Using Interest Inventory Profile Elevation to Predict Depression and Anxiety in Individuals with Disabilities Resulting from a Personal Injury

Cassandra P. (Cassandra Patrice) Smisson
FLORIDA STATE UNIVERSITY
COLLEGE OF EDUCATION

USING INTEREST INVENTORY PROFILE ELEVATION TO PREDICT
DEPRESSION AND ANXIETY IN INDIVIDUALS WITH DISABILITIES
RESULTING FROM A PERSONAL INJURY

BY
CASSANDRA P. SMISSON

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The members of the committee approve the dissertation of Cassandra P. Smisson defended on June 17, 2009.

_________________________________
James P. Sampson, Jr.
Professor Directing Dissertation

_________________________________
John Reynolds
Outside Committee Member

_________________________________
Gary W. Peterson
Committee Member

_________________________________
Robert C. Reardon
Committee Member

Approved:

Akihito Kamata, Chair, Department of Educational Psychology and Learning Systems

The Graduate School has verified and approved the above-named committee members.
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The present study was designed to address gaps in the literature, extend previous research, and increase current knowledge about interest inventory profile elevation as a construct. More specifically, the study investigated relationships between interest inventory profile elevation and depression, trait anxiety, and state anxiety. Age and cognitive impairment were also examined in these relationships. The sample consisted of 135 clients who sought services at a private psychological practice in central Florida during 2007 and 2008. The Self-Directed Search (SDS) was used to measure interest inventory profile elevation. The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) was used to measure depression (2-Scale), trait anxiety (7-Scale), and state anxiety (A-Scale). Trait anxiety was investigated with and without $K$ correction. A client intake form was also used to collect personal and demographic information. There were two research questions posed in the present study: 1) What are the relationships between interest inventory profile elevation and depression, trait anxiety (with and without $K$ correction), and state anxiety for individuals who have become disabled resulting from a personal injury? and 2) Do age and cognitive impairment influence the relationships among interest inventory profile elevation and depression, trait anxiety (with and without $K$ correction), and state anxiety for individuals who have become disabled resulting from a personal injury?

Pearson Product moment coefficients found no relationships between profile elevation and depression, trait anxiety (with and without $K$ correction), and state anxiety. A canonical correlation and hierarchical regression analyses found that profile elevation was not found to be related to the aforementioned variables by itself or in concert with other variables. These findings were not consistent with previous research, which found that interest profile elevation is moderately related to depressive personality traits. Results of the present study, however, found that cognitive impairment was the only variable that was found to be significantly associated with depression, trait anxiety with $K$, trait anxiety without $K$, and state anxiety.

Limitations, implications for counseling, and recommendations for future research were presented. Several ideas for how the findings from the present study can be used in practice were also included. The suggestions for future research would add to the state of the science in this area of counseling psychology.
CHAPTER I
INTRODUCTION

The purpose of this chapter is to introduce the reader to the present study, “Using Interest Inventory Profile Elevation to Predict Depression and Anxiety in Individuals with Disabilities Resulting from a Personal Injury.” The chapter includes a statement of the problem, research questions to be examined, and the social significance of the study.

Statement of the Problem

The relationship between interest inventory profile elevation and depression is unclear, although preliminary evidence does suggest a moderate relationship between low profile elevation and depressive personality traits (Fuller, Holland, & Johnston, 1999). There is also evidence in the literature suggesting relationships among depression, anxiety, and age. Current literature suggests, however, that initial age effects are mostly due to functional impairment and health problems and that there are no significant age effects on depression when age is controlled, meaning that as people get older, health problems and impairment in function may be misconstrued as depression. Finally, there is a great deal of literature discussing the certain types of injury and their relationships with depression and anxiety.

When reviewing the extant literature on disabilities, depression, anxiety, and profile elevation, there are definite gaps that need to be addressed. First, although there was preliminary evidence of a relationship between profile elevation and depressive personality traits, there was very little on profile elevation and depression as a clinical syndrome. While interest inventory profile elevation has been explored with measures using the Five Factor Model of Personality (Costa & McCrae, 1980), studies that utilize the MMPI-2 to examine profile elevation with depression and anxiety were not found in the literature. Next, seeing that depression and anxiety are commonly comorbid disorders, there is a gap in the literature pertaining to the relationship between anxiety and profile elevation. Additionally, no literature was found that addressed the relationship between profile elevation and depression and anxiety in individuals with disabilities. There was also no literature found on profile elevation and its relationship to either age or cognitive impairment. It is important to note, however, that interest inventory profile elevation is a relatively new construct in the vocational literature.
Many studies have examined certain types of injury in relation to depression and anxiety (e.g., traumatic brain injury, spinal cord injury), but there are significantly fewer studies that examine cognitive impairment as a variable that may mediate depression and anxiety. Finally, although there is a great deal of literature on depression, anxiety, and disabilities, as well as depression, anxiety, and age, there is a definite gap in the literature pertaining to the relationship between disabilities and age in relation to depression or anxiety.

Being able to correlate interest inventory profile elevation with depression and anxiety may provide important information about a client’s willingness and ability to participate in the career decision-making process, as well as the willingness to consider career alternatives, engage in reality testing, and engage in individual counseling services. Therefore, the research questions for the present study originate from the literature pertaining to the increased likelihood that individuals with disabilities may suffer from depression and anxiety, as well as the paucity of existing literature on the relationship between interest inventory profile elevation and depression and anxiety.

Research Questions

The following research questions were identified to address the content and conceptual gaps in the literature:

1. What are the relationships between interest inventory profile elevation and depression and anxiety for individuals who have become disabled resulting from a personal injury?
2. Do age and cognitive impairment influence the relationships among interest inventory profile elevation, depression, and anxiety for individuals who have become disabled resulting from a personal injury?

Social Significance

The repercussions of depression and anxiety reach much farther than the individual experiencing them. Over 30 million Americans have a lifetime history of anxiety (Regier, Boyd, Burke, Rae et al., 1988). Furthermore, anxiety disorders cost an estimated $42 billion dollars per year in the United States alone, including direct and indirect costs (Greenberg, Sisitsky, Kessler, Finkelstein et al., 1999). Depression’s annual toll on U.S. businesses amounts to about $70 billion in medical expenditures, lost productivity and other costs. Depression also accounts for about $17 billion in lost workdays each year (as cited in Lasker Medical Research Network). More than $11 billion in other costs accrue from decreased productivity due to symptoms that
Impact energy, affect work habits, and cause problems with concentration, memory, and decision-making (Pignone, Gaynes, Rushton, Burchell et al., 2002). Approximately 30,000 people in the United States and more than half a million people worldwide die by suicide each year (Joiner, 2005). Almost 95 percent of people who die by suicide experienced a mental disorder at the time of death, including depressive and anxiety disorders (Joiner, 2005).

Beck (1972) defined depression as the “cognitive triad” and posited that cognitions play a significant role in how an individual emotionally and behaviorally responds to events. An individual who is depressed may have a distorted schema about the self, the world, and the future, and this distorted schema with persistent negative thoughts may lead to passivity, anhedonia, and hopelessness. An individual who is depressed may have difficulty concentrating and making decisions (APA, 2000), which are crucial tasks for effective problem solving and decision-making. This suppressed ability to make decisions and problem-solve has direct implications for career decision-making (Saunders, Peterson, Sampson, & Reardon, 2000). In fact, cognitions and self-talk, which is the silent conversation individuals have with themselves about how well they are completing a given task (Sampson, Reardon, Peterson, & Lenz, 2004), helps individuals make career choices by helping to keep them motivated to engage in various career problem-solving and decision-making tasks when self-talk is positive. When self-talk is negative, however, it inhibits the process of career problem solving and decision making (Sampson et al., 2004).

Research has shown that individuals with disabilities may be at greater risk for mood and anxiety disorders (Bruce, Seeman, Merrill, & Blazer, 1994). Some of these individuals may seek career counseling as a means of reaching out for psychological help. In order for career counseling professionals to better identify those individuals who are in need of more intensive mental health counseling services, learning more about the relationship between interest inventory profile elevation and depression and anxiety in this population is important so that appropriate referrals can be made for those in need.

Because the construct of interest inventory profile elevation is still a relatively new construct in the literature, it is important to not only contribute to the literature in this area but also to contribute to the validation of profile elevation as a construct. Convergent validity could be established if the relationship between interest inventory profile elevation and depression is
significant. Additionally, correlating profile elevation with depression and anxiety could assist in contributing to the knowledge of its concurrent validity.
CHAPTER II
REVIEW OF THE LITERATURE

In this chapter, the five main topics of the present study will be discussed. The chapter will begin with a review of the literature on the Self-Directed Search, which includes a discussion of interests as measures of personality, Holland’s typological theory of vocational personalities, and interest inventory profile elevation. Next, the literature pertaining to individuals with disabilities will be reviewed, including an examination of the literature on depression and anxiety specific to this important population. Next, the literature on depression and anxiety will be reviewed, including symptoms, risk factors, and demographic differences by age. Finally, the literature on the Minnesota Multiphasic Personality Inventory will be reviewed. The chapter will close with a critique of the literature and relevant research questions that, if investigated, may help to close gaps in the literature.

Vocational Interests and Career Decision

Nature of career decisions

There are three types of career decisions that an individual can make: occupational, education- and training-related, and employment-related (Sampson et al., 2004). Occupational decisions involve choosing one occupation or a group of occupations for making future decisions about education, training, and employment. Educational and training decisions involve choosing a college major, program of study, or specific training opportunity that will facilitate an individual to acquire the knowledge, skills, and credentials necessary to obtain or uphold employment in a particular field. Employment decisions involve choosing and applying for an explicit position with an organization in an industry within a sector of the economy. Each of these types of career decisions is not mutually exclusive, although employment decisions are usually the end result of the career decision-making process.

Vocational Interests in Career Decision Making

Major theorists have provided varying opinions about the birth of the concept of vocational interest. Hansen (1984) posited that these hypotheses for the conceptual beginnings of vocational interests included environmental and social influences, genetics, personality traits, motives, drives, needs, and expressions of self-concept. Holland (1997) suggested that interest
preference results from biological inheritance, the parent-child relationship, and environmental interactions. There is yet to be universal agreement on the origins of vocational interests (Betsworth & Fouad, 1997).

Interests are defined as activities a person does for fun or enjoys (Reardon, Lenz, Sampson, & Peterson, 2006) and are an important part of career decision making. Psychologists discovered that people working in similar occupations tended to have similar patterns of interests. Interests are viewed as a determining factor in career selection and consequent satisfaction (Holland, 1997). Interest inventories and tests were created as a method of assessing interests and matching individuals with occupations that are consistent with their interests. Vocational assessment, which usually includes an assessment of interests, enhances client understanding, promotes self-exploration, and assists realistic decision making (Hackett & Lonborg, 1994; Hood & Johnson, 1991).

Vocational interests have been examined in relation to self-efficacy, which are beliefs concerning one’s ability to successfully perform a given task or behavior (Bandura, 1997). Previous research has found that self-efficacy increases interest and performance (Lent, Brown, & Hackett, 1994). Conversely, low self-efficacy expectations regarding a behavior lead to avoidance of those behaviors, poorer performance, and a tendency to resign at the first sign of difficulty. This is especially important in career decision making because low self-efficacy, leading to avoidance, would likely cause an individual to eliminate options in that area. Additionally, low self-efficacy may limit initial interest in an area by causing an individual to avoid the kinds of new experiences and educational opportunities that could encourage the development of new interests. Lent, Brown, and Hackett (1994) conducted a meta-analysis of studies that examined interests and self-efficacy and their relationships to career choice. Interests had a .60 correlation with career choice, whereas self-efficacy had a .40 correlation with career choice. This led the authors to conclude that both interests and self-efficacy are indeed important to career choice.

Vocational Interests and Personality

Relationships between vocational interests and personality have been studied for quite some time. Historically, studies in this area have examined differences in personality test scores between individuals interested in a particular vocation with those who did not report interest in a particular area (Harris, Vernon, Johnson, & Jang, 2006). For example, Berdie (1943) found that
men interested in skilled trades and engineering occupations were more masculine and less socially adjusted than men not interested in those fields. Another example includes Darley’s study (1938) which found that students who had interests in business had greater social abilities. Darley also reported that students interested in technical fields had lower morale, adjustment, and social scores. More recently, in a review of the relationship between vocational interests and personality, Tokar, Fischer, and Subich (1998) reported that extraversion was consistently related to enterprising and social vocational interests, openness was moderately related to artistic and investigative interests, conscientiousness was related to conventional interests, and agreeableness was related to social interests. Neuroticism was not, however, found to consistently correlate with vocational interests. A meta-analysis conducted by Larson, Rottinghaus, and Borgen (2002) found that openness was linked to artistic and investigative interests, while extraversion was related to enterprising and social interests. Realistic interests were not found to be related personality traits, and neuroticism was not found to be linked to vocational interests.

To further support the suggestion that vocational interests are a component of personality, Harris, Vernon, Johnson, and Jang (2006) examined the phenotypic correlations between vocational interests and personality to explore whether the relationship might be attributed to common genetic factors. A sample of 516 twins and siblings completed self-report vocational interest and personality scales, and factor analyses of each scale resulted in correlations between personality and vocational interests ranging from zero to .33. Heritability estimates of the scales showed that genetic components accounted for 0-56% of the variance for vocational interests and 44-65% for personality. Genetic correlations between the two areas ranged from zero to .50. Results of the study suggested that personality is related to some vocational interest dimensions and that some of the relationships have a common genetic origin.

Self-Directed Search

Holland’s Typological Theory of Vocational Personalities

In order to appreciate and use the Self-Directed Search (SDS; Holland, 1994), it is essential to understand John Holland’s typological theory of vocational personalities, more commonly referred to as RIASEC theory. Holland’s RIASEC theory (1997) describes the link between personality, work, and identity. In fact, Holland argued that vocational interest is an expression of personality. The theory states that individuals can be classified as one of six personality types, and there are six work environments that correspond with each of the six
personality types. Essentially, individuals seek work environments that are consistent with their personality. The individual is viewed as a fairly stable entity that moves in and out of the environments when the perceived fit is no longer ideal. There are seven assumptions that underlie the theory (Holland, Fritzsche, & Powell, 1994), which are as follows, with the first four being considered as key assumptions (Holland, 1997):

1. Most people can be classified into one of six personality types: Realistic, Investigative, Artistic, Social, Enterprising, or Conventional (RIASEC).

2. There are six model environments that are classified with the same labels as the six personality types. An environment may be a job, a leisure activity, a major in college, or any other facet of life in which an individual does work. Individuals with the same personality type make up the majority of those comprising these environments. For instance, a Realistic environment is most likely to consist of Realistic personalities.

3. People seek environments that will enable them to utilize their skills, express their attitudes and values, and take on agreeable roles and problems. In essence, people seek environments that complement their personalities.

4. An individual’s behavior is determined by the interplay between his or her personality and the environment.

5. Congruence, or agreement, between an individual and an occupation, or environment, can be represented by a hexagonal model.

6. Consistency within an individual or an environment can also be represented by a hexagonal model.

7. Differentiation of an individual or an environment can alter predictions made from his or her SDS profile, occupational code, or the interaction from both.

Holland's theory states that most people can be loosely categorized with respect to the six personality types. These types are determined by vocational and non-vocational preferences, life goals and values, self-beliefs, and problem-solving style (as cited in Bullock, 2006). The theory can be conceptualized on a hexagon, with each of the six personality types/environments strategically placed on a vertex of the hexagon. The placement of the six types on the hexagon represents a relationship among the types, which will be discussed in more detail when discussing the secondary constructs.
The SDS is a self-administered, self-scored, and self-interpreted instrument used in career counseling that assists in operationalizing Holland’s RIASEC theory (Holland et al., 1994). When an individual is administered the SDS, results provide a three-letter code that represents the individual’s personality in order of most pervasive (first letter) to the third most pervasive (third letter). This code represents the three RIASEC areas that best describe the individual’s personality. The first letter in the code represents the personality type that is most dominant for that individual, with the second and third letters of the code representing the personality types that the individual most closely resembles after the most dominant type. For example, if an individual produced the code AES, he would have personality traits most consistent with the Artistic area, followed by the Enterprising area and the Social area. This does not mean that he does not resemble the other three personality types (e.g., Realistic, Investigative, Conventional) at all, but rather that he most closely resembles the A, E, and S personalities.

On the SDS, individuals rate their activities, competencies, preferences, occupations, and self-estimates in relation to the RIASEC areas. Examinees also provide their occupational aspirations, which are referred to as occupational daydreams on the test, in order from most recent to least recent. Aspirations are based on the three-letter code of the first five aspirations provided. Gottfredson (2002) discussed the notion that an SDS assessment provides information about other aspects of vocational personality besides interests, including self-beliefs and aspirations. He stated that self-beliefs and interests lead to preferences and aversions for different activities as products of learning experiences. He also stated that aspirations often resemble goals that may inspire specific plans, organize one’s choices, and lead to additional learning. Gottfredson further suggested that self-estimates and self-ratings on the SDS may be interpreted as type-specific self-efficacy expectations, which is compatible with concepts derived from social-cognitive and goal theory, and that vocational aspirations may often resemble goals.

Holland and Gottfredson (1976) explained the strengths of the theory. First, the typology is easy to understand. Second, it has many essentials of a useful theory, including clearly defined concepts, internal consistency, broad scope, and clarifications for dealing with both personal development and change. Next, it is well-supported by research, which used large samples with varying demographics. Finally, the typology is easily applied to practical problems.

Although Holland’s typology is one of the most widely utilized concepts in career guidance, it is not without limitations, as noted by Holland et al. (1994). First, the hypotheses
about career environments should be more thoroughly explored, along with hypotheses about the interaction between the individual and the environment and the ideas about personal development. Second, it has been noted that the classification of occupations may differ for the varying mediums used to assess the types. Finally, Holland et al. (1994) suggested that several important personal and environmental circumstances fall beyond the scope of the typology, and researchers and practitioners should account for this. An example is the distribution of power, influence, and status within an individual’s social environment. Zunker (1994) stated that Holland’s theory and its corresponding instruments do not provide strategies to enhance deficits in self and occupational knowledge. Osipow and Fitzgerald (1996) suggested that RIASEC theory accounts for vocational behavior in a logical and straightforward way but gives no explanation as to why people develop into certain types. Brown (2002) also expressed concerns about perceptions of the SDS lacking cultural sensitivity.

There have also been concerns about the use of raw scores in calculating an individual’s three-letter code on the SDS (Daniels, 1994). There have been suggestions that the use of norm-referenced scores could assist in creating interpretations that are more gender and age-friendly. However, Holland et al. (1994) argued for using raw scores. They stated that a fair inventory uses one form for both genders and persisted that experimental studies have shown that the SDS works equally well for both men and women.

**Development of the SDS**

The SDS and its corresponding scales were developed as a means of assessing an individual’s similarity to each RIASEC personality type (Holland et al., 1994). The SDS contains scales or ratings of activities, competencies, self-concepts, and vocational preferences for each type. Holland’s theory implies other kinds of scales, such as values, personality traits, perceptions of the world, and sensitivity to environmental influences. However, the SDS does not directly measure these constructs in its scales because they are more difficult to develop or appear to have less predictive validity. Some of the SDS scales do overlap with these areas or are related to values and personality traits to some degree (Holland, 1997).

The Vocational Daydreams section of the SDS originated when Holland began to test the predictive validity of an individual’s self-reported vocational aspirations. He found that these expressed aspirations predicted the category of the subsequent occupation more efficiently than other well-known interest inventories at the time (Holland et al., 1994). The inclusion of the
Daydreams section has been useful for several reasons: a) coding an individual’s aspirations leads to efficient predictions of future aspirations; b) variability between the code of the current aspiration and the SDS code can be used to enhance self-knowledge; and c) assessing an individual’s expressed aspirations validates the importance of his self-direction and initiative (Holland et al., 1994).

The typology also led to the development of the Occupations Finder, an abbreviated version of the Holland occupational classification, which is used to categorize occupations according to the personality types that they most closely resemble (Holland et al., 1994). It includes six main categories that represent the RIASEC personality types, and each has 20 combinations of the six types, such as Realistic-Investigative-Artistic (RIA), Realistic-Investigative-Social (RIS), etc. By using the combinations of the six types, it is possible to better interpret or predict the behavior and activities of examinees and the influence of environments or occupations assigned to a particular category. For example, an individual with a code of AES should exhibit characteristics of the artistic type most, the enterprising type next, and the social type third.

*Intended use of the SDS*

The SDS was developed to serve two main functions: a) to increase the number of clients a counselor can assist, and b) to provide some type of career counseling for individuals who are unable to access, or who do not wish to access, a career counselor (Holland et al., 1994). Using the SDS enables counselors to increase the number of people whom they can assist by reducing or eliminating the time necessary to administer, score, and interpret an assessment form and reduces the amount of time needed for individual counseling. Therefore, counselors should have more time to spend with individuals who present with more complex career decision-making needs, as well as for program planning and evaluation.

The SDS can be used in individual and group counseling, but it has also been used for many purposes and in many settings for which it was not originally intended. It can be used in secondary schools, high schools, colleges, adult centers, correctional facilities, women’s centers, and various types of employment agencies. In the business world, it can be used in job placement, classification, and staff development. As a research tool, it can also be helpful in the education, business, and social science fields (Holland et al., 1994).
Several forms of the SDS have been developed for use with varying populations. The original and most common form is Form R (Regular), which will be used in the present study. Form R was designed primarily for use with high school students, college students, and adults. Form E (Easy), however, was created for adults and high school students with limited education or reading skills (Holland, 1996). The directions include only fourth-grade words, and scoring is simplified. Rather than a three-letter code, like on Form R, a two-letter code is obtained from scoring Form E. Several studies have been conducted using Form E with individuals who have cognitive disabilities, such as learning disabilities (Cummings & Maddux, 1987; Humes, 1992; Winer, Pierce, & Wilson, 1988).

Secondary Constructs of the SDS

The SDS utilizes secondary constructs that enable individuals to make predictions about a person or environment based on a Holland code. The secondary constructs of the SDS include consistency, differentiation, congruence, coherence of aspirations, commonness, and vocational identity. Consistency is defined as “the degree of relatedness between personality types or between environmental models” (Holland, 1997, p. 4), and it is determined by how close the first two letters of an individual’s Holland code are on the hexagon. A highly consistent code is one in which the first two letters are directly next to each other on the hexagon (i.e., AS). A code with low consistency is one in which the first two letters are directly opposite one another on the hexagon (i.e., AC; Reardon & Lenz, 1998). Strahan (1987) developed a method for calculating consistency based on a two- or three-point letter code.

Differentiation is defined as “the level of definition or distinctness of a personality profile” (Reardon & Lenz, 1998, p. 262), meaning that an individual who closely resembles the definition of one type is highly differentiated. However, if an individual similarly resembles all six of the RIASEC types, they are not highly differentiated in their interest pattern or personality. Differentiation is calculated by subtracting the lowest summary score from the highest summary score (Holland, 1997) or by using the Iachan index (Iachan, 1984). It has also been calculated in various other ways, as researchers have investigated its usefulness in other areas (as cited in Bullock, 2006). The Iachan index takes into account the first, second, and fourth summary scores when calculating differentiation and is considered to be more sensitive to the shape of the profile (Holland et al., 1994). Alvi, Khan, and Kirkwood (1990) stated that the Iachan index should be used for most purposes.
Congruence is defined as the degree of match between an individual and an environment. For example, a Realistic person working in a Realistic environment would have a high level of congruence. On the SDS, congruence is determined by the amount of match between an individual’s assessed and expressed interests, or the level of agreement between the code calculated from the occupational aspirations section and the code from the rating section. An exact match would be interpreted as a high level of congruence (Reardon & Lenz, 1998). Young, Tokar, and Subich (1998) identified more than 15 additional ways to calculate congruence.

Coherence of aspirations is defined as the extent to which the three-letter codes of an individual’s set of vocational aspirations or occupational daydreams belong in the same RIASEC category (Holland, 1997). It is determined by examining the vocational daydreams occupations to determine whether the same RIASEC letter appears first in the first three occupational codes. Practical usage has suggested that an individual with low coherence may be confused about the world of work, about his or her interests, and about how these are related. According to Reardon and Lenz (1998), high coherence could also be indicative of future perseverance in occupations with the same first code letter as that of the first aspiration.

Commonness is the frequency with which a three-letter code is observed (Reardon & Lenz, 1999). Codes that occur with a frequency of greater than 4.5% are High, while those that occur with frequencies between .11 to 4.49% are Average. Finally, those codes that occur with a frequency of less than .10% are Low. High commonness is associated with stability of choice.

Finally, vocational identity is an indicator of the extent to which an individual has a clear conceptualization of his or her goals, interests, and talents (Holland, 1997). This construct is related to differentiation and consistency because it contributes to defining the strength of personalities and environments. Vocational identity is measured with the Vocational Identity (VI) scale from My Vocational Situation (Holland, Gottfredson, & Power, 1980).

Interest Inventory Profile Elevation

Definition

Profile elevation on the SDS has been defined as the sum of the six RIASEC scores across the five sections of the SDS (activities, competencies, occupations, self-estimates 1, and self-estimates 2), with a possible range of scores between 14 and 300 (Fuller, Holland, & Johnson, 1999). Interest profile elevation has been viewed in the past as being interpreted solely by using a counselor’s judgment, but its interpretability has not been completely validated (Fuller
et al., 1999). This construct has been viewed as a separate entity from the SDS secondary constructs in that it may provide additional information regarding a client’s personality and preferences that can be explored in a counseling relationship (Bullock & Reardon, 2005).

Defining high and low elevations is important in conceptualizing profile elevation. Using adult norms from *The Self-Directed Search Technical Manual* (Holland et al., 1994) and calculating +/- 1 SD around the range, high and low profile elevations be defined as follows: high elevations (men, 150 >; women, 147 >), average elevations (men, 129-149; women, 128-146), and low elevations (men,< 128; women, < 127).

Prediger (1998) explored profile elevation as it relates to interests, but referred to it as profile level. Results showed that there was no relationship between profile level and interest, which was contradictory to the assumption that most career counselors make. In other words, an individual with a high profile level and a high point code of E of the SDS would not have a greater likelihood of entering into an E occupation than an individual with low interest level and a high point code of E on the SDS. This finding may be surprising to the assumptions of most counselors, but it does not mean that other important, interpretable factors are not related to interest profile elevation.

Darcy and Tracey (2003) identified a need for further exploration of interest profile elevation related to the RIASEC types. They suggested that a more in-depth investigation of interest profile elevation may provide more evidence as to whether it is related to a general interest factor, similar to the concept of Spearman’s general factor of intelligence. They stated that interest profile elevation may “bias the relations with other variables or be related to other variables in a substantive manner” (p. 227). This could mean that interest profile elevation may be a subordinate construct that accounts for much of the variance in SDS profiles rather than just another interpretable secondary construct. Based on the suggestion that profile elevation may be related to a general interest factor (Darcy & Tracey, 2003), Bullock and Reardon (2005) suggested that profile elevation may show an individual’s energy level, which may indicate the level of energy a client has to give to the career decision-making process.

**Previous Research on Related Constructs**

Much of the research on interest inventory profile elevation and correlates to personality has utilized the Five Factor Model of Personality (Costa & McCrae, 1980). Bullock and Reardon (2008) investigated the relationships among interest profile elevation, personality using a
measure of the Big Five personality traits, and four secondary constructs. They found that profile elevation was positively related to three of five personality factors, including openness, conscientiousness, and extraversion. The finding that openness and conscientiousness increased with profile elevation means that a client with higher profile elevation will most likely be open to considering options and be conscientious about career exploration tasks recommended to them. Results also showed that consistency was found to be positively related to profile elevation and accounted for a statistically significant amount of variance in the regression model, while the relationship to differentiation was inconclusive. These findings suggest that profile elevation may explain some parts of a client’s profile not explicated by the other secondary constructs.

Profile elevation has been found to be correlated with certain personality characteristics (Fuller, Holland, & Johnston, 1999; Gottfredson & Jones, 1993; Swanson & Hansen, 1986), and this information could be useful when working with clients. High profile elevation has been found to be moderately correlated with positive personality variables and effective educational functioning and achievement. It has also been found to be more predictive of college major and an expressive, enthusiastic, or impulsive style (Gottfredson & Jones, 1993). Individuals with high profile elevation are more likely to be expressive with their thoughts, needs, and preferences, and may have a pleasant and optimistic disposition. Fuller et al. (1999) stated that positive item endorsement could be viewed as a diagnostic indicator of good psychological adjustment.

Low profile elevation has been found to be moderately correlated with depressive traits, unsociability, unconventionality, and an unexpressive, unenthusiastic, or unimpulsive style (Bullock, 2006). It has also been correlated with a lack of willingness to consider occupations not previously considered. An individual with low profile elevation may be experiencing depression and may not be willing to express his or her needs, thoughts, and preferences. An individual with low profile elevation may need to be approached differently in a career counseling context because the client may not be as willing to consider alternatives and may not follow through with assigned tasks (Bullock & Reardon, 2008).

Researchers have acknowledged the possibility of there being a relationship between depression and interest inventory profile elevation for years (Spokane, Luchetta, & Richwine, 2002), and counselors have reported using interpretations of interest inventory profile elevation to determine whether a client was depressed or overzealous. Gottfredson and Jones (1993)
investigated profile elevation in the SDS and its relationship to certain personality characteristics, including depression on the Personality Styles Inventory (PSI; Silver & Malone, 1993). Among the PSI scales, the Depression scale was most negatively correlated with the sum of the SDS scores, $r = -.34$ and $r = -.23$ for men and women, respectively. Although some research exists, there appears to be a dearth of literature on this construct. Consequently, it can be assumed that counselors have based their interpretations of profile elevation on an intuitive understanding of the instruments instead of a research-based understanding (Gottfredson & Jones, 1993).

Individuals with Disabilities

*Disability Defined*

The World Health Organization (1980) defines a disability as “an individual limitation or restriction of an activity as the result of impairment.” With the understanding of the reality, seriousness, and implications of a disability, individuals may experience feelings of depression, helplessness and hopelessness, apathy, and/or dejection and discouragement (Falvo, 2005).

*Depression*

Research has shown that there is a relationship between disability and depression in that individuals with disabilities are more likely to be depressed (Bruce, Seeman, Merrill, & Blazer, 1994). According to the National Center for Birth Defects and Developmental Disabilities (2001), approximately 28% to 59% of adults with disabilities report being depressed. Turner and Beiser (1990) found that individuals with disabilities showed dramatically elevated rates of depressive symptomology and major depressive disorder. Not all individuals with disability experience significant depression, however, and in those who do, depression may not be prolonged. The degree to which depression is experienced varies a great deal across individuals with disabilities. However, in those who do experience depression, prolonged or unresolved depression can result in self-destructive behaviors, such as substance abuse or even suicide (Falvo, 2005).

In a community sample of physically disabled people, Turner and Noh (1988) found that individuals with disabilities are at dramatically elevated risk for depressive symptoms and that this high level of depression is typical for both men and women of all ages. Longitudinal analyses showed that there were four significant determinants of depression in this population: a) eventful stress, b) chronic strain, c) social support, and d) mastery, or the extent to which one
regards the occurrences in his or her life as being under personal control in comparison to being fatalistically ruled. It was found, however, that only the effects of social support and mastery were clearly observable across all age groups.

Several studies have examined the factors that may account for the relationship between depression and disabilities. Studies have shown links with biological and psychosocial factors (Friedland & McColl, 1992), social support (Allen, Ciambrone, & Welch, 2000), and chronic stress (Turner, & Noh, 1988). Mitra, Wilber, Allen, and Walker (2005) examined the associations among environmental factors, healthy behaviors, and depression in individuals with major disabilities and found that depression was associated with several mediating factors amenable to public health intervention. They found that individuals with disabilities who used tobacco and who had a lack of physical activity were more likely to report depression. Environmental factors, such as access to medical and surgical care, social support, and being a victim of assault in the last 12 months, were also associated with depression in the sample, which was consistent with previous research.

Anxiety

Individuals normally become anxious when confronted with a threat. A disability can pose a threat because of the potential loss of functioning, love, independence, or financial security (Falvo, 2005). Some individuals with disabilities fear the unknown or unpredictability associated with disability, which can provoke anxiety. For others, hospitalizations that keep them from family, home, and their daily routines produce anxiety. When disabilities are life-threatening, fear and anxiety may be related not only with loss of function, but also loss of life. Fear and anxiety associated with disability can place individuals in a state of panic, making them psychologically immobile and unable to act (Falvo, 2005).

Sareen, Jacobi, Cox, Belik, Clara, and Stein (2006) used a large sample of individuals ages 18 to 65 to examine whether there were unique associations between the presence of an anxiety disorder with certain physical conditions. They found that the presence of an anxiety disorder was significantly associated with a broad range of chronic conditions, including thyroid disease, respiratory disease, gastrointestinal disease, arthritis, migraine headaches, and allergic conditions. The study also examined whether the comorbidity of anxiety and physical health problems was independently related to poor quality of life and disability, and it was found that
Comorbidity was associated with increased likelihood of poor quality of life and disability compared with a physical condition alone.

Brenes et al. (2005) examined the effect of anxiety on the progression of disability over three years in a sample of older women who reported a great deal of difficulty with at least one of four areas: activities of daily living, walking across a room, lifting 10 pounds, and performing light housework. Results showed that 19% of the sample experienced symptoms of anxiety and that women with symptoms of anxiety were 28% to 67% more likely to experience greater functional difficulty than women without anxiety. In order to understand the effect that anxiety has on disability, three possible mediators were examined: physical activity, benzodiazepine and psychotropic medication use, and lack of emotional support. However, results showed no support for these factors playing a mediating role in the relationship between anxiety and disability.

An exploratory study by Iwasaki and Mactavish (2005) used a focus group approach to examine the meanings that individuals with disabilities pair with their experiences of stress. Results showed that the meanings attached to stress were strongly associated with the personal anxiety and discomfort that affected subjects’ physical, psychological, emotional, and social functioning. An analysis of subjects’ responses to sources of stress yielded two theme clusters: individual and systemic/environmental. The individual theme cluster included sources such as complications of disability and aging, health, interpersonal relationships, and inability to meet expectations. Sources or causes of stress in the systemic/environmental cluster included exclusionary social systems and structures for meeting needs of individuals with disabilities, physical accessibility, employment accessibility, and economic marginalization brought about by low incomes, expensive support services and goods (e.g., clothing), and inadequate housing.

Comorbid depression and anxiety occur quite frequently. In fact, studies have shown that the presence of an anxiety disorder is the strongest risk factor for the development of depression (Hranov, 2007). Epidemiologic studies have shown that subclinical mixed anxiety-depression may occur in 0.8-2.5% of the general population (Wittchen & Essau, 1993). However, the prevalence of comorbid depression and anxiety in the community may be as high as 10-20% (Katon & Roy-Byrne, 1991). Kessler, Chiu, Demler, and Walters (2005) utilized a sample of over 9,000 subjects and found that over 40% of the 12-month DSM-IV disorders were comorbid, with anxiety disorders being the most common (18.1%), followed by mood disorders (9.5%). Severity was also found to be strongly related to comorbidity.
There are many other factors that may contribute to the mental health concerns of individuals with disabilities. Obesity is more prevalent among adults who have disabilities and may be associated with poor mental health (Must et al., 1999). This may be due to physical inactivity since individuals with disabilities are more likely to encounter barriers to exercising regularly. Weil et al. (2002) examined the prevalence of obesity and weight loss attempts among adults with mobility and sensory disabilities and mental illness. Results showed that obesity was indeed more prevalent in this population than in the general U.S. population. It was found that attempted weight loss was less common for non-obese adults with lower extremity mobility difficulties and more common for those with mental illness, which may be associated with weight gain that often occurs from psychotropic medications. An interesting finding from the study was that individuals who are deaf or hard of hearing were also more likely to be obese. Although it appears that these individuals may have fewer obvious barriers to regular exercise than individuals with other types of disabilities, it is evident that more research is needed to understand the reasons for this risk for obesity.

Age and depression and anxiety in individuals with disabilities

As previously stated, depression is not a normal part of aging, but in any given year between one and two percent of individuals over the age of 65 who are living in the community and not in nursing homes or other institutions suffer from major depression (NIMH, 2002). Research has shown that there are no significant age effects on depression when the effects of age and other risk factors are controlled and that initial age effects were mostly due to functional impairment and health problems (Roberts, Kaplan, Shema, & Strawbridge, 1997). In fact, Roberts et al. (1997) found that what appeared to be age effects on depression were attributable to associated physical problems and related disability and not to age. Heithoff (1995) noted that major depression in elderly individuals can be ambiguous and conducted a study in which depressive symptoms attributed to physical causes were recoded so that they were equivalent to those with a psychiatric cause. Results showed no disproportionate rise in diagnosable depression in the elderly. While there are numerous studies that have examined depression and anxiety in one specific age group (e.g., elderly, adolescents) for individuals with disabilities, there are not nearly as many studies that directly compare individuals across ages.
Injury and depression and anxiety in individuals with disabilities

Physical injuries are common occurrences in the general population (O’Donnell, Creamer, Pattison, & Atkin, 2004). Psychiatric comorbidity has been examined in an injured population, and in the Australian National Survey of Mental Health and Well-being, 85% of men and 80% of women with PTSD met criteria for another psychiatric disorder (Creamer, Burgess, & McFarlane, 2001). The study found that major depressive episode, generalized anxiety disorder, and substance abuse were the most common comorbid disorders with PTSD in male subjects. Major depressive episode and generalized anxiety disorder were most common in women. In a study of motor vehicle accident survivors, Mayou, Bryant, and Ehlers (2001) found that 74% of subjects with PTSD also reported comorbid anxiety disorders. O’Donnell, Creamer, Pattison, & Atkin (2004) examined individuals who had been admitted to an emergency department for at least 24 hours due to a physical injury and found that 20% of injury survivors met diagnostic criteria for at least one psychiatric diagnosis at 12 months. PTSD and depressive disorders were the most frequent diagnoses, which accounted for 53% of all diagnoses. About half of those subjects who were diagnosed with one psychiatric condition also met criteria for another diagnosis, with PTSD being most commonly comorbid with depression.

Many types of physical injuries can have cognitive implications. Traumatic brain injury (TBI) affects approximately 1.5 million people in the United States each year, and an estimated 80,000-90,000 patients experience long-term disability due to these injuries (as cited in Jorge, 2005). TBI can result in permanent cognitive, emotional, sensory, motor, and other impairments (as cited in Rutland-Brown, Langlois, Thomas, & Lily, 2006). Falls may be the leading cause of TBI (28%) followed by motor vehicle accidents (20%; Langlois, Rutland-Brown, & Thomas, 2004).

Individuals with a history of TBI have an increased risk for many psychiatric disorders as compared to the general population, which includes major depression, dysthymia, panic disorder, obsessive –compulsive disorder, phobic disorder, and drug abuse and dependence (Silver, Kramer, Greenwald, & Weissman, 2001). The presence of psychiatric disorders may play a significant role in an individual’s long-term outcome, including psychosocial adjustment and return to work (Jorge & Robinson, 2002). Depression is the most common mood disorder after TBI, with estimates ranging between 10% and 77% (Alderfer, Arciniegas, & Silver, 2005), and may increase an individual’s risk for developing other neuropsychiatric problems, such as
suicidality, cognitive dysfunction, and aggressive behavior (Jorge et al., 2004). Anxiety is also frequently comorbid with depression following TBI, and rates may be as high as 77% (Jorge et al., 2004).

Mild head injuries represent about 80% of all head injuries sustained, and there is evidence of ongoing cognitive and behavioral problems following moderate or severe TBI (Ponsford et al., 2000). Cognitive and behavioral symptoms are common in individuals with mild TBI, including headache, dizziness, sensitivity to noise and/or bright lights, tinnitus, blurred or double vision, restlessness, insomnia, reduced speed of thinking, concentration and memory problems, fatigue, irritability, anxiety, and depression (Kay, 1992; Alves, Colohan, O’Leary, Rimel, & Jane, 1986; Dikmen, McLean, Temkin, & Wyler, 1986). Cognitive impairments are likely to be present in many individuals during acute hospitalization and for about 1-3 months after mild head trauma (Levin et al., 1987; Dikmen et al., 1986). Binder, Rohling, and Larrabee (1997) demonstrated that cognitive impairment does not persist over 3 months in the majority of patients with mild head injury. However, Ponsford et al. (2000) found that psychological adjustment levels deteriorated for individuals with mild TBI who experienced ongoing problems 3 months post-injury.

Depression

Symptoms

Depressive disorders are among the most common psychiatric disorders, characterized by feelings of sadness, loss of capacity to experience pleasure, sleep and appetite disturbance, increased feelings of worthlessness, fatigue, and thoughts of death and dying (Areán & Chavat, 2003). According to the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders, text revision (DSM-IV-TR; American Psychiatric Association [APA], 2000), depressive disorders include three categories of illnesses, including major depression, dysthymia, and depressive disorder not otherwise specified. Although each of the three disorders has a different course and varying levels of severity, they all share common symptoms and clinical features. First, all three consist of mood symptoms, which include feeling sad, empty, worried, and irritable. Second, they are characterized by vegetative symptoms, including fatigue, agitation, and social withdrawal. Third, changes in sleep and appetite are also common. Fourth, all three disorders consist of cognitive symptoms, which include trouble concentrating, difficulty
making decisions, low self-esteem, negative thoughts, guilt, suicidal ideation, and even hallucinations and delusions in very severe cases (Areán & Chatav, 2003).

Major Depressive Disorder is a chronic and recurrent illness and has been reported to be the fourth-leading illness causing impairment and disability (Rytsala et al., 2006). Furthermore, it is predicted to be the second major cause of functional disability by the year 2020 (Murray & Lopez, 1997). It is characterized by at least one major depressive episode, with no history of mania. A major depressive episode consists of at least five of nine possible symptoms for most of the day, nearly every day, for at least two weeks (APA, 2000):

a) Depressed mood;
b) Diminished interest or pleasure in all, or almost all, activities;
c) Significant weight loss or weight gain or a decrease or increase in appetite;
d) Insomnia or hypersomnia;
e) Psychomotor agitation or retardation;
f) Fatigue or loss of energy;
g) Feelings of worthlessness or excessive or inappropriate guilt;
h) Diminished ability to think or concentrate, or to make decisions;
i) Recurrent thoughts of death, suicidal ideation, plans, or attempts.

Dysthymic disorder is usually thought of as a chronic depression that lasts two or more years, but one that is not as severe as major depression. Unlike major depression, dysthymia only has one typical presentation. The symptoms of dysthymia include depressed mood most days, for most of the week, for two years, plus two or more of the following symptoms (APA, 2000):

a) Poor appetite or overeating;
b) Insomnia or hypersomnia;
c) Low energy or fatigue;
d) Low self-esteem;
e) Poor concentration or difficulty making decisions;
f) Feelings of hopelessness.

Depressive disorder not otherwise specified is a catchall for depressive conditions that are provisionary and need further research (Areán & Chatav, 2003). They include premenstrual dysphoric disorder, minor depressive disorder, recurrent brief depressive disorder, post-psychotic
depressive disorder of schizophrenia, major depressive disorder superimposed on psychotic or delusional disorders, and depression due to general medical conditions.

**Risk Factors**

Most researchers believe that depression is multifaceted, with causes stemming from the interaction of biological, psychological, and social factors (Kendler, Thornton, & Gardner, 2001). Research has shown that genetics play a contributory role to an individual’s susceptibility to depression. The principle method for studying heritability of psychopathology has been comparing the concordance rates of depression in identical, or monozygotic, twins to that of fraternal, or dizygotic, twins. According to twin studies, monozygotic twins have greater concordance rates for depressive disorders than do dizygotic twins, with a correlation of .46 for monozygotic twins and .20 for dizygotic twins (Englund & Klein, 1990). Family studies have also found that onset of depression is more likely in people with depressed family members than in those who do not have depressed relatives (Marazita et al., 1997).

Depressive disorders are also related to psychological variables, including individuals’ cognitive appraisals of themselves, their lives, and others; whether people proactively solve problems or avoid them; and the degree to which proactive attempts to cope with stress have been successful (as cited in Areán & Chatav, 2003). Research has shown that people who use active forms of coping, such as problem solving, are less likely to become depressed than those people who use passive forms of coping, such as avoidance (Garcia, Valdes, Jodar, Riesco, & de Flores, 1994). Welch and Austin (2001) found a strong relationship between avoidance coping and depression, and avoidance coping was found to explain a significant amount of the relationship between psychosocial stressors and depression. Other factors that have been found to be involved in the onset of depression are disturbances in neurotransmitter functioning, family history of depression or alcoholism, early parental loss or neglect, the occurrence of recent negative life events, a critical or hostile spouse, lack of a close confiding relationship, lack of adequate social support, and long-term lack of self-esteem (Fennell, 1989).

Rytsala et al. (2006) found that current level of depression and cumulative history of depression were the two most robust predictors of disability and adjustment in inpatients and outpatients with Major Depressive Disorder. Also, psychiatric comorbidity and social support as perceived by the individual were consistent predictors. In fact, when specific aspects of social support were examined, size of helping network and confidence in the ability of the network to
provide needed help were the strongest mediators of negative mood state in individuals with disabilities (Allen, Ciambrone, & Welch, 2000).

There have been inconsistent findings about whether physical activity can have a protective effect on depression. Strawbridge, Deleger, Roberts, and Kaplan (2002) used cross-sectional analyses on a large, longitudinal sample and found an association between physical activity and depression even when adjustments were made for a relatively large number of potential confounds, including baseline disability. Several different mechanisms have been offered by which depression could be reduced by physical activity. First, it has been postulated that increased levels of two types of brain neurotransmitters, monoamines and endorphins, are released, which may protect against depression (Thornen, Floras, Hoffman, & Seals, 1990). Improved fitness and increased self-esteem as a result of greater physical activity could also be plausible mechanisms (Strawbridge et al., 2002). Increased social interactions that occur during physical activity and engaging in other beneficial health behaviors, such as not smoking, avoiding obesity, and not drinking alcohol to excess could also be mechanisms by which physical activity prevents depression (Strawbridge et al., 2002).

Age

Depression is not a normal part of aging, but in any given year between one and two percent of individuals over the age of 65 who are living in the community and not in nursing homes or other institutions suffer from major depression (NIMH, 2002). Research has shown that there are no significant age effects on depression when the effects of age and other risk factors are controlled and that initial age effects were mostly due to functional impairment and health problems (Roberts, Kaplan, Shema, & Strawbridge, 1997). In fact, Roberts et al. (1997) found that what appeared to be age effects on depression were attributable to associated physical problems and related disability and not to age. Heithoff (1995) noted that major depression in elderly individuals can be ambiguous, and conducted a study in which depressive symptoms attributed to physical causes were recoded so that they were equivalent to those with a psychiatric cause. Results showed no disproportionate rise in diagnosable depression in the elderly. Joiner, Walker, Pettit, Perez, and Cukrowicz (2005) suggested that one should be cognizant of the fact that older individuals may obtain inflated scores on self-report depression measures due to endorsement of somatic and vegetative symptoms that can occur from causes
unrelated to depression (e.g., medical problems). The authors noted, however, that measures specifically created for geriatric populations do exist that are sensitive to such concerns.

Research on the elderly shows that social support has important consequences both for physical and psychological health status. For example, Blazer (1982) examined the influence of three types of social support (e.g., perceived social support, frequency of interaction, and roles and availability of attachment) on mortality among individuals 65 years of age and older. All three dimensions of support were associated significantly with mortality, with perceived support showing the strongest relationship. Allen, Ciambrone, and Welch (2000) examined the influence of life course stage and indicators of various aspects of social support on mood state in a randomly selected sample of both younger and older adults with chronic illness and disability. Results showed that of all aspects of social support examined, size of helping network and confidence in the ability of the network to provide needed help were the strongest mediators of negative mood state in individuals with disabilities. Having a confidant was also found to be more important for younger versus elderly individuals with disabilities.

Anxiety

Symptoms

Anxiety and depression are the two most common mental health problems seen in the general medical setting, yet anxiety lags far behind depression in terms of research and clinical health efforts in screening, diagnosis, and treatment (Kroenke, Spitzer, Williams, Monahan, & Lowe, 2007). Approximately 29% of the US population is estimated to have or have had one or more diagnosable anxiety disorders at some point in their lives (APA, 2000). More specifically, over 30 million Americans have a lifetime history of anxiety (Regier et al., 1988). Anxiety disorders cost an estimated $42 billion dollars per year in the United States alone, including direct and indirect costs (Greenberg et al., 1999). According to the DSM-IV-TR (APA, 2000), there are several types of anxiety disorders, including panic disorder, phobias, obsessive-compulsive disorder, post-traumatic stress disorder (PTSD), and generalized anxiety disorder (GAD). However, the four most common anxiety disorders are GAD, panic disorder, social anxiety disorder (phobia), and PTSD (as cited in Kroenke et al., 2007).

Generalized anxiety disorder (GAD) is characterized by excessive anxiety and worry occurring more days than not, for a period of at least six months, about a number of events or activities (APA, 2000). Worry can be difficult to control and can be associated with somatic and
cognitive symptoms, including muscle tension, restlessness or feeling keyed up or on edge, being easily fatigued, difficulty concentrating or mind going blank, sleep disturbance, and irritability (APA, 2000). In order to meet the diagnostic criteria for GAD, six out of 18 cognitive and somatic complaints must be present. The anxiety must not be confined to the features of any other Axis I disorder, and the anxiety, worry, or physical symptoms must cause clinically significant distress or functional impairment. People with GAD tend to believe that worrying may be an effective method of avoidance or preventing the occurrence of negative consequences.

**Risk Factors**

The literature on anxiety shows many possible risk factors for the development of anxiety disorders. For example, research has suggested that uncontrollable and unpredictable aversive events may play a large role in the development and onset of GAD, as a result of these events being more stressful and creating more fear and anxiety than controllable and predictable aversive events (Barlow, 2002). Although these events are usually not as traumatic as those experienced by individuals with PTSD, there is some evidence suggesting that individuals with GAD are more likely to have experienced childhood trauma than those with other anxiety disorders (as cited in Mineka & Zinbarg, 2006).

Zvolensky, Schmidt, Bernstein, and Keough (2006) discussed risk factors for anxiety disorders and focused primarily on four factors, with the most prominent being anxiety sensitivity and negative affectivity. The other two factors were cigarette smoking and panic attacks. Anxiety sensitivity was defined as the fear of anxiety and sensations related to anxiety, and is a trait-like cognitive predisposition that may increase the risk of anxiety problems (Reiss & McNally, 1985). Essentially, this perspective suggests that anxiety sensitivity may increase the probability of anxious and fearful responding to internal cues (e.g., bodily sensations), and it may be associated with attention to, and avoidance of, threatening stimuli. Negative affectivity is a personality trait that is assumed to shape individual learning experiences with aversive stimuli, as well as risk for developing problems with anxiety and mood (Gray & McNaughton, 1996).

Environmental factors may also play contributory roles in the development of psychopathology, including poor working conditions, which may be a significant source of stress and may contribute to the development of depressive and anxiety disorders (Pugliesi, 1999). Plaisier et al. (2007) conducted a longitudinal study to examine three dimensions of self-reported working conditions, including psychological demands, decision latitude, and job security in
2,646 working men and women in the Netherlands. Results showed that 10.5% of working women and 4.6% working men developed an incident depressive and/or anxiety disorder over the two year period. Psychological demands predicted the incidence of the disorders in both genders, but decision latitude and job security did not.

**Age**

Research has shown that anxiety may present differently across adult age groups. One proposed difference is that anxiety may manifest as somatic symptoms in older individuals (Turnbull, 1989). Furthermore, differentiating between symptoms of anxiety and somatization among older individuals has proven to be difficult because physical illnesses occur more often in older people. Additionally, many illnesses that are common in older age produce symptoms that are difficult to distinguish from anxiety (Turnbull, 1989). Comorbidity with depression also makes identifying anxiety in older individuals difficult because older persons who present with anxiety may actually be suffering from major depression. Conversely, highly anxious older individuals may also exhibit symptoms of depression more so than younger adults (as cited in Fuentes & Cox, 2000). In a study comparing anxiety in younger and older adults, Fuentes and Cox (2000) found that individual item responses were similar across age groups on various measures of anxiety, which suggests minimal age-group differences pertaining to symptoms that are most prominent. These results are contradictory to suggestions in the literature that anxiety may present differently in older adults.

**Minnesota Multiphasic Personality Inventory**

*Development of the MMPI and MMPI-2*

The MMPI (Hathaway & McKinley, 1951) was originally developed in the 1940s as a means of assessing the mental health of patients seen in medical practice, and since its development, countless studies have been conducted utilizing the MMPI and its many scales. The MMPI consists of 550 statements to which examinees respond “True” or “False.” It may be used with individuals who are 16 years of age or older who have at least a sixth-grade education or an IQ of 80 and can be completed in a relatively brief time, usually about an hour and a half.

Hathaway and McKinley (1951) believed that patients who endorsed similar symptoms or items on the MMPI were diagnostically more alike than they were different (Butcher & Williams, 2000). For example, an individual who endorses many items related to having a depressed mood is likely to be more similar to other depressed individuals than to other clinical
groups. The authors also believed that an individual who endorses more items of a particular nature could be considered to have a more serious problem than those individuals who report fewer symptoms. They developed scales by which examinees could be compared on certain variables in an attempt to quantify the relationship between number of endorsed psychological symptoms and diagnostic similarity. A group of items endorsed in a defined direction that relate to particular problems constitutes a scale.

The authors of the MMPI began with a large pool of 1,000 potential test items that were representative of symptoms of mental disorders or other problems treated on their psychiatric service (Butcher & Williams, 2000). The test items that were ultimately chosen reflected 26 content areas, including general health, family issues, religious attitudes, sexual identification, and psychiatric symptomology (Hathaway & McKinley, 1951).

Even though the original was considered to be an outstanding instrument, there were several concerns about it, including problems related to the items themselves (e.g., dated, ambiguous, or sexist items) and problems concerning the fact that norm groups were lacking in size and in the representativeness of the general population (as cited in Westefeld & Maples, 1998). Additionally, the original norms were created in the 1940s, which meant that responses of individuals taking the MMPI were compared to responses of typical men and women in the 1940s.

In 1989, a revision of the MMPI, known as the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer), was published. Approximately 14% of the original items were revised in an attempt to correct grammatical errors and to make the language more contemporary, nonsexist, and readable. The rewording of the items on the MMPI-2 that removed sexist and outdated language resulted in clients omitting fewer items and posing fewer questions about the meanings of words, which decreased the number of potential problems during administration. Items were added that address topics such as drug abuse, suicide potential, Type A behavior patterns, marital adjustment, and attitudes toward work. The MMPI-2 contains 394 of the original items, 66 items that were revised or rewritten, and 107 new items (as cited in Cohen, Swerdlik, & Phillips, 1996). The original MMPI validity and clinical scales remained relatively intact in the revised MMPI-2 in order to maintain continuity with the extensive research on the instrument in the last 65 years.
The MMPI-2 is considered to be an improvement over the original MMPI for several reasons:

a) The normative sample for the MMPI-2 is more diverse, representative, and includes people from seven different states.

b) Eighty-two items were rewritten, and 150 new items were developed for the MMPI-2, thus improving the item content.

c) Some new scales were developed for the MMPI-2, including three supplementary validity scales in addition to the four original validity scales. The 5-Scale (Masculinity-Femininity scale) and the McAndrew scale were also modified. Finally, new content scales were added in the MMPI-2.

The normative sample for the MMPI-2, which consisted of 2,600 individuals (1,462 females, 1,138 males) from seven states, had been matched to the 1980 United States Census data on several variables, including age, gender, minority status, social class, and education (Butcher, 1990). Unlike the original sample for the MMPI, the normative sample for the MMPI-2 included minorities (81% White, 19% non-White).

Overview of the Clinical Scales

The MMPI is comprised of ten basic clinical scales:

1. Hypochondriasis. The authors chose this construct because of the frequency of the problem in medical and mental health settings along with its straightforwardness in diagnosing. They defined hypochondriasis as “abnormal, psychoneurotic concern over bodily health” (Butcher & Williams, 2000, pp. 63).

2. Depression. This scale pulls for a generally negative frame of mind in which the individual has reported poor morale, lack of hope for the future, dissatisfaction with life, and a low mood.

3. Hysteria. This scale was created to measure conversion hysteria, which is known today as conversion disorder. Conversion disorder often manifests an unusual pattern of personality characteristics consisting of denial and over-the-top social assertiveness. However, under stress, the individual may become suddenly debilitated by physical problems, usually vague and of unknown origin.

4. Psychopathic Deviate. This scale was developed to measure antisocial tendencies or psychopathic behavior.
5. **Masculinity-Femininity.** Unlike most of the other scales, this scale is not based on a clinical syndrome, but instead was designed to identify personality features of homosexual men who had feminine interests or “male sexual inversion” (Hathaway, 1956).

6. **Paranoia.** This scale measures suspiciousness, mistrust, delusional beliefs, excessive interpersonal sensitivity, rigid thinking, and externalization of blame that is commonly found in paranoid disorders, such as with paranoid states, paranoid schizophrenia, and other severe paranoid disorders (Hathaway, 1956).

7. **Psychasthenia.** This scale was originally created to assess a psychological disorder that today would be called an anxiety disorder with obsessive-compulsive features.

8. **Schizophrenia.** This scale assesses the four recognized subtypes of schizophrenia at the time of the test’s development (i.e., catatonic, paranoid, simple, and hebephrenic).

9. **Hypomania.** This scale was intended to measure manic or hypomanic behavior, or the tendency to act in euphoric, aggressive, and hyperactive ways.

10. **Social Introversion.** This scale measures a polarized dimension of personality in which high scores assess social introversion and low scores assess social extroversion. Like the 5-scale, this scale does not measure a clinical syndrome.

**Validity Scales of the MMPI**

In addition to the ten clinical scales, the MMPI contains three validity scales that were designed to serve as indicators of factors such as response sets, attitudinal factors, and misunderstandings of directions that may influence test results: the *L*-scale, *F*-scale, and *K*-scale.

**L (Lie) Scale.** The *L*-scale, which is often referred to as the “Lie” scale, contains 15 items that are considered to be negative and apply to most people, such as “I do not always tell the truth” or “I gossip a little at times” (Dahlstrom, Welsh, & Dahlstrom, 1972). If an individual’s score does not fall within certain limits, the validity of the profile is questioned because the person may not have been willing to disclose anything negative about himself and may be an inaccurate misrepresentation.

**F (Infrequency) Scale.** The *F*-scale consists of 64 items that are not frequently endorsed by members of nonpsychiatric populations. The items also do not fit into any known pattern of deviance. An example item is as follows, and an endorsement of “True” would be scored on the *F* scale: “It would be better if almost all laws were thrown away” (Dahlstrom, Welsh, &
Dahlstrom, 1972). An elevated $F$-score could mean one of several things. First, it could indicate that the examinee did not take the test seriously and was randomly responding to items. Second, it could indicate that the individual may be very eccentric or was “faking bad.” This deliberate exaggeration of symptoms, or malingering, can be seen in profiles of people intending to commit fraud with health insurance to receive benefits and criminals attempting to look incompetent to stand trial due to mental illness (Cohen, Swerdlik, & Phillips, 1996).

**$K$ (Correction) Scale.** The $K$-scale is an indication of the frankness of the examinee’s self-report. An elevated $K$-score is associated with defensiveness and impression management. A low $K$-score is associated with excessive self-criticism and low ego-strength, desire to detail deviance, and/or a desire to fake bad. The $K$-scale is used as an indicator of test defensiveness and as a correction for the tendency to deny problems (Butcher & Williams, 2000). More specifically, the scores are statistically corrected for an examinee’s overwillingness or unwillingness to admit deviancy.

A $K$-corrected profile was developed by determining the proportion of $K$ that, when added to the raw score on the Clinical scale, would maximize the ability to discriminate between the normative groups and the criterion group. As a corrective factor, the $K$ scale modifies five MMPI clinical scales, including scales 1 (Hypochondriasis), 4 (Psychopathic deviate), 7 (Psychasthenia), 8 (Schizophrenia), and 9 (Hypomania). To improve test-based diagnostic assessment, the fractions of $K$ that are added to the five clinical scales were empirically determined (Butcher & Williams, 2000). They found that adding $K$ to the other Clinical scales (2 [Depression], 3 [Hysteria], 5 [Masculinity-Femininity], and 6 [Paranoia] reduced their ability to discriminate, so the $K$ correction was not added to these scales.

Hathaway and McKinley (1951) found that the $K$ correction improved the validity of the clinical scales. However, results of successive studies have been negligible and unconvincing (Dahlstrom, Welsh, & Dahlstrom, 1972). In fact, Hunt, Carp, Cass, Winder, and Kantor (1948) and Silver and Sines (1962) found no increase in diagnostic accuracy when the $K$ correction was used with Veteran’s Affairs (VA) and state hospital patients. Heilbrun (1963) determined in a university sample that only three scales separated normal from maladjusted college students better when $K$-corrected than when not $K$-corrected – scales 3 (Hysteria), 7 (Psychasthenia), and 8 (Schizophrenia). Weiner (1948), however, found an 8% decrease in false negatives by using the $K$ correction when no control group was used. Conversely, Bloom (1977) found that the $K$-
corrected MMPI tended to produce a large number of false positives as assessed from a clinical interview.

Tyler and Michaelis (1953) and Yonge (1966) concluded that adding $K$ to the five $K$-corrected scales in a sample of college students actually decreased the validity and reliability of the scales. Greene (2000) suggested that when using college samples, using Heilbrun’s proposed $K$-corrections, determining another more appropriate set of $K$-corrections, or avoiding the use of $K$-corrections altogether may be preferable and that additional research in other populations must be done. Archer, Fontaine, and McCrae (1998) found that the $K$-correction did not result in higher correlations with external criteria in a psychiatric sample. Colby (1989) concluded that profiles with $K$-corrections did not differentiate patients from non-patients better than profiles without $K$-correction.

Wooten (1984) reported that there were changes in codetype when non-$K$-corrected profiles were compared with $K$-corrected profiles. He concluded that that his findings supported the use of adding $K$ to profiles. Clearly, support for its use is limited, but the $K$ correction seems to be the norm rather than the exception in clinical and research use.

Scoring the MMPI-2

After determining whether an MMPI profile is valid, interpreting an individual’s scores on the standard clinical scales is the next step. When scoring the MMPI, raw test scores are converted to $t$-scores, which are standard scores that have a mean of 50 and a standard deviation of 10, so that an examinee’s scores can be compared to the normative sample. $T$-scores of 65 or higher correspond to the 92nd percentile, at which point the elevation takes on clinical meaning and may indicate a problem that warrants further exploration (Butcher & Williams, 2000).

In contemporary usage, the MMPI clinical scales are referred to by number rather than by their original name because a literal interpretation of the names of the scales would be inaccurate (Cohen, Swerdlik, & Phillips, 1996). For example, a high score in the Schizophrenia scale does not indicate that an individual has schizophrenia. He could be diagnosed as having some other form of psychosis or could even be diagnosed as normal. In practical usage, the clinical scales are viewed as continuums of particular personality traits associated with the criterion group on which the test was normed. For example, an individual who scores high on the Paranoia scale would be thought of as highly suspicious, having feelings of persecution, and distrustful. It
should be noted that this is contrary to the original purpose, which was to be used in classification and differential diagnosis (Cohen, Swerdlik, & Phillips, 1996).

**Intended Use of the MMPI-2**

Although the authors may not have originally intended for the MMPI to be utilized in so many different facets, research has been conducted on various types of populations, in various types of settings, and for many different purposes. Greene, Gwin, and Staal (1997) discussed factors that should be considered when assessing the appropriateness of using the MMPI-2 in research, including the fact that the MMPI-2 clinical scales measure various forms of psychopathology and do not measure general personality, even though some positive personality or emotional factors are assessed. The authors also discussed the importance of describing the sample because MMPI-2 scale elevations and code types can differ drastically as a function of any of these variables, and in order to draw any type of meaningful comparisons between and among studies, such information is needed. Other areas addressed in the review included validity considerations, determining which scores to use, reporting and analyzing data, and areas of current debate within the MMPI-2 field.

**Clinical Scales of Interest on the MMPI-2**

2-Scale. The clinical scale measuring depression, most commonly referred to in the literature as the 2-Scale, was developed as a measure of symptomatic depression and is used by clinicians and researchers for diagnostic and treatment purposes, subject selection, and group assignment. The scale was created such that frequency of item endorsement (i.e., total raw scale scores) increased progressively by severity of the symptoms so that individuals without symptoms endorsed fewest test items, a normal group experiencing depression endorsed more items, and patients in the depressed phase of manic-depressive psychosis (criterion group) endorsed the most (Dahlstrom, Welsh, & Dahlstrom, 1972).

When developing the original MMPI, Hathaway and McKinley (1951) utilized 50 patients who were in the depressed phase of a manic-depressive disorder. They used several groups to contrast scores for scale development, including 139 normal married men and 200 normal married women ages 26 to 43, 265 college students, and 50 patients without clinical depression. Originally, the 2-Scale was developed by determining which of the test items significantly differentiated depressed patients from individuals in the normal group. During the
revision into the MMPI-2, three objectionable items were deleted from this scale (Butcher & Williams, 2000).

Individuals who score high on the 2-Scale are viewed as depressed, unhappy, dysphoric, pessimistic, self-deprecating, guilt prone, and sluggish (Greene, 2000). They report having somatic complaints, weakness, fatigue, low energy, and tension. These individuals are indecisive, prone to worry, and lacking self-confidence. They report feeling useless and are unable to function effectively most of the time. They feel inadequate and report feeling like a failure at work. They are often viewed as shy, introverted, timid, reclusive, and aloof. They tend to maintain psychological distance and avoid interpersonal involvement. They are usually viewed as being passive and unassertive and tend to make concessions in interpersonal relations to avoid conflict. High scorers tend to be motivated to seek and receive treatment.

The 2-Scale of the MMPI-2 has been found to be associated with the presence of a mood disorder (Nelson, 1987; Nelson & Cichetti, 1991). Butcher (as cited in Butcher & Williams, 2000) found that the 2-Scale of the MMPI-2 clearly discriminated between depressed individuals and normals, with a t-score of 65 providing good separation between the two groups. Ben-Porath, Butcher, and Graham (1991) found that the 2-Scale score was the most effective standard scale for discriminating between depressed individuals and schizophrenics in an inpatient setting.

Nelson (1987) suggested that the total score for the 2-Scale can give clinicians an incomplete and possibly misleading picture of clinical depression from results of a study using a sample of depressed inpatients. He recommended using a Depression subscale score rather than the total scale score when measuring depression in an inpatient sample. Nelson and Cicchetti (1991) found that total 2-Scale scores are sensitive to varying levels of depressive severity in a less impaired population, such as an outpatient population, and suggest that the MMPI-2 has good utility as an index of depression in adult outpatient populations.

7-Scale. When Hathaway and McKinley (1951) originally developed the MMPI, they obtained a criterion group of patients who possessed behavioral features of anxiousness, severe ruminations, and obsessive-compulsive features. The responses of the criterion group were compared with the responses of the normal Minnesota sample (e.g., 139 men and 200 women ages 26-43) to obtain the provisional scale. Internal consistency statistics were then used to eliminate items that were poorly correlated with the total score. The final scale had high internal consistency and a clear relationship with the first factor (anxiety) of the MMPI. Although
psychasthenia does not exist as a clinical diagnosis today, the syndrome’s central features (e.g., anxiety, ruminations, feelings of insecurity, etc.) are very present in today’s clinical settings. Scale composition did not change during the revision for the MMPI-2 (Butcher & Williams, 2000).

Individuals who have high scores on the 7-Scale tend to be anxious, tense, and agitated. They often experience great discomfort, worry, and feelings of apprehension, and they are considered to be high-strung, depressed, and jumpy. They also have difficulty concentrating and report being introspective, ruminative, indecisive, obsessive, and compulsive. They experience feelings of insecurity and inferiority, lack self-confidence, and are plagued by self-doubt. They are often very self-critical, self-conscious, and self-deprecating. They are viewed by others as rigid and moralistic, are overly perfectionistic, conscientious, and are guilt-prone. They lack ingenuity and do not demonstrate original problem-solving skills. They tend to distort the importance of problems and overreact to minor situational problems. They usually do not interact very well socially. They are often described as neat, orderly, organized, and reliable. Individuals who score high on this scale may be somewhat resistant to therapy, express hostility toward their therapist, remain in therapy longer than most patients, and usually make slow, gradual progress in therapy (Butcher & Williams, 2002). Research on the 7-Scale has shown that it is associated with severe and incapacitating anxiety. Schofield (as cited in Butcher & Williams, 2000) found that the 7-Scale was the peak score among neurotic outpatients diagnosed as having anxiety-state or obsessive-compulsive disorders. The behavioral correlates for the 7-Scale suggest disabling psychological symptoms in inpatient psychiatric settings with a high percentage of severe affective disorders and schizophrenics.

Anxiety Scale. The Anxiety (A) Scale (Welsh, 1956) contains items that assess general maladjustment or emotional upset. Individuals who obtain high scores on the A-Scale are endorsing symptoms of anxiety, tension, inability to function, and lack of efficiency in managing everyday affairs and admitting to numerous psychological symptoms. The information obtained by the A-Scale is highly correlated with the 7-Scale (.75).

The MMPI-2 and Physical Health

Taylor (1970) demonstrated that interpretation of the MMPI may be significantly affected by physical health status. In Taylor’s study, males with and without spinal cord injuries completed the MMPI, and it was found that those with a disability had significantly higher
elevations on scales 1 (Hs), 2 (D), 3 (Hy), and 4 (Pd), which suggests more preoccupation with bodily functions, more feelings of hopelessness and pessimism, more tendency to repress and deny, and more problems with impulse control, hostility, and restlessness. Taylor suggested that this effect can be corrected for and ought to be taken into account in MMPI research. He proposed two methods for correction. The first requires deriving a corrector scale, which would involve selecting items on which the individuals with disabilities and those without differ to use as correctors on the scales affected by the somatically-relevant items. The second, which is the usual paradigm in these studies, involves scoring the MMPI answer sheet twice, once counting the “somatically relevant” items and once deleting them. T-scores are computed without the somatically relevant items, but no attempt is made to correct for the deleted items, which lowers the standard profile. The overview of MMPI-2 research by Greene, Gwin, and Staal (1997) concluded that based on the decreases in scale elevation, the MMPI and MMPI-2 are biased against the medical or physical condition being investigate and that a correction should be used.

The MMPI and Career Assessment

Although its intended purpose was not career-related, the MMPI has been used as a means by which one can assess several career-related constructs. Peterson and Clark (1990) described the utility of the MMPI as an instrument that can be used to assess an individual’s general level of personal and social adjustment and as a means of assisting career counselors to predict certain types of career matches. The authors also discussed how the MMPI can be used to show how clients cope with stress, as well as how it can be useful in determining whether or not to refer a client for additional treatment related to potentially serious problems. Flynn, Sipes, Grosenbach, and Ellsworth (1994) used the MMPI-2 and other various instruments to assess F-16 pilots and found that pilots agreed on the identification of top performers in their field. Results also showed that the pilots agreed on key personality qualities that aviators should possess in order for them to perform their job well, which included leadership and high tolerance for stress.

Interests have been a focus of some of the research associated with career and the MMPI. Tinsley, Tinsley, Boone, and Shim-Li (1993) examined the scientist-practitioner behavior of counseling psychology students by utilizing the MMPI and other instruments, specifically predicting scores related to interests, preferred job, and record of publication. The authors found, however, that the MMPI was not a significant predictor of these behaviors. Di-Russo and De-
Rosa (1987) examined vocational interests with the Career Assessment Inventory in relation to MMPI scores in vocational rehabilitation clients. Using the MMPI, these clients were classified into four groups (e.g., normal, severely disturbed, antisocial, and faking bad), and the four MMPI groups were analyzed in terms of Career Assessment Inventory theme scores. The authors found that maladjusted clients scored differently than normal clients on interest measures.

The MMPI has also been used in personnel selection. Bartol, Bergen, Volckens, and Knoras (1992) examined the relationship between MMPI scores and job performance and stress in police officers. The authors found that the MMPI was an effective means for studying these relationships. Additionally, they found that the MMPI was effective in examining gender differences in reactions when exposed to tragedy and responsibility for others’ safety. Hiatt and Hargrave (1988) used the MMPI in the personnel selection of police officers and found that the MMPI was additive in terms of accurately classifying the job performance of most subjects as either satisfactory or unsatisfactory. This information was found to be useful in predicting the maladaptive behavior of applicants classified as unsatisfactory at screening. Kornfeld (1995) used the MMPI-2 to select candidates for the police force and found that all 84 applicants displayed a defensive style in responding. Applicants also had low scores on the 0-Scale (Social Introversion) and 2-Scale (Depression), as well as extreme scores on the 5-Scale (Masculinity-Femininity).

The MMPI has also been useful in examining career issues in individuals with disabilities. Feuerstein and Thebarge (1991) found the MMPI-168 version to be useful in differentiating individuals with chronic pain disorders who continued to work as compared with patients who were work-disabled. Those individuals who were work-disabled reported more pain, severity, more job stress, and a perception of greater physical and psychosocial disability. Cook (1983) used the Mini-Mult and found that psychological disability was related to psychopathology in rehabilitation clients. Lees-Haley (1991) examined Ego Strength scores on the MMPI-2 and compared malingers to non-malingers in personal injury claimants and found that it was useful in distinguishing the groups, especially when used with other validity scales. In fact, it was proposed that scores less than 31 should be the cutoff for identifying individuals who are malingering in personal injury cases for nonpsychotic outpatient populations.
The MMPI and Specific Populations

The MMPI has been used more than any other objective instrument to assess personality functioning (as cited in Stukenberg, Brady, & Klinetob, 2000). It was normed on a sample that was randomly selected from the general population, and interpretations are based on drawing comparisons from the sample. Since the development of the MMPI and its revision, many studies have deviated from using samples comprised of individuals from the general population and have targeted specific populations with varying demographics. Stukenberg, Brady, and Klinetob (2000) described MMPI-2 profiles of adults who were admitted to an acute-care inpatient psychiatric facility unit and who were referred for psychological testing. The average profile produced clinically significant elevations on scales F (Infrequency), 2 (Depression), 4 (Psychopathic Deviate), 6 (Paranoia), 7 (Psychasthenia), and 8 (Schizophrenia). The most common code type was a 6-8/8-6 with 19.8% of the sample obtaining this code, followed by 7-8/8-7 (9.7%), no clinically elevated scales (8.3%), and 4-6/6-4 (7.6%). Women had significantly higher scores than men on scales 1 (Hypochondriasis), 2 (Depression), and 3 (Hysteria), but only had medium effect sizes.

Although the MMPI-2 was not designed specifically for the assessment of anxiety disorders, it has shown some utility in exploring anxiety. For example, MMPI-2 profiles of individuals who were referred to a shyness clinic and met the diagnostic criteria for social phobia were examined in a study done by Henderson (1997). Results showed mean elevations on the 2-Scale (Depression; \( t = 74.4 \)), 7-Scale (Psychasthenia, \( t = 74.0 \)), 8-Scale (Schizophrenia; \( t = 73.9 \)), 0-Scale (Social Introversion; \( t = 69.0 \)), 4-Scale (Psychopathic Deviate; \( t = 67.1 \)), and 6-Scale (Paranoia; \( t = 64.7 \)). The overall elevations were similar for both men and women. The mean profile for men, however, was a 2-7-8 code type, whereas the mean profile for women was a 8-2-7 code type. In addition, \( t \)-scores for men were significantly higher than for women, which indicated more severe psychopathology in men seeking treatment. In a similar study, Levin, Hermesh, and Marom (2001) found that the average MMPI-2 profile in patients with social phobia had significant elevations for the triad of 2 (Depression), 7 (Psychasthenia), and 8 (Schizophrenia). Unlike Henderson’s (1997) findings, though, Levin Hermesh, and Marom (2001) found that the three-point code of 2-7-8 was maintained for both males and female. They found that the level of elevation was maintained for both genders, as well, which was contradictory to the results of Henderson (1997).
Taylor (as cited in Fow, Yee, Wilson-O’Connor, & Spataro, 1996) looked at MMPI profiles of individuals with traumatic spinal cord injury (SCI) and found elevations on the 4-Scale (Psychopathic Deviate) and 9-Scale (Hypomania), which suggests levels of impulsiveness and energy that might indicate that these individuals are at increased risk for traumatic SCI. Ironically, though, Athelstan and Crewe (1979) suggested that the personality traits that place individuals at increased risk for SCI and frustrating treatment staff due to non-compliance may also positively influence long-term adjustment to disability. The authors posited that individuals who have actively caused their injury may view their disability from an internal locus of control perspective and may not experience as much psychological distress as those who were inactive agents in their injuries. A study conducted by Fow, Yee, Wilson-O’Connor, and Spataro (1996), though, found no differences between MMPI-2 profiles of SCI individuals with different types of onset (e.g., active-traumatic, passive-traumatic, non-traumatic).

Critical Analysis of Literature

When examining the literature relating to depression and anxiety and disabilities, there are several limitations. For example, the relationship between anxiety disorders and physical disorders found in clinical samples may be limited by sampling biases (Sareen et al., 2006). Next, although epidemiologic samples help to reduce the likelihood of sampling bias, most studies using an epidemiologic sample used self-report diagnosis of physical health conditions, which may in and of itself increase self-report bias because individuals with anxiety disorders are more likely to report physical symptoms (APA, 1994). In addition, most epidemiologic studies have used novice interviewers to diagnose mental disorders instead of using trained health professionals. Furthermore, findings on the relationship between comorbidity of anxiety disorders and physical conditions with disability and quality have been discrepant.

Although past research suggests that there are not many age-related effects on depression and anxiety, it is important to determine what the relationship is like in individuals with disabilities. It is also important to note that while there are numerous studies that have examined depression and anxiety in one specific age group (e.g., elderly, adolescents) for individuals with disabilities, there are not nearly as many studies that directly compare individuals of differing age groups.

Even though the MMPI-2 has been criticized in the extant literature for not actually being a measure of personality, it is a commonly administered instrument that can provide information
about an individual’s personality traits and possible clinical syndromes. Being able to utilize the MMPI-2 and SDS together may provide important information about a client’s willingness and ability to participate in the career decision-making process, as well as his willingness to consider career alternatives, engage in reality testing, and his need for additional individual counseling services.

Individuals with disabilities may utilize career counseling or vocational rehabilitation services, for which the SDS and/or MMPI-2 may be administered. While the SDS is typically thought of to assess interests, the elevation of the profile has been shown to be correlated with certain personality characteristics, such as higher openness to experience, higher extraversion, and lower depressive personality traits. The relationship between interest inventory profile elevation and psychopathology, specifically depression and anxiety, however, is still vague. The literature on depression, anxiety, individuals with disabilities, the MMPI-2, and the SDS can be used to improve our understanding of the possible relationship and propose related questions relating to the relationship between interest inventory profile elevation, depression, and anxiety in this population. Furthermore, while interest inventory profile elevation has been explored with numerous measures pertaining to the Five Factor Model of Personality (Costa & McCrae, 1980), which examines depressive personality characteristics, none were found that utilize the MMPI to examine depression and anxiety with profile elevation.

Research Questions

The following research questions were identified to address the content and conceptual gaps in the literature:

1. What are the relationships between interest inventory profile elevation and depression and anxiety for individuals who have become disabled resulting from a personal injury?
2. Do age and cognitive impairment influence the relationships among interest inventory profile elevation, depression, and anxiety for individuals who have become disabled resulting from a personal injury?

Operational Definition of Terms

The following definitions are provided to facilitate the reader’s understanding of the critical terms in the present study.

**Depression** is a mood disorder characterized by feelings of sadness, loss of capacity to experience pleasure, sleep and appetite disturbance, increased feelings of worthlessness, fatigue,
and thoughts of death and dying (Areán & Chatav, 2003). Depression will be operationalized by the 2-Scale of the MMPI-2 in the present study.

**Trait anxiety** reflects the presence of stable individual differences in the tendency to respond with state anxiety in the anticipation of threatening situations and is more characterological (Spielberger, 1972). Trait anxiety will be operationalized using the 7-Scale of the MMPI-2.

**State anxiety** can be defined as an unpleasant emotional state in the face of a threat or danger. It is more situational, and cognitive appraisal of a threatening situation is a prerequisite for the experience of this emotion (Lazarus, 1991). State anxiety will be operationalized using the A-Scale of the MMPI-2.

**Disability** has been defined as “an individual limitation or restriction of an activity as the result of impairment” (World Health Organization, 1980).

**Interests** are “those things a person does for fun or enjoys” (Reardon, Lenz, Sampson, & Peterson, 2006).

**Profile elevation** has been defined as the sum of the six RIASEC scores across the five sections of the SDS (Fuller, Holland, & Johnson, 1999) and includes interests and ability self-estimates. Using adult norms from *The Self-Directed Search Technical Manual* (Holland et al., 1994) and calculating 1 S.D. above and below the range, high and low profile elevations can be defined as follows: high elevations (men, 150 >; women, 147 >), average elevations (men, 129-149; women, 128-146), and low elevations (men, < 128; women, < 127).

**Delimitations**

Interest inventory profile elevation is defined in the present study in relation to the Self-Directed Search and could be defined in relation to other measures of vocational interest, which were not accounted for in this study. Also, one of the measures used in the present study, the client intake form, is an instrument that has not been validated but is used to collect demographic, background, medical, and educational information. The item that was used to determine whether an individual had a cognitive impairment or other impairment was a self-report item and may not have been inclusive of all symptoms of a cognitive impairment. These symptoms could also represent conditions other than a cognitive impairment. Another delimitation of the present study is that all of the clients of the private practice from which data was collected pursued litigation during or after services were rendered. This raises the issue of
malingering, which is the intentional misrepresentation or exaggeration of symptoms for external incentives, such as financial compensation in personal injury litigation or avoidance of prosecution for criminal charges (Iverson & Binder, 2000). This concern was addressed by excluding subjects with an F-score of greater than 80 on the MMPI-2 (Butcher & Williams, 2000). Additionally, while ecological validity was increased by utilizing data from actual clients at a private practice, the criterion nature of the sample must be considered when making generalizations of results. Findings of the present study can only be generalized to the specific population assessed – litigation-seeking individuals with disabilities resulting from a personal injury. Also, internal validity was reduced because the researcher had less control over data collection procedures. The archival nature of the study presented concerns in that the researcher had no control over how data was collected or what was verbalized to subjects.
The present study examined the relationships between interest inventory profile elevation, depression, and anxiety to address gaps in the extant literature. Age and cognitive impairment were also examined in these relationships. Age was an important variable in the present study because previous research has shown relationships between age, depression, and anxiety, although initial age effects may be mostly due to functional impairment and health problems. Cognitive impairment was also examined in these relationships to explore the presence of depression and anxiety in individuals with cognitive difficulties versus those without cognitive difficulties. This variable was important to examine considering that career decision making, for which an interest inventory may be administered, is a cognitive process.

Hypotheses

The following hypotheses were used to test the relationships between interest inventory profile elevation, depression, and anxiety, as well as for these relationships taking age and cognitive impairment into consideration:

Research Question 1:

a. There is a negative relationship between interest inventory profile elevation and depression;

b. There is a negative relationship between interest inventory profile elevation and trait anxiety (with $K$ correction);

c. There is a negative relationship between interest inventory profile elevation and trait anxiety (without $K$ correction);

d. There is a negative relationship between interest inventory profile elevation and state anxiety.

Research Question 2:

There is no relationship among interest inventory profile elevation, depression, and anxiety, using age and cognitive impairment as mediating variables.
Research Design

This exploratory study utilized a co-relational research design with a criterion sample. Co-relational research represents a general approach to research that focuses on determining the covariation among naturally occurring variables (Goldman, 1978). The goal of co-relational research is to predict relationships between variables by using correlations or more sophisticated statistical techniques. Because the data for the present study were collected at a psychological practice from actual clients, results generated from the present study have high ecological validity, which increases generalizability of the findings. However, results can only be generalized to the specific population assessed.

Variables

Depression

Depressive disorders are among the most common psychiatric disorders, characterized by feelings of sadness, loss of capacity to experience pleasure, sleep and appetite disturbance, increased feelings of worthlessness, fatigue, and thoughts of death and dying (Areán & Chatav, 2003). According to the DSM-IV-TR (APA, 2000), depressive disorders include three categories of illnesses, including major depression, dysthymia, and depressive disorder not otherwise specified. Although each of the three disorders has a different course and varying levels of severity, they all share common symptoms and clinical features. First, all three consist of mood symptoms, which include feeling sad, empty, worried, and irritable. Second, they are characterized by vegetative symptoms, including fatigue, agitation, and social withdrawal. Third, changes in sleep and appetite are also common. Fourth, all three disorders consist of cognitive symptoms, which include trouble concentrating, difficulty making decisions, low self-esteem, negative thoughts, guilt, suicidal ideation, and even hallucinations and delusions in very severe cases (Areán & Chatav, 2003). Depression was assessed using the 2-Scale of the MMPI-2.

Anxiety

Approximately 29% of the US population is estimated to have or have had one or more diagnosable anxiety disorders at some point in their lives (APA, 2000). According to the DSM-IV-TR (2000), there are several types of anxiety disorders, including panic disorder, phobias, obsessive-compulsive disorder, post-traumatic stress disorder (PTSD), and generalized anxiety disorder (GAD). However, the four most common anxiety disorders are GAD, panic disorder, social anxiety disorder (phobia), and PTSD (as cited in Kroenke et al., 2007).
Spielberger (1972) made a distinction between types of anxiety. Trait anxiety reflects the presence of stable individual differences in the tendency to respond with state anxiety in the anticipation of threatening situations and is more characterological. Trait anxiety was assessed using the 7-Scale of the MMPI-2. Conversely, state anxiety can be defined as an unpleasant emotional state in the face of a threat or danger. It is more situational, and cognitive appraisal of a threatening situation is a prerequisite for the experience of this emotion (Lazarus, 1991). State anxiety was assessed using the A-Scale of the MMPI-2.

*Interest Inventory Profile Elevation*

Profile elevation on the SDS has been defined as the sum of the six RIASEC scores across the five sections of the SDS (Fuller, Holland, & Johnson, 1999), and includes interests and ability self-estimates. Using adult norms from *The Self-Directed Search Technical Manual* (Holland et al., 1994) and calculating 1 S.D. above and below the range, high and low profile elevations can be defined as follows: high elevations (men, 150 >; women, 147 >), average elevations (men, 129-149; women, 128-146), and low elevations (men, < 128; women, < 127). Low profile elevation has been found to be moderately correlated with depressive traits, unsociability, unconventionality, and an unexpressive, unenthusiastic, or unimpulsive style (as cited in Bullock, 2006).

*Age*

This interval variable was assessed using self-report data from the client intake form and is the age at which subjects completed the MMPI-2 and SDS.

*Cognitive Impairment*

Cognitive impairment was assessed using self-report data from the client intake form. Subjects were categorized as having a cognitive impairment if they endorsed at least one of the four possible responses indicating cognitive difficulty.

*Measures*

**Self-Directed Search**

The SDS is a self-administered, self-scored, and self-interpreted instrument used in career counseling that assists in operationalizing Holland’s RIASEC theory as a way of classifying an individual’s interests (Holland et al., 1994). Individuals rate their activities, competencies, preferences, occupations, and self-estimates in terms of the six RIASEC areas on the SDS, as well as list their occupational aspirations, or occupational daydreams. Reliability estimates for
the summary scales of the SDS are \( r = 0.90 \) to \( 0.94 \), which indicates considerable reliability (Holland et al., 1994). Test-retest reliability ranges from \( 0.76 \) to \( 0.89 \). Specific psychometric data for vocational aspirations are not included in the *SDS Technical Manual* (Holland et al., 1994) because this construct is comprised of having individuals make a list of occupational daydreams or an occupational history. Predictive validity of the SDS has been demonstrated with respect to occupational choice and college major in high school, college, and adult samples. Holland et al. (1994) reported that evidence of the construct validity of the SDS has been reported in over 500 studies.

*Minnesota Multiphasic Personality Inventory-2*

The MMPI-2 is a structured psychological instrument that consists of 567 questions that require a true or false response. A number of articles have reported the psychometric properties of the MMPI–2 and its associated scales: major reviews (Butcher, Graham, & Ben-Porath, 1995; Greene, Gwin & Staal, 1997), predictive validity (Vendrig, Derksen, & deMey, 2000), convergent validity (Hicklin & Widiger, 2000; Rossi, Van den Brande, Tobac, Sloore, & Hauben, 2003), and discriminant validity (Strassberg & Russell, 2000; Wise, 2001). Munley (2002) utilized a predominantly male sample from a Veteran’s Affairs Medical Center and found that test-retest correlation coefficients for the entire sample ranged from \( 0.48 \) to \( 0.69 \) for the Basic scales, \( 0.49 \) to \( 0.80 \) for the Supplementary scales, and \( 0.56 \) to \( 0.78 \) for the Content scales. Convergent validity of the MCMI-III personality disorder scales was evaluated by the correlational data between the MCMI-III personality disorder scales and the MMPI-2 clinical scales (Rossi, Van den Brande, Tobac, Sloore, & Hauben, 2003). Significant correlations were found between most of the MCMI-III personality disorder scales and the MMPI-2 clinical scales, including the 2-scale of the MMPI-2 with the avoidant personality disorder scale \( (r = .60) \) and depressive personality disorder scale \( (r = .59) \). The 7-Scale of the MMPI-2 strongly correlated with many of the personality disorder scales: depressive \( (r = .77) \), avoidant \( (r = .71) \), masochistic \( (r = .70) \), borderline \( (r = .69) \), schizotypal \( (r = .68) \), dependent \( (r = .67) \), negativistic \( (r = .66) \), and schizoid \( (r = .61) \). Parker, Hanson, and Hunsley (1988) conducted a meta-analytic study examining reliability, stability, and convergent validity of the original MMPI, along with the Rorshach and WAIS. For the MMPI, results showed good reliability \( (r = .84) \), but this included interrater and intrarater reliability, *K-R* 20, alpha, and part-whole correlations. The MMPI was also found to
have good stability \( (r = .74) \) and decent convergent validity \( (r = .46) \). The MMPI-2 contains several validity, clinical, content, and special scales to assess adult psychopathology.

Depression was assessed using the 2-Scale of the MMPI-2. The 2-Scale has been found to be associated with the presence of a mood disorder (Nelson, 1987; Nelson & Cichetti, 1991). Butcher (as cited in Butcher & Williams, 2000) found that the 2-Scale of the MMPI-2 clearly discriminated between depressed individuals and normals, with a \( t \)-score of 65 providing good separation between the two groups. Ben-Porath, Butcher, and Graham (1991) found that the 2-Scale score was the most effective standard scale for discriminating between depressed individuals and schizophrenics in an inpatient setting.

Trait anxiety was assessed using the 7-Scale of the MMPI-2. Research on the 7-Scale has shown that it is associated with severe and incapacitating anxiety. Schofield (as cited in Butcher & Williams, 2000) found that the 7-Scale was the peak score among neurotic outpatients diagnosed as having anxiety-state or obsessive-compulsive disorders. The behavioral correlates for the 7-Scale suggest disabling psychological symptoms in inpatient psychiatric settings with a high percentage of severe affective disorders and schizophrenics.

State anxiety was assessed using the Welsh Anxiety (\( A \)) scale of the MMPI-2. Internal consistency (.89 for men, .90 for women) and test-retest reliability are high (.91 for men and women) for the A-Scale (Butcher et al., 1989).

Client Intake Form

A client intake form (see Appendix A) created and used by a private practice in central Florida was utilized in the present study. It consisted of 21 pages of questions intended to obtain personal and demographic information, information about the client’s disabling conditions, and educational and work histories. Data related to age and problems with mental functioning were examined for the present study.

Sample

The sample consisted of 135 clients who sought services at a private psychological practice in central Florida during 2007 and 2008. A total of 650 clients were reviewed for inclusion in the study, but after careful consideration of inclusion/exclusion criteria, as well as missing data, the number of usable subjects was 135. Table 1 provides descriptive statistics for the present study’s sample. Subjects consisted of 73 (54.1%) males and 62 (45.9%) females. Subjects ranged in age from 21 to 67, with a mean age of 46.55 \( (S.D. = 11.57) \). The distribution
of age represented a normal curve, with the greatest number of ages represented toward the right half of the curve (see Figure 1). Years of education ranged from 6 to 22 years with a mean of 13.40 years ($S.D. = 2.42$). Presenting problems ranged from minimal to profound in terms of severity and included spinal cord injuries, head and neck injuries, extremity injuries, and organ problems (such as respiratory and bladder problems). Of the 135 total subjects, 97 (71.9%) claimed to have some sort of cognitive difficulty by endorsing the aforementioned item on the client intake form, whereas 38 (28.1%) did not endorse having any problems with mental functioning. All of the subjects in the present sample pursued litigation during or after services of the practice are rendered.

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>73</td>
<td>54.1</td>
</tr>
<tr>
<td>Female</td>
<td>62</td>
<td>45.9</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td>19</td>
<td>14.1</td>
</tr>
<tr>
<td>31-40</td>
<td>22</td>
<td>16.3</td>
</tr>
<tr>
<td>41-50</td>
<td>32</td>
<td>23.7</td>
</tr>
<tr>
<td>51-60</td>
<td>53</td>
<td>39.2</td>
</tr>
<tr>
<td>61-67</td>
<td>9</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Cognitive impairment was determined by an item on the client intake form. Identification of cognitive difficulty was made on the basis that subjects must have checked one or more of the four items on the client intake form indicating cognitive functioning for the following question: “Check problems with mental functioning you have had since the accident/incident.” Possible responses included:

1. Memory Problems;
2. Concentration Problems;
3. Mental Alertness Problems; and
4. Attention Span Problems.

Inclusion criteria for the present study included the following:

a) Subjects were at least 18 years old;
b) Subjects had experienced a personal injury that resulted in a disability;
c) Subjects had an F score that is 80 or less on the MMPI-2 to exclude malingerers and random responders.

Exclusion criteria for the present study included the following:

a) Subjects were below the age of 18;
b) Subjects had not experienced a personal injury resulting in a disability;
c) Subjects had an F score that is higher than 80 on the MMPI-2, which may have indicated malingering or random responding.

Data Analyses

Analyses for the present study were conducted by the researcher after data for 135 subjects was compiled from the archives at the private practice. Valid profiles were defined as those in which the F-Scale of the MMPI-2 was 80 or less (Butcher & Williams, 2000), as indicated in the inclusion criteria. Trait anxiety, as operationalized by the 7-Scale, was examined twice in each analysis, once with the K correction and once without it. All analyses were carried out using the Statistical Package for the Social Sciences (SPSS) for the following two research questions:

*Research question 1: What are the relationships between interest inventory profile elevation and depression and anxiety for individuals who have become disabled resulting from a personal injury?*

Pearson Product moment coefficients were calculated in order to determine the relationships between: a) interest inventory profile elevation and depression; b) interest inventory profile elevation and trait anxiety (with K correction); c) interest inventory profile elevation and trait anxiety (without K correction); and d) interest inventory profile elevation and state anxiety. Descriptive statistics, including mean, standard deviation, range, skewness, and kurtosis were also calculated.

*Research question 2: Do age and cognitive impairment influence the relationships among interest inventory profile elevation, depression, and anxiety for individuals who have become disabled resulting from a personal injury?*

A canonical correlation was conducted to determine whether a multivariate relationship exists between a set of predictor and criterion variables. Predictor variables consisted of profile elevation, age, and cognitive impairment. Criterion, or dependent, variables consisted of depression, trait anxiety (with and without K correction), and state anxiety. A Wilk’s lambda statistic was calculated to determine whether an overall relationship exists. For roots that emerged from the analysis, eigenvalues were calculated. Additionally, several hierarchical regression analyses were also performed to determine the following relationships. The following hierarchical regressions were conducted, in which profile elevation was the first step and age
plus type of injury was the second step.

a) Profile Elevation + Age + Type of Impairment → Depression
b) Profile Elevation + Age + Type of Impairment → Trait Anxiety (with K)
c) Profile Elevation + Age + Type of Impairment → Trait Anxiety (without K)
d) Profile Elevation + Age + Type of Impairment → State Anxiety

Procedures

The researcher received clearance to use human subjects from the university institutional review board (see Appendix B). The data set that was used consisted of subjects who completed the MMPI-2 and SDS during the normal intake process for a private practice at which they sought vocational or rehabilitation psychology services. All subjects were given an identical intake packet for completion, which was completed without a proctor in an onsite testing room. Tests were scored by a support staff employee of the private practice. A support staff employee also compiled data in an SPSS spreadsheet using the inclusion criteria and specific instruction from the researcher. Therefore, the researcher did not view any client files, maintaining absolute confidentiality. Every client during 2007 and 2008 was reviewed for inclusion in the study.
To explore the relationships among interest inventory profile elevation, depression, and anxiety, both correlational and regression analyses were conducted. The main variables of interest were interest inventory profile elevation as measured by the Self-Directed Search (Holland et al., 1994) and depression, trait anxiety, and state anxiety as measured by the Minnesota Multiphasic Personality Inventory-2 (Butcher et al., 1989). Trait anxiety was measured with and without $K$ correction, which was developed to determine the proportion of $K$ that, when added to the raw score of an MMPI-2 clinical scale, would maximize the ability to discriminate between normative and criterion groups (Greene, 2000). Components of both instruments were compared to each other and were used in determining the amount of variance that profile elevation, along with age and type of injury, contributes to depression and anxiety. This chapter presents the results of these analyses including a demographic description of the sample, the means, standard deviations, skewness, and kurtosis of each of the main variables, and the hypotheses and results for each of the research questions originally proposed.

Data Analysis

Research Question 1: What are the relationships between interest inventory profile elevation and depression and anxiety for individuals who have become disabled resulting from a personal injury?

a. There will be a negative relationship between interest inventory profile elevation and depression;
b. There will be a negative relationship between interest inventory profile elevation and trait anxiety (with $K$ correction);
c. There will be a negative relationship between interest inventory profile elevation and trait anxiety (without $K$ correction);
d. There will be a negative relationship between interest inventory profile elevation and state anxiety.

Descriptive statistics were calculated for each variable, including mean, standard deviation, range, skewness, and kurtosis, and are presented in Table 2. When examining
skewness and kurtosis, the author concluded that the skewness and kurtosis for all of the variables examined were within the expected range of chance fluctuations in those statistics and that there were distributions with no significant skewness or kurtosis.

Table 2
Sample Descriptive Statistics (N = 135)

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>46.55</td>
<td>11.57</td>
<td>21-67</td>
<td>-.53</td>
<td>-.74</td>
</tr>
<tr>
<td># of cognitive difficulties</td>
<td>1.84</td>
<td>1.49</td>
<td>0-4</td>
<td>.11</td>
<td>-1.41</td>
</tr>
<tr>
<td>F-Scale t-score</td>
<td>56.13</td>
<td>9.84</td>
<td>36-79</td>
<td>.06</td>
<td>-.81</td>
</tr>
<tr>
<td>K-Scale t-score</td>
<td>52.15</td>
<td>10.67</td>
<td>30-78</td>
<td>-.02</td>
<td>-.68</td>
</tr>
<tr>
<td>Depression</td>
<td>72.60</td>
<td>14.22</td>
<td>38-109</td>
<td>-.01</td>
<td>-.20</td>
</tr>
<tr>
<td>Trait anxiety (with K)</td>
<td>64.78</td>
<td>13.20</td>
<td>37-97</td>
<td>.26</td>
<td>-.64</td>
</tr>
<tr>
<td>Trait anxiety (without K)</td>
<td>48.66</td>
<td>14.69</td>
<td>19-85</td>
<td>.35</td>
<td>-.49</td>
</tr>
<tr>
<td>State anxiety</td>
<td>53.41</td>
<td>10.88</td>
<td>35-85</td>
<td>.54</td>
<td>-.13</td>
</tr>
<tr>
<td>Profile elevation</td>
<td>123.13</td>
<td>45.12</td>
<td>20-242</td>
<td>-.06</td>
<td>-.46</td>
</tr>
</tbody>
</table>

Using adult norms from The Self-Directed Search Technical Manual (Holland et al., 1994) and calculating 1 S.D. above and below the average range, high and low profile elevations be defined as follows: high elevations (men, 150 >; women, 147 >), average elevations (men, 129-149; women, 128-146), and low elevations (men,< 128; women, < 127). Means for the present study in a sample of individuals with disabilities resulting from a personal injury were 131.49 (S.D. = 46.77) for males and 117.65 (S.D. = 42.25) for females.

Correlation coefficients were computed between profile elevation and depression, trait anxiety, and state anxiety. Results of the correlational analyses presented in Table 3 show that none of the four correlations were statistically significant and were all less than or equal to .13. In general, the results suggest that profile elevation is not related to a) depression, b) trait anxiety (with K correction), c) trait anxiety (without K correction), or d) state anxiety in this population. Therefore, the original hypotheses were rejected.
Table 3  
*Correlations between SDS Profile Elevation and Depression and Anxiety (N = 135)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Profile elevation</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Depression</td>
<td>-.130</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Trait anxiety (with K)</td>
<td>-.060</td>
<td>.774*</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Trait anxiety (without K)</td>
<td>-.004</td>
<td>.742*</td>
<td>.939*</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>5. State anxiety</td>
<td>.113</td>
<td>.580*</td>
<td>.715*</td>
<td>.866*</td>
<td>–</td>
</tr>
</tbody>
</table>

*p < .01.

Research Question 2: Do age and cognitive impairment influence the relationships among interest inventory profile elevation, depression, trait anxiety (with and without K correction), and state anxiety for individuals who have become disabled resulting from a personal injury?

a. There will be no relationships among interest inventory profile elevation and depression, trait anxiety (with and without K correction), and state anxiety, using age and cognitive impairment as mediating variables.

A canonical correlation was used to determine the degree to which personal variables (e.g., profile elevation, age, and cognitive impairment) are related to personal adjustment variables (e.g., depression, trait anxiety with K correction, trait anxiety without K correction, and state anxiety). Variables were grouped together and named (e.g., personal adjustment variables, personal variables) based on theoretical or literature-based support. A canonical correlation analysis is the correlation of two canonical (latent) variables and provides indices of both statistical and practical significance. For each canonical variate one can also assess how strongly it is related to measured variables in its own set or the set for the other canonical variate.

The relationship between personal adjustment variables and personal variables was statistically significant. As seen in Table 4, this relationship was captured with two pairs of canonical variates, $\chi^2(12) = .719, p < .001$ and $\chi^2(6) = .856, p < .001$, respectively. The first line in the table indicates statistical evidence for a relationship between the two sets of variables. The second line suggests that, after controlling for the first canonical pair, there is a residual relationship that still has a systematic portion that can be represented by the second pair. The third line indicates that there is no significant residual relationship after controlling for the first
and second canonical pairs. Squaring the associated canonical correlation of .400 ($R^2 = .16$) and .361 ($R^2 = .13$) suggested that the two pairs were of practical importance.

Table 4  
*Dimension Reduction Analysis*

<table>
<thead>
<tr>
<th>Roots</th>
<th>p-value</th>
<th>Wilks Lambda</th>
<th>Eigenvalue</th>
<th>Canonical R</th>
<th>F</th>
<th>Hypoth DF</th>
<th>Error DF</th>
<th>Error DF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 3</td>
<td>.000*</td>
<td>.719</td>
<td>.191</td>
<td>.400</td>
<td>3.746</td>
<td>12.00</td>
<td>338.95</td>
<td></td>
</tr>
<tr>
<td>2 to 3</td>
<td>.003*</td>
<td>.856</td>
<td>.150</td>
<td>.361</td>
<td>3.462</td>
<td>6.00</td>
<td>258.00</td>
<td></td>
</tr>
<tr>
<td>3 to 3</td>
<td>.379</td>
<td>.985</td>
<td>.015</td>
<td>.122</td>
<td>.977</td>
<td>2.00</td>
<td>130.00</td>
<td></td>
</tr>
</tbody>
</table>

$p < .01$.

Figure 2 shows the relationships between canonical variates and among canonical variables, dependent variables, and covariates for the first canonical variate. This figure shows that the relationship between the two canonical variates is relatively strong and that cognitive impairment is the best predictor for the personal adjustment variables.

![Diagram](image)

**Figure 2**  
*Relations between Canonical Variables and Variables for 1st CV Pair*
Table 5 provides the correlation matrix for the covariate, or personal variables, and canonical variables, as well as the dependent, or personal adjustment variables, and canonical variables. The matrix shows that the correlation largest in magnitude for the first variate is cognitive impairment. For the second pair, the largest correlation was for that of depression and profile elevation and age, but the loadings of the dependent variables did not provide strong evidence for a second canonical variate. For the personal adjustment variables and the canonical variates, the matrix shows that the correlations largest in magnitude are found for depression through state anxiety for the first variate pair. Despite the fact that the second canonical root was significant at the multivariate level, none of the personal adjustment variables significantly loaded onto the root at the univariate level, which suggests a weak relationship and should be viewed with caution.

Table 5
Correlations between Covariate and Canonical Variables/
Dependent and Canonical Variables

<table>
<thead>
<tr>
<th>Covariate variables</th>
<th></th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile elevation</td>
<td>.011</td>
<td>-.730*</td>
<td>.685</td>
</tr>
<tr>
<td>Age</td>
<td>-.141</td>
<td>.790*</td>
<td>.597</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>.961*</td>
<td>.194</td>
<td>.195</td>
</tr>
</tbody>
</table>

Dependent variables

<table>
<thead>
<tr>
<th>Depression</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trait anxiety (with K)</td>
<td>.849*</td>
<td>.523</td>
<td>.058</td>
</tr>
<tr>
<td>Trait anxiety (without K)</td>
<td>.880*</td>
<td>.102</td>
<td>-.444</td>
</tr>
<tr>
<td>State anxiety</td>
<td>.915*</td>
<td>-.385</td>
<td>.094</td>
</tr>
</tbody>
</table>

*p < .05.

In conclusion, the relationship between personal adjustment variables and personal variables is captured well by one canonical pair – personal adjustment variables and cognitive impairment. Profile elevation, however, was not found to be related to personal adjustment. Although the multivariate relationship between profile elevation and depression and age was significant, none of the personal adjustment variables loaded onto the root strongly enough to
contribute to the prediction of the root. Therefore, the original hypothesis that there would be no relationships among interest inventory profile elevation, depression, trait anxiety (with and without $K$ correction), and state anxiety using age and type of injury as mediating variables was supported per the canonical correlation.

A series of hierarchical regression analyses were also conducted to examine how well profile elevation, age, and the presence of a cognitive impairment predicted depression, trait anxiety, and state anxiety. The results of the analysis are shown in Table 6, with each of the alternative lines for Step II representing results from a different equation in which Step I entered profile elevation and Step II entered age and cognitive impairment. The first regression was conducted to evaluate how well profile elevation, age, and cognitive impairment predicted depression as assessed by the 2-scale of the MMPI-2. The first model, which included profile elevation, had an $R^2$ of .017, which was not significant at the .05 level $F(1, 134) = 2.285, p = .133$. When age and cognitive impairment were added to the model, however, the $R^2$ of .152 was statistically significant at the .05 level, $F(3, 134) = 7.80, p < .05$, indicating that approximately 15% of the variance of depression in the sample can be accounted for by the combination of profile elevation, age, and cognitive impairment. Furthermore, 13.5% of the variance in depression can be attributed to the addition of the second set of variables alone. When further examining the contribution of each of the variables, it is shown that cognitive impairment is the only variable that significantly predicts depression by itself ($p < .01$), with 12.7% of the variance being accounted for by cognitive impairment.
Table 6
Summary of Hierarchical Regression Analysis for Variables Predicting Depression (N = 135)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Profile elevation</td>
<td>-.041</td>
<td>.027</td>
<td>-.130</td>
<td>-.039</td>
<td>.026</td>
<td>-.125</td>
</tr>
<tr>
<td>Age</td>
<td>.045</td>
<td>.101</td>
<td>.037</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>11.348</td>
<td>2.559</td>
<td>.360**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.017</td>
<td></td>
<td>.152*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$</td>
<td>2.285</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$F$ for change in $R^2$

*p < .05, **p < .01

The second regression analysis was conducted to determine how well profile elevation, age, and cognitive impairment predicted trait anxiety (with $K$ correction) as assessed by the 7-scale of the MMPI-2. The results of the analysis are presented in Table 7. The first model, which included profile elevation, had an $R^2$ of .004, which was not significant at the .05 level $F(1, 134) = .482, p = .489$. When age and cognitive impairment were added to the model, however, the $R^2$ of .128 was statistically significant at the .05 level, $F(3, 134) = 6.425, p < .05$, indicating that approximately 13% of the variance in trait anxiety in the sample can be accounted for by the combination of profile elevation, age, and cognitive impairment. Furthermore, 12.5% of the variance in trait anxiety can be attributed to the addition of the second set of variables alone. When further examining the contribution of each of the variables, it is shown that cognitive impairment is the only variable that significantly predicts trait anxiety with $K$ by itself ($p < .01$), with 12.0% of the variance being accounted for by cognitive impairment.
### Table 7
Summary of Hierarchical Regression Analysis for Variables Predicting Trait Anxiety with K correction (N = 135)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>B</td>
</tr>
<tr>
<td>Profile elevation</td>
<td>-.018</td>
<td>.025</td>
<td>-.060</td>
<td>-.023</td>
<td>.024</td>
<td>-.080</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td>-.129</td>
<td>.095</td>
<td>-.113</td>
</tr>
<tr>
<td>Cognitive imp.</td>
<td></td>
<td>10.250</td>
<td>2.408</td>
<td>.351**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.004</td>
<td></td>
<td></td>
<td>.128*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$</td>
<td>.482</td>
<td></td>
<td></td>
<td>6.425</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td></td>
<td></td>
<td></td>
<td>9.367</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, **p < .01

The third regression analysis was conducted to determine how well profile elevation, age, and cognitive impairment predicted trait anxiety (without $K$ correction) as assessed by the 7-scale of the MMPI-2. The results of the analysis are presented in Table 8. The first model, which included profile elevation, had an $R^2$ of .000, which was not significant at the .05 level $F(1, 134) = .002, p = .967$. When age and cognitive impairment were added to the model, however, the $R^2$ of .143 was statistically significant at the .05 level, $F(3, 134) = 7.298, p < .05$, indicating that approximately 14% of the variance in trait anxiety in the sample can be accounted for by the combination of profile elevation, age, and cognitive impairment. Furthermore, all 14% of the variance in trait anxiety can be attributed to the addition of the second set of variables alone. When further examining the contribution of each of the variables, it is shown that cognitive impairment is the only variable that significantly predicts trait anxiety without $K$ by itself ($p < .01$), with 13.4% of the variance being accounted for by cognitive impairment.
Table 8  
Summary of Hierarchical Regression Analysis for Variables Predicting Trait Anxiety without K correction (N = 135)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>Profile elevation</td>
<td>-.001</td>
<td>.028</td>
<td>-.004</td>
<td>-.010</td>
<td>.027</td>
<td>-.030</td>
</tr>
<tr>
<td>Age</td>
<td>-.190</td>
<td>.105</td>
<td>-.150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive imp.</td>
<td>12.013</td>
<td>2.657</td>
<td>.369**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>.000</td>
<td></td>
<td>.143*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$</td>
<td>.002</td>
<td></td>
<td>7.298</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td>10.946</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, **p < .01

The fourth regression analysis (Table 9) was conducted to evaluate how well profile elevation, age, and cognitive impairment predicted state anxiety as assessed by the A-scale of the MMPI-2. The first model, which included profile elevation, had an $R^2$ of .013, which was not significant at the .05 level $F(1, 134) = 1.728, p = .191$. When age and cognitive impairment were added to the model, however, the $R^2$ of .154 was statistically significant at the .05 level, $F(3, 134) = 7.934, p < .05$, indicating that approximately 15% of the variance in state anxiety in the sample can be accounted for by the combination of profile elevation, age, and cognitive impairment. Furthermore, 14% of the variance in state anxiety can be attributed to the addition of the second set of variables alone. When further examining the contribution of each of the variables, it is shown that cognitive impairment is the only variable that significantly predicts state anxiety by itself ($p < .01$), with 12.2% of the variance being accounted for by cognitive impairment.
Table 9
Summary of Hierarchical Regression Analysis for Variables Predicting State Anxiety (N = 135)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 B</th>
<th>Model 1 SE B</th>
<th>Model 1 β</th>
<th>Model 2 B</th>
<th>Model 2 SE B</th>
<th>Model 2 β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile elevation</td>
<td>.027</td>
<td>.021</td>
<td>.113</td>
<td>.019</td>
<td>.020</td>
<td>.081</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>- .177</td>
<td>.077</td>
<td>- .189</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive imp.</td>
<td></td>
<td>8.495</td>
<td>1.955</td>
<td>.353**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td></td>
<td>.013</td>
<td></td>
<td>.154*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( F )</td>
<td></td>
<td>1.728</td>
<td></td>
<td>7.934</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( F ) for change in ( R^2 )</td>
<td></td>
<td></td>
<td></td>
<td>10.908</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < .05 \), ** \( p < .01 \)

In conclusion, the hierarchical regression analyses found that profile elevation is not associated with the personal adjustment variables (depression, trait anxiety with \( K \) correction, trait anxiety without \( K \) correction, state anxiety) by itself or in the presence of other variables. Therefore, the original hypothesis was supported in that there is no relationship among these variables using age and cognitive impairment as mediating variables in individuals with disabilities resulting from a personal injury. Results showed that cognitive impairment is the only variable that significantly predicts the personal adjustment variables.

Additional Analyses

Correlation coefficients were computed between profile elevation and trait anxiety with and without \( K \) correction. Results of the correlational analyses presented in Table 10 show that neither of the correlations were statistically significant and were less than or equal to -.060. In general, the results suggest that \( K \) correction did not have a significant effect on the relationships between profile elevation and trait anxiety in this population.
Table 10
Correlations between Profile Elevation and Trait Anxiety with and without K (N = 135)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Profile elevation</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>2. Trait anxiety (with K)</td>
<td>-.060</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>3. Trait anxiety (w/o K)</td>
<td>-.004</td>
<td>.939*</td>
<td>–</td>
</tr>
</tbody>
</table>

*p < .01.

Correlation coefficients were computed between age, depression, trait anxiety (with and without K correction), and state anxiety. Results of the correlational analyses presented in Table 11 show that none of the four correlations were statistically significant and were all less than or equal to .155. In general, the results suggest that age is not related to depression, trait anxiety, or state anxiety in this population.

Table 11
Correlations between Age and Depression and Anxiety (N = 135)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>–</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Depression</td>
<td>.106</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Trait anxiety (with K)</td>
<td>-.053</td>
<td>.774*</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Trait anxiety (w/o K)</td>
<td>-.096</td>
<td>-.742*</td>
<td>.939*</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>5. State anxiety</td>
<td>-.155</td>
<td>.580*</td>
<td>.715*</td>
<td>.866*</td>
<td>–</td>
</tr>
</tbody>
</table>

*p < .01.

Correlation coefficients were computed between cognitive impairment, depression, trait anxiety (with and without K correction), and state anxiety. Results of the correlational analyses presented in Table 12 show that all four correlations for cognitive impairment were statistically significant and were all greater than or equal to .327. In general, the results suggest that cognitive impairment is related to depression, trait anxiety, or state anxiety in this population.
Table 12
Correlations between Cognitive Impairment and Depression and Anxiety (N = 135)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cognitive Impairment</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Depression</td>
<td>.365*</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Trait anxiety (with $K$)</td>
<td>.335*</td>
<td>.774*</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Trait anxiety (w/ out $K$)</td>
<td>.349*</td>
<td>-.742*</td>
<td>.939*</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>5. State anxiety</td>
<td>.327*</td>
<td>.580*</td>
<td>.715*</td>
<td>.866*</td>
<td>–</td>
</tr>
</tbody>
</table>

*$p < .01$.

Correlation coefficients were computed between number of cognitive difficulties, profile elevation, depression, trait anxiety (with and without $K$ correction), and state anxiety. Results of the correlational analyses presented in Table 13 show that number of cognitive difficulties was significantly related to depression, trait anxiety (with and without $K$), and state anxiety, and were all greater than or equal to .384. In general, these results suggest that an individual who has a higher number of cognitive difficulties will have greater depression and anxiety. However, number of cognitive difficulties was not significantly related to profile elevation.
Table 13
*Correlations between Number of Cognitive Difficulties and Profile Elevation, Depression, and Anxiety (N=135)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. # Cognitive difficulties</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Profile elevation</td>
<td>.013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Depression</td>
<td>.422*</td>
<td>-.130</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Trait anxiety (with K)</td>
<td>.384*</td>
<td>-.060</td>
<td>.774*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Trait anxiety (w/ out K)</td>
<td>.406*</td>
<td>-.004</td>
<td>-.742*</td>
<td>.939*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. State anxiety</td>
<td>.393*</td>
<td>.113</td>
<td>.580*</td>
<td>.715*</td>
<td>.866*</td>
<td></td>
</tr>
</tbody>
</table>

*p < .01.

In conclusion, the canonical correlation and hierarchical regression analyses found that profile elevation was not related to any of the personal adjustment variables by itself or in concert with other variables. The analyses found that cognitive impairment was the only variable that was found to be significantly associated with depression, trait anxiety (with and without K correction), and state anxiety. Additional analyses determined that adding the K correction to the 7-Scale did not have an effect on the relationships between profile elevation and trait anxiety in this population, nor did age. Consistent with the canonical correlation and hierarchical regression analyses, additional analyses found that cognitive impairment was related to the personal adjustment variables and that there was a positive relationship between number of cognitive difficulties and depression, trait anxiety (with and without K correction), and state anxiety.
The purpose of the present study was to increase knowledge about the relationships between interest inventory profile elevation, depression, and anxiety in individuals with disabilities resulting from a personal injury. Two assessment instruments were used to measure the variables of this study. The Self-Directed Search (Holland et al., 1994) was used to measure interest inventory profile elevation, which was defined as the sum of the six RIASEC scores across the five sections of the SDS (Fuller, Holland, & Johnston, 1999). The MMPI-2 (Butcher et al., 1989) was used to measure depression, trait anxiety (with and without \( K \) correction), and state anxiety. This chapter includes a discussion of the results, study limitations, implications for practice, and recommendations for future research.

Discussion of Findings

This section includes a summary of the findings as related to the study’s original hypotheses, as well as a discussion of and comparison to the relevant literature presented in Chapter II.

*Research Question One*: What are the relationships between interest inventory profile elevation and depression and anxiety for individuals who have become disabled resulting from a personal injury?

Researchers have acknowledged the possibility of there being a relationship between depression and interest inventory profile elevation for years (Spokane, Luchetta, & Richwine, 2002). Contrary to what previous literature suggested, though, results of the present study showed that profile elevation was not significantly correlated with depression, trait anxiety, or state anxiety in individuals with disabilities resulting from a personal injury. Relationships between profile elevation and depression, trait anxiety (with \( K \) correction), trait anxiety (without \( K \) correction), and state anxiety were negative, meaning that individuals with higher profile elevation scores had lower depression and anxiety scores. However, these relationships were not statistically significant and could have been due to chance. Therefore, the original hypotheses that there would be statistically significant negative relationships between profile elevation and depression, trait anxiety with \( K \), trait anxiety without \( K \), and state anxiety were not supported.
These results were inconsistent with previous studies that found profile elevation to be correlated with certain personality characteristics (Fuller, Holland, & Johnston, 1999; Gottfredson & Jones, 1993; Swanson & Hansen, 1986). More specifically, the literature suggested that low profile elevation was found to be moderately correlated with depressive traits, unsociability, unconventionality, and an unexpressive, unenthusiastic, or unimpulsive style (as cited in Bullock, 2006). The contradiction between the results of the present study and previous studies is an important finding because, although there may still be a possible relationship between profile elevation and depressive personality traits, it shows that using interest inventory profile elevation as an indicator for a possible depressive disorder would not be a valid screening tool in individuals with disabilities resulting from a personal injury.

An alternative explanation for these results could be associated with the fact that the 2-scale of the MMPI-2 is thought to function more as a state than a trait scale. As Greene (2000) stated, “Scale 2 is thought to measure reactive or exogenous depression rather than ‘neurotic’ or endogenous depression” (p. 134). Therefore, scores would be expected to vary as the client’s mood changes. Much of the previous literature related to interest inventory profile elevation and depression has suggested that a moderate relationship between the two variables exists when depression was viewed more as a personality characteristic (Fuller et al., 1999) than a clinical syndrome. Thus, the 2-scale of the MMPI-2 may be a better indicator of depression as a clinical syndrome than as a measure of depressive personality traits. The suggestion that profile elevation is not significantly related to clinical syndromes but rather areas of personality is consistent with Holland’s (1997) original position that vocational interest is an expression of personality.

According to Gottfredson (2002), self-estimates and self-ratings on the SDS may be interpreted as type-specific self-efficacy expectations and that vocational aspirations may often resemble goals. The finding of the present study that profile elevation is not significantly correlated with depression neither supports nor negates Gottfredson’s idea. If a significant negative relationship had been found between profile elevation and depression, as originally hypothesized, it would have been consistent with Gottfredson’s position because individuals who endorse having fewer interests and lower self-estimates, and thus have lower profile elevation scores, have been found to be moderately related to depressive personality traits (Fuller, Holland, & Johnston, 1999). Therefore, individuals with depression may have lower self-efficacy expectations (Gecas, 1989).
There is a dearth of previous research on the relationship between interest inventory profile elevation and anxiety, but anxiety was included in the present study because of the high prevalence of comorbid depressive and anxiety disorders. Studies have shown that the presence of an anxiety disorder is the strongest risk factor for the development of depression (Hranov, 2007). Katon and Roy-Byrne (1991) found that the prevalence of comorbid depression and anxiety in the community may be as high as 10-20%. However, results of the present study suggested that there is not a statistically significant relationship between interest inventory profile elevation and trait or state anxiety in individuals with disabilities resulting from a personal injury and that any relationship that does exist may be due to chance.

Research Question 2: Do age and cognitive impairment influence the relationships among interest inventory profile elevation and depression and anxiety for individuals who have become disabled resulting from a personal injury?

Results of the present study found that personal variables (profile elevation, age, cognitive impairment) and personal adjustment variables (depression, trait anxiety with $K$, trait anxiety without $K$, state anxiety) are significantly related. Furthermore, all of the personal adjustment variables were shown to be associated with cognitive impairment. This relationship showed that depression and anxiety were higher with the presence of a cognitive impairment. However, the relationship between interest inventory profile elevation and personal adjustment variables was not significantly mediated by age and cognitive impairment. Although cognitive impairment was not found to be a mediating variable in the relationship between profile elevation and depression, trait anxiety (with and without $K$ correction), and state anxiety, it was found to be significantly correlated with depression and anxiety without profile elevation. The relationship between cognitive impairment and depression has been supported by previous studies in the literature, such as Silver et al.’s (2001) finding that individuals with a history of traumatic brain injury have an increased risk for many psychiatric disorders as compared to the general population, including major depression and dysthymia. Additionally, the present study found that greater number of cognitive difficulties were significantly related to greater levels of depression and anxiety, which was also consistent with the literature on traumatic brain injury (Alderfer et al., 2005; Silver et al., 2001; Kay, 1992; Alves et al., 1986; Dikmen et al., 1986).

Despite the fact that age was not found to be a mediating variable in the relationship between profile elevation and anxiety, research has shown that anxiety may present differently
across adult age groups (Turnbull, 1989). Correlation coefficients in the present study, however, found no significant relationships between age and anxiety. This was supported by the findings of Fuentes and Cox (2002) that individual item responses were similar across age groups on various measures of anxiety, suggesting minimal age-group differences pertaining to anxiety symptoms that are most prominent. The present study also found no significant relationships between age and depression, which was supported by studies in the literature suggesting that there are no significant age effects on depression when the effects of age and other risk factors are controlled (Roberts et al., 1997).

Although results of the present study found no statistical significance in the relationships between interest inventory profile elevation, depression, and anxiety, findings should be viewed taking sample size into consideration. While a sample size of 135 was within the appropriate range for having sufficient power for the number of variables examined, a larger sample size may have provided a more ideal condition for stronger relationships between and among variables. Similarly, the sample size must be considered when examining whether relationships between profile elevation, depression, and anxiety exist because relationships did exist, albeit weak ones. For depression and trait anxiety (with and without $K$-correction), weak negative relationships were found, whereas the relationship between profile elevation and state anxiety was a weak positive relationship. Therefore, it may be inappropriate to state that no relationship exists between these variables when, in fact, weak relationships do exist.

**Additional Findings**

An additional finding was that there was no significant difference in the relationships between profile elevation and trait anxiety, with and without $K$-correction, in the present study. This was consistent with the findings of Archer, Fontaine, and McCrae (1998), who found that the $K$-correction did not result in higher correlations with external criteria in a psychiatric sample. Similarly, Hunt et al. (1948) and Silver and Sines (1962) found no increase in diagnostic accuracy when the $K$ correction was used with VA and state hospital patients. Colby (1989) concluded that profiles with $K$-corrections did not differentiate patients from non-patients better than profiles without $K$-correction. Although the relationship with the $K$-corrected trait anxiety score was greater than that of the non-$K$-corrected score, the difference was not statistically significant and could have been due to chance. Therefore, the $K$-correction, which is used as an
indicator of test defensiveness and as a correction for the tendency to deny problems (Butcher & Williams, 2000), did not increase the strength of the relationship with profile elevation.

Limitations

There are several limitations relevant to the study’s internal and external validity. The limitations are related to the population and restricted range of interest inventory profile elevation.

Sample

The sample used in this study was from a private psychological practice specializing in vocational and rehabilitation psychology services. Selection bias may have been a threat to the internal validity of the present study. Subjects were not randomly selected because every client seen by the practice in 2007 and 2008 was reviewed for inclusion in the study. Additionally, all subjects sought litigation before or during the time when psychological measures were administered. Variables related to the uncertainty and stress of litigation, as well as other unknown variables of litigation, may have influenced the results. It is possible that subjects answered test questions in a manner that made them appear to have more psychopathology than they actually do, but it was assumed for purposes of the present study that subjects responded accurately and honestly. Yet the findings of this study should only be generalized to litigation-seeking adults who have become disabled as a result of a personal injury. Finally, although age was used as a mediating variable, there may not have been enough subjects above age 65 to make conclusions about the relationship between profile elevation and depression and anxiety in older individuals.

Restricted Range of Interest Inventory Profile Elevation

There is a possible high score of 300 on interest inventory profile elevation. Using adult norms from The Self-Directed Search Technical Manual (Holland et al., 1994) and calculating 1 S.D. above and below the average range, high and low profile elevations be defined as follows: high (men, 150 >; women, 147 >), average (men, 129-149; women, 128-146), and low (men, < 128; women, < 127). The highest score in the present sample was 242, and the mean score was 125. Furthermore, there were only 6 individuals in the sample who had profile elevation scores above 200. Although data for the present study were not truncated, there were minimal scores that could be considered “high.” Therefore, it may be difficult to make conclusions about the relationship between profile elevation and depression and anxiety when the full range of profile
elevation scores was minimally represented. Although the sample size for the present study was within the appropriate range for having sufficient power, a sample size approximately two-thirds larger would have provided a large enough sample to make convincing statements about extreme scores on both ends of the continuum, assuming it met assumptions for normality. Additionally, a larger sample size may have increased the probability of finding stronger relationships between and among variables.

Implications for Counseling

The findings of the study have implications for counseling practice. As previously stated in an earlier chapter, assessments are often interpreted in ways that are not consistent with research (Fuller, Holland, & Johnson, 1999). Interest inventory profile elevation often gets interpreted using the counselor's judgment (Gottfredson & Jones, 1993), which may be due to the fact that there is still relatively little empirical research on interest inventory profile elevation. Lehberger (as cited in Bullock & Reardon, 2008) suggested that individuals with lower scores on the SDS may require more rigorous career counseling services than those with higher scores and more distinct profile shapes. The present study was designed to provide support for the interpretation of profile elevation in relation to depression and anxiety based on previous research that has shown some personality correlates of profile elevation that may be helpful in more accurately interpreting the construct. Consistent with Fuller, Holland, and Johnston’s (1999) suggestion that profile elevation’s interpretability has not been completely validated, the present study showed that there is still much that needs to be explored in interpreting the relationships between interest inventory profile elevation, clinical syndromes, and personality traits.

Practitioners who utilize the MMPI-2 and SDS in their psychological test batteries are likely to find the results of the present study relevant to their practice. Contrary to findings of prior research, results of the current study found that interest inventory profile elevation is not significantly related to depression and anxiety. As previously discussed, though, results should be interpreted with caution due to the inherent limitations of the study. Despite the fact that the mean score for depression was relatively high in the present sample (mean = 72.60, S.D. = 14.22), it can also be assumed that practitioners can use the SDS with a high degree of confidence that depression as a clinical syndrome may not interfere with an individual’s expression of interests and ability self-estimates.
Additionally, the finding that cognitive impairment was significantly related to depression and anxiety has implications on clinical practice. Counselors working with individuals presenting with a cognitive impairment should be aware of the potential for depression and/or anxiety issues. Administering a screener for depression and anxiety, such as the Beck Depression Inventory and Beck Anxiety Inventory, could be an effective way to identify the presence of a mood disorder in individuals with cognitive impairment, which could be an important piece of information in assisting these individuals in the career decision making process. The additional finding that there is a significant relationship between depression, anxiety, and number of cognitive difficulties present provides an even stronger argument for practitioners to screen for depression and anxiety in this population.

Bullock and Reardon (2005) suggested that interest inventory profile elevation may provide additional information apart from the SDS secondary constructs about a client’s personality and preferences that can be explored in a counseling relationship. For example, profile elevation could potentially provide information about a client’s differentiation on the SDS, which is defined as “the level of definition or distinctness of a personality profile” (Reardon & Lenz, 1998, p. 262). A poorly differentiated profile could have high or low profile elevation, and the relationship of profile elevation with depression or anxiety could provide additional information about what is keeping a client from more strongly identifying with an area(s) of interest. Discussing symptoms of mood and anxiety disorders with older clients who have lower profile elevation scores and a cognitive impairment could be important in the career decision making process. In summary, results of this study contribute to further conceptualizing interest inventory profile elevation as a separate construct from the SDS secondary constructs in research and clinical practice, but further research needs to be done.

Recommendations for Future Research

The results and discussion of the present study have highlighted several areas for future research. These research areas include using the SDS with measures of depression and anxiety, investigating extreme interest inventory profile elevation scores, RIASEC types in relation to profile elevation, and profile elevation as a multi-faceted construct, and replicating the study.

*Using the SDS with Measures of Depression and Anxiety*

Results of the present study did not find a significant relationship between profile elevation and depression, which was incongruent with results of prior research. As previously
discussed, this could be attributed to the notion that the 2-Scale of the MMPI-2 assesses depression as a clinical syndrome rather than as a personality trait. Future research should utilize other measures of depression to assess whether the aforementioned conclusion is correct in other populations and to ascertain whether profile elevation is related to depression as a clinical syndrome or as a personality characteristic. There are several other instruments used to measure depression and anxiety that could be used in future studies to assess the relationship with interest inventory profile elevation. The Beck Depression Inventory, Beck Anxiety Inventory, Hamilton Depression Scale, Geriatric Depression Scale, and the Spielberger State-Trait Anxiety Inventory, to name a few, are some common measures of depression and anxiety that could be explored in relation to interest inventory profile elevation.

Although the present study did not utilize the Harris-Lingoes subscales (Harris & Lingoes, 1955), future studies could examine possible relationships between interest inventory profile elevation and the Harris-Lingoes scales associated with Scale 2 (Depression), including D1-Subjective Depression, D2-Psychomotor Retardation, D3- Physical Malfunctioning, D4-Mental Dullness, and D5- Brooding. However, these scales are typically only used when the 2-Scale of the standard clinical scales reaches a level that is considered clinically significant ($t = 65$). No Harris-Lingoes scales exist for Scale 7 (Psychasthenia) because the authors considered this scale to be unidimensional and, therefore, unsuitable for subscales.

There are other opportunities for using the MMPI-2 with the SDS. Bullock and Reardon (2005) suggested that profile elevation may show an individual’s energy level, which could indicate the level of energy a client has to give to the career decision-making process. In order to explore this postulation, future research could assess the relationship between interest inventory profile elevation and the 9-scale of the MMPI-2, which can be viewed as a measure of psychological and physical energy, with high scorers having excessive energy and possible hypomanic or manic symptoms (Hathaway, 1951). An individual’s score on the 9-scale has been found to be related to age (as cited in Greene, 2000), so using age as a mediator in this relationship could also be useful.

**Extreme Interest Inventory Profile Elevation Scores**

The distribution of interest inventory profile elevation in the present sample represented a normal curve, with a mean of 123.13 ($S.D. = 45.12$) and a range of 20 to 242. With most of the scores falling in the middle two-thirds of the bell curve, the findings from this study can be
applied to individuals with moderate profile elevation scores with a high degree of confidence. Future research, however, may want to explore the relationships investigated in this study in individuals with extreme interest inventory profile elevation scores.

**RIASEC Types**

As previously noted, Holland’s RIASEC theory (1997) stated that individuals can be classified as one of six personality types: realistic, investigative, artistic, social, enterprising, or conventional. Exploring interest inventory profile elevation in relation to each of these personality types may provide additional information about an individual apart from the secondary constructs. Future research may want to investigate profile elevation based on RIASEC type to indicate potential differences or trends in level (e.g., low, moderate, high) according to personality type.

**Profile Elevation as a Multi-Faceted Construct**

Researchers have likened the construct of interest inventory profile elevation to the concept of Spearman’s general factor of intelligence in that it is a global or general (unidimensional) interest factor (Darcy & Tracey, 2003). However, future research could investigate the possibility of profile elevation being a multi-faceted construct with varying patterns. For example, it may be appropriate to separate the five sections of the SDS into two groups and examine profile elevation in that manner. The two groups could include activities and occupations as one group and competencies, self-estimates I, and self-estimates II into another group. This would separate estimates of ability from interests, whereby a profile elevation score could be computed and explored for each group.

**Replication of the Study**

There are several reasons why replicating the present study would be important, including 1) the need for a larger sample; 2) the need for a sample that includes a broader range of ages; 3) the need for a non-litigation seeking sample; and 4) to further establish interest inventory profile elevation as a construct in the literature and establish validity as a measure.

Findings of the present study found weak relationships between profile elevation, depression, and anxiety, but these relationships were not statistically significant and may have been due to chance. Although the sample size used in the present study was within the appropriate range for having sufficient power, using a larger sample may have resulted in stronger relationships between and among variables. Furthermore, although the present study
included a wide distribution of ages, the distribution represented a normal curve, with the greatest number of subjects’ ages represented toward the right half of the curve (see Figure 1). Unfortunately, there was not a representative sample of individuals who would be considered geriatric. Therefore, results about older individuals from the present study cannot be compared with results from previous literature, especially since only three subjects in the present study were age 65 or older. A replication of this study that included a greater number of older adults with disabilities resulting from a personal injury could provide important information about the relationship between profile elevation, depression, and anxiety.

Future researchers in the area of profile elevation may wish to use a sample of individuals who are not seeking compensation in the form of litigation. There is much existing literature regarding MMPI-2 profiles of litigation-seeking individuals, particularly those of individuals who are malingering, or “the intentional production of falsely or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as avoiding military duty, avoiding work, obtaining financial compensation, evading criminal prosecution, or obtaining drugs” (APA, 2000). Norms for profile elevation should be developed for a non-compensation-seeking population, as well as information regarding possible relationships between profile elevation and depression and anxiety.

The present study should be replicated to assist in further defining interest inventory profile elevation as a construct in the counseling psychology professional literature. Because it is still a relatively new construct in the literature, norms need to be created for varying populations, including college students and non-disabled adults, if interest inventory profile elevation is to be widely used among practitioners. The present study utilized a sample of individuals with disabilities from a private practice, but there were no norms found in the literature for this population even in the general population. Additionally, the present study found that little convergent validity between profile elevation and the 2-Scale, 7-Scale, and A-Scale of the MMPI-2. Therefore, a replication of the present study could provide stronger evidence for divergent validity of profile elevation relative to these other measures. Finally, replicating the present study using different measures of depression and anxiety would also assist in establishing convergent and divergent validity of profile elevation.
Conclusion

The present study examined the relationship between interest inventory profile elevation, depression, trait anxiety (with and without K correction), and state anxiety. The empirical examination of these variables was conducted because of a need to better understand the construct of profile elevation in interest inventories and the relationship between these variables. For the first research question, profile elevation was not shown to be significantly related to depression or anxiety in individuals with disabilities resulting from a personal injury. The second research question resulted in a finding that profile elevation was not related to depression, trait anxiety, or state anxiety, using age and cognitive impairment as mediating variables. These findings were inconsistent with findings of prior research, which showed that interest profile inventory was moderately associated with depressive personality traits. Results of the present study also found that cognitive impairment was significantly associated with depression, trait anxiety (with and without K correction), and state anxiety.

Chapter V included a summary of the present study’s findings, an examination of the study’s limitations, and implications for clinical practice and future research. Through this, it is palpable that the present study provided important information about profile elevation that will further the construct in the field of counseling psychology. Furthermore, the exploration of relationships found among profile elevation, depression, and anxiety, with age and cognitive impairment as mediating variables, provide some interesting implications for counselors and ideas for future research.
APPENDIX A
CLIENT INTAKE FORM
**Client Intake Form**

Please complete this form in detail. If needed, ask for assistance. Not all questions will apply; write N/A (not applicable) if questions do not apply.

**BACKGROUND INFORMATION** (please print)

<table>
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<tr>
<th>First Name:</th>
<th>Middle:</th>
<th>Last:</th>
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<tr>
<th>City:</th>
<th>State:</th>
<th>Zip:</th>
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<tr>
<th>Home Phone:</th>
<th>Cell Phone:</th>
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<table>
<thead>
<tr>
<th>Date of Birth:</th>
<th>Age:</th>
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<table>
<thead>
<tr>
<th>Date of Accident/Incident:</th>
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Please describe accident/incident:

<table>
<thead>
<tr>
<th>Did you strike your head?</th>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you lose consciousness?</td>
<td>Yes</td>
<td>No</td>
<td>Don't Know</td>
</tr>
</tbody>
</table>

If so, for how long?

List each problem you have as a result of the accident/incident. Continue on the back if necessary. Be specific.

1._____________________________________
2._____________________________________
3._____________________________________
4._____________________________________
5._____________________________________
6._____________________________________
7._____________________________________
What problems listed above, if any, did you have before the accident/incident?

__________________________________________

Check problems with mental functioning you have had since the accident/incident.

☐ No Problems
☐ Memory Problems
☐ Concentration Problems
☐ Mental Alertness Problems
☐ Speech Problems
☐ Attention Span Problems
☐ Other __________________________________

Please provide examples of the problems you checked:

__________________________________________

__________________________________________

__________________________  Are you ☐ Right-handed  ☐ Left-handed  ☐ Both
__________________________

Race: ________________________

Birthplace: __________________ Citizenship: __________________

First Language (if not English): ______________________

Height: ____________________  Current Weight: _____________

Weight Before Injury/Incident: ______________________

What caused your weight change?

__________________________________________

Describe your efforts to control your weight:

__________________________________________
Marital Status ___________________ Date Married ____________________

How many times have you been married? ________________________________

Spouse/Partner's Name (first and last) ________________________________

Spouse/Partner's Date of Birth ________________________________

Spouse/Partner's Job Title and Place of Employment ________________________________

Names, ages and gender of your children: ________________________________

Describe any disabling problems or special needs your spouse/partner or children have: ________________________________

Describe your home (Example: 2,000 sq. ft. 2-story house, 800 sq. ft. apartment, 1,500 sq. ft. mobile home, etc.): ________________________________

What is the size of property your home is located on? ________________________________

How long have you lived at your present home? ________________________________

Do you: ☐ rent your home or ☐ own your home? ________________________________

If you lived somewhere other than your current home at the time of the accident or incident, explain your reasons for relocation: ________________________________

Where do you plan to live? ________________________________

Describe any changes you have made to your home due to disabilities (Example: installed ramp, installed handrails, etc.): ________________________________

Is access within your home limited? If so, how? ________________________________
Do you have any pets or farm animals? If so, please describe: ________________________

How many people live with you and how are they related? (Example: John Smith, Uncle, 72 years old)

______________________________

At the time of your injury/incident, what was your job title? ______________________

Employer ______________________ Rate of pay ______________________

Present employment status: □ Employed □ Unemployed □ Disability
Present job title: ______________________
Present employer: ______________________
Present rate of pay: ______________________

PHYSICAL CONDITION AND MEDICAL INFORMATION

Who are the doctors treating you for problems associated with the accident/incident in question?

<table>
<thead>
<tr>
<th>Name</th>
<th>Specialty</th>
<th>Last Appointment</th>
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<tbody>
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</table>

Who was the last doctor that treated you? List the doctor, examination date, and reason for treatment.

______________________________
List scheduled appointments you have with medical professionals.

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</table>

List each surgery you had before the accident/incident.

<table>
<thead>
<tr>
<th>Type of Surgery</th>
<th>Year or Age</th>
<th>Surgeon</th>
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</table>

List each surgery you had after the accident/incident.

<table>
<thead>
<tr>
<th>Type of Surgery</th>
<th>Year or Age</th>
<th>Surgeon</th>
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</table>

Are you scheduled for other surgery? If so, list the surgeries and dates. Also, list recommended surgeries.

<table>
<thead>
<tr>
<th>Type of Surgery</th>
<th>Date of Surgery</th>
<th>Surgeon</th>
</tr>
</thead>
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</tbody>
</table>
Check each type of treatment you have had since the incident/injury:

- Physical Therapy
- Occupational Therapy
- Speech Therapy
- Massage Therapy
- Aquatic Therapy
- Psychotherapy/Counseling
- Group Therapy
- Biofeedback
- Other: __________________________

- Cognitive Rehabilitation
- Acupuncture
- Chiropractic Treatment
- Prescribed Home Exercise
- Pain Management
- Specify any injections you have had:

List current treatment/therapy: __________________________

_____________________________________________________

If not currently in treatment/therapy, on what date were you discharged?

_____________________________________________________

List all assistive aids you use (Example: cane, TENS unit, lumbar support pillow, traction device, cervical collar, etc.): __________________________

_____________________________________________________

_____________________________________________________

82
List your medications. Continue on back of this page if necessary.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Purpose</th>
<th>Dosage/Frequency</th>
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</tbody>
</table>

Which medications listed above were you taking before the accident/incident?

________________________________________________________________________

Describe side effects caused by medication: ______________________________________

________________________________________________________________________

Have you taken medication within the last 24 hours? If so, describe.

________________________________________________________________________

How much weight can you safely lift and carry? ________________________________

Has any physician advised a lifting restriction? If so, explain.

________________________________________________________________________

________________________________________________________________________

What problems, if any, do you have when lifting? ______________________________
Check all problems listed below that you have. Describe your problems in the space provided.

NECK:
☐ Turning head to right
☐ Turning head to left
☐ Bending head forward
☐ Leaning head back

HANDS AND ARMS:
☐ Use of right hand or arm
☐ Use of left hand or arm

FEET AND LEGS:
☐ Use of right foot or leg
☐ Use of left foot or leg

OTHER PROBLEMS:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Using the definitions below, rate your current ability to perform the following physical activities during an 8-hour work day, even if you are not employed at present (assume regularly scheduled breaks).

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>Constantly</th>
<th>Cannot do for any amount of time</th>
<th>Up to 33% of the time</th>
<th>From 34% to 66% of the time</th>
<th>More than 67% of the time</th>
<th>(0 - 2.3 hrs/day)</th>
<th>(2.3 - 5.6 hrs/day)</th>
<th>(5.6+ hrs/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td>Circle One</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td>Standing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>Sitting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bending at waist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td></td>
<td>Squatting</td>
<td>1</td>
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<td>3</td>
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<td></td>
<td></td>
<td>Kneeling or getting on hands/knees</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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<td></td>
<td></td>
<td>Climbing stairs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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<td></td>
<td>Pushing/pulling</td>
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<td></td>
<td></td>
<td>Reaching with right hand</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<td></td>
<td></td>
<td>Reaching with left hand</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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<td></td>
<td>Handling</td>
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<td></td>
<td>Gripping right hand</td>
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<td>2</td>
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<td></td>
<td>Gripping left hand</td>
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<td>Right-arm extension overhead</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<td></td>
<td>Left-arm extension overhead</td>
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<td>2</td>
<td>3</td>
<td>4</td>
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<td>Right-arm extension horizontal</td>
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<td></td>
<td>Left-arm extension horizontal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td></td>
<td></td>
<td>Driving</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tr>
</tbody>
</table>

Please explain any limitation you may have with the activities listed above.
In general, how many minutes/hours are you able to do the following without resting or overexerting yourself?

Walk_____ Stand_____ Sit_____ Drive_____

What type of transmission does the vehicle you drive have? □ Automatic □ Manual

Have changes been made to it? __________________________________________

How often do you drive? ____________________________________________

Do you have a disabled person parking placard? ________________________

Describe any problems you have with driving:

_________________________________________________________________

_________________________________________________________________

Do you have trouble with the following? If so, explain.

<table>
<thead>
<tr>
<th>Balance***</th>
<th>N</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Vision</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Smell</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Taste</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Breathing</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Bowel/bladder</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Dental Health</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Fatigue</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

***If you have problems with balance, have you fallen? Describe any recent falls.

_________________________________________________________________

_________________________________________________________________
***Have you fallen since you became injured and had medical care or additional problems? Please explain.

__________________________________________________________________________

__________________________________________________________________________

Check all conditions that worsen your problems, and explain your difficulty.

☐ Outdoors

☐ Cold Temperatures

☐ Hot Temperatures

☐ Dampness/High Humidity

☐ Noise

☐ Vibration

☐ Fumes, dusts, gases.

List all restrictions your physicians have advised.

<table>
<thead>
<tr>
<th>Physician</th>
<th>Restriction</th>
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</tbody>
</table>

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ACTIVITIES OF DAILY LIVING
Do you have problems sleeping? ________________________________
How many hours do you sleep per night? __________________________
What time do you usually go to sleep? ____________________________
What time do you usually wake up? ______________________________
If you have sleep problems, what is the cause? ______________________
________________________________________________________________
________________________________________________________________
Do you nap? If so, explain. ________________________________________
List all sleep aid medications you take. ________________________________
Do you have problems with nightmares? If so, describe repeated themes? ________________
________________________________________________________________
Do you have problems with grooming or self-care? If so, describe. ________________
________________________________________________________________
________________________________________________________________
If any people assist you in your daily care, please note who helps you and the type of assistance provided. ________________________________
________________________________________________________________
________________________________________________________________
Are there household chores you did before the injury/incident that you cannot do now? If so, list them here.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

Has there been any change in your leisure activities since your disabling problems began? If so, explain.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

MENTAL HEALTH

Have you ever had any mental health treatment before the incident in question? If so, please describe.

__________________________________________________________________________

__________________________________________________________________________

Please describe all mental health treatment you had after the incident in question.

__________________________________________________________________________

__________________________________________________________________________
Use the following scale (1 - 4) to indicate the extent that the mental health problems listed concern you:

(1) Not at all   (2) Somewhat   (3) Moderately   (4) Very much

- Anger          - Financial Problems
- Anxiety/Coping w/stress - Legal Problems
- Change in Eating Pattern - Loneliness
- Child Management Problems - Use of Alcohol or Drugs
- Conflict w/Family Members - Sexual Problems
- Concern about Physical Health - Thoughts of Suicide
- Feeling Depressed - Feeling Guilty
- Marital or Significant Other Relationship

Please explain your primary mental health concerns:

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
EDUCATION AND SPECIAL TRAINING

<table>
<thead>
<tr>
<th>Name</th>
<th>Major/Degree</th>
<th>Dates Attended</th>
<th>Graduation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
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<tr>
<td>Vocational Training</td>
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<td>College</td>
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<td>College</td>
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<tr>
<td>Graduate School</td>
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<tr>
<td>Employer-Sponsored Training</td>
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<td>Employer-Sponsored Training</td>
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<td>Employer-Sponsored Training</td>
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<tr>
<td>Continuing Education</td>
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<td>Continuing Education</td>
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<tr>
<td>Other Training</td>
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</tbody>
</table>
How did you perform in school?

If you were tested in the following, note your score:
SAT ______ ACT ______ Other ______

Did you ever repeat a grade in K-12? If so, what grades and why? ______

While in school, what kind of classes were you in:
☐ Regular classes ☐ Honors classes
☐ Accelerated classes ☐ Remedial classes
☐ Special education ☐ Emotionally handicapped
☐ Other special programming: ______
Please explain: ______

List any special skills you have (Example: computer, foreign languages, musical, athletic, artistic, etc.): ______

List all the work-related credentials you hold or have held (Example: licenses, certifications, registrations, etc.): ______

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Describe on-the-job training you have had __________________________________________

________________________________________

________________________________________

________________________________________

Do you have access to a computer?  □ Yes  □ No  Describe your computer skills
(Example: software you are able to use, programming skills, etc.):

________________________________________

________________________________________

________________________________________

________________________________________

List skills that you have developed through training and work experience.

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

Have you considered retraining?  □ Yes  □ No  If so, describe.

________________________________________

________________________________________
WORK EXPERIENCE

List each job you have held. Start with your most recent job and continue in reverse order. It is important to fully complete this information.

<table>
<thead>
<tr>
<th>JOB TITLE</th>
<th>EMPLOYER</th>
<th>DATES</th>
<th>WAGES</th>
<th>REASON FOR LEAVING</th>
</tr>
</thead>
<tbody>
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</table>
CAREER DEVELOPMENT

Which job do you consider your most skilled or challenging? 

Were you ever terminated from a job? □ Yes □ No  If so, from what job(s) and why? 

Have you ever made a claim for workers' compensation benefits? □ Yes □ No  If so, explain. 

How many hours per week did you work at the time of the injury/incident? 

Describe employment benefits associated with the job you held at the time of the injury/incident. 

Describe the job responsibilities you had at the time of the injury/incident. 

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________
What was the heaviest amount of weight you lifted/carried in your job?

List your job’s physical requirements (Example: extended sitting or standing, climbing ladders, exposure to extreme temperatures, etc.).

Did you take time off work after the injury/incident? If so, how long?

Describe any military experience you have had. Include branch of service, dates of service, rank at discharge, military occupation, and type of discharge.

List volunteer work experience you have had during the past 5 years.

List other organizations in which you participate (Example: church, social clubs, community organizations, etc.).

What were your employment earnings during the year before the injury/incident?
What were your highest earnings during your work career? Please list the amount and year. 

Estimate your average monthly expenses.
Describe your financial situation.

List all sources and amounts of your present income.

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount per Month</th>
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</table>

Have you applied to the Social Security Administration for disability benefits?

If so, what was the disposition on your application?

I certify that I have completed the information requested accurately and to the best of my ability.

_________________________  _______________________
Signature                  Date
Office of the Vice President For Research  
Human Subjects Committee  
Tallahassee, Florida 32306-2742  
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 5/19/2008

To: Cassandra Smisson [csmisson@gmail.com]

Address: 201 Parkbrook Circle, Tallahassee, FL 32301
Dept.: EDUCATIONAL PSYCHOLOGY AND LEARNING SYSTEMS

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
Using interest inventory profile elevation to predict depression and anxiety in individuals with disabilities from a personal injury

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 05/14/2008. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 5/13/2009 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is
reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: James Sampson, Jr., Advisor [jsampson@admin.fsu.edu]
HSC No. 2008.1339
REFERENCES


Reports, 80, 695-702.


Chapter 6, vision for the decade: Proceedings and recommendations of a symposium. Atlanta, GA: Centers of Disease Control and Prevention.


Plaisier, I., de Bruijn, J., de Graaf, R., ten Have, M., Beekman, A., Penninx, B. W. (2007). The contribution of working conditions and social support to the onset of depression and anxiety disorders among male and female employees. Social Science & Medicine, 64, 401-410.


Shahnasarian, M., & Leitten, C. L. *A longitudinal study of claimants’ return to work and related vocational factors*. Unpublished manuscript.


BIOGRAPHICAL SKETCH

Cassandra P. Smisson pursued her doctoral work in the Combined Ph.D. program in Counseling Psychology and School Psychology at the Florida State University in Tallahassee, FL. Her degree had an emphasis in counseling psychology. Her Master of Science degree was completed in Kinesiology with an emphasis in sport psychology at Georgia Southern University in Statesboro, GA. She completed her Bachelor of Science in Psychology at Clemson University in Clemson, SC. Currently, Cassandra P. Smisson is completing her American Psychological Association accredited pre-doctoral internship at the Michael E. DeBakey Veteran’s Affairs Medical Center in Houston, TX, where she is completing rotations in vocational rehabilitation, spinal cord injury, neuropsychology, geropsychology, post-traumatic stress, chronic pain management, and forensic psychology. After completion of her doctoral requirements, she plans to enter private practice as a post-doctoral fellow with a group psychological practice in Houston, TX and plans to stay in private practice after completion of her licensure requirements for the state of Texas.