistic, Social, Enterprising and Conventional. Holland's theory has been thoroughly researched and has been proven valid (Holland, Gottfredson, & Nafziger, 1975)

A textbook explanation of John Holland's Theory describes his theory as being based on the following basic precepts,

1) An occupational selection can mirror an individual's personality.
2) An individual's view of his abilities, aptitudes and career goals defines his vocational interest. Thus, an interest inventory can also be a personality inventory.
3) An individual's view of stereotypes imparts important psychological meaning.
4) The existence of six different personality types and individuals can be used in evaluation; however, individuals are a combination of types, not a pure type.
5) Six distinct working environments exist, each individual one dominated by a specific type.

6) Individuals will naturally seek jobs that compliment their personalities, thus maximizing their individual strengths and minimizing their weaknesses.

7) Individuals' career-related behaviors, such as success, satisfaction, and job stability can be reasonably predicted by examining his/her match with their environment. (Ferguson, 2000)

These concepts are unique to John Holland's theory of career development. The concepts were used in the establishment the hexagon personality-codes for occupations (see Figure 1). The personality-code was based on individual personal characteristics and the attitudes of individuals who were satisfied in their occupation. The theory states that occupations can be classified into codes based on an individual's preference for working with people, data or activities. The people portion of the profile is associated with similarities between workers occupations and their personal lives, including their interest, work styles, attitudes, values, and personality characteristics. The data portion is composed of the workers interest in dealing with information and their preference for working closely with data or not working with data. The activities portion consists of characteristics related to both the job and personal activities of the individual (Arnold 2004; Campbell & Borgen, 1999). Part of the acceptance of the model is that it is easy to understand and to explain. Holland's career development model is considered user-friendly (McDaniel & Snell, 1999).

The basis of Holland's entire theory is that the closer an individual's personality matches his job profile; the greater the satisfaction the individual will obtain from their occupation. The theory hypothesizes that all individuals possess a part of each of six

personality types. However, most individual's personalities are comprised of at least of three personality types. When occupations are matched to an individual's personality type, the theory states that an individual will be best suited to their employment. Holland's basic concept is that job satisfaction is based on accurately knowing one's self (Holland, 1973a).

The framework for classification is easy to conceptualize. The hexagon model is the method of classification for the personality types (see Figure 1). Each personality type is comprised of a three-letter code (Gottfredson & Holland, 1989). This framework establishes a personality code that has become widely used and familiar among professionals within the counseling community. The technical terminology such as consistency, differentiation, identity and congruence allows individuals across the country to accurately describe occupations within a conceptual framework (Shivy, Phillips, & Koehly, 1996). This framework is a key to element of the understandability of its information by consumers and counselors (Rayman & Atanasoff, 1999).

As early as 1966, Holland himself developed this method to determine the degree of similarity between an individual's personality code and their work environment. An example of a three-letter code is SAI. An SAI code reveals that an individual primarily prefers social interaction with an artistic tendency with an investigative nature. The social personality type is the dominant characteristic while the investigative characteristic is less dominant. The elements of personality types are named on the hexagon beginning at the upper left point of the hexagon. Beginning at the eleven o'clock position then proceeding clockwise around the hexagon, the order is as follows: Realistic, Investigative, Artistic, Social, Enterprising and Conventional (Prince & Heinser, 2000). Theoretically, a high

level of correlation is believed to occur when the first letter of the code of an occupation is the same as the first letter code of the person's choice. A moderate degree of correlation is believed to occur when the first letter of the code of an occupation is hexagonally adjacent to the first letter code of the person, while a low level correlation is thought to occur when the first letter code of the occupation is neither hexagonally adjacent nor identical to the person's code. There have been mathematical models proposed to perform correlations (e.g., Kwak & Pulvino, 1982), which used all three letters of the code. The methods have been developed which measure the congruency of all three letters of code that have proven most useful (Miller, 1999).

The Holland code model is applied in various ways and settings. It is also used as a method of identifying occupations by an occupational code (Campbell & Hansen, 1986; Gottfredson & Holland, 1989). Many fields of study use occupational codes in the United States. These fields include labor economics, manpower planning, occupational forecasting, job analysis, compensation and vocational guidance. Professionals in these fields rely heavily upon work-related data and information collected from various government agencies. Traditionally, this information has been found in numerous publications, such as the Dictionary of Occupational Titles (1991), the U.S. Department of Labor publications, and other well-known sources.

The goal of career development is to inform, educate and enlighten individuals with information regarding occupations as they exist in the world of work. A typical use of Holland's theory is the transition of individuals from one phase of life into another. An example is transition from high school to work. Increasingly researchers and counselors have used Holland's model when informing students of career options. For example,

Holland contends that using the personality codes to match individuals with academic choices increases the individual's academic satisfaction and ultimately career success (Chartrand & Walsh, 1999). Holland's information is also widely used for adults seeking career advancement or career change (McDaniel & Snell, 1999).

Holland's theory has also been used to explain why individuals with high intelligence have high career aspirations. Interpersonal factors are associated with occupational choice could also include biological inheritance, parents, peers, teachers, social class, educational experience, geography, and vocational opportunity. However, a major question remains: What factors influence a career change? Holland's theory would suggest that generally, individuals who initiate a career change were not matched congruently with their interests and abilities. Adolescents are viewed as most vulnerable to career change. As to whether changes in the field of training and vocational choice are random or orderly, Holland maintains the process to be orderly. He proposes the following ideas as reasons for career changes: (a) exposure to new vocational roles and experience; (b) a change of certain job demands; (c) specialty training which limits an individual's vocational options; (d) a vocational choice, is made based on incomplete information rather than making an informed choice; (e) both personal and environmental factors were not studied (Holland, Davis, & Cooley, 1975).

The Holland theory has also been applied in industry via the person–environment fit concept. The P–E fit concept has become an organizational goal in the field of industrial psychology. Schneider (1987) introduced a model that he called the Attraction Selection- Attrition (ASA) Cycle. This model suggests an explanation of how an organization is a function of its employees. The model proposes that each individual

employee performs similarly within the organization, as a result the organization begins to function as one, and therefore the organization becomes products of the individuals within the organization. The employee's functioning explains how the ASA cycle begins. Therefore, when a company has been operating for a long period of time, it appears to resemble the people who work for the company. Schneider alleges that Holland has the foremost theoretical positions in the field of vocational psychology. Schneider stated, "for present purposes, Holland's most important contribution is his idea that not only can careers and career interests be grouped into six categories, but that career environments may also be grouped." As Holland (1985a) explains individuals are attracted to different careers as a function of their own interests and personality. Holland also contends that people who are similar enjoy similar career environments. Schneider's ASA model was originally written in 1987. Research continues to document the ASA model as valid. The use of personality testing has become a major business in industry. As such human resource professionals utilize the person-environment fit concept in industry in understanding career choice (Muchinsky, 1999).

Pervin (1993) notes that a person's pattern of behavior over time comprises their unique personally. While Holland suggests that people try to fit into their environment, Hogan and Roberts (2000) suggest that individuals select activities they enjoy which are consistent with their unique identity. Schneider, Smith and Goldstein 2000, indicate individuals who fit the environment experience career satisfaction and greater commitment to their job.

Measurements of the specific work environmental elements are more difficult to determine than individual interest. The methods used to measure these elements have a

direct effect on the congruency between career interest and occupation job satisfaction. If an occupation is coded incorrectly and a person chooses an occupation based on this code then the congruency may be invalid. Lent (1996) and Lenz (1996) indicated that the correct coding of the individual work environment was imperative. The way in which a work environment is coded can affect and influence the calculation of congruency. For example, a physician's position at one location was reviewed and coded. The code developed was site specific and was determined by the settings. While all physician positions are coded the same, in reality a physician may be a staff physician that has different duties than a specialty physician such as an internist, emergency room physician, or surgeon. However, the code would be the identical. This may lead to lack of consistency in coding could affect the congruency of a study (Chartrand & Walsh, 1999). This use of the occupational code may be a very weak link in the work environment fit code. It may be necessary to rename some occupations while others may completely disappear. Krumboltz (1996) and Savickas (1997) indicated that the work setting is changing such that employees are expected to be able to handle any work task that is requested. Numerous occupations no longer have a specific job description. Occupations continue evolved to be more outcome base than task driven. However, Krumboltz (1996) found that people might have very different characteristics but be successful in the same occupation (Chartrand & Walsh, 1999).

Throughout history there are periods of industrial change and downsizing which is prominent in industry. Layoffs periodically affect our economy. For example, the first edition of the Dictionary of Occupational Titles (1977) contains job descriptions for approximately 17,500 jobs; however, in the revised (1991) edition one can find a

description for approximately 12,000 jobs. In 1973, Holland published his first edition of the book, *Making Vocational Choices.* Holland emphasized individuals taking a part in their own vocational choice making. At this time, he developed the measurement known as the Self-Directed Search. In 1982, Gottfredson, Holland and Ogawa published the first copy of the Dictionary of Holland Codes in 1982, and 1996 Gottfredson and Holland published revised copies of the Holland codes. The new replacement for the DOT is the O*NET (2000). The O*NET currently uses the Holland codes (Muchinsky, 1999).

Studies on Measuring Congruence

Combinations of the three letter personality codes were studied for congruency. The concept of measuring congruence is the idea of qualifying the degree to which a person-environment fit is valid. A term widely used in career development is congruence, which means agreement between the occupations an individual has stated an interested in pursuing and the tested occupation they are exploring (Gati 1986; Osipow, 1987). Measuring congruence is the concept of qualifying the degree to which a person-environment fit is valid.

Numerous methods have been developed to measure congruency. Results have varied based on the method used. Congruency utilizing only one letter of the code was conducted by Assouline and Meir (1987) as well as Tranberg, Slane, and Ekeberg (1993). These studies found wide-ranging congruency correlations from .05 to .98. The amount of variation in this correlation confirmed that methods for measuring congruency could not be interchanged. Until recently, the methods measuring congruency used only the first letter of the person and the first letter of the environment. However, measuring the

degree of congruency of the three-letter code provides greater understanding of the code as such, improves the career development process.

Many methods have been developed; however, most of these methods only use the first letter of the code. Recent research by Zener and Schnulle (1976), Kwak and Pulvino (1982), and Icahn (1984) has attempted to examine the degree of congruency of a three-letter codes correlation to the environment. These are known as the Z Index (Zener & Schnuelle, 1976), the KP (Kwak & Pulvino, 1982), and the M Index (Iachan, 1984). These methods are important as each of the six types and levels of the Holland code may be evaluated. It is hypothesized that each will reveal a different but important bit of information that is lost when using only one letter of the code. Research methods were not able to evaluate congruency of the three-letter code rendering incomplete results (i.e., Assouline & Meir, 1987; Grotevant, Cooper & Kramer, 1986; Rounds, Davis, & Lofquist, 1987).

The Iachan Index is a measure designed to measure the congruency between two Holland Codes. Congruency means the match between the two codes; for example, an exact match is perfect congruency, 99th percentile, if the first letter of one codes matches the second letter of a comparisons code then the congruency score would fall to about the 97th percentile. The Iachan Index is a model developed to measure this agreement. This is an important when determining the reliability or validity of a Holland code, if the Holland code is determined by an alternate method rather than the Holland Self-Directed Search-Directed Search. It lends for comparison of agreement between measures (Iachan, 1984).

Studies have also been conducted to evaluate the Holland's code through measured congruency between the pairs of three-level codes. Mathematical models were developed and evaluated based on their ability to perform correlations utilizing all three letters of the code. Comparing the three-letter code presents a problem in that exactly 14,400 combinations exist of any two sets of codes (Kwak & Pulvino, 1982).

The Zener-Schuelle index (Z-S; 1976) method is based on the inverse probability of two three-letter codes taken two at a time; in other words, the Z-S index uses a specially devised ordinal index (0–6) and inversely relates it to the probability of chance. According to Holland (1973b), the Zener-Schuelle index estimates the index between two three-letter codes in a useful way, especially in the divergence is unusual (index 0–2).

Each of the above methods demonstrates strengths and weaknesses. The choice of which method to use depends upon the purpose of utilization. Career counselors who need information quickly and less precisely may wish to use the Z-S index. For other counselors needing a more precise degree of validity, the K-P or M method would be appropriate.

An additional method was developed by Miller (1997) to identify the agreement between the three-letter Holland codes using different assessment methods. The method combines the scores in a mathematic manner to confirm the consistency of the code over time. An individual's code should remain the same over time. While relatively new, this method is viewed as an easier method to determine agreement among and within the code (Hutchinson, 2000a).

Congruency of the hexagon codes has been extensively researched. Congruency studies typically occur over a relative specific time period. Holland's theory indicates that individuals seek a congruent environment; therefore, it is a process and not something that is idle. Research to confirm this would need to be conducted longitudinally over certain periods of time (Chartrand & Walsh, 1999).

Several well-known studies inquired as to whether congruency exists between the work environment and vocational interest (Assuoline & Meir, 1987; Trang, Slain, & Ekberg, 1993; Young, Tokar, & Subich, 1998; Walsh, 2000). Various studies in the 1980's measuring congruency between work environment and vocational interest conclude that the correlation between personality congruency and job satisfaction is 30%. However, the mean correlation for individuals in the social category and job satisfaction is .33. Additional studies conducted in 1998 by Young, Tokar, and Subich found mixed results. A study by Donnay and Borgen (1996) used the general occupational and basic interest themes on the Strong Interest Inventory to differentiate individuals in 50 various occupations. The sample included 18,000 people who were employed in the same occupation for at least three years. These individuals reported being satisfied with their occupation. Essentially, the findings confirmed Holland's theory that birds of a feather flock together. This confirms Holland's person–environment (P–E) congruency theory. Additional findings included 62% of the women and 59% of the men reported high job satisfaction (Chartrand &Walsh 1999).

Challenges to the Holland Model

Even through there is extensive research supporting Holland model, Tinsley believes that Holland's hexagon Person–Environment model fit has not been proven over time. The model fails to address or examine several issues required for congruency. Tinsley contends overall the model fails to measure or address: (a) an individual's knowledge, skills and abilities; (b) an individual's values, needs and interests; (c) an outcome to include satisfaction of job performance, tenure on job, etc.; (d) a result that is congruent with Person–Environment fit (Hesketh, 1999). Holland's methods of measuring fit have proven erroneous and as such fail to provide valid longitudinal data to support Person–Environmental fit outcome-based results (Edwards, 1991). Results do not support overall fit such as job satisfaction or performance. Therefore, results received to date are considered incomplete (Hesketh, 1999). Research conducted by Hesketh and Gardner (1993) reported no direct relationship influence in the Person–Environment fit. Hesketh agreed with Tinsley (2000), that research conducted to date provides no support to a direct P–E relationship thus leaving much to chance.

Additionally, Tinsley contends that although an attempt is made to evaluate the work environment, certain elements are not addressed by the hexagon's three-letter personality code. Decades of research by Warr (1987) documents that there are certain common elements found within a desired work environment. These are elements that cannot be predicted. Such elements included opportunity for advancement, monetary incentive, positive feedback, personal respect, and the implied notion of independence and control. The belief is that good work environments produce satisfied workers regardless of whether an individual "fits" the work environment (Hesketh, 1999).

Holland's model fails to address the additional unique personality traits possessed by an individual. Hersketh (1993) summarizes this criticism of Holland's model in that it does not take into account an individual's personality, which has a direct effect on job satisfaction. The basic premise concludes that certain personality types such as extroverts are happier in several occupational environments. Additional longitudinal research is called for to focus on the many additional personality traits, which may effect job satisfaction (Hesketh, 1999).

The hexagon model has a restricted range of measurement. Hunter (1986) questioned the role intelligence and special abilities play in job satisfaction. When homogenous samples are measured, special abilities do not account for a decreased predictive validity. However, Prediger (1989) found that when using broader samples, which were not as, homogenous, individual abilities did account for unique variances. The need for longitudinal studies measuring individual differences would contribute invaluable dimensions to the P–E fit theory.

Prediger supports Holland's model thus refuting Tinsley findings. He believes that the hexagon approximates reality when applied to measures of work relevant interest. Issues with P–E fit research involve career interest and job satisfaction as well as relevance of measurement. Lent and Savickas in (1994) indicated that there are numerous dimensions upon which people fit into their environment. Dawis (1991) indicated that job satisfaction consists of several components. There are two broadly defined variables: intrinsic satisfaction, or satisfaction with the work one is doing; and, extrinsic satisfaction, which is satisfaction with the conditions of the work environment. For P–E fit studies; it would appear that intrinsic job satisfaction should be the basis to measure

congruency. Studies done by Scrapello-Campbell (1983) indicate that a global measure of job satisfaction does not necessarily measure intrinsic job satisfaction with any adequacy. Therefore, no studies have been identified to determine if Holland's hexagon model would provide useful information on the P–E fit involving purely intrinsic job satisfaction (Prediger, 2000).

Evidence exists supporting the Holland's hexagon, which is contrary to Tinsley's (2000), contention, that Holland's hexagon lacks validity. Prediger (1996) reported that there is adequate evidence to support the hexagon as reality based. A composite of data and research has been based on the analysis of data, things and people work-task dimensions. Support for this conclusion would include research conducted which involved the job analysis for 12,000 occupations and of interest inventory data for 1,000 career groups and 100,000 individuals (Prediger, 1996).

A summary of 30 years of hexagon-based research by Holland (1997) revealed the following:

> The key characteristic of the Hexagon model is the RIASEC order and the implied distance or relationship among the types. If these attributes did not hold most of the time, the research about the types would not support the expected similarities and differences…. The definition of consistency also depends on the hexagon model — so long as consistent. As it stands, consistency is clearly related to direction of choice. (pp. 159–160)

Prediger concludes that Holland's hexagon is a mirror of reality. Additional writers have also disagreed with Tinsley's (2000) article. These authors also agree that the body of research supports Holland's Circular Model of Order as valid (Rounds,

McKenna, Hubert, & Day, 2000). The authors suggest Tinsley based his conclusions on a misunderstanding of the model. Models are used to link attitudes to behavior (Ajzen & Fishbein, 1980). Overall the authors agree and conclude that Tinsley's argument regarding lack of validity is without merit.

The History of John Holland's Theory of Career Development

Relevant issues to the development of Holland's career development theory will be discussed. This section will explain revisions that took place in 1966, 1973a, 1985a and 1997. John Holland's theory of career development has spanned over forty years (Reardon, Lenz, Simpson & Peterson 2000). Throughout this time fame, John Holland has consistently supported the belief that personality and vocational choice are related.

> If vocational interests are constructed as an expression of personality, then they represent the expression of personality in work, school subjects, hobbies, recreational areas and preferences, in short what we have called vocational interests are simply another aspect of personality. The vocational interests or expression of personality then it follows that interest inventories are personality inventories. (Holland, 1973a, pg. 7)

In the initial years of Holland's career development theory, many individuals were attempting to identify and analyze the process, which occurs as individual's transition from career exploration to career selection and is better known as the career development process. One instrumental theorist was Donald Super. He theorized that most children identify with their father's career and would therefore imitate their father's career through role-playing. As children develop, they continue to role-play but are exposed to varied

activities, which inform them of the world of work. Super's theory was dominant for a number of years in understanding the career development process. As interest continued to grow in career development John Holland developed his theory of career development. Although this theory was unique in design and very influential, it was not the first to propose such a person-environment idea. Holland's theory evolved from the contributions of many. The basic concept was based on Murray's (1938) and Giannantonio and Hurley-Hanson's (2006) acknowledgments that behavior is dependent on an individual's personality as well as interest in their environment (Gottfredson, 1999). Darley and Hagenah (1955) describe vocational interest measure as a method of impersonality theory, which in turn is reflected in individual's career goals **(**Hogan & Blake, 1996).

Holland relied on concepts derived from vocational psychology literature of both interest personality (Darley& Hagenauh, 1955; Guilford, Christensen, Bond & Sutton, 1954) as well as job structures (McCormick, Jeanneret & Mecham, 1972). Lastly, he based his theory on the personality inventory he developed. The inventory was developed based on job titles, and is known as the Vocational Preference Inventory (Holland, 1959).

The 1996 Revision of Holland's Theory

Since its initial development, Holland's Theory of Career development has undergone numerous revisions. Initially published in 1959 in *the Journal of Counseling Psychology*, extensive research conducted by Holland and others during the next seven years resulted in approximately 14 major theory based studies (Holland, 1962; Holland & Nichols 1964). Data collected was instrumental in the theory's initial revision, which was published in 1992 in *The Psychology of Vocational Choice: A Theory of Personality*

Types and Model Environments. The initial revision focused on the environment and methods for measuring the impact of work environments.

The 1973 Revision of Holland's Theory

Prior to 1966, the majority of research conducted on Holland's theory focused on high school youth of above average intelligence. Researchers viewed this focus as a definite limitation (Osipow & Walsh, 1983). Additional theory-based research studies were conducted with various populations. The result of this research demanded the 1973 revision. This revision has become the most well known as it incorporated the use of the of hexagon model. This model added a method to determine congruency or what is better known as the P–E fit model. At the time of the 1973 revision, practitioners and researchers other than Holland had examined, researched and validated its theoretical concepts.

Later in the 1970s, Holland experienced a hurdle in the format of the questioning of the application of his theory to males as well as females, which was resolved through research later the same decade. Data collected from 43,391 males and females supported the person–fit theory. Holland continued his research designed to support his theory and published the results in his 1973 book (Gottfredson, 1999).

Holland's (1973b) published book, which included his original data regarding personality types, was a direct result of his research with individuals. During the late 1960s, Holland began writing extensively about his theory. David Campbell became interested in Holland's personality trait theory. Campbell was determining the correlation matrices of the Strong Interest Blank when he discovered some basic occupational patterns. He realized the occupational patterns resembled Holland's hexagon. Campbell

contacted Holland and suggested that they work together to develop scoring scales for each of Holland's themes and integrate these into the Strong Vocational Interest Blank. Holland agreed and they worked together resulting in the application of Holland's theory to interest inventory (Campbell & Holland, 1972). This application proved that Holland's theory could be used to organize vocational data provided through interest inventorying. In 1972, this data was merged and it was apparent that Holland's theory was very useful in creating a valid interest instrument. During the 1970s, Campbell took a break and went on sabbatical only to return due to the women's movement in the United States being in an uproar over the division of male and female profiles found on the Strong Interest Inventory. During these years, the forms were combined into a single booklet that became known as the Strong-Campbell Interest Inventory. Items were cut from 420 to 325. This is when the Strong Interest Inventory adopted Holland's theoretical base. The Strong-Campbell Interest Inventory became more prominent due to the use of Holland's theory. By merging theory major changes occurred (Gottfredson, 1999).

The 1985 Revision of Holland's Theory Vocational Identity Scale

Holland's 1985 revision added the concept of vocational identity, which doubled the professional interest in his theory. For 20 years prior to 1985 only 15 articles had been published about the theory, however, from 1985 until 1995, 61 articles were published. Several studies (Johnson, Smither, & Holland, 1981; Rayman, Bernard, Holland & Barnett, 1983) of the Vocational Identity Scale have proven its value as a method of career development.

The 1997 Revision of Holland's Theory

In 1997 Holland introduced the idea of physiological types being characterized in terms of a set of "beliefs" that exist about their self and their environment. These revisions emphasized the classification of work milieu. The Position Classification Inventory (Gottfredson & Holland, 1996) was used to integrate work classifications with individual personality classification. The theory offers a method of career development with little or no counselor intervention (Holland, 1973, Nafziger, Holland, Helms, & McPartland, 1974). Holland's theory had simplified the career development process by giving ownership of the process to each individual. It has provided a practical method for counselors to improve the career development process (Holland, Powell, & , Fritzsche 1994; Zener & Shenulle, 1976).

Application of John Holland's Theory

The historical context and the current use of the Strong Interest Inventory and the Directed Search (SDS) will be reviewed.

Overview

In 1997, Savickas devoted an entire issue of the *Career Development Quarterly* to address the five most used interest inventories. These inventories are the: (a) Campbell Interest and Skill Survey, (b) the Kuder Occupational Interest Survey, (c) the Career Search Schedule, (d) Holland's Self-Directed Search, (e) the Strong Interest Inventory, and (f) the Skills Confidence Inventory (the unisex edition of the ACT Interest Inventory). This list exemplifies the current influence of the Holland theory and the impact of his hexagon taxonomy in the field of career development. Each of the

instruments reviewed utilize Holland's three-letter code with the exception of the Kuder Interest Inventory (Campbell & Borgen, 1999).

Historical Context of the Strong Interest Inventory

Alfred Binet is known as the father of standardized testing (Siegler, 1992). As a physician, Binet was asked to identify individuals who would not benefit from in-school instruction. In today's society, these individuals would be known as slow learners. Binet worked with a colleague, Simon, and developed a method to evaluate students which had never before been utilized. Initially, Binet asked several students the same standardized question. Binet preceded to norm the responses (Campbell & Borgen, 1999). To do this, he determined at what age the average student learns information presented (Anastasi, 1997; Binet & Simon, 1973).

Early in 1916, Binet combined his work with the work of Luis Terman at Stanford University, which eventually gave birth to the first intelligence test, known as the Stanford-Binet. The instrument was used and revised. Then in 1917, shortly after its development, the U.S. Army imitated its use at examining units. At one of the examining units in Camp Jackson, Nashville, Tennessee, a chief examiner named E. K. Strong became one of the assistant examiners (Becker, 2003). At the completion of the war, Strong began working in applied psychology at Carnegie Institute of Technology. Later in 1923, Strong joined the faculty at Stanford Business School and began to work under Terman. Strong became very interested in vocational interest. Later in 1927, Strong published the Strong Vocational Interest Blank (SVIP), and in 1933 he published the female version of the Strong. The Strong Vocational Interest Inventory was normed in the

same way Binet had normed his intelligence test. Individuals were asked the same question and then answers were compared. Techniques in each situation were similar, but the content and populations were different. Both Strong and Binet believed that validity should be directly linked to behavior. For the Stanford-Binet, items were selected to assess intelligence while in the Strong case items were selected that were related to specific occupations. Strong continued to collect dozens of samples comparing thousand of respondents. Strong developed his reporting profile during the 1930s. At this time he did not have the benefit of correlating, clustering or factor analysis programs (Campbell & Borgen, 1999).

After World War II, the first automating scoring for the Strong Vocational Interest Blank was developed. It was obvious that jobs clustered in various categories. Strong's creation of occupational skills and interest inventories was initiated. Numerous revisions have continually been developed. The occupational scales contain various types of different information from factors, which people liked to those they did not like. The test had current and criterion-based validity (Campbell & Borgen, 1999).

The 1960 Revision of the Strong Interest Blank

During the 1950s, Strong decided to update his vocational interest inventory. Information originally gathered was transferred to the University of Minnesota where information was computer analyzed and keypunched on IBM cards. During 1958, a graduate student named Campbell was hired at to perform the computer analysis for this revision. For the next five years, additional norming and work was done until the revision was complete in 1963. By the completion of the norming process, Strong had passed away and Campbell had finished his doctorate. Campbell had become a member of the

Minnesota faculty; as such, he was appointed the Director of the Center of Interest Measurement Research. During the next several years, revisions were completed and a new booklet and test was published (Campbell & Borgen, 1999).

Initially, The Strong Interest Inventory first had 23 basic scales in 1966. After testing and research, the six Holland scales were added in 1972. The adding of the Holland scales resulted in more widely accepted and an easier interpretation of the Strong Interest Inventory. Campbell completed the basic interest scales in the 1950s while completing his Master's thesis. These results were not specifically positive or empirically sound. The actual scales, which are currently used, were developed in 1966 at the University of Minnesota. This is when the basic 23 scales were actually developed. These scales were found most useful in counseling and research. Later the same year, the men's form was revised and in 1969 the female form was revised. Hence, after 15 years of work, both forms appeared to be in relatively strong standing. But the Holland scales were the next change to appear (Campbell & Borgen, 1999).

It is widely believed that if Strong were to build an interest inventory today, he would undoubtedly utilize Holland's model. However, the fact remains that Holland built his model on Strong's ideas (Holland, 1976). Through the 1960 and 1970s, scales on the Strong Interest Blank began to appear and it became apparent that Strong's method would be utilized (Campbell & Borgen, 1999).

The data received from the Strong Interest Inventory reflects the extent to which an individual is interested in various types of people, data, and activities. The scores also reflect the correlation between the individual, interest and the type of occupation in which they are working. It also identifies the similarities of workers in similar occupations

(Powers 2006). The Strong Interest Inventory 2004 (Case & Blackwell 2008) remains one of the most utilized criterion-based interest inventories.

The Self-Directed Search

Overview

Holland developed the Self-Directed Search (SDS) but approached the development of the test development from a different vantage point then Binet. Although all items were itemized, Holland preferred a different approach to the norming process. Holland had noticed specific characteristics about individuals seeking employment. An example would be an individual who enjoyed hunting, fishing and outdoor activities maybe unlikely to be interested in English literature (Campbell & Borgen, 1999).

SDS Format

The SDS has a unique format which includes: (a) self-administered, self-scored, and self-interpreted; (b) a combination of occupational dreams, preferred activities, self-assessment competencies, and occupations; (c) scales are apparent to the user; (d) raw scores are standard scores; (e) a three-letter code which identifies occupations; (f) encourages discussion with the counselor; and (g) the users retains a copy of their profile (Rayman & Atanasoff, 1999). The SDS can be group administered (Avallone, 1974; Holland, 1985a) or simply used as a stand-alone assessment, which is one factor in its effectiveness as a vocational counseling tool.

Initially, in the SDS individuals are asked to investigate occupations. This exploration is initiated through a daydream section. The daydream section of the SDS is used to measure an individual's stated vocational interest. This preferred interest is valued in the career development theory. Holland was extremely interested in the expressed interest of individuals. In several research studies, Holland and Gotffredson (1975) indicated that individual's conveyed interests were as predictive as interest inventory scales and in some cases, were more predictive. Overall, information obtained in the daydream section provides valuable information for exploration. Individuals who are unhappy with their code are provided the opportunity to gain additional knowledge by way of career exploration. If the stated and tested codes are the same or similar counselors are reassured that the code is representative of the individual's true personality type and career interest (Reardon & Lenz, 1998).

The activities section of the SDS investigates the individual's hobbies and task. Task which are those performed by the individual for leisure. These sometimes include activities, which the individual may not enjoy. Individual's can evaluate likes or dislikes thus, gains an idea of how leisure time is spent. The competency section follows and asks individuals to describe their skills. This section allows an individual to evaluate skills of which they have no interest. This section is viewed as a key in the Holland career development process. The occupation section follows. This section lists occupations with which the individuals select. The individuals make occupational choices based on interest.

The self-estimate section asks a consumer to rate their competencies for completing specific tasks. The SDS process has received empirical support from

Holland's studies. Holland theorized in1994 that if the first letter of the code of an individual's daydreams or current occupation is the same as the tested first letter code, then the individual will maintain the occupation over time. In 1990, Holland, Gottfredson, and Baker found that one solidly expressed interest or two or three expressed interest a in the same code yielded better data than any interest inventory in predicting occupational success (Reardon & Lenz, 1998).

SDS Research

Holland's studies support success and confirmation of the effectiveness of the SDS in predicting vocational outcomes. A study conducted Zener-Schnuelle (1976) found no pre- to post-test changes in the experimental-control groups in the area of vocational preferences. This study revealed that 75% of the females in both groups preferred social, artistic, and clerical occupations. Almost 75% of the males in both groups preferred science, trades/technical and business occupations an indicated on both the pre- and post-test. The conclusion of this study was that while the interest inventory might broaden individual's career exploration activities, it is not certain as to whether the students really explore vocational alternatives. The same study does give evidence to the fact that males and females taking the self-directed search are more open to exploring a broad array of occupations (Baker & Hanson, 1976).

Studies in the seventies were conducted to determine whether the SDS was valid (Avalone, 1974; Cooper, 1976; Krivasty & Magoon, 1976; McGowan, 1974; Nelson, 1975; Nolan, 1974; Prediger, McLure, & Noeth, 1976; Redmond, 1973; Schaefer, 1976; Zener & Schnuelle, 1976). These studies indicated that the use of interest inventories have a small effect on an individual's career choice. Also, interest seemed to be totally

unrelated to sex, age, social class, or theoretical basis. Results of the validly studies revealed that consumers completing the SDS expressed more vocational alternatives, a better self-understanding and appeared more self-confident in their career decisions. The researchers believed this to be true because of (a) the vast number of options available to individuals completing the SDS, (b) the construction presentation of the information on the SDS, and (c) additional guides and supplemental career information presented in the SDS profile increases a self-understanding. Results indicated that the effects of the SDS are found because of the vast number of vocational occupations presented. The structure of the SDS was considered secondary and results coincide with previous studies obtained (Nelson, 1975; Redmond, 1973; Zener & Schnuelle, 1976). Students completing the SDS often seek additional information prior to making concrete career choices (Holland, Takai, Gottfredson, & Hanau, 1978; Takai & Holland, 1979).

Research data documents that the SDS directly affects an individual's career decision-making process (Holland & Rayman, 1986). In 1985, Holland stated that counselors must consider how interest inventories impact an individual's vocational thinking, thus affecting their understanding of careers, which then affects their vocational planning. A previously sighted study by Holland, Tankai, Gottfredson, and Hanau (1979) revealed that the numerous vocational alternatives suggested by the SDS instruction booklet provided a positive affect on females. Traditional studies have also documented this affect on high school students, college students, and adults (Avallone, 1974; Osborn & Reardon, 2006; Zener & Schnuelle, 1976,). SDS is used to confirm expressed vocational choices, to confirm college students' educational choices and as such provide affirmation of career choice. Studies document how the Self-Directed Search enhances an

individual's interest in the career exploration process (O'Neil, Muchow, & Burk, 1980; Lenz, Reardon & Reed 2003). Additionally, the use of the Holland code may also assist a career counselor in determining which method of career development works best with an individual (Reardon & Bullock 2007). For example, some individuals might work best in group counseling while other individuals might work better with individual counseling, while still others might work better in a workshop or self-help type situation (Clark, 1996; Kivlighan & Shapiro, 1987; Osborn & Reardon 2006; Szymanski, Hershensen, Enright, & Ettinger, 1996). Research conducted by Niles in 1993 revealed that individual's selection of career counseling services correlates with their Holland-type code (Rayman & Atanasoff, 1999).

The Self-Directed Search (SDS) has been used by over 22,000,000 individuals and translated in 25 languages. The Psychological Assessment Recourses (1994), reports that the SDS remains a widely used measure of person/environment congruency. Much has been written and researched about this instrument. The following is a summary of the belief of why SDS has been used with such vigor in the career guidance field (Rayman & Atanasoff, 1999).

As a result of the SDS research, John Holland and associates developed a measure known as the Vocational Education and Insight Kit or VEIK (Holland, 1979). This Kit was a card-sort kit. The basic philosophy behind this Kit was to stimulate career discussion. Research indicated that the VEIK was similar to the Self-Directed Search and it is viewed as providing no additional utility. The SDS has a manual entitled "You and Your Career" (Holland, 1985b). This manual is a pamphlet, which discusses basic ideas relating to the use of the Holland codes. The manual is written in an easy-to-read basic

form, which is consumer-friendly. Also, a manual is available entitled "Educational Opportunities Finder" (Rosen, Holmberg, & Holland, 1999), which allows consumers to match vocational areas of interest with their educational goals. The Leisure Activity Finder (Holmberg, Rosen, & Holland, 1999) also assists a consumer in integrating leisure activities, which can assist in managing stress.

John Holland's theory has sparked pre-developed measures of career identity and career barriers. The "My Situation" (MBS; Holland, Daiger, & Power, 1980) is specifically developed to identify individuals' vocational identity and assist in developing a diagnostic intervention to improve vocational outcome. The Holland themes also influenced the development of the well-known Career Attitudes and Strategies Inventory (CASI; Holland & Gottfredson, 1994). This instrument is also self-directed. The emphasis of this measure is to evaluate adults in the areas of career aptitudes, experiences, and feelings, which could impede an individual's career options.

Career Development Methods for Non-Reading Individuals with Disabilities

A critical need for career development methods and services exist for individuals with severe disabilities. National studies continue to confirm that individuals with disabilities experience higher rates of unemployment than the general population (United States Census Data, 2002). Clearly, career development is an issue that must be addressed in future amendments to the Rehabilitation Act of 1973. As early as the mid-1950s, Hall and Warren emphasized the criticalness of career development for individuals with severe disabilities. The framework of career development differs from the typical idea of occupational choice (Rubin & Roessler, 2008). Occupational choice is a process of the

selection of a specific job while career development is a life long process (Szymanski & Hershenson, 1998).

Historically, a counselor's effectiveness is based on the number of job placements typically known as "case closures." Through the years this has changed and the overall effectiveness of a counselor be based on the "quality" of the consumer's integration into society. The "quality" of this integration should be based on assisting individuals in career and vocational guidance rather than a one-time job placement. Vocational rehabilitation should be career focused rather than occupation focused. Concurring with these recommendations were many others who stressed career development verses job placement and case closure. The twenty first century has seen a shift in emphasis on job placement towards the development of independency and self-sufficiency. Career development needs to included: (a) a career suggest a lifelong process which is based on individual choices to participate; (b) an individual personal plan is developed through self-determination principles of self-satisfaction and is directed towards an individuals vision of their future; (c) individual career choices evolve through decision-making and work experiences; (d) the individual promotes job changes, flexibility, success, and failure, with no minimum or maximum hours of work; and (e) an individual career encourages quality technology to improve learning, performance, communication, independence, and interdependence. Vocational Rehabilitation (VR) counseling should include lifelong personal future planning, self-determination, self-satisfaction and informed formal career choices, job changes which included access to quality technology (Martin, 2006; Roessler & Rubin 2006).

Interest assessment is used in the variety of applied and research settings for career development purposes. The initial step in career development is interest-testing which leads to career exploration, and a career choice. Typically, interest-testing takes place in college, high school and with counseling services. However, interest inventories are also used in employment agencies, rehabilitation service agencies and social service agencies. Major objectives of interest testing are (a) a method to determine vocational choice, (b) a method to determine a relationship between interest to other variables such as an individual's personality, and (c) a method to identify the role interest inventories play in career development process (Hanson, 1995). Therefore, the greatest use of the interest inventorying continues to be the gathering of data, the identification of values and the reinforcement of abilities and of personalities in the career development process. This information is used to assist individuals in developing and making quality of life decisions (Hayes, 2001).

In order to effectively plan and work with individuals with disabilities in transition planning it is necessary to use valid career assessment instruments. Career surveys are instruments that are most likely used with individuals with disabilities (Kapes & Whitefield, 2002). A review of literature indicates that career interest inventories are broad and scoped and must be used with scrutiny and integrity in regards to individuals with disabilities. The selection and administration of interest inventories is a practical concern for students with special needs. Much care must be used in administering and interpreting the results of such inventories. Results of a valid interest inventory would appear to lend credence to extensive career exploration activities (Bentley, 1985).

Studies indicate that individuals with disabilities do not get exposed to prevocational activities, which are important steps necessary for them to successfully transition from school to work (Benz, Lindstrom, & Halpern, 1993). The National Transition Study (Blackorby & Wagner, 1996) reported youth with disabilities occupy entry-level occupations. This data confirms the fact that these youth have not be provided the opportunity to actively participate in their career development process. Even when the emphasis is on self-awareness, numerous barriers exist for individuals with disabilities (Karge, Patton, & de la Garza, 1992; Marlett, 1987; Roessler, Brolin, & Johnson, 1992). No method has been established to provide youth with disabilities individualized career development (Guess, Benson, & Siegel-Causey, 1985). Individuals with disabilities may be unable to make an informed career choice because of lack of appropriate assessment techniques (Benz & Halpern, 1993).

McLaughlin and Lewis (1994) reviewed vocational interest inventories. Most require a fourth grade reading level. Only three are reading-free. These are: (a) AAMB Becker Reading Free Interest Inventory, (b) Geist, and (c) the WRIOT. Interest inventories are limited for non-reading individuals restricting their opportunity to make an informed career choice (Agran & Morgan, 1991; Ferrara, Rudrud, Wendlegass, & Markve, 1985).

Critique of Non-Reading Interest Inventory

A critique on the Wide Range of Interest's Opinion Test (WRIOT), written by Donald G. Cytowski, Professor of Psychology, at Southern Illinois Carbondale, reported that while the test name WRIOT is an interesting acronym, the test presents nothing

positive (Burros, 1985). This instrument is a non-verbal interest inventory consisting of line drawings of individuals performing unskilled occupations. The inventory requires the consumer to choose from most liked to least liked activity. It can be administered to individuals who do not understand English or who are unable to read. The instrument's developers acknowledge that not all consumers attach the same meaning to each item. The majority of the pictures present males performing work tasks. The few women represented are performing a limited number of activities, which include a filing task, a food service task, and a customer service task. These are considered stereotypical representations. The manual lacks detailed normative data, such as the identification of the subjects involved in the norming process. The analysis also identifies a number of items. The rejections of any items are still scored positively. While this is acceptable psychometrics, it tends to reduce the chance of taking all items into consideration and presents problems for interpretation (Power, 2006).

A Review of the AAMD Becker Reading-Free Vocational Interests Inventory

The AAMD Becker was developed for the individuals with mental retardation at high school level in 1975. The current version of this measure, vision II, has a male form and a female form. Originally, the picture interests inventory was developed for use with the high school level population previously identified as, mentally retarded. This inventory is totally non-verbal and requires on reading or written statements. The items are simple and direct. The norm sample had a mean IQ range of 62 to 69 which was previously classified as the trainable mentally retarded. The inventory is administered orally with specific directions are provided for group and individual administration (Becker 1985).

The manual does state that the preferences are presented in first choice format in an effort to write only in first choice the most liked activities. Norm tables give conversion to a variety of scores and individual profile sheets that are provided for profiling the percentile ranks for each examinee so that the high average or a low scores can be easily noted. Profiles are not provided for the examinee or the reviewer. Research studies are needed to determine how well the examinee understands such a profile (Becker, 2003; Powers, 2006).

Summary and Conclusion

John Holland's s theory of vocational choice continues to be the most widely utilized theory of career development both in theory and application, despite numerous years of mixed empirical support (Reardon & Ruff, 2003). Its congruency hypothesis states that worker satisfaction, performance and quality of life are positively related to the correlation of a person's individual Holland code. It stresses the importance of an individual's match of personality with their work settings, which is the cornerstone of John Holland's person-environmental fit theory **(**Brown & Gore, 1994**).**

Rehabilitation legislation continues to emphasize the need for the functional vocational assessment, career exploration supported employment and job accommodation for rehabilitation of individuals with the more severe disabilities (Martin, 2006). Despite this studies continue to report that people with disabilities have lower workforce participation rates than the general public (Burkhauser & Houtenville, 2003). Individuals who are functionally illiterate or severely disabled may be highly unlikely or unable to

find and obtain employment, thus millions remain unemployed or at best underemployed in the United States (U.S. Census Bureau, 2002)

Reviews of career assessments inventories reveal only three-picture interest inventories and these have are not theoretical based and are out of date (Siegel, Robert, Waxman, & Gaylord & Ross, 1992).No adequate assessment measure exists; therefore, there is no career development process available for individuals with severe disabilities therefore many remain underemployed or unemployed (Agran & Morgan, 1991; Ferrara, Rudrud, Wendlegass, & Markve, 1985).

III. DEVELOPMENT OF THE CANNON PICTURE INTEREST INVENTORY

Introduction

John Holland's theory is an operational theory of career development process based on an individual's interaction with his/her works setting. The impact of this theory is vital to the practice of career counseling; for years it has provided a way to determine a person's fit with his/her environment (Weinrach, 1996). His theory is uniquely defined, being both specific and broad in scope. It is based upon a hexagon typology that is easy to understand and allows for utilization across cultures and the life span (Holland, 1992a). There is a personality type for each point of a hexagon, thus making six personality types and six work environments. Each work setting is comprised of three personality types, resulting in a three letter code. Each profile falls into one of six personality types: Realistic, Investigative, Artistic, Social, Enterprising and Conventional (Holland, Gottfredson, & Nafziger, 1975). The occupational code is simple to understand and is used to describe an individual's personality characteristics as they relate to the work environment (Rayman & Atanasoff, 1999). Holland's philosophy is that individuals of similar personality types like the same or similar types of work. The assumption is that an individual who is correctly matched to his/her work environment is more likely to be productive and successful, and to feel satisfied with his/her occupational choice (Rayman

& Atanasoff, 1999). The code allows for basic framework within the workforce that enables individuals to "fit" employment milieus (Shivy, Phillips, & Koehly, 1996).

All of the interest inventories based on John Holland Theory of Career Development require that a person read at or above the fourth grade level. A review of vocational interest inventories was conducted in 1994 by McLaughlin and Lewis. This review indicated that most interest inventories require at least a fourth grade reading level. In Powers 2006, indicated that there are only three utilized reading-free inventories. These are: (a) AAMB Becker Reading Free Interest Inventory, (b) Geist, and (c) the WRIOT. None of these inventories are theory based and appear to restrict job selection to specific jobs rather than an occupational group of jobs. Therefore, this limited number of interest inventories hinders the career development process for non-readers and as such may impact or result in their underemployed or unemployed (Agran & Morgan, 1991; Ferrara, Rudrud, Wendlegass, & Markve, 1985).

Purpose of the Study

The purpose of this study was to develop a non reading vocational interest inventory and determine its concurrent validity and reliability. The inventory development consisted of: (a) test item selection, (b) photography of interest items, (c) review/critique of pictures for test items by a professional panel, (d) picture/item selection and test development of Form A and Form B, (d) administration of the CPII to non-readers, (d) administration of the CPII to readers, (e) scoring of the CPII, and (f) entry of scores/data and examination of test data results. Research questions used as the basis for data collection are shown below.

Test Development

The Cannon Picture Interest Inventory is a non-reading picture interest inventory of individuals performing various tasks. Two forms were developed—Forms A and B. Development consisted of a four-step process. Construct validly was established through the following steps. Pictures were taken of tasks that are mentioned in the Activities Section of both The Holland Self Directed Search Form E-4th and The Strong Interest Inventory. Three Certified Vocational Evaluators served as expert judges in the selection of pictures used for test items. Each expert was familiar with the John Holland Theory of Career Development and actively conducted vocational evaluations.

Rating forms and pictures were mailed to each expert, who was asked to respond by: (a) independently identifying the occupational code, of each picture, and (b) rating the picture on a five-point scale for over-all clarity, with 5 being the highest rating. Two pilot ratings were conducted. Initial picture ratings were conducted on 509 pictures of individuals performing various tasks. Due to a lack of representation in the Investigative (I) code, Enterprising (E) code, and Social (S) code, as determined in the initial expert ratings, an additional 161 pictures were taken with emphasis on I, E and S occupations. The expert raters then re-evaluated all pictures receiving a quality rating of 9 or higher on the initial rating. A total of 36 different pictures were selected for both Form A and Form B. Each picture had congruence in code rating of 2 out of 3 and a picture quality rating of 12 or greater. (Congruence in code means that at least two out of three evaluators agreed on the letter code the picture represents.) Each picture selected was then presented five random times in each form. As a result, two test booklets were developed—Form A and Form B. Each booklet contains 60 pages with three pictures randomly assigned to each

page. On each page the examinees select the one picture that is of the most interest to them. Each picture is identified by a letter; i.e. A, E, C, I R, S, each letter represents an occupational group, and counts one point, for a total of 60 points. The raw score is equal to the number of times a letter is selected, resulting in a Holland Code. For example, if a person's raw score was: A-20, E-1, C-24, I-1, R-10, S-4, their Holland Code score would be CAR.

Research Questions

The following research questions were developed for this study:

Research Question 1. Is there a positive relationship between the occupational group scores obtained on Form A and those obtained on Form B of the CPII when administered to the same group of individuals?

HØ There will be no significant relationship between the top three scores obtained on alternate forms of the Cannon Picture Interest Inventory (CPII).

Research Question: 2. Is there a positive relationship between the occupational group scores obtained on the Holland Self Directed Search and Form A or Form B on the CPII when administered to the same group of individuals?

HØ: There will be no significant relationship between the three letter occupational code score on the CPII and three letter occupational code from the Holland Self Directed Search for the same subjects.

Methods and Procedure

The data collected for the reliability and validity of the CPII came from participants in the state sponsored rehabilitation programs in either Florida or Alabama. . The test series each participant took was determined by whether the person could or could not read above the fourth grade level. The test administrators determined the reading level based on achievement testing. Non-readers, those who read at less than a fourth grade level, took both Form A and Form B of the CPII. Individuals reading above the fourth grade level were administered both the Holland Self Directed Search and either Form A or Form B of the CPII. Consent forms were read to all participants and all participants were required to sign a consent form to participate in the study. For those participants under age 18, a parent's consent was required. All testing took place at the end of the subjects' regular assessment process and had no impact on their overall vocational assessment. Data collection for the reliability portion of the study utilized the administration of both Form A and Form B of the CPII. The test administrators recorded initial data regarding the test taker, including age, sex, and reading grade level. The instructions for taking the CPII were read to the test takers. The test takers were guided through the practice section of the inventory. They could ask questions as needed about the testing procedure at this time or at any time during the process. The evaluator recorded difficulties encountered by the test takers on a specific form. The test taker took each form of the test, recording his/her selections in the answer booklet. The entire process took about 45 minutes. Answer booklets were sent to the principal investigator for scoring. Individuals who read at the fourth grader level or greater took either Form A or Form B of the CPII and The Holland Self Directed Search in order to determine the

concurrent validity of the CPII. Using either Form A or Form B of the CPII, test administrators completed initial data regarding the test taker which included: age, sex, and reading grade level. Instructions were read to the test takers. The test takers were guided through the practice section of the inventory. They asked questions as needed about the testing procedure at this time or at any time during the process. The evaluator recorded difficulties encountered by the test takers on a specific form. Each test taker took the test, recording his/her selections in the answer booklet. Using the Self Directed Search, test administrators asked the test takers to enter his/her initial data which includes age, sex and reading grade level, if it was above or below the fourth grade. The administrator read the instructions to the test takers. The test taker recorded his/her answers. The test administrator sent scores from both the CPII and the Self Directed Search to the principal investigator.

Participants

The population for this study was a convenience sample of individuals with various disabilities who were referred to the following community rehabilitation centers for vocational assessment/testing: (a) 33 developmentally delayed adults participants from Goodwill Industries Suncoast, St. Petersburg Florida, (b) 20 participants from Wiregrass Rehabilitation Center, Dothan, Alabama, (c) 11 participants from Vocational Rehabilitation Program, Central Alabama, Troy, Alabama, (d) 7 participants from Easter Seals of Birmingham, Birmingham, Alabama, and (e) 23 participants from Lakeshore Rehabilitation Center, Birmingham, Alabama. Community rehabilitation centers provide various services to individuals with disabilities, one of which is assessment. This made a

total of 94 participants who volunteered for the study. A total of 93 completed the study. Their ages ranged from 10 to 54. Four participates did not complete the age data. Two questionnaires submitted were unusable because they were incomplete. The participant failed to complete the entire test. No reason was noted as to why the tests were left incomplete. A total of 28 males (29.8%) and 65 females (70.2 %) participated in the study. Of the 93 participants, 49 (51%) were non-readers.

Statistical Analysis

All statistical analyses were run on a 2009 Lenovo personal computer. The statistical program used in the analysis was SPSS 17.1 for Windows. Descriptive statistics were used to describe the age and gender of the subjects. Each person taking the test received six scores; one score for each of the six Holland theme areas, i.e. RIASEC; Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The three highest scores were then converted to a three letter Holland Summary Code. The following is an example of one individual's scores; A-20, E-1, C-24, I-1, R-10, S-4, their resulting Holland Code score would be CAR (Conventional, Artistic & Realistic). This individual would look for occupations which are comprised of this Holland theme. Participants individual Holland Code was entered into the SPSS. Each letter of the code, (RIASEC), was entered in SPSS and assigned a numerical value. The R = 6, E = 5, C = 4, I = 3, 2 = S and A =1 .There were 49 non-reading tests and 43 reading tests scored. The reliability of the CPII was determined by the alternate test form method (Salvia & Ysseldyke, 1998). Test scores from CPII Form A were compared to test scores from Form B. The data was first analyzed utilizing cross tabs then converted to a Cramer's V

score. Validity was analyzed by the comparison of the Cannon Picture Interest Inventory (either Form A or Form B) and a similar measure, the Holland Self-Directed Search. Test results were correlated utilizing cross tabs, Cramer's V. Cramer's V is utilized because we have three rows of data and three columns of data. The range of Phi is limited with nominal data to a 2x2 table, because the upper limits of the phi can exceed one. Therefore, it is difficult to interpret the results. A Cramer's V must be used; it has an upper limit of one. If Cramer's V is greater then 0.30 then it indicates a significant relationship. The Statistical Package for the Social Sciences (SPSS) was utilized to analyze the data. This method was used for this data because it is nominal (Haley, 2005).

Congruency was also measured across instruments by the Iachan Index measure (Iachan 1984.Congruency means that the summary code is exactly the same or similar in construct. For example a person may have a Holland Code of AIS. The Holland code AIS means that A, Artistic, is in the first letter of the Holland Code, this is of importance because determines the occupational theme of the person code. The letter in the first position has the most weight in the code. If you change the code to IAS: while it has the same three letters, in this code Investigative is the major theme. The jobs resulting for this code would vary for those of the first. The Iachan Index is a measurement developed to measure the congruency between two sets of Holland codes. If the codes compared are exact on two different measures then they have a high Iachan Agreement Score (28), which results in a 99 percentile ranking. This method of comparing the three letter code was utilized by the test developers of the Self-directed Search. The Self-Directed Search has several sections, so each section results in a mini-Holland code. The Iachan method of comparison is used to compare a three letter codes from one section of the test to

another section of the test. A textbook explanation follows: for example, a specific numerical weight is given to an exact match. An exact match is when the first letter of the two codes matches, in the cases the score given would be a 22. For a first letter and second letter match the score given would be a 10 and the third letter would be a 4. The following chart shows the exact values. For example, an exact match would receive a congruency score of 28. This congruency score is then converted to a percentile score (Holland, Powell, & Fritzche, 1997).

Table 1

Table for Calculating the Iachan Code

	SDS Summary Code			
Occupation Code	First letter match	Second letter match	Third letter match	No match
First letter	22	10	4	0
Second letter	10	5	2	0
Third letter	4	2	1	0

Results

Reliability

Reliability is the consistency of a test measure over time. Therefore, the results of the CPII, if reliable, should remain the same over time (Kerlinger, 1964). There are several methods for determining reliability; one of which is the alternate forms method,

which was utilized in this study. In this instance, alternate forms, Form A and Form B of the CPII, were administered to the same individual. Reliability is dependent upon the CPII score remaining the same on both Form A and Form B. On the CPII each individual score is comprised of a three letter code, the occupational code. If reliable, the three letter code resulting from both Form A and Form B for each individual should be the same. Therefore, to establish reliability, the results of Form A were compared to the results of Form B (Salvia & Ysseldyke, 1998.) Both forms of the CPII were taken by a sample of 49 non-readers (n = 49).

Cramer's V Analysis of the First Three Letters Form A and Form B

Table 2 shows a crosstabs congruency table analysis was conducted utilizing Cramer's V. There are six possible occupational group answers (A, S, E, R, I or C). The top three highest answers combine to form a three letter Holland Code. Each individual code is comprised of three letters. Table 1 has the congruency scores for the top three letters of Form A and Form B. Results support statistically strong relationships between the answers in the first letter on Forms A and B at V.677, the answers in the second letter on Forms A and B at V .618, and the answers in the third letter on Forms A and B at V.418. Table 4 shows the result of the analysis of the Holland Occupational Code for Form A and Form B of the CPII. There was a congruency for the first two letters was stronger that for the third letter. Both forms of the CPII have a moderate to strong relationship between the administrations of Form A when compared with Form B. These results suggest the CPII has alternate form reliability (Healy, 2005).

Table 2

Cramer's V Analysis of The CPII Summary Code Form A compared to Form B *(N-49)*

Cramer's V 's	Letter 1 Form B	Letter 2 Form B	Letter 3 Form B
Letter 1 Form A	**.677**	.375	.352
Letter 2 Form A	.392	**.618**	.368
Letter 3 Form A	.366	.280	**.418**

Cumulative Percentages of the Occupational Scores from Form A and Form B

Table 3 shows the cumulative percentage of the Occupational Scores from Form A and Form B. The cumulative frequency is the percentage of time that an occupational group was selected as the first, second or third choice thus comprising the Holland three letter occupational code. The percentage of differences indicates percentage of time the scores on Form A differed from those on Form B.

Table 3

Cumulative Percentage of Variance in the Occupational Scores from Form A and Form B of the CPII

Occupational Type	Cumulative Percentages Form A	Cumulative Percentages Form B	Percentage of Difference
Artistic	40.0	44.0	4.0
Social	38.0	38.0	0.0
Conventional	52.0	56.0	4.0
Investigative	28.0	22.0	6.0
Enterprising	62.0	58.0	4.0
Realistic	74.0	68.0	6.0

Table 4 shows the Iachan Index for Form A and B or the CPII. The Iachan Index is a measure of agreement (congruency score) between two Holland codes. (For a detailed of the Iachen Index see Chapter 3.) This index gives a high value for exact matches, and lower value for any lesser agreement that occurs. The highest possible congruency score is a 28, or a 99th percentile ranking, which means that the two codes are exactly alike. The congruency score can range from 0-28 in congruency or 0-99th percentile ranking. The concurrent validity portion of this study , compared the summary code for Form A of CPPI the Holland Summary code which resulted in; Eleven out of twenty two participants with a congruency score ranging from 28-16 resulting in a percentile ranking 99-84 %. Six had a congruency score ranging from 22-14 resulting in

a percentile ranking of 84-51 %. The data demonstrates a significant agreement between the first three letters of form A and the first three letters of the Holland code. Twenty – three of forty nine had a congruency score of 28.Specifically, 50 % of all participants ranked at 84% or higher in congruency, while 27% had a moderate congruency score (Holland, Powell, & Fritzsche, 1997; Iachan, 1984).

Table 4

Iachan Index of Agreement Scores for Form A & B of the CPII

Number of Participants	Agreement Score	Percentile Rank
23	28	99%
5	27 (M)	97%
3	26 (M)	92%
1	26 (F)	90%
2	24	84%
1	22	72%
2	21	62%
1	21 (F)	60%
2	20 (M)	59%
2	20 (F)	53%

(table continues)

Table 4 (continued)

Number of Participants	Agreement Score	Percentile Rank
1	16	48%
1	12	44%
2	10 (M)	34%
1	10 (F)	22%
1	6	12%
1	2	8%

Content Validity

Content validity indicates whether the test measures the concept it was designed to measure, which in this case was interest (Rubin & Babbie, 2005). The content validity was established during the test construction and consists of (a) the literature review, (b) pictures taken of activities/tasks found on the Strong Interest Inventory and the Self Directed Search and (c) the review of the pictures by a professional panel of three CVE. During the item selection/test development phase, the three CVEs rated each picture/test item. Their rating was the basis for determining in which category/personality group the picture belonged. This rating resulted in each picture's assignment of a personality code: Social, Realistic, Enterprising, Investigative, Conventional or Artistic. Each picture was selected by having all three raters place the picture in the same primary occupational group (congruency score of nine or higher).

Concurrent Validity

Concurrent validity indicates how well the instrument is able to measure what it is designed to measure, in this case interest as defined by the Holland Code (Rubin & Babbie, 2005). The construct validity was determined for both Form A and Form B by conducting a crosstabs analysis using congruency table analysis of the results/scores of CPII and a similar measure of the Holland Self Directed Search. The Holland Self Directed Search is comprised of four different sections, the scores from which make up a Holland Summary Code. These sections include Activities, Competencies, Occupations, and Self-Estimates Scales. These scores are added together to make the Summary Code. The Holland Summary Code consists of a three letter code. Because the data are nominal the analysis was conducted utilizing Cramer's V.

Table 5 shows the Cramer's V relationship of the Occupational Summary Code Scores on Form A of the CPII and the Holland Summary Code. Results confirm a significantly significant relationship for the first letter, second and third letter of the code, with a V.520 for the first letter, a V.483 for the second letter and a V.489 for the third letter. This initial data demonstrates a relatively high content validity for the CPII Form A when compared to The Summary Code of the Holland Self–Directed Search.

Table 5

Concurrent Validity of Form–A of CPII and Holland Summary Code

Cramer's V	Letter 1 Holland Summary Code	Letter 2 Holland Summary Code	Letter 3 Holland Summary Code
Letter 1 Form A	**.520**	.521	.463
Letter 2 Form A	.509	**.483**	.542
Letter 3 Form A	.462	.487	**.489**

Table 6 is the Iachan Index Score for Form A of the CPII and the Holland Summary Code. The congruency score can range from 0–28 or 0–99th percentile ranking. The concurrent validity portion of this study , or the summary code for Form A of CPPI when compared to summary code of the Holland code resulted in 11 out of 21 participants with a congruency score ranging from 28–16 resulting in a percentile ranking 99–84 %. Six had a congruency score ranging from 22–14 resulting in a percentile ranking of 84–51 percent. The data demonstrates a significant agreement between the first three letters of form A and the first three letters of the Holland code. Specifically, 50% of all participants ranked at 84% or higher in congruency, while 27% had a moderate congruency score (Holland, Powell, & Fritzsche, 1994; Iachan, 1984).

Table 6

The Iachan Index Score for Form A of the CPII and the Holland Summary Code

Number of Participants	Agreement Score Percentile Rank	Percentile Ranking
4	28	99%
3	27-24	97%
1	24 (F)	89%
2	22	72%
1	18	54%
1	16 (M)	84%
1	16	53%
2	16 (M)	84%
1	14	51%
1	11	38%
2	10	34%
2	8 (F)	25%
1	6 (M)	24%

M = Male, F = Female

Table 7 shows the results of a frequency distribution that was conducted to determine the reliability between Form A and the Holland Self–Directed Search. A frequency distribution is the number of times an occupational group was selected by each

individual participant. The cumulative frequency percentile score total is the number of times an occupational group was selected on both Form A and Form B by all participants. The difference between the cumulative frequencies of Form A was compared to the cumulative frequency of Holland Self Directed Search. The variance across all themes was less than 17 %. They were as follows: Realistic was 6.0 % difference, Social was 17.3 % difference, 8.4 % different, Conventional percent difference 8.4%, Investigative percent difference 3.2%, Enterprising difference 11.6%, and Artistic percent difference 16.3% (Healy, 2005).

Table 7

Variance of Cumulative Percentages of the CPII Form A and the Holland Summary Code

Occupational Type	Cumulative Percentages Form A	Cumulative Percentages Holland	Percentage of Difference
Artistic	22.1	15.8	16.3
Social	35.8	18.5	17.3
Conventional	19.0	10.6	8.4
Investigative	17.0	13.8	3.2
Enterprising	11.6	22.2	11.6
Realistic	15.8	8.5	6.0

Table 8 shows the first three letters of the CPII Form- B were compared to the first three letters Summary code from the Self Directed Search. Analysis was conducted utilizing Cramer's V (n =23). Results confirm a significantly strong positive relationship between: (a) Letter 1 of Form A (CPII) and Letter 1 of the Holland Summary Code at V.635, and (b) a moderately significant relationship in the second letter of the CPII and the Holland Summary Code at V.525 and (c) a statistically strong relationship between letter 3 Form A of the CPII and letter three of the Holland Summary Code at V.458.

Table 8

Concurrent Validity of Form –B of CPII and Holland Summary Code

Cramer V's	Letter 1 Holland Summary Code	Letter 2 Holland Summary Code	Letter 3 Holland Summary Code
Letter1 Form B	**.635**	.477	.494
Letter 2 Form B	.424	**.525**	.411
Letter 3 Form B	.474	.491	**.458**

Table 9 shows the frequency distribution conducted to determine the reliability between Form B and The Holland Self–Directed Search. This frequency represents the number of times an occupational group was selected by each individual participant. The cumulative frequency percentile score total is the number of times an occupational group was selected on both Form B of The CPII and The Holland code by all participants. The

difference between the cumulative frequencies of Form B was compared to the cumulative frequency of Holland Self Directed Search. The variance across all themes was less than 17%. They were as follows: Artistic difference 11.4%, and Social difference.

Table 9

Cumulative Percentage of Variance in the Occupational Scores from Form A and Form

Occupational Type	Cumulative Percentages Form B	Cumulative Percentages Holland	Percentage of Difference
Artistic	28.7	17.3	11.4
Social	28.7	20.5	8.2
Conventional	22.3	26.6	4.3
Investigative	9.5	15.7	6.2
Enterprising	11.1	17.2	6.1
Realistic	7.9	12.1	2.2

Table 10 shows the Iachan Index which is a measure of agreement (congruency score) between two Holland codes. The concurrent validity portion of this study, compared the summary code for Form B of the CPII to the Holland summary code which resulted in; 10 out of 23 participants with a congruency score ranging from 28-16 resulting in a percentile ranking 99-84 %. Five had a congruency score ranging from 22-14 resulting in a percentile ranking of 84-51 %. The data demonstrates a significant

agreement between the first three letters of form A and the first three letters of The Holland code. Specifically, 48% of all participants ranked at 84% or higher in congruency, while 28 % had a moderate congruency score Others were below even the 10 %. (Holland, Powell, & Fritzsche, 1994; Iachan, 1984b).

Table 10

The Iachan Index Score for Form B of the CPII and the Holland Summary Code

Number of participants	Agreement Score	Percentile Rank
4	28 (F)	99%
1	20	97%
2	25 (M)	92%
1	24 (F)	89%
2	24 (M)	84%
3	21 (M)	60%
1	16 (M)	53%
1	16 (F)	48%
1	20 (F)	53%
1	14	51%
1	10 (F)	22%
2	6 (F)	24%
1	11 (F)	38%
1	6 (F)	13%
1	4 (F)	7%

Research Question One

The first research question asked, " Is there a positive relationship between the three highest occupational group scores obtained on Form A and the three highest occupational group scores obtained on form B of the CPII when administered to the same group of individuals?" The null hypothesis stated that there will be no relationship between the top three scores obtained on alternate forms of the Cannon Picture Interest Inventory (CPII). Results of a crosstabs analysis utilizing Cramer's V indicate a strong relationship between the scores obtained on Form A and Form B when administered to non-readers. Therefore, the null hypothesis is rejected

Research Question Two

The second research question asked, "Is there a positive relationship between the three highest occupational group scores obtained on the Holland Self Directed Search and Form A or Form B on the CPII when administered to the same group of individuals?" The null hypothesis stated that there will be no relationship between the top three scores of the CPII and three letter occupational code from the Holland Self Directed Search for the same subjects. Results of a crosstabs analysis utilizing Cramer's V indicate a strong relationship between the scores obtained on Holland Self-Directed Search and Form A and Form B of the CPII. Therefore, the null hypothesis is rejected

Discussion

The purpose of this study was to determine the validity and reliability of a non-reading interest inventory, the CPII. Research questions were designed to answer the following questions: (a) whether a positive relationship exist between the three highest

occupational group scores obtained on Form A of the CPII and the three highest occupational group scores obtained on form B of the CPII when administer to the same group of individuals, (b) whether a positive relationship between the three highest occupational group scores obtained on the Holland Self Directed Search Summary Code and Form A or Form B on the CPII when administered to the same group of individuals, and (c) whether a positive relationship between the three highest occupational group scores obtained on the Holland Self Directed Search Activities Section and Form A or Form B on the CPII when administered to the same group of individuals. Results of a crosstabs analysis utilizing Cramer's V indicated a strong relationship between the scores obtained from Form A and Form B when administered to non-readers, as well as between the scores obtained on Form A and Form B of the CPII and the scores Holland Self Directed Activities Section as well as the Activities section of the Holland Self-Directed Search.

The purpose of this study was to: (a) develop, (b) administer, (c) score, and (d) analyze the scores of the Cannon Picture Interest Inventory (CPII). The non-reading picture interest inventory is based on John Holland's well known theory of career development. This theory is based on six personality types; he theorized that each person's unique personality type will ultimately influence his or her career choice (Powers, 2006). There are several interest inventories relating to Holland's theory. The one utilized in this study was the Holland Self-Directed Search (SDS). The CPII used the norms of Self-Directed Search to develop this non-reading interest inventory. When completely developed, this inventory will be the only non-reading interest inventory based on Holland's theory. At the completion of the administration of the CPII, the data

was designed to measure the initial reliability and validity of the CPII. Cramer's V was the method used to analyze the data. It was determined there is a statistically significant positive relationship between: (a) Form A and Form B of the CPII, (b) the Summary Code of the Holland Self-Directed Search and Form A and B of the CPII, and (C) the Activities Code of the Self-Directed Search and Form A and B of the CPII. The preliminary study of the CPII suggests a significantly strong relationship between the interest testing of a non-reader and that of a reader on a similar measure. Initial data indicates reliability and validity.

Limitations and Recommendations

Conclusions of the reliability and the validity of the CPII are contingent on the following limitations: (a) item selection process, (b) test design forced choice, (c) length of time between test and re-test,(c) number of individuals in some of the sub-groups, and (d) statistical method used lends for the probability of a Type I error, (e)sample size and (f) limited population . Any one or all of these limitations could affect the usability, reliability, predictability, and validity of the CPII (Rubin & Babbie, 2005).

An inherent limitation could be included in the item selection process, content validity, as the item/picture selection was based on the items previously identified on the Self-Directed Search and the panel of vocational experts (Haley, 2005). In the initial assessment of the item/picture selection lowest congruency scores were lower in three sub-groups of Enterprising, and Investigative. Lower congruency scores were received in these three subgroups. The test items can be further verified by having a group of at least one hundred non-reading reading individuals indicate whether the picture items are

Artistic (A), Investigative (I), Conventional (C), Realistic(R), Enterprising (E), or Social (S).

The CPII is a forced choice inventory; the individual must choose an answer for three possible answers. The Holland Self Directed Search is designed in a manner that allows the individual the freedom of selecting only the items s/he prefers. However, on the CPII the individual may be forced to select items' which s/he does not like or want to do which may skew answers in an area of non-interest

The length of time between test and re-test on the alternate form of the CPII varied from location to location. There was no standard length of time between test re-test administrations. On some occasions the test was re-administered on the same day; on others it was administered days apart. The test is only interest, there is no" learning," "halo effect" or "faking good" to be concerned about. Research, (Super 1990), indicates that although interest may change over time, it would not vary from day to day. Therefore, the length of time between test and re-test may not have had a negligible effect.

The study could have been greatly improved a lager sample size as well as a random sample which would allow for generalization of the results. The revision would also like to conduct a qualitative study on at least 100 non-reading participates with various disabilities and have them identify what theme they think each pictures in the CPII represents. A factor analysis should be conducted for construct validly. A correlation should be conducted on the sores received on the Activities section of the Self-Directed Search and Form A and B of the CPII.

Recommendations for additional study include: (a) additional review of test items by verifying whether the picture represents the code as identified, then conducting a factor analysis, (b) administering the CPII to other populations with the test re-test time at least two weeks apart, and (c) administering the CPII to several hundred non–readers in various populations.

When the null hypothesis is rejected there is a probability that the researcher has rejected the null hypothesis when the null hypothesis is in fact true. This constitutes a Type I error. In this case it would mean that the CPII is not reliable, dependable or valid. In the case of the CPII the researcher can conduct extensive follow-up qualitative studies and ask the person which type of work they think each picture represents and would they like to do the type of work pictured (Rubin & Babbie, 2005).

Implications for Non-Reading Individuals

Vocational/career interest testing is recognized as being central to the vocational rehabilitation and job placement process for individuals with disabilities (Powers, 2006). Consequently rehabilitation counselors must have access to interest tests that will provide reliable and valid result for all consumers including non-readers. The CPII will address the needs of a counselor trying to determine career placement options for non-reading individuals. The Holland theory is based on the fact that a person is likely to choose a satisfying job if they choose one that fits their personality type (Holland, 1997).

IV. CONCLUSION

The purpose of this study was to determine whether the Cannon Picture Interest Inventory (CPII), a non-reading interest inventory based on John Holland's Theory of Career Development, is reliable and valid. The research questions were: (a) Reliability; Is there a positive relationship between the occupational group scores obtained on Form A and those obtained on Form B of the CPII when administered to the same group of individuals? , and (b)Validity; Is there a positive relationship between the occupational group scores obtained on the Holland Self Directed Search and Form A or Form B on the CPII when administered to the same group of individuals?

Reliability was determined for the CPII by way of the alternate test re-tests method (Salvia & Ysseldyke, 1998) The CPII consists of Form A and Form B. Both forms were administered to the same group of non-reading participants. Each participant's raw scores were added, the three highest scores were converted into a three letter Holland Code. The resulting Holland codes on Form A were compared to the Holland codes on Form B. The reliability was based on the correlation of the scores. Three methods of correlation was used: (a) crosstabs analysis utilizing Cramer's V, (b) the Iachen Index to measure congruency between scores on Form A and Form B, and (c) the percentage of variance between Form A and Form B.

The Cramer's V supported test reliability, indicating a statistically positive strong relationship between the answers in the first letter on Forms A and B at .677, the answers in the second letter on Forms A and B at .618, and the answers in the third letter on Forms A and B at .418. When utilizing the Cramer's V statistic a value of greater than .30 indicates a strong relationship (Healy, 2005).

The Iachen Index is a measure of agreement, (congruency score), between two Holland codes (for a detailed description of the Iachen Index see Chapter 3). This index gives a high value for exact matches, and less value for any lesser agreement that occurs. The highest possible congruency score is a 28, or a 99 percentile ranking, which means that the two codes are exactly alike. If the first two letters of the code are the same then the congruency is score is 27 or 97 percentile ranking. The congruency score can range from 0–28 or 0–99 percentile ranking. In this study, 32 of 49 had a congruency score ranging from 28-26 resulting in a percentile ranking 99–90 %. Eight had a congruency score ranging from 24–20 resulting in a percentile ranking of 84–59 %. The data demonstrates a significant agreement established by the percent of congruency between the first three letters of form A and the first three letters of form B of the CPII test .Specifically, 65 % of all participants ranked 90% or higher in congruency; while 16 % had a moderate congruency score (Holland, Powell, & Fritzsche, 1997; Iachan1984b).

A frequency distribution was conducted to determine the reliability between Form A and Form B. The frequency distribution is the number of times an occupational group was selected by each individual participant. The cumulative frequency percentile score total is the number of times an occupational group was selected on both Form A and Form B by all participants. The difference between the cumulative frequencies of

Form A was compared to the cumulative frequency of Form B. The variance across all themes was less than 6.0 % They were as follows: Realistic was 4.0 %, Social was 0.0 %, Conventional was 4.0%, Investigative 6.0%, Enterprising 4.0%, and Artistic 4.0%.

The concurrent validity was determined by comparing the CPII to a well known valid similar measure, the Holland Self-Directed Search (Healy, 2005). Validity was determined by: (a) a cross tabs analysis of both Form A and Form B via Cramer's V, (b) the Iachen Index to measure congruency between Form A and Form B of the CPII and the Holland Self-Directed search and (c) the percentage of variance between both Forms A and B of the CPII and the Holland Code Summary Code.

A crosstabs analysis was conducted of the results/scores of Form A of the CPII and a similar measure, the Holland Self-Directed Search. Analysis was conducted utilizing Cramer's V. Results confirm a significantly strong relationship between the Form A of the CPII and the Holland Summary Code for the first letter, second and third letter of the code, with V.520 for the first letter, V.483 for the second letter and V .489 for the third letter. This initial demonstrates a significantly high content validity for the CPII (Healy, 2005).

The crosstabs analysis between Form B of the CPII and the Holland Summary code also confirm a significantly strong relationship for the first letter, second and third letter of the code, with V.635 for the first letter, V .525 for the second letter and V .458 for the third letter (Haley, 2005). This initial demonstrates a relatively high concurrent validity for the CPII Form B when compared to the Summary Code of the Holland Self-Directed Search (Rubin & Babbie, 2005).

A frequency distribution was conducted to determine the reliability between Form A and the Holland Self-Directed Search. A frequency distribution is the number of times an occupational group was selected by each individual participant. The cumulative frequency percentile score total is the number of times an occupational group was selected on both Form A and Form B by all participants. The difference between the cumulative frequencies of Form A was compared to the cumulative frequency of the Holland Self-Directed Search. The variance across all themes was less than 17 %. They were as follows: Realistic was 6.0 %difference, Social was 17.3 % difference, Conventional percent difference 8.4%, Investigative percent difference 3.2%, Enterprising percent difference 11.6%, and Artistic percent difference 16.3 % (Healy, 2005).

A frequency distribution was conducted to determine the reliability between Form B and the Holland Self-Directed Search. A frequency distribution is the number of times an occupational group was selected by each individual participant. The cumulative frequency percentile score total is the number of times an occupational group was selected on both Form B of the CPII and the Holland code by all participants. The difference between the cumulative frequencies of Form B was compared to the cumulative frequency of Holland Self Directed Search. The variance across all themes was less than 12%. They were as follows: Realistic was 2.2 %difference, Social was 8.2 % difference, Conventional was 4.3%, Investigative 6.2%, Enterprising 6.1%, and Artistic 11.4 %.

The Iachan Index is a measure of agreement (congruency score) between two Holland codes. (For a detailed description of the Iachan Index see Chapter 3.) This index

gives a high value for exact matches, and lower value for any lesser agreement that occurs. The highest possible congruency score is a 28, or a 99th percentile ranking, which means that the two codes are exactly alike. If the first two letters of the code are the same then the congruency is score is 27 or 97th percentile ranking. The congruency score can range from 0-28 or 0-99th percentile ranking. The concurrent validity portion of this study compared the summary code for Form A of CPPI and the Holland Summary code which resulted in eleven out of twenty-two participants with a congruency score ranging from 28–16 resulting in a percentile ranking 99–84 %. Six had a congruency score ranging from 22–14 resulting in a percentile ranking of 84–51 %. The data demonstrates a significant agreement between the first three letters of form A and the first three letters of The Holland code. Specifically, 50 % of all participants ranked at 84% or higher in congruency, while 27% had a moderate congruency score (Holland, Powell, & Fritzsche, 1997; Iachan1984).

The Iachen Index is a measure of agreement (congruency score) between two Holland codes. (For a detailed description of the Iachen Index see Chapter 3.) This index gives a high value for exact matches, and lower value for any lesser agreement that occurs. The highest possible congruency score is a 28, or a 99th percentile ranking, which means that the two codes are exactly alike. If the first two letters of the code are the same then the congruency is score is 27 or 97th percentile ranking. The congruency score can range from 0-28 or 0-99th percentile ranking. The concurrent validity portion of this study compared summary code for Form B of CPPI to the Holland summary code which resulted in ten out of twenty-one participants with a congruency score ranging from 28–16 resulting in a percentile ranking 99–84 percent. Five had a congruency score ranging

from 22–14 resulting in a percentile ranking of 84–51 percent. The data demonstrates a significant agreement between the first three letters of Form A and the first three letters of the Holland code. Specifically, 48% of all participants ranked at 84% or higher in congruency, while 28 % had a moderate congruency score (Holland, Powell, & Fritzsche, 1997; Iachan1984b).

Conclusions of the reliably and the validity of the CPII are contingent on the following limitations: (a) item selection process, (b) test design-forced choice, (c) length of time between test and re-test, (c) the sample was of a limited population and was a sample of convenience, (d) small subject pool some in some of the sub-groups, and (d) statistical method used lends for the probability of a Type I error. Any one or all of these limitations could affect the usability, reliability, predictability, and validity of the CPII (Rubin & Babbie, 2005).

The study could have been greatly improved with a random sample thus allowing for generalization of the results. Future studies are needed across various populations of non-reading individuals. Additionally, it would be beneficial to conduct a qualitative study on at least 100 non-reading participates with various disabilities and have them identify what theme they think each pictures in the CPII represents. A factor analysis should be conducted for construct validly. A correlation should be conducted on the sores received on the Activities section of the Self-Directed Search and Form A and B of the CPII.

Overall, the results of this study are positive and encourage additional test development. It is the first qualitative step in the development of the only picture interest inventory based on John Holland's Theory of Career Development. This theory of career

development (Holland, 1959, 1966, 1973, 1985, and 1997) is based how well each person "fits" into their work environment. Non-reading individuals have no access to counseling based on John Holland's theory of career counseling since it's inception in 1959 since there is no interest inventory based on this theory that is available for non-reading individuals. All theory based interest inventories require that a person read at a 4th grade or higher reading level.

With the influx to America of groups from other countries and cultures and countries who are poor English readers, there remains a significant number, between 40-44 million Americans, one in five adults, in the US who function at the lowest literacy level (Wedgeworth, 2003). This number is rising and included in this population are the developmentally delayed. The prevalence of developmentally delayed is approximately 2.5 5to 3% of the general population (Luckasson, Coulter, Pollowas, Reiss, Schalock, Snell, Spitalnick & Stark, 1993).

The need for continued development of the CPII, a non-reading picture interest inventory, is not only needed but is ethically mandated. It is the only way that true career counseling can take place with the non-reading population. Research documents that interest is vital key to the career development of individuals with disabilities and affects their vocational viability or drive (Powers 2006; Shertzer & Linden, 1979). Data supports that interest inventories remain the most effective tool for identifying an individual's career choices (Salomone, 1996). However, interest inventories are limited for non-reading individuals, restricting their opportunity to make informed career choices (Agran & Morgan, 1991; Ferrara, Rudrud, Wendlegass, & Markve, 1985). It is also difficult to determine their vocational viability or drive (Powers 2006; Shertzer & Linden, 1979).

Research confirms that interest inventories remain the most effective tool for identifying an individual's career choices (Salomone, 1996).The necessity for expansion of this service, as well for new tools and methods for the vocational assessment of this population, is apparent to all who work within the rehabilitation community (Siegel, Robert, Waxman, & Gaylord Ross, 1992).

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APPENDICES

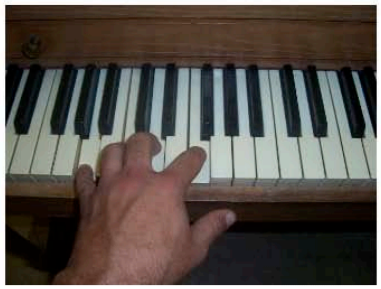
APPENDIX A

SAMPLES OF THE CANNON PICTURE INTEREST INVENTORY FORM A, WORD INSTRUCTIONS, ANSWER SHEETS AND PICTURE EXAMPLES

ARTISTIC OCCUPATIONS -A

A

Draw Picutres



A

Play an Instrument

A

Arrange Flowers

Choose the picture with the "A" under it if you would like to do a a job which is Artistic .

Examples of jobs which are Artistic include : artist , singer , musican, actor , cartoonist, poet , novelist , sculptor/ sculptress, playwright, composer, or writer.

Answer Profile Sheet Form A

Test Site: 5 Date: _____

Age: _____Male or Female _____

Reading: Above or Below 4th Grade

Page 1: **A___S___I___C__E___R___**

Page 2: **A___S___I___C__E___R___**

Page 3: A___S___I___C__E___R___

Page 4: A___S___I___C__E___R___

Page 5: A___S___I___C__E___R___

Page 6: A___S___I___C__E___R___

Totals: **A___S___I___C__E___R___**

Code:

Stated Career Goals:

NUMBERS 11-20

11. I A E

12. S C R

13. A E S

14. C I R

15. E S C

16. R I A

17. S C R

18. A I E

19. C R I

20. E S A

Total: A_ S_ I_ C_ E_ R_

NUMBERS 21-30

21. R I A

22. S C E

23. A E I

24. S R C

25. S A E

26. C I R

27. E S C

28. R I A

29. S C R

30. I A E

Total: A___S ___I ___ C___ E___R ___

Numbers 31-40

31. C R I

32. A E S

33. R I A

34. E S C

35. E S A

36. C R I

37. S C E

38. R I A

39. S C R

40. I A E

Total: A___S ___I ___ C___ E___R ___

Numbers 41- 50

41. C R I

42. A E S

43. R I A

44. E S C

45. A E I

46. R C S

47. A E S

48. R C I

49. E S C

50. R I A

Total: A___S ___I ___ C___ E___R ___

Numbers 51-60

51. S R C

52. E A I

53. C R I

54. A E S

55. R I A

56. E S C

57. E I A

58. S C R

59. E A S

60. C R I

Total: A_ S_ I_ C_ E_ R_

Form A **Page 1**

S-1

S-2

NUMBERS 1-10

1. E A S

2. C R I

3. E S C

4. R I A

5. S C R

6. E I A

7. I C R

8. E A S

9. R I A

10. E C S

Total: A_ S_ I_ C_ E_ R_

Instruction Sheet

Please read all the information in ***bold italics*** to the consumers**.**

Each page of this booklet has a group of three different job tasks. The purpose of this booklet is to help you decide what type of job task or job you might like to do. There are no right or wrong answers.

Open the test booklet. Point to the pictures while you read.

A: These pictures are examples of Artistic Occupations. Drawing pictures, playing the piano, and/or arranging flowers. Choose the picture with the letter A under it if you would like to do an Artistic job. Examples of which are Artistic jobs include: artist, singer, musician, actor and/or writer.

R: This is an example of Realistic Occupations. Cutting meat, cooking and driving. Choose the picture with the letter R under it if you would like to do a Realistic job. Realistic jobs are "hands on" labor jobs. Examples of Realistic jobs include: mechanic, firefighter, truck driver, construction worker and cook.

I: This is an example of Investigative Occupations. Studying about the body, using a microscope and /or knowing about medicines. Choose the picture with the letter with the "I" under it if you would like to do an Investigative job. Investigative jobs require problem solving skills. Examples of Investigative jobs include: biologist, lab worker, pharmacist and investigator.

C: This is an example of Conventional Occupations. Sorting mail, adding numbers and / or clerical task. Choose the picture with the letter "C" under it if you would like to do a Conventional job. Examples of Conventional jobs include: bookkeeper, payroll clerk, and bank teller.

E: This is an example of Enterprising Occupations: Selling phones, selling houses and/or selling cars. Choose the picture with the letter "E" under it if you would like to do a sales type job. Examples of Enterprising jobs include: real estate sales person and or clothing sales person.

S: This is an example of Social Occupations: Teaching, counseling and /or nursing. Choose the picture with the letter "S" under it if you would like to do a job which is

teaching or helping others. Examples of Social jobs include: social worker, teacher, nurse and/or counselor.

Turn the page

Three job task are on each of the following pages. Under each picture is a different letter. Look at the picture and circle the letter on the answer sheet that matches the picture of the picture you like best. You must choose one and only one.

Let's practice: (Turn to page S-1 in the answer booklet and in the test)

On page S1: There are three pictures:

One is a picture of an A Job

One is a picture of an I Job

One is a picture of a C Job.

Which one do you like the best? Circle the answer sheet that matches the one you would like to do. You must make a choice. If you really do not like any choose the one that you dislike the least.

Let's practice (Turn to page S-11 in the answer booklet and in the test)

On page S 11: There are three pictures:

One is a picture of an E Job

One is a picture of an S Job

One is a picture of an A Job.

Which one do you like the best? Circle the letter on your answer sheet that matches the one you would like to do. You must make a choice. If you really do not like any choose the one that you dislike the least.

There are several other pages of job task like these. Be sure to mark an answer for every page.

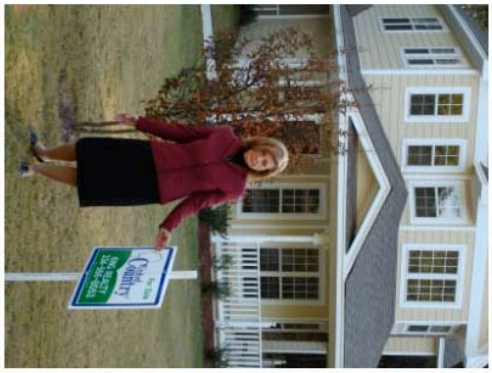
Dear Test Administrator:

Read this note to the participants after getting the consent form signed, but prior to the specific test instructions.

> ***You (or your parents) signed this consent form*** (point to the consent form***) which informed you that "You are invited to participate in a research study regarding a picture interest inventory." "You were selected as a possible participant because you are participating in a program to help you decide what type jobs you may like." "I want to be sure you understand that these test results will not be used to make recommendation about you. It is just to help the test developer, Bonnie Cannon, who is a student at Auburn University." "Your participation is voluntary." "Would you still like to participate?"***

Now read the CPII test instructions.

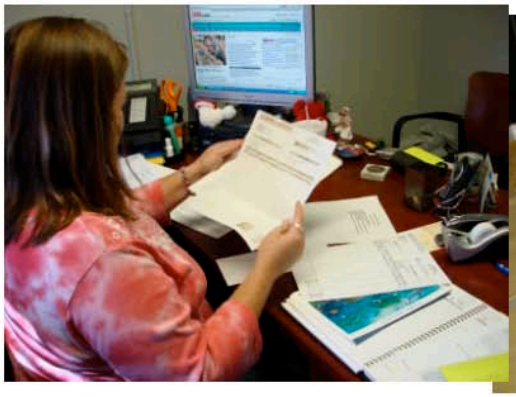
A



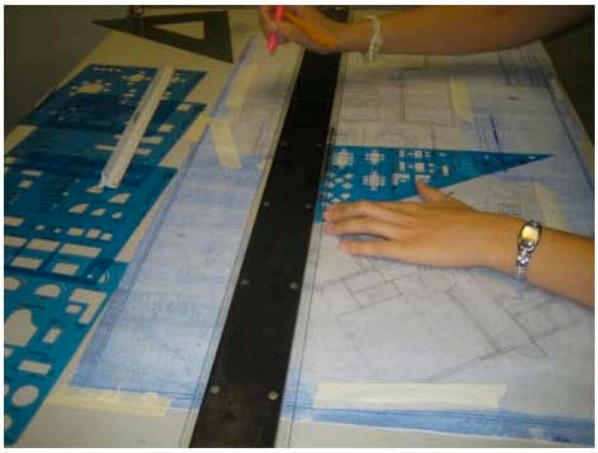
E

S

1

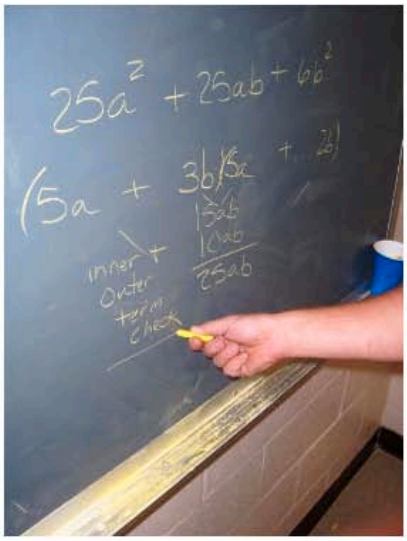


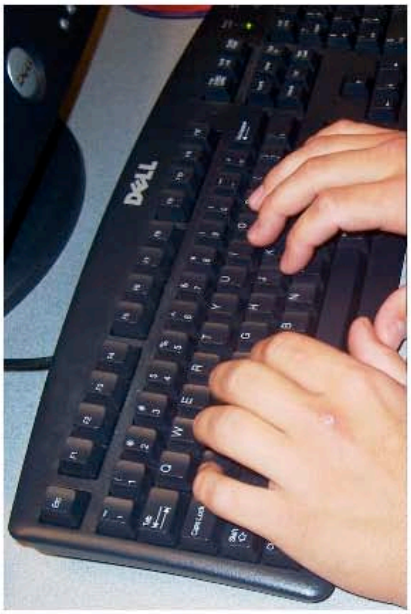
C



I

2


25a² + 25ab + 6b²
(5a + 3b)(5a + 2b)
inner +
outer
term
check
15ab
10ab
25ab


DELL

3

APPENDIX B

WORD INSTRUCTIONS, ANSWER SHEETS, AND PICTURE EXAMPLES

Realistic Occupations -R

R
Cutting Meat

R
Cooking

R
Driving

Choose a the picture wih the "R" under it if you would like to do a Realistic job .

Realistic jobs are jobs which are "hands on " labor jobs. Some examples of Realstic jobs include: mechanic, firefighter, truck driver, construction worker and cook .

Answer Profile Sheet Form B

Test Site: 5 Date: _____

Age: _____Male or Female _____

Reading: Above or Below 4th Grade

Page 1: **A___S__I ___C__E__R___**

Page 2: **A___S__I ___C__E__R___**

Page 3: A___S__I ___C__E__R___

Page 4: A___S__I ___C__E__R___

Page 5:A___S__I ___C__E__R___

Page 6: A___S__I ___C__E__R____

Totals: **A___S__I ___C__E__R___**

Code:

Stated Career Goals:

NUMBERS 1-10 **Page 1**

1. E A S

2. C R I

3. E S C

4. R I A

5. S C R

6. E I A

7. I C R

8. E A S

9. R I A

10. E C S

Total: A_ S_ I_ C_ E_ R_

11. I A E

12. S C R

13. A E S

14. C I R

15. E S C

16. R I A

17. I C R

18. A E C

19. C R I

20. E S R

Total: A_ S_ I_ C_ E_ R_

21. E I A

22. S C I

23. A E S

24. C R A

25. E S C

26. E I R

27. S C R

28. I S A

29. S C R

30. I A E

Total: A___S ___I ___ C___ E___R ___

31. C R I

32. A E R

33. R I A

34. A S E

35. E S C

36. E I R

37. S C R

38. S I A

39. I C R

40. E A C

Total: A___S ___I ___ C___ E___R ___

41. A R I

42. E S R

43. I E A

44. S C I

45. A E S

46. R C A

47. E S C

48. R E I

49. S C R

50. I A S

Total: A___S ___I ___ C___ E___R ___

51. C R I

52. E A C

53. I R A

54. E S R

55. A E I

56. S I C

57. A E S

58. C R A

59. C S E

60. R I A

Total: A_ S_ I_ C_ E_ R_

Instruction Sheet

Please read all the information in ***bold italics*** to the consumers**.**

Each page of this booklet has a group of three different job tasks. The purpose of this booklet is to help you decide what type of job task or job you might like to do. There are no right or wrong answers.

Open the test booklet. Point to the pictures while you read.

A: These pictures are examples of Artistic Occupations. Drawing pictures, playing the piano, and/or arranging flowers. Choose the picture with the letter A under it if you would like to do an Artistic job. Examples of which are Artistic jobs include: artist, singer, musician, actor and/or writer.

R: This is an example of Realistic Occupations. Cutting meat, cooking and driving. Choose the picture with the letter R under it if you would like to do a Realistic job. Realistic jobs are "hands on" labor jobs. Examples of Realistic jobs include: mechanic, firefighter, truck driver, construction worker and cook.

I: This is an example of Investigative Occupations. Studying about the body, using a microscope and /or knowing about medicines. Choose the picture with the letter with the "I" under it if you would like to do an Investigative job. Investigative jobs require problem solving skills. Examples of Investigative jobs include: biologist, lab worker, pharmacist and investigator.

C: This is an example of Conventional Occupations. Sorting mail, adding numbers and / or clerical task. Choose the picture with the letter "C" under it if you would like to do a Conventional job. Examples of Conventional jobs include: bookkeeper, payroll clerk, and bank teller.

E: This is an example of Enterprising Occupations: Selling phones, selling houses and/or selling cars. Choose the picture with the letter "E" under it if you would like to do a sales type job. Examples of Enterprising jobs include: real estate sales person and or clothing sales person.

S: This is an example of Social Occupations: Teaching, counseling and /or nursing. Choose the picture with the letter "S" under it if you would like to do a job which is

teaching or helping others. Examples of Social jobs include: social worker, teacher, nurse and/or counselor.

Turn the page

Three job task are on each of the following pages. Under each picture is a different letter. Look at the picture and circle the letter on the answer sheet that matches the picture of the picture you like best. You must choose one and only one.

Let's practice: (Turn to page S-1 in the answer booklet and in the test)

On page S1: There are three pictures:

One is a picture of an A Job

One is a picture of an I Job

One is a picture of a C Job.

Which one do you like the best? Circle the answer sheet that matches the one you would like to do. You must make a choice. If you really do not like any choose the one that you dislike the least.

Let's practice (Turn to page S-11 in the answer booklet and in the test)

On page S 11: There are three pictures:

One is a picture of an E Job

One is a picture of an S Job

One is a picture of an A Job.

Which one do you like the best? Circle the letter on your answer sheet that matches the one you would like to do. You must make a choice. If you really do not like any choose the one that you dislike the least.

There are several other pages of job task like these. Be sure to mark an answer for every page.

Dear Test Administrator:

Read this note to the participants after getting the consent form signed, but prior to the specific test instructions.

> ***You (or your parents) signed this consent form*** (point to the consent form***) which informed you that "You are invited to participate in a research study regarding a picture interest inventory." "You were selected as a possible participant because you are participating in a program to help you decide what type jobs you may like." "I want to be sure you understand that these test results will not be used to make recommendation about you. It is just to help the test developer, Bonnie Cannon, who is a student at Auburn University." "Your participation is voluntary." "Would you still like to participate?"***

Now read the CPII test instructions.

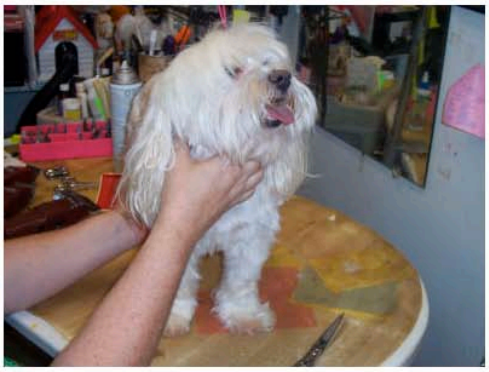
A

E

S

1

C

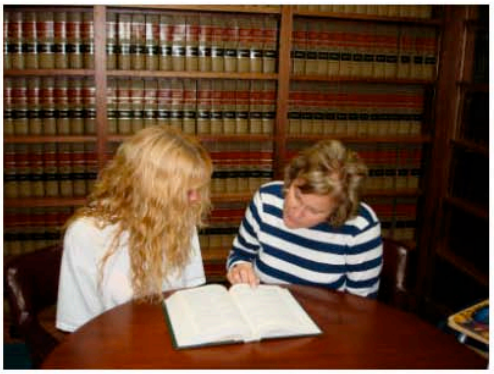


R

I

2

E



S

C

3

APPENDIX C

LETTERS OF CONSENT

AUBURN
UNIVERSITY

COLLEGE OF EDUCATION
REHABILITATION AND SPECIAL EDUCATION

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

Adult Consent (Reading Participants)
Research Study of the Validity and Reliability of the Cannon Picture Interest Inventory

You are invited to participate in a research study to help validate a prototype of a picture vocational interest inventory: The Cannon Picture Interest Inventory. Bonnie Cannon is conducting this research study, under the direction of Dr. Randall McDaniel in the Auburn University Department of Rehabilitation and Special Education. You were selected as a possible participant because you are a part of the rehabilitation program. This is not a required part of your rehabilitation program. You will be asked to complete one form of the Cannon Picture Interest Inventory, which is under development, and another interest inventory, The Self-Directed Search.

The Cannon Picture Interest Inventory is in a binder and contains pictures of individuals performing various tasks. On each page you will select the one picture that represents work that would be of the most interest to you. This inventory is in the initial stage of development. The results of the inventory will not affect your vocational placement or educational goals. We must have your permission to include you in the study.

The only likely risk that you may experience is normal mild test anxiety such as is experienced by anyone placed in a testing situation. If you decide to participate in this research study, you will be asked to look at an interest test booklet and select pictures of jobs which you would like to perform. You will also be asked to complete the Self-Directed Search, an interest inventory that asks you about tasks you may like to perform. Your total time commitment will be approximately 30-45 minutes, depending on how quickly you work.

If you participate in this study you will see pictures of jobs that you might like to learn to do. However, we cannot promise you that you will receive any benefit from your participation. There is no monetary compensation to you, nor is there any cost to you if you decide to participate.

Participant's initials____

1228 HALEY CENTER
AUBURN, AL 36849-5226

TELEPHONE:
334-844-5943

FAX:
334-844-2080

www.auburn.edu

You can change your mind about participating and withdraw at any time before or during the study. Participation is completely voluntary. If you decide not to participate or choose to withdraw, all your data can be withdrawn as long as it is identifiable. The decision about whether or not to participate or to stop participating will not jeopardize your future relationship with your rehabilitation program with Alabama or Florida Department of Vocational Rehabilitation Services or Auburn University.

Your privacy will be protected. Any information obtained in connection with this study will remain anonymous. Information obtained through your participation may be used to fulfill an educational requirement, and may also be published in a professional journal, as well as be presented at professional meetings. A copy of this document is being provided for you to keep.

If you have questions about your rights, you may ask them now or contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WILL PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE. THANK YOU FOR YOUR ASSISTANCE WITH THIS RESEARCH.

Participant's signature Date	Investigator obtaining consent Date
Printed Name	Printed Name

AUBURN
UNIVERSITY

COLLEGE OF EDUCATION
REHABILITATION AND SPECIAL EDUCATION

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

Informed Consent Letter Non –Reading Adults
Validity and Reliability Study for the Cannon Picture Interest Inventory

You are invited to participate in a research study of a prototype picture interest inventory, The Cannon Picture Interest Inventory. The study is being conducted by Bonnie Cannon, doctoral student, under the direction of Dr. Randall Mc Daniel, Professor, in the Auburn University Department of Rehabilitation and Special Education. You were selected as a possible participant because you are participating in a program to help you decide what type jobs you like. This is not part of your rehabilitation program.

If you decide to participate in this research study, you will be asked to look at two books of pictures and select the pictures you like by marking on an answer sheet. It should take you about 35-40 minutes.

You may feel a little anxious as you would when taking any other test. There is no cost for taking the picture interest inventory.

If you take the Cannon Picture Interest Inventory you will see job tasks that you may like to perform. We cannot promise you that you will receive any benefits. You will not be paid for your participation

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with your rehabilitation programs with the Alabama or Florida Department of Rehabilitation or Auburn University.

1228 HALEY CENTER
AUBURN, AL 36849-5226

TELEPHONE:
334-844-5943

FAX:
334-844-2080

www.auburn.edu

Participant's initials _____

Your privacy will be protected. Any information obtained in connection with th study will remain anonymous. Information obtained through your participation may be used to fulfill an educational requirement, published in a professional journal, presented at a professional meeting.

If you have questions about this study, please ask them now or contact Bonnie Cannon at 334-332-3005 or Dr. Randall McDaniel at 334-844-5943. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contac the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING HAD THE CONSENT LETTER READ TO YOU, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date	Investigator obtaining consent Date
Printed Name	Printed Name
	Co-Investigator Date
	Printed Name

The Auburn University
Institutional Review Board
has approved this document for use
from 1/29/08 to 1/28/09.
Protocol # 07-149 EP 0801

AUBURN
UNIVERSITY

COLLEGE OF EDUCATION
REHABILITATION AND SPECIAL EDUCATION

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AUBURN, AL 36849-5226

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NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

PARENTAL PERMISSION/CHILD CONSENT

Research Study of the Validity and Reliability of the Cannon Picture Interest Inventory

Your child is invited to participate in a research study to help validate a prototype of a picture vocational interest inventory: The Cannon Picture Interest Inventory. Bonnie Cannon is conducting this research study, under the direction of Dr. Randall McDaniel in the Auburn University Department of Rehabilitation and Special Education. Your child was selected as a possible participant because he or she is part of the rehabilitation transition program at his/her school. As a part of this program your child will be taking vocational interest inventories about the kind of jobs he/she likes similar to this test that is under development. Specifically, this study will ask your child to complete two forms of the Cannon Picture Interest Inventory, Form A and Form B. This picture interest inventory is in a binder and contains pictures of individuals performing various tasks. On each page your child will select the one picture that represents work that would be of the most interest to them. This inventory is in the initial stage of development. The results of the inventory will not affect your child's vocational placement or educational goals. Since your child is age 18 or younger we must have your permission to include him/her in the study.

The only risk to your child that we can imagine is that s/he may experience normal mild test anxiety such as is experienced by anyone placed in a testing situation. If you decide to allow your child to participate in this research study, your child will be asked to look at a two interest test booklets and select pictures of jobs which he/she might like to perform. Your child's total time commitment will be approximately 30-45 minutes, depending on how quickly he/she works.

If your child participates in this study, he/she can expect to see pictures of jobs he/she might like to learn to do however we cannot promise you that your child will receive any benefits form his/her participation. There is no monetary compensation to your or your child but there is also no cost to you if your child decides to participate.

Your child can change his/her mind about participating and withdraw at any time before or during the study. Participation is completely voluntary. If a participant chooses to withdraw, his/her data can be withdrawn as long as it is

Parent/Guardian Initials_____

identifiable. The decision about whether or not to participate or to stop participating will not jeopardize the child's future relationship with his/her school program or his/her rehabilitation program with Alabama Department of Vocational Rehabilitation Services or Auburn University.

Your child's privacy will be protected. Any information obtained in connection with this study will remain anonymous. Information obtained through your participation may be used to fulfill an educational requirement, and may also be published in a professional journal, as well as be presented at professional meetings. A copy of this document is being provided for you to keep.

If you or your child have questions about your child's rights, ask them now or you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WILL ALLOW YOUR CHILD TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO ALLOW YOUR CHILD TO PARTICIPATE. YOUR CHILD'S SIGNATURE INDICATES HIS/HER WILLINGNESS TO PARTICIPATE. THANK YOU FOR YOUR ASSISTANCE WITH THIS RESEARCH.

_____ _____

Participant's signature Date Investigator obtaining consent Date

_____ _____

Printed Name Printed Name

_____

Parent/Guardian Signature Date

_____

Printed Name

The Auburn University
Institutional Review Board
has approved this document for use
from 1/29/08 to 1/28/09.
Protocol # 07-149 EP 0801