

THE IMPACT OF A COGNITIVE INFORMATION PROCESSING
INTERVENTION ON DYSFUNCTIONAL CAREER THOUGHTS AND
VOCATIONAL IDENTITY IN HIGH SCHOOL STUDENTS

by

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B. A., Kansas State University, 1967

M. A., Chapman University, 1984

AN ABSTRACT OF A DISSERTATION

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Abstract

This study examined the impact of two career interventions on the dysfunctional career thoughts (DCTs) and vocational identity (VI) of 55 high school seniors. Research has shown an inverse relationship between levels of DCTs and VI. One intervention was based on the Cognitive Information Processing approach (Peterson, Sampson, & Reardon, 1991; Peterson, Sampson, Lenz, & Reardon, 2002; Peterson, Sampson, Reardon, & Lenz, 1996; Sampson, Reardon, Peterson, & Lenz, 2004) and incorporated *Improving Your Career Thoughts: A Workbook for the Career Thoughts Inventory* (CTI workbook; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996c) and the Self-Directed Search (SDS; Holland, 1994). The second intervention employed only the SDS. A control group used neither activity.

Levels of DCTs and VI were assessed pre-intervention and post-intervention using the Career Thoughts Inventory (Sampson, Peterson, Lenz, Reardon, & Saunders, 1996a) and the Vocational Identity scale of My Vocational Situation (Holland, Daiger, & Power, 1980a). Earlier studies indicated improvements in levels of dysfunctional career thinking after CIP-based interventions (e.g., Kilk, 1998; Morano, 2005; Reed, 2006), but no previous studies employed the complete CTI workbook. Additional studies (e.g., Loughhead & Black, 1990; Mau, 1999; Wiggins, 1987) indicated that levels of vocational identity could be increased by using the SDS as an intervention.

The combined use of the CTI workbook and SDS produced significant improvements in all five measures of DCTs and VI. It was also shown that use of the SDS as a stand-alone intervention did improve levels of VI, but not to the extent of the improvements shown by combined use of the SDS and CTI workbook. Use of the SDS as a stand-alone intervention did not produce improvements in levels of DCTs. The control group, which employed neither the CTI workbook nor the SDS, unexpectedly showed significant improvements in scores for two CTI scales which may have been due to the influence of confounding variables.

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Dedication

To my beloved Karen. Many women do noble things, but to me
you surpass them all.

CHAPTER 1 - Introduction

The ability to make good career decisions is a major issue for high school students (Eme, Maisiak, & Goodale, 1979; Erikson, 1959; Gati & Saka, 2001; Taveira, Silva, Rodriguez, & Maia, 1998; Violato & Holden, 1988). One of school counselors' main missions is to help high school students make satisfying educational and occupational decisions (Gysbers & Henderson, 2000). Unfortunately, little work has focused on ways to help counselors assess and reduce dysfunctional thinking that hinders students when they attempt to make effective career decisions. Sampson, Peterson, Lenz, Reardon, and Saunders (1996b) identified dysfunctional career thinking as a component of the career decision making process. Sampson et al. seek to enhance career decision making among high school students by helping them reduce the impact of dysfunctional career thinking on their career decisions.

Dysfunctional career thoughts (DCTs) is used to describe a specific category of difficulties in career decision making (Peterson, Sampson, & Reardon, 1991). DCTs are inappropriate, inaccurate, or irrational thoughts that inhibit effective career problem solving and decision making for almost everyone (Sampson et al., 1996b). Sampson et al. estimated that 95% of adults have some level of dysfunctional career thinking whereas nearly 99% of high school students were shown to exhibit DCTs. The challenge is how to reduce the influence DCTs exert when levels become problematic to the career decision making process. Students who view their involvement in the career decision process in an

accurate, positive way tend to make effective decisions. Those students with inaccurate views of themselves or who view the decision making process negatively (e.g., due to the influence of DCTs) tend to make poorer career decisions (Sampson et al.). For example, a high school student who possesses faulty beliefs about his or her ability to make good career decisions will likely have difficulty arriving at a satisfying decision.

DCTs not only hinder the career decision making process for high school students, they also have a detrimental impact in other areas related to students' career development. Osborn (1998) identified three areas of impact on emotional states, self-related issues, and cognitive tasks. The detrimental impact DCTs can have on students' emotional states include depression (Corbishley & Yost, 1989; Dryden, 1979; Sampson, Reardon, Peterson, & Lenz, 2004; Saunders, Peterson, Sampson, & Reardon, 2000), anxiety (Dryden; Sampson et al.), anger (Corbishley & Yost; Dryden; Strausberger, 1998), and perfectionism (Osborn). The self-related issues adversely impacted by DCTs can include decreased sense of well-being (Judge & Locke, 1993), increased vulnerability (Sampson et al.), self-defeating behaviors resulting in avoidance and resistance to making career decisions (Gati & Saka, 2001; Hornak & Gillingham, 1980), and a lack of self-clarity (Sampson et al.). Cognitive tasks important to students' career development that can be negatively influenced by DCTs include premature foreclosure of potentially satisfying career options (Brown & Lent, 1996), inadequate planning (Lewis & Gilhousen, 1981), irrational or distorted views of the role of work (Lewis & Gilhousen; Nevo, 1987), poor decision making

(Sampson et al.), the erroneous perception of barriers to making career decisions (Sampson et al.), and misconceptions about the process of making career decisions (Thompson, 1976).

Gati and Saka (2001) identified career-related dysfunctional beliefs as one of the most prominent problems high school students face as they try to make satisfying decisions about education or employment after graduation. Although the detrimental impact dysfunctional thinking can have on career development is well documented, little work has been completed to develop interventions for school counselors to use with students. As a result, high school students not only need to be taught basic decision making skills (Feller, 2003a; Gati & Saka; National Commission on the High School Senior Year, 2001a; Steinberg & Allen, 2002), but school counselors also need the conceptual framework and tools to help students deal with the dysfunctional thoughts that negatively impact effective career decisions (Gati, Krausz, & Osipow, 1996; Kilk, 1998; Kinnier & Krumboltz, 1986; Lewis & Gilhousen, 1981). Sampson et al. (1996a, 1996c) developed the Career Thoughts Inventory (CTI) and *Improving Your Career Thoughts: A Workbook for the Career Thoughts Inventory* (CTI workbook) to be used together as an intervention for DCTs. Although the CTI and its workbook have been examined as ways to help college students and adults with DCTs, neither has been evaluated for use by high school students (Sampson et al., 1996b).

Another construct relevant to helping high school students make good career decisions is *vocational identity* (VI). Holland, Daiger, and Power (1980a)

defined vocational identity as a construct addressing the “possession of a clear and stable picture of one’s goals, interests, and talents” (p.1). Holland (1985) described VI as the outcome of the “increasing differentiation of preferred activities, interests, competencies, and values” (pp.16-17) by adolescents as they try to understand who they are in relation to the world of work. According to Holland et al., students who possess a well-developed VI should make relatively untroubled, satisfying career decisions compared to those who do not. Students with higher levels of VI should be more successful in making career decisions (Conneran & Hartman, 1993; Graef, Wells, Hyland, & Muchinsky, 1985; Holland & Holland, 1977; Saunders, Peterson, Sampson, & Reardon, 2000). Diemer and Blustein (2007) identified the development of vocational identity in adolescents as an “important career development task” (p. 108).

Sampson et al. (1996b) and Holland, Johnston, and Asama (1993) reported a negative relationship between the DCTs and VI. According to Sampson et al., DCTs limit the level of VI in both quality and accuracy; the greater the number of DCTs, the lower the VI. Holland et al. reported that low VI was related to high numbers of DCTs, whereas individuals with high VI are relatively free of DCTs. Holland and Holland (1977) and Holland et al. related DCTs and VI to students’ effectiveness in career decision making. Individuals with low VI and more DCTs were often ineffective in making career decisions. Those individuals who were effective career decision-makers tended to have fewer DCTs and higher VI.

The adverse impact DCTs have on students' ability to discover satisfying career paths (Gati & Saka, 2001; Kilk, 1998) may effectively immobilize their academic progress (Galinsky & Fast, 1966). In addition, the success or failure students may have in making their first major career decision can impact the way they deal with the career decisions they will make in the future (Gati & Saka; Hurley & Thorp, 2002).

Concern over high school seniors' first significant career decision is also a major issue for parents and school counselors (Galinsky & Fast, 1966; Gati & Saka, 2001; Ginzberg, Ginzberg, Axelrad, & Herma, 1963; Hawkins & Bradley, 1977; Herr & Cramer, 1996; Holland, 1985; Mann, Harmoni, & Power, 1989; Scott, Reppucci, & Woolard, 1995; Tiedeman & O'Hara, 1963; Violato & Holden, 1988). The process students use in making their first, and all subsequent, career decisions is as important as the actual choices they make about education or employment following graduation from high school (Holland, 1997; Krumboltz, 1983; Mann et al., 1989; Super, 1980; Tyler, 1958).

Emergence of a global economy, rapidly advancing technologies, and fundamental changes in the nature of work have changed the way high school students must think about career choices (Kroger, 2007). These factors may not be well understood by students and may contribute to the anxiety they experience when facing educational and occupational decisions (Kroger). The United States' economy has undergone a fundamental shift from manufacturing to services; the number and types of occupations students can consider has changed (Carnevale & Desrochers, 2003). Work is becoming more dynamic; its

requirements, nature, and distribution are changing significantly (Carnevale & Desrochers; Feller, 2003a; Jarvis & Keeley, 2003; Lum, Moyer, & Yuskavage, 2000; U.S. Department of Labor, n.d.). Because of these changes, students can no longer view the workforce as predictable and stable; they cannot make career decisions the same way their parents did (Carnevale & Desrochers). Students must cope with relatively frequent job transitions (Jarvis & Keeley; Mann et al., 1989), global competition, technological sophistication of work, and occupational insecurity (Feller, 2003b). According to Seligman (1998), if students do not understand and adapt to this changing occupational environment, their misconceptions may lead them to dysfunctional ways of thinking and poor choices regarding education and work. To succeed in today's environment students need a clear understanding of their "goals, interests, and talents" (Holland et al., 1980a, p. 1) and an accurate way of thinking about themselves in relation to career decisions (National Commission on the High school Senior Year, 2001b).

Need for the Study

There is a continuing need to enhance career decision making in high school students. High schools have not succeeded in teaching career decision making skills and some students continue to make flawed, unrealistic career decisions (Feller, 2003a; Gati & Krausz, 1996; Herman, Olivo, & Gioia, 2003; Herr & Cramer, 1996; Hoyt, 2001; Hurley & Thorp, 2002; National Commission on the High School Senior Year, 2001b; O'Shea & Harrington, 2003; Prediger & Sawyer, 1985; Steinberg & Allen, 2002). School counselors need to be able to

help students identify and correct the problems they face in attempting to make satisfying career decisions. Failure to help students with these problems may lead them to try to place the responsibility for career decisions on another person or to avoid making career decisions altogether (Gati & Saka, 2001; Keim, Strauser, & Ketz, 2002; van Ecke, 2007).

DCTs are a major problem for students (Gati & Saka, 2001). Peterson et al. (1996) found that students who have distorted cognitions about themselves and their career options have difficulty making educational and career decisions. Additionally, DCTs are also related to problems students may have with their emotional states, self-related issues, or cognitive functioning (Hinkelman & Luzzo, 2007; Osborn, 1998). Hinkelman and Luzzo further suggested that successful interventions to reduce DCTs for students during the high school years could reduce the prevalence of long-term adjustment problems later in life.

School counselors need a way to assess the impact of interventions they employ to help students enhance career decision making. Gati et al. (1996) emphasized the importance of learning whether or not interventions significantly improved students' DCTs and whether these changes also improve students' career decision making skills. Lustig and Strauser (2003) also identified the need for additional research to find effective ways to reduce the impact of dysfunctional career thoughts.

Sampson et al. (1996a, 1996b, 1996c) developed the *Career Thoughts Inventory* (CTI) to provide a means to assess DCTs and the CTI workbook as a means to mitigate them. Although both the CTI and workbook have been in use

for several years, there have been calls for more examination of their efficacy. Sampson et al. (1996b) recommended further research to investigate the utility of the CTI and CTI Workbook. They specifically identified a need to better define the relationship between dysfunctional career thinking and VI. Sampson et al. suggested that future research was needed to examine the impact of completion of the CTI Workbook on dysfunctional career thinking. Gilbert (1997) and Fontaine (2001) both noted the CTI workbook had not been evaluated for its efficacy in correcting dysfunctional career thoughts or improving career decision making. While the CTI has been used in research since its inception (Vernick, 2002), Carr (2004) reported the CTI workbook has received almost no attention in research studies. To date, no research has been reported on the usefulness of the CTI workbook for high school students.

Purpose of the Study

The purpose of this study will be to investigate the comparative impact of career interventions on the career thoughts and vocational identity of high school students. The career interventions were based on the Self-Directed Search (SDS; Holland, 1994) as a stand-alone intervention, and on the SDS used in combination with the Cognitive Information Processing approach (CIP; Peterson et al. 1991; Peterson, Sampson, Lenz, & Reardon, 2002; Peterson et al. 1996; Sampson et al., 2004).

A second purpose of this study was to compare the results of the SDS and SDS-CIP interventions with the results of a control group. Research indicates the vocational identity of students participating in either of the intervention groups

should increase compared to students in the control group (Holland & Holland, 1977; Reed, Lenz, Reardon, & Leierer, 2000; Slaney, Plako-Nonemaker, & Alexander, 1981). Also, relative to the control group, dysfunctional career thinking should decrease for students participating in the SDS-CIP intervention (Carr, 2004; Reed, Lenz, Reardon, & Leierer; Sampson et al., 1996b).

Research Questions

The research questions addressed by this study were:

1. Upon completion of the interventions, will the level of dysfunctional career thoughts (DCTs) for the treatment group that employed both the SDS and the CTI workbook be less than the level of DCTs for the treatment group that employed only the SDS?

2. Upon completion of the interventions, will the levels of DCTs for the treatment groups be less than the level of DCTs for the control group?

3. Upon completion of the interventions, will the level of DCTs within each of the treatment groups less than the respective pretest levels?

4. Upon completion of the interventions, will the level of vocational identity (VI) for the treatment group that employed both the SDS and the CTI workbook be greater than the level of VI for the treatment group that employed only the SDS?

5. Upon completion of the interventions, will the levels of VI for the treatment groups be greater than the level of VI for the control group?

6. Upon completion of the interventions, will the level of VI within each of the treatment groups greater than the respective pretest levels?

Definitions of Terms

1. *Dysfunctional Career Thoughts*. A pattern of thinking about one's assumptions, attitudes, behaviors, beliefs, feelings, plans, and/or strategies that inhibits effective career problem solving and decision making (Sampson et al., 1996b). Dysfunctional career thoughts will be assessed using the CTI (Sampson et al., 1996a).

a. *Decision Making Confusion*. An "inability to initiate or sustain the decision making process as a result of disabling emotions or a lack of understanding about the decision making process itself" (Sampson et al., 1996b, p. 28). Decision making confusion will be assessed using the Decision Making Confusion subscale of the CTI (Sampson et al., 1996a).

b. *Commitment Anxiety*. The "inability to commit to a specific career choice, accompanied by generalized anxiety about the outcome of the decision making process" (Sampson et al., 1996b, p. 28). Commitment anxiety will be assessed using the Commitment Anxiety subscale of the CTI (Sampson et al., 1996a).

c. *External Conflict*. The "inability to balance the importance of one's own self-perceptions with the importance of input from significant others resulting in reluctance in assuming responsibility for decision making" (Sampson et al., 1996b, p. 29). External conflict will be assessed using the External Conflict subscale of the CTI (Sampson et al., 1996a).

2. *Vocational Identity*. Holland et al. (1980b) defined VI as "the degree to which a person possesses a clear and stable picture of his or her goals,

interests, and talents” (p. 1). VI will be assessed using the Vocational Identity scale of My Vocational Situation (Holland et al., 1980a).

Limitations

Participants may not be representative of the population of high school students. Students who participated were seniors in a small rural school who volunteered to take part in this study rather than attend regularly scheduled study periods. As a result, study findings may not generalize to other high school students. In addition, results of this study were limited to the extent that the instruments measured the constructs investigated and to the extent the participants responded to the instruments accurately and honestly.

CHAPTER 2 - Review of the Literature

High school students make career decisions using higher-order cognitive skills as well as lower-order thought processes to match interests with occupational choices (Peterson et al., 1991; Peterson et al., 1996). If any of these processes are adversely influenced by dysfunctional thoughts, students may find their career decisions are unsatisfactory (Kinnier & Krumboltz, 1986) or even self-defeating (Judge & Locke, 1993). In responding to this problem, Reardon, Lenz, Sampson, and Peterson (2006) stated the following:

Having a lot of information about yourself and your options and how to use information in a decision making situation are very important but they are not sufficient in effective career problem solving. The missing ingredients are referred to as metacognitive skills, or the skills that govern *how* we think about career problem solving and decision making. (p. 67)

The Cognitive Information Processing (CIP) approach (Peterson et al. 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004) has been developed to help individuals enhance their career problem solving and decision making. This approach may offer school counselors the means to help high school students make better career choices by reducing the influence of their dysfunctional career thoughts.

Topics this literature review addresses are (a) antecedents to the CIP approach, (b) the CIP approach to career problem solving and decision making,

(c) dysfunctional career thoughts (DCTs), and (d) vocational identity (VI). The chapter concludes with a summary of the review.

Antecedents to the Cognitive Information Processing Approach

Osborn (1998) noted a strong basis in counseling theory and research for the way thoughts impact behavior, emotion, and decision making. This paradigm is the foundation for the approach to career decision making and problem solving that is the basis for this study. According to Sampson et al. (1996b), the CIP approach is grounded in earlier work in cognitive therapy (Beck, 1976; Beck, Emery, & Greenberg, 1985; Beck, Rush, Shaw, & Emery, 1979), cognitive restructuring (Ellis, 1962, 1977; Meichenbaum, 1977), and information processing theory (Newell & Simon, 1972).

Beck (1967) identified cognitions common to individuals experiencing depression; the common denominator was a distortion of reality. From this Beck concluded dysfunctional cognitions have a detrimental impact on behavior and emotions. As noted by Sampson et al. (1996b), continued study revealed individuals maintain dysfunctional cognitions by six systematic thinking errors (Beck et al., 1979; Beck et al., 1985):

1. Arriving at specific conclusions without supporting evidence or in the face of contradictory evidence;
2. Filtering out all information except that which confirms the original cognition;
3. Generalizing unsubstantiated conclusions to unrelated situations;
4. Distorting information beyond reasonable significance;

5. Inappropriately attributing external events to self; and
6. Erroneously assigning experiences into absolute categories (e.g., all or nothing, right or wrong, either/or).

Sampson et al. (1996b) summarized the four steps of the cognitive therapy process, postulated by Beck et al. (1979), to change dysfunctional thoughts as follows: (a) cognitive restructuring; (b) collaboration between the counselor and client to systematically test dysfunctional cognitions; (c) understanding the linkage between cognitions, emotion, and behavior; and (d) developing and maintaining an effective helping relationship. These steps play an integral role in the CIP approach (Sampson et al.)

In addition to Beck's (1979) work, which stresses faulty thinking styles, Sampson et al. (1996b) also attributed the theoretical basis for cognitive restructuring in the CIP approach to Ellis' (1962, 1977) Rational-Emotive Therapy and Meichenbaum's (1977) Cognitive-Behavior Modification approach. Ellis (1977) identified various irrational beliefs which, when acted on as reality, caused distortions of actual reality (e.g., it is an absolute necessity to be loved by everyone). Meichenbaum's focus on dysfunctional thoughts was directed toward internal speech and coping skills as causative factors for faulty thinking. Stone (1983) concluded all three theorists focused on the impact of dysfunctional cognitions on emotions and behaviors. Another similarity between the theories advanced by Beck, Ellis, and Meichenbaum is the use of cognitive-behavioral methods to restructure thoughts and behaviors. In summary, Ellis identified irrational beliefs individuals use to distort reality and cause distress, Beck (1976)

addressed the thought processes underlying irrational beliefs, and Meichenbaum developed a generalized set of ways to deal with the problems caused by irrational thinking.

At about the same time Beck (1967) began formulating a theory of cognitive therapy, other disciplines within psychology were examining analogies between human thought capabilities and computer systems. The impetus for this research was an attempt to develop computer programs to simulate human thought processes (Herr & Shahnasarian, 2001). Noting both computers and humans acquire, store, and apply information, Newell, Shaw, and Simon (1958) postulated the possibility of computers using artificial intelligence to solve symbolic logic problems. This work led Newell and Simon (1961) to theorize human thought processes could be expressed as computer programs. In 1971, Hunt developed a distributed memory model to describe human memory processes in computing terms. The following year, drawing on Hunt's distributed memory model, Newell and Simon (1972) advanced a comprehensive theory of human problem solving using an information processing approach which evolved into information processing theory (Eysenck & Keane, 2005). Newell and Simon (1972) identified the major concern in problem solving as "finding paths from initial states to desired states" (p. 788). Peterson et al. (1991) later used this finding as the basis for describing a career problem as a gap between an individual's present situation and his or her desired career goal.

Information processing theory was integrated into the field of cognitive psychology and became referred to as cognitive information processing theory.

As defined in cognitive psychology, cognitive information processing theory described the development of human information processing skills in terms of metacognitive skills and memory development (Eysenck & Keane, 2005). To this point, cognitive psychologists had employed cognitive information processing theory as way to explain the way knowledge enters, is stored, and is retrieved from human memory (Eysenck & Keane). In 1991 Peterson et al. integrated cognitive information processing theory with the work completed by Beck (1976), Ellis (1973), and Meichenbaum (1977). The result was a framework of theory and practice used to address career decision making and career problem solving which was referred to as the Cognitive Information Processing (CIP) approach (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004).

Cognitive Information Processing Approach

The CIP approach to career problem solving and decision making is intended to be a convergence of career development theory and practice (Sampson et al., 2004). At the same time, the CIP approach also seeks to instill what Peterson and Swain (1978) termed “a critical appreciation” (p. 293) for career problem solving and decision making skills for students’ lifetimes (Peterson et al., 1996; Sampson et al.). The CIP approach is based on integration of career problem solving theories from cognitive psychology with perspectives on human information processing to arrive at a new way of dealing with career choices and decision making (Peterson et al., 1996). As described

by Peterson et al. (1991), the CIP approach provides a theoretical basis for examining dysfunctional career thoughts.

According to Sampson et al. (2006), the CIP approach is founded on two concepts, the *Pyramid of Information Processing Domains* and the *CASVE Cycle*. The Pyramid of Information Processing Domains addresses the content (i.e., information, skills, and thoughts) of career problem solving and decision making while the CASVE Cycle describes the process (sequences) involved (Sampson et al.).

The Pyramid of Information Processing Domains

The Pyramid of Information Processing Domains is a conceptual representation of the cognitive elements of career decision making. The component parts of the pyramid are arranged in a hierarchical order relating to Parsons' (1909) three factors for making satisfactory career choices (Peterson et al., 1996). Parsons described self-understanding, occupational knowledge, and the process of relating them to each other as the factors involved in career decision making. Peterson et al. noted that Parsons' three factors are represented by three of the components of the Pyramid of Information Processing Domains: self-knowledge, occupational knowledge, and decision making skills. Each of these components, plus the fourth—executive processing—will be discussed.

As described by Peterson et al. (1991), self-knowledge and occupational knowledge comprise the knowledge domain forming the base of the Pyramid of Information Processing Domains. Self-knowledge encompasses an individual's

knowledge of values, interests, skills, and employment preferences (Sampson et al., 2004). From a client's perspective, Sampson, Peterson, Lenz, and Reardon (1992) referred to this information as "knowing about myself" (p. 70). According to Tulving (1972), self-knowledge is stored as perceptions of a series of events over time (i.e., episodic memory) and is influenced by an individual's interpretations of what happened instead of the actual events. Occupational knowledge complements self-knowledge at the base of the pyramid.

Occupational knowledge is made up of "knowledge of individual occupations and possession of a schema for how the world of work is organized" (Sampson et al., 2004, p. 23). As described by Tulving, both knowledge of occupations and an individual's schema about the world of work are stored as semantic (composed of verifiable facts) rather than episodic memory. Sampson et al. (1992) described occupational knowledge as "knowing about my options" (p. 70) when dealing with clients. Sampson et al. (2004) cited Holland's (1966, 1985, 1997) hexagon as a valid, simple schema of the world of work to order occupational knowledge. Sampson et al. (2004) described the knowledge domain as the foundation for the two other domains located above it in the pyramid.

The decision making skills domain is the middle element of the pyramid. This is the location of the CASVE Cycle, the CIP conceptualization of decision making (Peterson et al. 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). Sampson et al. (1992) functionally describe this domain as the process of "knowing how I make decisions" (p. 70).

The top of the pyramid represents the executive processing domain which includes the metacognitive processes that control the functioning of the two domains below it (Sampson et al., 1996b). Sampson et al. (1999) described the function of metacognitive skills in the CIP approach as one of influencing the way individuals think and act as they deal with career decision making and problem solving. The three principal metacognitions in this domain that exert control over the decision making skills and knowledge domains are self-talk, self-awareness, and monitoring and control functions (Peterson et al. 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004).

Sampson et al. (1999) described self-talk as “the silent conversations clients have with themselves about their past, present, and future capability to complete . . . [career] problem solving and decision making” (p. 13). Self-talk can be either positive or negative and influences an individual’s self-efficacy (Bandura, 1977) for career problem solving and decision making (Sampson et al., 1999). Positive self-talk can help individuals involved in career problem solving and decision making remain motivated, actively seek needed information, stay focused, think clearly about options, look for help when they need it, or follow-through with the actions needed to execute a plan of action (Sampson et al., 1999). Negative self-talk can make clients less likely to clearly state their objectives on a job resume, remain motivated enough to find possible sources of employment, follow-up leads for expanding their network of employment contacts, prepare for job interviews by researching potential employers, offer

positive insights or project enthusiasm in job interviews, or follow-up job interviews with thank you letters (Sampson et al., 1996b).

Self-awareness is a concept describing the ability of an individual to act as a spectator observing his or her own career decision making and problem solving behavior (Peterson & Swain, 1978). This metacognitive function provides individuals the means to monitor negative self-talk, the need for more information, or emotional impact on a decision making task. It also provides individuals with the information required to deal with these situations in the monitoring and control function in the executive processing domain (Peterson et al., 1996).

Functions in the executive processing domain also provide the means for individuals to monitor and control the other processes taking place in the knowledge and decision making skills domains (Peterson et al., 1991; Peterson et al., 2001). As part of executive processing, the monitoring function provides an individual a way of knowing when to stop a task and move on to the next one, gather more information, or find help. The control function allows an individual to regulate his or her actions (e.g., set priorities; initiate, stop, or re-visit the various actions taken in the decision making cycle; or control negative thoughts that may interfere with the process) (Peterson et al., 1991; Peterson et al., 1996; Sampson et al., 1996b). The difference between these two regulatory processes is between “knowing” (the monitoring process) and “doing” (the control process) (Sampson et al., 2004, p. 48).

CASVE Cycle

The other major concept in the CIP approach is the CASVE Cycle described by Peterson et al. (1991), Peterson et al. (2002), Peterson et al. (1996), and Sampson et al. (2004). This cycle is the CIP model for decision making and is in the center of the Pyramid of Information Processing Domains. CASVE is an acronym referring to the five phases involved in the cycle including: *Communication, Analysis, Synthesis, Valuing, and Execution*. The Communication phase of the CASVE Cycle is the starting point from which signals internal or external to an individual are processed (Peterson et al. 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). Career problems are signaled by some external condition (e.g., the need to decide upon a course of action after graduating from high school) or by an internal state which may demand attention (e.g., anxiety over career indecision). In either case, these signals cause an individual to communicate internally or with someone else by seeking ways to move from the current situation to a more desirable one. The communication process needed to identify the problem gap which exists between current and desired reality was first identified by Newell and Simon (1972) and is the initial step in the CIP approach to career problem solving.

The second phase of the CASVE Cycle, Analysis, involves gathering and examining information relevant to the career problem (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). Information analyzed at this phase of the process could involve self-knowledge or knowledge about occupations, information about the career decision making, or understanding dysfunctional career thoughts. The goal of this phase is for the

individual to identify the reasons for the problem gap between one's present situation and a desired state of events.

Peterson et al. (1991), Peterson et al. (2002), Peterson et al. (1996), and Sampson et al. (2004) noted the goal of the third phase, Synthesis, was for a person with a career problem to formulate options which could reduce or eliminate his or her problem gap. Two processes used to identify solution options are *elaboration* (generating a wide range of possible solutions) and *crystallization* (reducing options to a manageable number).

During the Valuing phase individuals seek to choose the best course of action from the options generated in the Synthesis phase (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). The goal for individuals going through this phase is to identify, by using internal assessments mediated by individual value systems (Super, 1980), the one choice most likely to reduce or remove a career problem. In addition to providing a preferred solution, which becomes a vision of the future, the valuing phase also creates an internal commitment for the individual to act on that choice.

The Execution phase is the implementation of the course of action identified in the Valuing phase (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). At this point in the CASVE Cycle, a person develops a plan to transform his or her first choice of options into a viable plan of action. This is done through identification and achievement of logical, intermediate steps or goals each of which is realistic and attainable for the

individual. According to Peterson et al. (1996), the best evidence an individual has made a career decision is when a person acts on his or her plan.

After completing all five phases of the CASVE Cycle, individuals evaluate the results of the process by returning to the Communication phase to determine if the demands which defined the career problem have been satisfied by the chosen solution. If this is the case, the process is complete. If not, individuals re-enter the cycle at the Analysis phase to identify and implement alternative solutions or to determine whether or not problem has a solution (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004).

Dysfunctional Career Thoughts

Background

Betz (1992) and Dryden (1979) attributed the first acknowledgement that career beliefs could be impacted by dysfunctional thinking to Ellis (1977) and Meichenbaum (1977). Soon after Ellis and Meichenbaum described the possible linkage between dysfunctional thinking and career beliefs, others noted that this issue was not being addressed. Lewis and Gilhousen (1981) stated “traditional counseling interventions are useful but do not begin to touch the source of vocational maladies. Interests, values, and occupational information are of little consequence if the client cannot put them into realistic [rational] perspective” (p. 1). Later Corbishley and Yost (1989) and Osborn (1998) noted significant attention had been given to the impact of dysfunctional thinking on clinical conditions but the notion that dysfunctional thinking could impact career choice and development needed more examination.

Prior to the advent of the CIP approach (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004), several researchers began to explore the impact of irrational thinking on career development by identifying dysfunctional ways of thinking specific to career decision making (i.e., irrational or maladaptive beliefs that adversely impact an individual's ability to make rational career choices) (Corbishley & Yost, 1989; Dryden, 1979; Krumboltz, 1983; Lewis & Gilhousen, 1981; Mitchell & Krumboltz, 1987; Nevo, 1987; Thompson, 1976).

Thompson (1976) was one of the first to address the relationship between faulty cognitions and career problems. He noted changing faulty beliefs was a central theme of several therapies. Faulty beliefs were addressed in terms of their impact on personal-social problems, not career choice issues. Thompson postulated that irrational expectations and faulty beliefs were also at the root of many career problems; he identified four misconceptions peculiar to career decision making that tended to dominate students' attitudes toward career development. First, Thompson noted students had the idea career decision making and problem solving were precise processes producing a plan fitting their needs exactly. Second, he also identified the erroneous idea that students believed career decisions were made at a point in time and that these decisions were final. Third, Thompson reported students believed career assessment instruments would produce answers that would tell them "what they should do" (p. 32). Finally, Thompson identified a faulty causal relationship between interests and abilities. He noted many students mistakenly believed if they

identified their interests, success in their areas of interest would follow as a matter of course.

Corbishley and Yost (1989) loosely grouped dysfunctional career cognitions into three categories. The first constraining category (*I Can't*) dealt with an individual's belief he or she lacked the ability or resources, or was restrained by someone else from pursuing career desires. Cognitions described in this category included beliefs about being unable to make satisfying career decisions or not being good enough at the process to meet others' expectations. The second category (*I Won't*) was used to classify individuals who chose to withdraw from or refused to participate in the career choice process. Cognitions in this category included withdrawing or refusing to participate because the career choice process was too difficult and unfair or the process would likely not end in a satisfying solution. Finally, the third category (*I Shouldn't*) was based on the theme individuals should not have to participate in a process that violated their own or someone else's rules (e.g., participation would displease family members or go against rigid role expectations or occupational stereotypes).

Based on the 11 irrational beliefs originally identified by Ellis (1962), Dryden (1979) identified four common irrational beliefs found in career counseling: (a) "There is only one career for me and it will be an absolute disaster . . . if I am not accepted," (b) "It is absolutely essential for me to reach the top of my career," (c) "It is absolutely essential for me to be approved of by the people I go to work with," and (d) "My parents want me to go into 'X' career. . . how can I pursue the career of my choice?" (p. 186).

Krumboltz (1983) postulated unfounded or inappropriate private rules people use to make career decisions that cause failures in the process of making career choices. Krumboltz believed these troublesome beliefs about career choice were based on (a) faulty generalizations, (b) self-comparisons with a single standard, (c) exaggerated estimates of the emotional impact of an outcome, (d) false causal relationships, (e) ignorance of relevant facts, (f) giving undue weight to low probability events, or (g) self-deception. Later Mitchell and Krumboltz (1987) identified two categories of beliefs that caused problems in career decision making. The first category included maladaptive beliefs and generalizations grouped under four following areas: (a) faulty self-observations, (b) inaccurate world views, (c) poor decision making self-efficacy, and (d) unrealistic conditions required for a satisfactory career choice.

The second category of beliefs Mitchell and Krumboltz (1987) discussed was composed of seven myths specifically identified for their adverse impact on career decision making. These myths and their underlying irrational ideas were first introduced by Lewis and Gilhousen (1981) as a way to aid counselors to expose and challenge maladaptive thoughts common in inappropriate career exploration. In the following description of these myths, Mitchell and Krumboltz' terminology is followed by Lewis and Gilhousen's presentation of the same dysfunctional thought:

1. Mitchell and Krumboltz: "I must be absolutely certain before I can act"
(p. 171).

Lewis and Gilhousen: "Crystal Ball Myth" (p. 296). The suggestion is that successful career decision makers have clear pictures of their career paths.

2. Mitchell and Krumboltz: "Career development involves only one decision" (p. 171).

Lewis and Gilhousen: "When Are You Going to Decide, You Dummy!" (p. 297). This myth is based on the idea that a career decision is a single event that should occur within close proximity of high school graduation.

3. Mitchell and Krumboltz: "If I change, I have failed" (p. 171).

Lewis and Gilhousen: "Quitters Never Win" (p. 297). The implication is that once a career choice is made, it must be followed regardless of the consequences.

4. Mitchell and Krumboltz: "If I can just do *this*, then I will be happy" (p. 171).

Lewis and Gilhousen: "I want you to have it better than I did" (p. 297). There are two ideas behind this myth. The first is that success can be achieved if an established set of rules is followed. The second idea is children must out-perform their parents in terms of career achievements.

5. Mitchell and Krumboltz: "My work should satisfy all my needs" (p. 171).

Lewis and Gilhousen: "My Work is My Life" (p. 298). This myth reflects the belief one's work is the center, and most important element, of a person's life.

6. Mitchell and Krumboltz: "I can do anything as long as I'm willing to work hard enough" (p. 171).

Lewis and Gilhousen: "Anyone Can Be President" (p. 298). This myth implies lack of success merely means a person has not worked hard enough.

7. Mitchell and Krumboltz: "My worth as a person is integrally related to my occupation" (p. 171).

Lewis and Gilhousen: "My Son or Daughter the Doctor" (p. 298). The belief supporting this myth stems from the idea being in the right occupation will bring more happiness and self-worth than being in other occupations perceived to have less prestige.

Nevo (1987) drew on the work of Thompson (1976) and Lewis and Gilhousen (1981) to formulate a series of irrational expectations that frustrate the career decision making and problem solving process. Nevo's seven irrational expectations were: (a) the need to find one, perfect occupation that satisfies all significant players in a person's life; (b) over-reliance on counselors and assessments to identify a specific occupation; (c) the notion hard work can make any occupational choice successful; (d) being an acknowledged expert in an occupation is essential; (e) finding a suitable occupation to solve all other problems a person may have; (f) using intuition to validate a career choice; and

(g) the idea vocational choice is a one-time act requiring no further career decisions.

Betz (1992) noted that study of DCTs was shifting from the process of identifying and characterizing them to finding ways to assess DCTs and reduce their impact. Kinnier and Krumboltz (1986) recommended using cognitive restructuring to intervene in dysfunctional career thinking, but did not identify a reliable way to identify dysfunctional thoughts. Their recommendation was for counselors to be vigilant in looking for evidence of DCTs, noting maladaptive thoughts are often subtle and hidden. Kinnier and Krumboltz implied the presence of DCTs could be assessed only by probing and asking questions based on an individual counselor's style and each client's unique situation.

In another approach, Brown and Lent (1996) advocated assessing DCTs by comparing an individual's scores on a variety of aptitude and interest measures and noting obvious discrepancies or inconsistencies. Anecdotal evidence indicated this might be a productive way to generate material for use during career counseling sessions. Brown and Lent acknowledged the drawback to their strategy was the need for rigorous empirical testing.

One of the first studies to examine the relationship between DCTs and a cognitively-based approach to reducing them was completed by Mitchell and Krumboltz (1987). Mitchell and Krumboltz based their study on the assumption that dysfunctional thoughts influenced career decision making. They tested the effectiveness of a cognitive restructuring intervention in reducing maladaptive career thoughts on university students who had difficulty making career

decisions. The level of dysfunctional career thinking evidenced by the students was assessed using a 36-item questionnaire developed for the study. Results showed the number of maladaptive career thoughts decreased significantly after a cognitive restructuring intervention.

Career Thoughts Inventory Research

Peterson et al. (1991) published the initial version of the CIP approach to conceptualize a way to enhance career problem solving and decision making. Soon after, Sampson et al. published the CTI (1996a) as a screening tool to assess levels of DCTs for high school students, college students, and adults. At the same time, the CTI workbook (Sampson et al., 1996c) was developed for use as an intervention to reduce the impact of DCTs on individuals' career decision making. Since the development of the CTI and the workbook there have been sufficient numbers of studies to warrant publication of research bibliographies in this topic (e.g., Carr, 2004; Osborn, 2004; Sampson, Peterson, Reardon, & Lenz, 2006). None of the studies reported using high school students as research participants. Only Carr reported using the CTI workbook as an intervention.

When the CTI (Sampson et al., 1996a) has been used as a means of assessing dysfunctional career thinking in individuals, levels of DCTs have been reported using either the CTI Total Score or one of the three subscale scores (Decision Making Confusion, External Conflict, or Commitment Anxiety). Dagenhart (2005) found a significant, positive relationship between college students' levels of negative career thoughts as measured by the CTI and depression as indicated by scores on the Beck Depression Inventory II (Beck,

Steer, & Brown, 1996). In addition, Dagenhart found no significant gender differences between the CTI Total Score and the BDI-II score but found women scored significantly higher than men on the Commitment Anxiety subscale of the CTI.

Dipeolu, Reardon, Sampson, and Burkhead (2002) found a significant negative correlation between the prevalence of dysfunctional career thoughts and positive adjustment to learning disabilities. The study compared college students with learning disabilities with college students in the normative sample of the CTI. The Total Score and all three subscale scores for the CTI were negatively correlated with positive adjustments to disabling conditions. In addition to their finding on the relationship between DCTs, based on the CTI Total score, and adjustment to learning disabilities, Dipeolu et al. found students with learning disabilities had significantly higher scores on the External Commitment subscale of the CTI than the students in the CTI normative sample. Dipeolu et al. attributed this difference to an increased inability by students with learning disabilities to balance demands from significant others with their own career desires when compared with students from the normative sample.

Kilk (1998) used the CTI (Sampson et al., 1996a) to establish levels of DCTs and then analyzed these data with levels of decidedness on academic majors. Kilk's findings suggest that DCTs may adversely influence students' ability to choose an academic major in college. She also found students who were undecided about an academic major had higher levels of DCTs than students who were able to choose a major.

Kleiman, Gati, Peterson, Sampson, Reardon, and Lenz (2004) used the CTI (Sampson et al., 1996a) to examine correlations between levels of decidedness about career plans and DCTs. They hypothesized that individuals who were at an advanced stage of the career decision making process would have fewer DCTs than those individuals who were just starting the process of making career plans. Their results provided support for the hypothesis. In addition, they reported finding no gender differences in the CTI Total Scores or the scores for the three CTI subscales.

In an attempt to understand DCTs and their impact on individuals' career development, Lustig and Strauser (2003) used the CTI (Sampson et al., 1996a) in a descriptive study to identify groups of individuals with disabilities based on their measured levels of DCTs. Participants were receiving job placement services and also had a diagnosis based on the Diagnostic and Statistical Manual – Fourth Edition (DSM IV; American Psychiatric Association, 1994). CTI scores from this group were compared to scores from a group of individuals who had not been diagnosed with a condition from the DSM IV. Cluster analysis produced three groups of individuals based on measured levels of DCTs (dysfunctional thoughts, external conflict, and productive thoughts).

Lustig and Strauser (2002) also found a relationship between a sense of coherence and the level of DCTs individuals experience. They described *sense of coherence* as the belief an individual may have that sense and order can be derived from the world around him or her. Correlational analysis confirmed the hypothesis that individuals with a stronger sense of coherence would have lower

levels of DCTs. Lustig and Strauser found no significant gender or ethnic differences in participants' responses on the CTI.

Osborn (1998) used the CTI (Sampson et al., 1996a) to examine how perfectionism and DCTs influence career indecision in college students. CTI Total Scores and subscores were correlated with scores from the Frost Multidimensional Perfectionism Scale (Frost, Marten, Lahart, & Rosenblate, 1990). Osborn found significant, positive correlations between scores for both instruments. When DCTs and perfectionism were examined for their respective contributions to career indecision, DCTs were found to be a significant contributor while perfectionism was not.

Reed (2006) examined DCTs in light of their contributions to the coping behaviors individuals use when they attempt to make career decisions. The CTI (Sampson et al., 1996a) was administered to undergraduate college students along with the NEO-Five Factor Inventory Form S (NEO-FFI; Costa & McCrae, 1992). Reed found that while neuroticism, as measured by the NEO-FFI, had a more dominant influence on the coping strategies individuals use to make career decisions, DCTs also contributed significantly to the coping strategies chosen.

Keim et al. (2002) used CTI scores (Sampson et al., 1996a) from three groups of women from low socioeconomic status backgrounds to characterize differences between the groups of participants. The basis of the study was the theoretical assumption that DCTs adversely influence career and employment-seeking behaviors. Results indicated significantly lower levels of DCTs in the

group with no plans to seek employment when they were compared to the two groups of employment-seeking participants.

Van Haveren (1999) studied dysfunctional career thinking and gender using college students as participants. Van Haveren found underclass college students had significantly higher DCTs than upperclass students as indicated by their CTI Total Scores. He also found male college students, as compared to female students, had higher levels of DCTs as measured by the Decision Making Confusion and External Conflict subscale scores of the CTI.

In addition, the CTI (Sampson et al., 1996a) has been used as a pretest and posttest measure in several studies. Austin et al. (2003) measured the efficacy of a CIP-based intervention by using the CTI (Sampson et al.) to assess levels of DCTs in adult participants in a career course before and after the intervention. Significant reductions in the CTI Total Score and all three CTI subscale scores were reported after the intervention.

Reed, Lenz, Reardon, and Leierer (2001) found significant reductions in levels of DCTs as measured by pretest and posttest administration of the CTI (Sampson et al., 1996a) in conjunction with a CIP-based, semester-long career course for college students. Osborn, Howard, and Leierer (2007) used a research design similar to the one used by Reed et al. to determine if similar results could be obtained in a career course which met only six times in six weeks. The college freshmen who participated had significantly reduced DCTs after completing the course. In addition, Morano (2005) evaluated DCTs as part of an eight-week course designed to help college students choose an academic

major by using the CTI (Sampson et al.) as a pretest and posttest measure. After the intervention Morano found a significant drop in levels of DCTs as measured by the CTI Total Score and all three subscale scores for the treatment group.

Werner (2003), in a study of the impact of a learning community intervention for college students, used the CTI (Sampson et al., 1996a) as a pre-intervention and post-intervention measure of DCTs. Werner used an eight-week CIP-based intervention to present information organized around the Pyramid of Information Processing Domains (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). No significant differences were found in DCTs as measured by comparing pre-intervention and post-intervention CTI scores.

Carr (2004) used the CTI workbook to investigate the effectiveness of reframing dysfunctional career statements for university students. He used the CTI (Sampson et al., 1996a) to assess DCTs before and after allowing students to complete the CTI workbook (Sampson et al., 1996c). Levels of DCTs were not significantly reduced after students completed the CTI workbook; Carr attributed this to treatment diffusion when information was presented to all participants during the intervention.

In addition to Carr (2004), who based a career intervention entirely on the CTI workbook (Sampson et al., 1996c), Reed, Lenz, Reardon, and Leierer (2000, 2001) and Osborn et al. (2007) used portions of the workbook in their investigations into ways to reduce levels of DCTs. In the studies conducted by Reed et al., the CTI workbook was an optional activity during CIP-based

interventions. No data or analyses regarding use of the CTI workbook were included in either report. Osborn et al. reported using a portion of the CTI workbook in a study of college students' DCTs. One of the five sections in the CTI workbook was used as a homework assignment after the first class meeting in a six-week career course. No other sections of the workbook were used as part of the intervention; the course also included administration of the CTI (Sampson et al., 1996a), lectures, group exercises, class discussions, and individual sessions with the instructor. Results showed a significant reduction in DCTs after students completed the course. No significant gender or ethnic differences in participants' responses to the CTI were found.

The CTI (Sampson et al., 1996a) has been used in conjunction with the SDS (Holland, 1994) in several studies. Railey and Peterson (2000) used both in a criterion group design to examine differences in occupational interest structure and DCTs between three groups of female prison inmates differentiated by their attitudes about seeking employment. The goal of this study was to determine if assessing DCTs and interest structure could be used as the basis for developmentally appropriate career interventions. Findings implied that the significant differences between groups in Commitment Anxiety and coherence could be used to offer career services targeted to the needs of each group.

Wright (2000) studied the relationships between career decidedness, satisfaction with occupational choice, self-efficacy, career interests, and DCTs. College students completed the SDS (Holland, 1994) and the CTI (Sampson et al., 1996a). Results indicated Decision Making Confusion (Sampson et al.) was

inversely related to career decidedness and satisfaction with occupational choice for Holland's Social and Investigative personality types. Further, Wright found Decision Making Confusion to be inversely related to an individual's confidence in occupational skills for all six Holland personality types.

Wright, Reardon, Peterson, and Osborn (2000) investigated relationships between the constructs measured by the CTI (Sampson et al., 1996a) and those measured by the SDS (Holland, 1994). Specifically, Wright et al. assessed the relationships between Holland's (1966, 1985, 1997) RIASEC typology and the prevalence of DCTs among college students. Although they found no significant relationship between Holland's secondary constructs and CTI scores, they did find significant relationships between two of Holland's personality types and DCTs. Students with high Realistic scores on the SDS had high CTI Decision Making Confusion scores and low Commitment Anxiety scores, whereas students who scored high on the Enterprising type had low Decision Making Confusion and high Commitment Anxiety scores.

Vocational Identity

Foundations of Vocational Identity

Kroger (2007), Vondracek (1992), and Skorikov and Vondracek (1998) identified Erickson's (1959, 1968) writings as the foundation for current conceptualizations of identity. Erickson (1968) identified the establishment of an identity as the major task of adolescence and described the search for vocational identity (VI) as having a central role in the process children go through to arrive at their conceptualizations of themselves. Erickson (1968) made the observation

that “In general, it is the inability to settle on an occupational identity which most disturbs young people” (p. 132). Vondracek and Porfeli (2003) supported this notion while Kroger characterized adolescents’ search for vocational direction as a “formidable task” (p. 70). Vondracek noted although Erickson made repeated references to the centrality of vocational identity in adolescent development, he did not make specific contributions to career theory.

Both Galinsky and Fast (1966) and Holland (1966, 1985, 1997) addressed the impact of vocational choice on identity formation. Galinsky and Fast described vocational choice as the defining feature of adolescents’ identity searching. Holland (1997) postulated identity formation begins with adolescents’ differential development of “preferred activities, interests, competencies, and values” (p. 18). This development process includes occupational interests and produces an individual’s personality type. Personality type in turn influences a person’s characteristic skills and coping mechanisms (Holland, 1966).

As a precursor to later work defining VI, Holland and Holland (1977) described differences between vocationally decided and vocationally undecided students. Their findings suggested vocationally decided high school students differed from vocationally undecided students primarily in their sense of identity and vocational maturity. From this earlier work, Holland, Gottfredson, and Power (1980) developed three diagnostic scales to assess vocational identity and difficulties in vocational decision making. These scales are the basis for *My Vocational Situation* (MVS; Holland, Daiger, & Power, 1980a) which Vondracek (1992) described as “a direct and easily interpretable means of assessing the

differentiation and relative consistency of personality patterns” (p. 138). Holland, Daiger, and Power (1980b) referred to the construct measured by MVS as vocational identity and defined it as “the possession of a clear and stable picture of one’s goals, interests, and talents” (p. 1). Holland (1997) reframed this definition of VI when he later referred to MVS as a way of measuring “the clarity of a person’s vocational goals and self-perceptions” (p. 33).

Holland (1997) believed a person with well developed VI would gravitate to work congruent with his or her personality characteristics. In addition, he believed persons with higher levels of VI would be more persistent in their search for congruent work and be more satisfied with work they find than persons with low levels of VI. Buchanan’s (1997) research using the SDS (Holland, 1994) and MVS (Holland et al., 1980a) indicated VI was a predictor of job satisfaction in adults. Holland (1997) noted an individual’s level of VI did not predict an occupational area or career aspirations; he related the level of VI to the degree of stability in individual’s occupations or aspirations.

According to Holland (1997), development of a clear sense of VI is crucial for students to avoid career development problems. Holland postulated that the impact of maladaptive career development was the formation of “beliefs about the self and the occupational world that make it difficult for the person to translate his or her personal characteristics into occupational opportunities” (p. 196). Holland noted that Sampson et al. (1996b) made a similar linkage between VI and DCTs. Leung (1998) used MVS to examine the relationship between VI and career choice congruence. He found while VI was related to high school

students' congruence in their choices for college majors, it was not related to their choices for careers.

Vocational Identity Research

Mauer and Gysbers (1990) analyzed the VI scores from MVS (Holland et al., 1980a) results for over 4,000 freshmen at the University of Missouri. They concluded VI was not a unitary construct but rather described a more complex formulation. Tinsley, Bowman, and York (1989) completed a factor analysis of MVS scores and agreed with Mauer and Gysbers that VI was a complex construct. One factor seemed to measure confidence and certainty about an individual's career. Holland, Johnston, and Asama (1993) described VI as a single factor which "has a cluster of personality and value correlates that help define its meaning" (p. 5). Correlational research completed by Hellmich (1996), using college students as participants, supported MVS as a way to measure occupational clarity for individuals.

Betz, Klein, and Taylor (1996) characterized MVS (Holland et al., 1980a) as an instrument used frequently in research investigating career indecision. Additionally, it has been used to assess pretest/posttest results in experimental research, differentiate between the characteristics of research participants, and measure the effectiveness of career interventions. MVS has been used to assess levels of VI in high school students, college students, and adults. In the years after Holland et al. (1993) reported MVS had been used in over 50 studies since its initial publication, this instrument continued to be used with relative frequency; all told, there have been more than 90 studies reported.

Jacobsen (1995) and McCharen (1995) used MVS (Holland et al., 1980a) as a pretest and a posttest measure to assess changes attributable to a career intervention in research designs involving high school or college students. Jacobsen found significant changes in levels of VI in low-achieving 10th graders after allowing them to use CHOICES, a computer-assisted career guidance system. Jacobsen used MVS scores to assess levels of VI in pretest and posttest administrations. By using MVS (Holland et al.) to measure VI in a pretest/posttest control group design with 9th grade students, McCharen concluded that formulating a four-year plan of study had a significant, positive impact on the VI of any students in the 14 to 16 year-old age group regardless of their gender.

Tanouye (1991) administered MVS (Holland et al.) before and after an intervention to examine the use of changes in career indecision as predictors of changes in VI for high school students. Whereas Tanouye found significant increases in the levels of VI for the participants after exposure to a career planning course, levels of career indecision were not found to be useful predictors of change in MVS scores. Foley (1999) administered MVS (Holland et al.) as a pretest/posttest measure to high school students to investigate the impact of the SDS (Holland, 1994) on VI. Foley concluded that levels of VI could be predicted from students' levels of career decision making self-efficacy, general indecisiveness, and career choice anxiety. Caligiuri (1997) used MVS scores to conclude 10th grade students increased their posttest levels of VI by participating in a career development workshop. Finally, Laflin (2005) used MVS (Holland et al.) as a pretest/posttest measure to assess changes in 9th grade

students' VI as a result of a comprehensive counseling program. Results showed a significant increase in VI in boys and girls as a result of participation in the counseling program; the study yielded no significant gender differences in VI.

In addition to using MVS (Holland et al., 1980a) as a pretest/posttest measure in studies using high school students as research participants, other researchers have also used MVS in other studies to assess levels of VI in high school students. Conneran (1996) used the SDS (Holland, 1994) in conjunction with MVS (Holland et al.) to examine the extent to which VI and three SDS constructs (congruence, differentiation, and consistency) would predict occupational stability for high school students. Of the four predictor variables, only congruence was found to be significant. Bangley (1992) also used MVS to examine the effect of two interventions on VI levels on high school students. In this case, no significant change in VI levels was reported although the brevity of each intervention session and the low number of sessions were thought to be limiting factors impacting the effect of the interventions.

In studies that investigated VI in college students, interventions ranged from a single session of individual counseling (Buescher, Johnston, Lucas, & Hughey, 1989) to semester-long group career classes (Baldwin, 1998; Dubin, 1996; Henry, 1994; Montolio, 1988; Rayman, Bernard, Holland, & Barnett, 1983; Wachs, 1986). Of the studies reported, only one (Shahnasarian, 1985) did not find a significant increase in VI as a result of the various interventions employed. Barnes and Herr (1998) reported individual career counseling, a career interest inventory, and a computer-aided career guidance program (CACG) were all

effective in increasing students' VI. Mau's (1999) results supported Barnes and Herr's conclusions about CACG efficacy, as did Shahnasarian's. Anderson (1995), Conyers (1996), and Marinelli (1997) employed brief group interventions and each reported significant increases in VI. Bash (1987) found a negative relationship between VI and DCTs and Ryan-Jones (1990) reported a negative relationship between VI and career indecision. Both findings are consistent with the expectations of Holland (1966, 1985, 1997) and the CIP approach (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). The results of these studies involving college students indicate VI can be increased by a wide variety of interventions including career interest inventories, such as the SDS (Holland, 1994) and group learning experiences.

Researchers have been consistent in their findings in terms of the relationship between VI and gender, academic performance, or racial differences in studies using MVS (Holland et al., 1980a). Henry (1993) and Peeke (1997) used MVS to assess VI in college students and found no gender differences. Several studies included examination of MVS scores for gender differences in high school students (Gushue, Clarke, Pantzer, & Scanlan, 2006; Gushue, Scanlan, Pantzer, & Clarke, 2006; Grotevant & Thorbecke, 1982; Laflin, 2005; Soto, 1997). None of the studies found gender differences reflected in the MVS scores with the exception of Grotevant and Thorbecke who did find VI was positively related to masculinity for both male and female participants.

The relationship between academic performance and VI was reported in four studies. In studies of college students, neither Gehlert, Timberlake, and

Wagner (1992) nor Healy, Tullier, and Mourton (1990) found any relationship between academic performance as measured by students' GPA and their VI scores as measured by MVS (Holland et al., 1980a). In studies using high school students, Laflin (2005) found high school students whose GPA was in the lowest quartile also had the lowest levels of VI. On the other hand, Soto (1997) found no differences in VI when comparing academically high-achieving high school students with academic low-achievers.

Leong (1991), Peeke (1997), and Toporek (2001) reported on the relationship between race and VI. Leong found no relationship between VI and race when comparing MVS scores (Holland, 1980a) for Asian American college students with those of White college students. Both Peeke and Toporek examined the relationship between VI and race by comparing MVS scores for White college students with Black students. In both instances, no relationship was found.

Several researchers examined the impact of the SDS (Holland, 1994) as an intervention on levels of VI. Loughhead and Black (1990) used the SDS as a career program for adults with disabilities and reported significant increases in VI scores after the intervention. Pusateri (1995) found VI was negatively correlated with low, flat SDS profiles for college students. She hypothesized this negative correlation reflected participants' lack of maturity, confusion, or poor sense of identity. This is consistent with Holland's theory (1966, 1985, 1997) and the CIP approach (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004) which postulate low, flat SDS profiles may indicate

immaturity, low VI, or depression. Wiggins (1987) reported that the SDS, when used as a career intervention, was effective in raising VI levels for high school students. Finally, Foley (1999) administered the SDS to high school students to examine its impact on VI. No significant differences in VI levels as measured by MVS were reported for high school students who were given the SDS when compared to VI levels for students who took a different career interest assessment.

Vernick (2002) noted the CTI (Sampson et al., 1996a) and MVS (Holland et al., 1980a) were both useful instruments in identifying students for whom the SDS (Holland, 1994) would be ineffective as a career intervention. Vernick equated low levels of VI with lack of career decision making readiness as measured by the CTI. Vernick postulated students with low VI or high levels of DCTs would most likely not benefit from taking the SDS without individualized help.

A series of studies using MVS (Holland et al., 1980a) and the CTI (Sampson et al., 1996a) investigated the relationship between VI and DCTs. With one exception, all studies found a significant, inverse relationship between VI and DCTs (Dodge, 2001; Sampson et al., 1996b; Saunders, 1998; Saunders, Peterson, Sampson, & Reardon, 2000; Strauser, Lustig, Cogdal, & Uruk, 2006; Yanchak, Lease, & Strauser, 2005). Strausberger (1999) unexpectedly found a positive correlation between VI and DCTs. This relationship was explained as descriptive of undecided college students who had fairly strong vocational

identities but who were experiencing anxiety and confusion about the process of making a career choice which elevated their levels of DCTs.

Summary

Dysfunctional thinking can adversely impact the metacognitive functions and decision making skills high school students use to make career decisions (Judge & Locke, 1993; Kinnier & Krumboltz, 1986; Sampson et al., 1996b). Ways to conceptualize this problem have been addressed since the 1970s (Ellis, 1977; Meichenbaum, 1977). DCTs were first identified as a class of irrational thoughts pertaining to career development (Dryden, 1979; Corbishley & Yost, 1989; Lewis & Gilhousen, 1981) and subsequently characterized by their impact on individuals' career choices (Krumboltz, 1983; Mitchell & Krumboltz, 1987; Nevo, 1987; Thompson, 1976).

Peterson et al. (1991) drew from several theories (Beck, 1976; Ellis, 1973; Meichenbaum, 1977; Newell & Simon, 1972) to formulate the CIP approach to facilitate career decision making and reduce the negative effects of DCTs in high school students, college students, and adults. This approach addresses both the content and process of career decision making through two major concepts, the Pyramid of Information Processing Domains and the CASVE Cycle (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). These concepts illustrate the theoretical basis of CIP and are used as aids in learning opportunities intended to change dysfunctional thinking. A major emphasis of the CIP approach is to enhance career problem solving and decision making (Peterson et al., 1991).

One of the major tasks of adolescence is to develop an identity, especially as identity relates to the world of work (Erickson, 1968, Kroger, 2007). Holland et al. (1980a) described the result of this developmental process as VI and measured it with MVS. VI has been found to be negatively correlated with DCTs (Dodge, 2001; Sampson et al., 1996b; Saunders, 1998; Saunders et al., 2000; Strauser et al., 2006; Yanchak et al., 2005). Students who have high levels of DCTs also have low levels of VI. Numerous studies (e.g., Barnes & Herr, 1998; Buescher et al., 1989; Folsom & Reardon, 2003) have shown it is possible to influence levels of VI by a variety of interventions; group learning experiences have been used most commonly for this purpose. Studies of VI have shown there is a positive relationship between levels of VI and the ability to decide on educational and occupational choices, job satisfaction, and possession of a clear sense of vocational direction.

Although high school students' VI has been studied repeatedly, no studies investigating DCTs in high school students have been reported. Findings from studies of college students (e.g., Kleiman et al., 2004; Morano, 2005) show DCTs have an adverse impact on students' ability to make educational and occupational decisions. For college students, career courses (e.g., Kilk, 1998; Morano; Reed, 2006) have generally been a successful way to reduce the impact of DCTs on career decision making.

The CTI (Sampson et al., 1996a) was developed based on the CIP approach as a screening tool and needs assessment for DCTs and has been used several times in studies of college students and adults. Some studies (e.g.,

Saunders et al., 2000; Strauser et al., 2006) combined the CTI with MVS to investigate the relationship between DCTs and career choice. The CTI workbook (Sampson et al., 1996c) is a learning resource to assist individuals in changing specific DCTs; it has been examined analytically only once, with inconclusive results. Neither the CTI nor the CTI workbook has been examined using high school students as research participants. At this point, more research is needed to examine the efficacy of these resources in career guidance for high school students.

CHAPTER 3 - Method

This study investigated the impact of career interventions on the DCTs (Peterson et al., 1991) and VI (Holland et al., 1980b) of high school students. The basis for this study was the Cognitive Information Processing approach (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). The research questions addressed by this study were:

1. Upon completion of the interventions, will the level of DCTs for the treatment group that employed both the SDS and the CTI workbook be less than the level of DCTs for the treatment group that employed only the SDS?
2. Upon completion of the interventions, will the levels of DCTs for the treatment groups be less than the level of DCTs for the control group?
3. Upon completion of the interventions, will the level of DCTs within each of the treatment groups be less than the respective pretest levels?
4. Upon completion of the interventions, will the level of VI for the treatment group that employed both the SDS and the CTI workbook be greater than the level of VI for the treatment group that employed only the SDS?
5. Upon completion of the interventions, will the levels of VI for the treatment groups be greater than the level of VI for the control group?
6. Upon completion of the interventions, will the level of VI within each of the treatment groups be greater than the respective pretest levels?

This chapter includes a discussion of the following topics: the participants, the instruments, the procedures used to carry out the study, the research

hypotheses to be tested, the research design, the statistical analyses, and the career interventions.

Participants

Participants for the treatment and control groups were seniors attending a rural community high school in north central Kansas. The student body is 95% White with the remainder made up of Black, Hispanic, Native American, Asian, and students of multiple ethnicities. In 2007, there were 127 seniors, 104 juniors, 112 sophomores, and 120 freshmen. Typically, approximately 54% of the graduating class attended four-year colleges, 20% attended community colleges, 10% attended technical colleges, and 3% entered military service (Kansas State Department of Education, 2007).

Instruments

Career Thoughts Inventory

The *Career Thoughts Inventory* (CTI; Sampson et al., 1996a) is designed to measure dysfunctional career thoughts in career problem solving and career decision making. The CTI is based on the Cognitive Information Processing approach (CIP; Peterson et al. 1991; Peterson et al., 2002; Peterson et al. 1996; Sampson et al., 2004) derived from cognitive therapy (Beck, 1976; Beck et al., 1985; Beck et al., 1979), cognitive restructuring (Ellis, 1962, 1977; Meichenbaum, 1977), and information processing theory (Newell & Simon, 1972).

Sampson et al. (1996b) described the CTI as “a theory-based assessment and intervention resource intended to improve the quality of career decisions made by adults, college students, and high school students and the quality of career services delivered to these individuals” (p. 1). The CTI is a self-administered instrument consisting of 48 negative statements to which individuals respond using a 4-point rating scale ranging from “Strongly Agree” (0) to “Strongly Disagree” (3). Typically, the CTI can be administered in 7 to 15 minutes.

The CTI Total score ranges from 0 to 144 and represents a “single global indicator of dysfunctional career thinking in career problem solving and decision making” (Sampson et al., 1996b, p. 2). Higher CTI Total scores are indicative of greater levels of dysfunctional career thinking.

The CTI also yields scores on three construct scales. The 14-item Decision Making Confusion (DMC) scale “reflects an inability to initiate or sustain the decision making process as a result of disabling emotions and/or lack of understanding about the decision making process itself” (Sampson et al., 1996b, p. 2). The 10-item Commitment Anxiety (CA) scale “reflects and inability to make a commitment to a specific career choice, accompanied by generalized anxiety about the outcome if the decision making process” (p. 2). The 5-item External Conflict (EC) scale “reflects an inability to balance the importance of one’s own self-perceptions with the importance of input from significant others, resulting in a reluctance to assume responsibility for decision making” (p. 2).

Improving Your Career Thoughts: A Workbook for the Career Thoughts Inventory (CTI workbook; Sampson et al., 1996c) accompanies the CTI. The CTI workbook is designed to assist individuals in identifying, challenging, and replacing dysfunctional career thoughts, and then taking action to make career decisions. Sampson et al. described one function of this workbook as a means to provide a cognitive restructuring intervention.

The CTI was normed on adults, college students, and high school students. Multiple regression analysis of the normative data indicated that ethnicity accounted for .1% and gender accounted for .2% of the variance in CTI Total scores when all normative groups were combined ($N = 1,562$). Based on these data, Sampson et al. (1996b) concluded there was no significant relationship between CTI Total scores and either ethnicity or gender, negating the need for separate norms for either factor. Sampson, Peterson, Lenz, Reardon, and Saunders (1998) determined the internal consistency of the CTI Total score and construct scales for each of the norm groups. Coefficient alphas (Cronbach's α) for the CTI Total score ranged from .93 to .97 and the standard error of measure (SEM) ranged from .86 to 1.03. The ranges for Cronbach's α and the SEM for the three construct scale scores were as follows: Cronbach's α for DMC ranged from .90 to .94 and the SEM ranged from .29 to .36; Cronbach's α for EC ranged from .74 to .81 and the SEM ranged from .09 to .14; and Cronbach's α for CA ranged from .79 to .91 and the SEM ranged from .22 to .25. In addition, Sampson et al. (1998) computed a test-retest stability coefficient over a 4-week interval using 73 volunteer college students and 48 volunteer 11th and

12th grade high school students. The stability of the CTI Total score and DMC, EC, and CA scores was higher for the college student sample ($r = .86, .82, .79,$ and $.74,$ respectively) than stability for high school students ($r = .69, .72, .70,$ and $.52,$ respectively). When high school and college subjects were combined, stability coefficients were $.77$ for the CTI Total score, $.77$ for the DMC score, $.63$ for the EC score, and $.75$ for the CA score.

Content validity for the CTI was a factor considered during the design of the instrument. The eight major constructs of the CIP approach (self-knowledge, occupational knowledge, communication, analysis, synthesis, valuing, execution, and executive processing) and the items on the CTI were directly linked as the instrument was developed. Of the 48 items on the CTI, there are six items associated with each of the eight major CTI constructs. This was done to insure comprehensive treatment of the relevant aspects of career decision making and problem solving in the CTI.

Construct validity for the CTI was established by examining the empirical consistency of clusters of CTI items with the CIP approach's theoretical basis (Sampson et al., 1996b). This was accomplished through a series of principal components analyses (PCA) with orthogonal rotation that identified DMC, CA, and EC as interpretable factors. These three factors were first identified during three developmental studies conducted during item selection and scale construction, and then replicated using data from four groups involved in norming the CTI. The three-factor solution resulting from the PCA accounted for 47.3% of the variance for all participants combined, 51.6% of variance for the adult

sample, 45.5% of the variance in the college student sample, and 41.8% of the variance in the high school student sample. These statistics led Sampson et al. to conclude that the three construct scales (DMS, EC, and CA) provided “the most generalizable solution across all populations” (p. 52).

Convergent validity was examined by investigating the extent to which the CTI scores correlated in conceptually consistent directions with four instruments judged to measure similar constructs. The four instruments chosen for this comparison were My Vocational Situation (Holland et al., 1980a), the Career Decision Scale (Osipow, Carney, Winer, Yanico, & Koschier, 1987), the Career Decision Profile (Jones, 1989), and the Revised NEO Personality Inventory (Costa & McRae, 1992). Pearson product-moment coefficients computed for the adult, college student, and high school student normative groups indicated that CTI scales were inversely correlated with positive constructs (e.g., vocational identity, certainty, and knowledge about occupations and training) and positively correlated with indecision (Sampson et al., 1996b). For high school students, all correlations between the four CTI scores (CTI Total, DMC, EC, and CA) and the 18 convergent variables used for the comparisons were in the hypothesized direction, and 70 of the 72 correlations were statistically significant (Sampson et al.).

Sampson et al. (1996b) addressed criterion-related validity by examining CTI Total and subscale scores for students in two universities who were either seeking career services ($n = 199$) or not seeking career services ($n = 149$). MANOVA results showed significant differences in all four scores between the

groups of clients and non-clients. In addition, a post hoc analysis of the items on the CTI showed significant differences between clients and non-clients on 26 of the 48 items. Additionally, the post hoc analysis showed that clients always scored higher than non-clients on each of the 48 CTI items. Sampson et al. (1996) interpreted these results as providing evidence that the CTI has adequate criterion-related validity in discriminating between clients and non-clients.

My Vocational Situation

My Vocational Situation (MVS; Holland et al., 1980a) is a brief, 20-item instrument developed to help counselors assess three areas of difficulty individuals may experience in career decision making: problems in vocational identity, lack of occupational information, and personal or environmental barriers to achieving an occupational goal. There are separate scales to assess each of the three areas: an 18-item, true-false Vocational Identity (VI) scale to provide an indication of the extent to which an individual may have “a clear and stable picture of one’s goals, interests, and abilities” (Holland et al., 1980b, p. 1); a 4-item yes-no Occupational Information scale to assess the degree to which an individual believes he or she needs additional vocational information; and a 4-item yes-no Barriers scale to assess the degree to which an individual may face external barriers in career decision making. For this study, only the VI scale was used.

Holland et al. (1980) estimated that MVS can be completed in 10 minutes or less. MVS is appropriate for use with individuals or in a group setting and it can be used for high school and college students as well as adults (Holland,

1997). In a study to add to the normative data for MVS, Lucas, Gysbers, Buescher, and Heppner (1988) found no significant differences between genders when they examined large, heterogeneous groups.

Holland et al. (1993) investigated the use of the VI scale of the MVS as a diagnostic tool and found the most popular use of the scale is as a pre-/post-criterion for evaluating career interventions. In the CIP approach, Peterson et al. (1991) indicated the VI scale of MVS should be used to measure meta-cognitions or career beliefs.

In estimating reliability for MVS, Holland et al. (1980b) reported a Kuder-Richardson 20 (KR 20) internal consistency coefficient of .86 for the VI scale. Holland et al. (1980) reported test-retest reliability estimates ranging from .52 to .84 for intervals of one week to seven weeks. These reliability estimates generally define the ranges reported by other investigators for periods up to three months (Holland et al., 1993).

Holland et al. (1993) investigated construct validity for the VI scale. Their findings suggested that the vocational identity construct measured by the VI scale has a significant, positive correlation with desirable vocational attitudes (Crites, 1978), vocational commitment (Grotevant & Thorbeck, 1982), desirable career beliefs (Krumboltz, 1991), desirable problem-solving attitudes (Heppner & Krieshok, 1983), and rational career decision making styles (Leong & Morris, 1989). In addition, Carson (1993) found the VI scale correlated with job satisfaction ($r = .45$) while Wanberg and Muchinsky (1992) found a strong negative correlation between VI and indecision ($r = -.78$).

The VI scale of the MVS and its predecessor, the Vocational Decision Making Identity Scale (Holland & Holland, 1977), correlated positively with being decided about vocational choices (Holland et al. 1993). Holland et al. (1993) reported that construct validity with the VI scale was further established through significant correlations in the desired directions with other career-oriented instruments: the Career Decision Scale (Osipow, Carney, & Barak, 1976); the Career Beliefs Inventory (Krumboltz, 1991); the Career Factors Inventory (Chartrand, Robbins, Morrill, & Boggs, 1990); the Medical Career Development Inventory (Savickas, 1985); and the Problem Solving Inventory (Heppner & Krieshok, 1983).

Criterion validity for the VI scale was described by Holland et al. (1993) in a summary paper of the scale's validity and reliability. Holland et al. reported that the VI scale "discriminates among well-defined criterion groups and predicts . . . treatment outcomes." (p. 5) Rayman and Bernard (as cited in Holland et al., 1993) reported a Pearson product-moment correlation of $r = .67$ between university students' VI scores and their ability to declare an academic major within one month after completing a career course. Grotevant and Thorbecke (1982) determined that occupational commitment in high school students was positively correlated with VI scores (boys $r = .49$, and girls $r = .42$). In a student needs survey, Duas (as cited in Holland et al., 1993) reported correlations which ranged from .43 to .52 for items like "I would like help in deciding on a major" and the VI scale score.

Self-Directed Search

The *Self-Directed Search Form R* (SDS; Holland, 1994) is designed to be a self-administered, self-scored, and self-interpreted interest inventory and is based on Holland's (1966, 1985, 1997) theory of vocational personalities and work environments. According to Ciechalski (2001), the SDS is designed for use by high school students and can be used for groups under the supervision of a counselor. The SDS has been developed to fulfill two main purposes: to provide a means of career counseling to people who, either by choice or circumstance, do not use the services of a career counselor; and to give career counselors the means to reach significantly more people (Holland, 1997).

According to Lumsden, Sampson, Reardon, and Lenz (2002), the mean time for individuals to complete the Internet version of the SDS was approximately 14 minutes. The instrument is made up of 228 items distributed between four sections: Activities, Competencies, Occupations, and Abilities. The Activities section is made up of 11 items for each of Holland's (1966, 1985, 1997) personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. This section provides an estimate of an individual's preferences by his or her responses to short statements about activities he or she would either "like" or "dislike." The Competency section provides an evaluation of an individual's level of perceived competence and aptitudes in each of the six personality areas by using 11 short descriptive statements for each of the personality types. An individual responds "yes" to those activities he or she can do competently, or "no" to those activities he or she has never performed or performs poorly. The Occupations section provides an opportunity for an

individual to respond “yes” to occupations that appeal to or interest him or her, and “no” to occupations he or she may dislike or find unappealing. This section is made up of 14 items in each of the six personality areas. The Abilities section is a self-rating of abilities in 12 areas. In this section, individuals compare themselves to other persons of their own age. Each self-rating in the 12 areas is made using a 7-item scale that ranges from “Low” (1) to “High” (7).

Each section yields a score for each of Holland’s six personality types. Scores for the Activities, Competencies, and Occupations sections are the sum of “Yes” or “Like” responses for each of the six personality areas in each section. Scores for the Abilities section are the numerical scores for each personality area. Total Scores for the SDS are the sum of the “Yes” or “Like” responses for each personality area and the scores from the Abilities section for the corresponding personality areas. The three highest Total Scores identify an individual’s most prominent personality areas and are assigned a letter code corresponding to the first letter of each area (e.g., R=Realistic, I=Investigative). A person whose three highest Total Scores were in the Realistic, Investigative, and Artistic personality areas would have a “RIA” three-letter code. The three-letter code is compared to the codes for the 1,335 occupations in the SDS *Occupations Finder* (Holland, 1996) to generate a list of those occupations with codes similar to the codes of the person completing the SDS. Occupations listed in the *Occupations Finder* are arranged by personality type, a three-letter occupation code, and the level of general educational development required for each.

Holland (1994) described reliability for the SDS in terms of internal consistency and test-retest reliability. KR 20 coefficients for the Activities, Competencies, and Occupations scales ranged from .72 to .92, whereas the KR 20 coefficients for the personality areas ranged from .90 to .94. Pearson product-moment correlation coefficients ranging from .37 to .84 were reported for the Abilities rating scales. All correlation coefficients for the Self-Estimates rating scales were statistically significant. The values for high school students tended to be at the lower end of the range, whereas the values for adults tended to be at the higher end. The summary scales were examined for test-retest reliability over intervals ranging from 4 to 12 weeks; retest Pearson product-moment correlation coefficients ranged from .76 to .84. Holland (1994) and Ciechalski (2001) noted this range indicated adequate stability.

Holland (1994) noted that a review of concurrent and predictive validity studies of interest inventories indicates that most inventories show the percentage of a sample whose inventory score agrees with the stated occupational aspiration (the "hit rate") is in the range of 40% to 55%. The SDS data yielded a hit rate of 54.7% (Holland). In addition, Zener and Schnuelle (1976) found that high school students who took the SDS selected occupations which were significantly more congruent with their personality traits and reported less need to consult with a counselor for career decisions than students who did not take the SDS. Using *t*-tests, Conneran and Hartman (1993) found that chronically career undecided high school students exhibited a significantly lower amount of agreement between their SDS Summary Codes and the occupations

they selected than students who were not chronically career undecided (males, $t(69)=3.23$, $p<.05$; females, $t(39)=6.39$, $p<.05$).

Procedures

Permission to conduct this study was obtained from the building principal, the district superintendent, the school board, and the Kansas State University Institutional Review Board. Fifty-five of the high school students in the senior class were randomly assigned to the treatment and control groups. To identify students for these groups, informed consent letters were sent to students inviting them to take part in the study and asking their parents or guardians to permit them to participate (Appendix A). Both students and their parents or guardians were asked to indicate their willingness to participate by signing the informed consent letter and returning it to the school within 10 days. A self-addressed, stamped envelope for returning the signed letters to the school was included in the mailing. Once the informed consent letters were returned, 55 names were selected from the letters received using the following procedure. Each of the three groups was assigned a number: one, two, or three. A table of random numbers was used to assign students to each of the three groups until each group had at least 18 students in it.

All of the sessions in this study were conducted during the school's SIP/Club Time periods. A SIP/Club Time period is a 60-minute block of time scheduled for the entire student body every other school day. The periods are normally used by students for study, research, and meetings of organizations.

There were two school counselors assisting the researcher in administering the activities of the treatment groups. One counselor assisted in administering the pretest/posttest instruments. The second counselor assisted in reconciling student schedules with intervention activities and in scheduling students for any needed make-up sessions.

During the week prior to the first session of the study, the school counselors were given the Weekly Activities Plan (Appendix B) to be followed for each session of the intervention. They were also be given copies of MVS (Holland et al., 1980a), the CTI (Sampson et al., 1996a), and the CTI workbook (Sampson et al., 1996c). In addition, each counselor received one hour of orientation to the activities shown in the plan as well as a short review of goals, materials, and activities just prior to each session. This was done to prepare them to conduct intervention activities in the event of the researcher's inability to do so.

Pre-intervention and post-intervention sessions for all three groups took place during the SIP/Club Time periods before and after the seven sessions for the CTI workbook treatment group. The pre-intervention and post-intervention sessions were used to administer the CTI (Sampson et al., 1996a) and My Vocational Situation (Holland et al., 1980a), and the After Graduation Plans questionnaire (Appendix C) which were retained in students' counseling files.

The CTI workbook intervention consisted of seven weekly sessions of 45 minutes each (including two sessions to administer the SDS to this group). The

SDS intervention consisted of two 45-minute sessions conducted during the two weeks that followed the fifth session for the CTI workbook intervention.

Students who missed a session were given make-up sessions either individually or in small groups during the time between the regularly scheduled sessions. Immediately after all the sessions had been completed, students who participated in this study but who did not have the opportunity to participate in all intervention sessions by virtue of group assignment were invited to do so.

Hypotheses

The hypotheses were as follows:

1. Upon completion of the interventions, the level of DCTs for the treatment group that employed both the SDS and the CTI workbook will be less than the level of DCTs for the treatment group that employed only the SDS.
2. Upon completion of the interventions, the levels of DCTs for the treatment groups will be less than the level of DCTs for the control group.
3. Upon completion of the interventions, the level of DCTs within each of the treatment groups will be less than the respective pretest levels.
4. Upon completion of the interventions, the level of VI for the treatment group that employed both the SDS and the CTI workbook will be greater than the level of VI for the treatment group that employed only the SDS.
5. Upon completion of the interventions, the levels of VI for the treatment groups will be greater than the level of VI for the control group.
6. Upon completion of the interventions, the level of VI within each of the treatment groups will be greater than to the respective pretest levels.

Research Design

A pretest/posttest control group design (Heppner et al., 1992) was used for this study. The four steps involved in this design were:

1. Participants were randomly assigned to one of three groups: the SDS-only treatment group; the SDS and CTI workbook treatment group; and the control group.
2. Pretests were administered to all three groups.
3. Treatments (career interventions) were administered to the respective treatment groups; no treatment was administered to the control group.
4. Posttests were administered to all three groups.

The pretest/posttest control group design allowed comparisons between treatment groups and the control group, and also allowed comparisons between treatment groups. This design controlled for threats to internal validity, although it necessitated caution in making generalizations to populations outside the study (Heppner et al., 1992).

Statistical Analyses

A series of 3 x 2 mixed design analyses of variance (ANOVA) was used to examine pre-intervention to post-intervention differences in mean scores for each of the dependent variables. The dependent variables were the levels of DCTs and VI as measured by scores on the CTI (Sampson et al., 1996a) and the Vocational Identity scale of My Vocational Situation (Holland et al., 1980a), respectively. The three levels of the independent variable were the types of career intervention: one which employed only the SDS (Holland, 1994), one

which employed both the SDS and the CTI workbook (Sampson et al., 1996c), and one based on taking neither action. The Type I error rate used for tests of significance was .05.

Post hoc examination of interactions and main effects followed Howell's (2002) recommendations pertaining to research designs based on intervention models. Boik (as cited in Howell) postulated that in performing post hoc examinations it could be more accurate to derive separate error terms for each tested effect rather than testing effects against a pooled error term. Based on Boik's work, Howell demonstrated that it could be more accurate to describe the effects of an intervention by running separate repeated measures ANOVAs within groups than it was to compare post-intervention results between groups. Howell noted that by following the latter approach, statistical anomalies (e.g., the incorrect rejection of a research hypothesis) could result by deriving small, invalid *F* statistics by using large within-groups error terms in the variance ratio denominator computed by pooling error terms.

Career Interventions

The interventions were based on the Cognitive Information Processing approach (CIP; Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). CIP builds on Holland's (1966, 1985, 1997) work and also addresses the possibility that students may have deficiencies in the way they make career decisions. Approximately two thirds of the students were assigned to participate in either the SDS and CTI Workbook Intervention or the SDS Intervention in approximately equal numbers. The remaining one third of the

students were assigned to the control group and participated in neither intervention.

The SDS and Career Thoughts Inventory Workbook Intervention

This intervention began with completion of the activities in the CTI workbook and concluded with administration of the SDS. Detailed instructions for each session are presented in Appendix B. The CTI workbook, when used in conjunction with the CTI, is designed to assist students to interpret their CTI scores and effectively enhance their exploratory, problem-solving, and decision-making behaviors (Sampson et al., 1996c). The workbook provides cognitive restructuring and action planning exercises to help students in pursue predetermined goals and outcomes (Sampson et al.).

Session One: Introducing Negative Career Thoughts

The objective of the first session was to introduce the concept of negative career thoughts and how to deal with them using the CTI workbook. After the introduction, the researcher referred to the CTI workbook and presented the four steps to improving negative career thoughts: identify, challenge, alter, and act.

Following the explanation of the steps to improve negative career thoughts, students were given their CTI results for use during the session. The students used their CTI scores to identify the nature of their negative career thoughts by completing the activities in Sections 1 and 2 of the CTI workbook. Upon completion of each session, both the CTI and the CTI workbook were collected from each student and retained for use in subsequent sessions. After students used their CTI results to identify their individual levels of negative career

thoughts, they were given an opportunity to take the next steps--to personalize and challenge their negative career thoughts.

Session Two: Identifying Negative Career Thoughts

This was the first of two sessions dedicated to the cognitive reframing exercise in Section 3 of the CTI workbook. The objective for this session was for students to write personalized versions of the negative career thoughts they identified previously from their CTI results. This activity was the first step in facilitating the cognitive restructuring of DCTs (Sampson et al., 1996b). Following completion of this portion of the CTI workbook, the researcher summarized the points and activities of the session and answered any questions the students had.

Session Three: Challenging and Altering Negative Career Thoughts

This session was the second part of the cognitive reframing exercise in Section 3 of the CTI workbook. In this session students completed two activities. First, students reviewed statements in the CTI workbook that challenged the DCTs identified in the previous session. Following the review, students wrote reframed versions of their DCTs using the CTI workbook as a guide. The reframing process was intended to alter the negative content of DCTs and facilitate concrete action in career decision making (Sampson et al., 1996b).

Session Four: Acting

The goal of this session was for each student to develop an Individual Action Plan (IAP) using the activities in Section 3 of the CTI workbook. The action plan allowed students to develop small, concrete steps to make the career

choice process more manageable. The purpose of the IAP was to provide students a means to transition from the temporary benefits of the reframing exercise to “real world” actions that show them “their ‘new’ approach to thinking is better than their ‘old’ approach” (Sampson et al., 1996b, p. 18). Items that were part of the individual action plans included the following: (a) decision making goals (e.g., a program of study or obtaining an education-related job), (b) activities that would help in reaching each goal (e.g., learning job training requirements or job shadowing), (c) names of people or information resources required to complete each activity, (d) the priority for accomplishing each activity, and (e) a target completion date for each activity. At the completion of the session, the researcher reviewed the main points and types of activities addressed in the session, and then related the contribution of each activity to changing negative career thoughts. The researcher collected the action plans at the end of the session. A copy of the Individual Action Plan was placed in each student’s counseling file for follow up, as required, by the school counseling staff.

Session Five: Decision Making and Resources

The objective for this session was for each student to focus on the aspects of career decision making that his or her CTI results indicated could be problematic. The researcher distributed action plans, CTI results, and CTI workbooks at the beginning of the session and collected them when the session was over. Section 4 of the CTI workbook was used to conduct a discussion on career decisions and to complete the Decision Making Checklist exercise. The last part of this session was devoted to a recap of the information covered.

Section 5 of the CTI workbook was used to summarize the main points and stress that students could make good use of support from school counselors, their family, and friends. The researcher concluded the session by encouraging students to arrange times for individual career counseling so they could better understand the link between his or her CTI results and any current career problems he or she may be experiencing.

Session Six: The Self-Directed Search

The objective for this session was for each student to complete the SDS (Holland, 1994) and print his or her SDS report. The researcher administered the SDS in a computer lab using the online version of the instrument. After completing the SDS, students saved and print their SDS summary reports produced by the online SDS program. The researcher retained students' SDS reports for use during the next session and for subsequent inclusion in each student's counseling file.

Session Seven: Self-Directed Search Interpretation

This session was conducted in a computer lab to allow students to reference Web sites for occupational information and possible fields of study after reviewing their SDS reports. After distributing the SDS reports, the researcher allowed students to refer to their individual reports while explaining the format and contents of each major section including General Information, the explanation of Holland's theory, and the Summary Code data. The researcher described two major sources of information available on the Internet that students could use to find more information about occupations and possible

fields of study: the *Occupational Outlook Handbook* (U.S. Department of Labor, 2006; <http://www.bls.gov/oco/>), and the *Occupational Information Network* (O*NET; <http://www.online.onetcenter.org/>). Students used the balance of the time for this session to review their SDS reports and research career information on the Internet while the researcher provided individual assistance. At the completion of the post-intervention session for this group, the researcher distributed CTI, CTI workbook, and SDS results to the students for their personal reference; copies were placed in each student's counseling file.

The Self-Directed Search Intervention

The second intervention was based on Holland's (1966, 1985, 1997) theory which indicated students are most likely to be helped by career interventions which give a more accurate sense of self and occupations, and a way to link self- and occupational knowledge. This intervention addressed these topics through administration and group interpretation of Holland's (1994) SDS.

This intervention consisted of two 45-minute sessions to administer and interpret the SDS. Each student in this group completed the online SDS (Holland, 1994) during the first session and participated in a group interpretation of the results during the second session. Both sessions were conducted using the Internet in one of the school's computer labs as described in sessions six and seven for the SDS and CTI workbook intervention treatment group. At the completion of the posttest session for this group, the researcher distributed the SDS reports to the students for them to retain for personal information, and a copy was placed in each student's counseling file.

CHAPTER 4 - Results and Discussion

This study investigated the impact of a cognitive information processing intervention on the dysfunctional career thoughts and vocational identity of high school students. The intervention was based on the Cognitive Information Processing approach (CIP; Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004) which was developed to help individuals enhance their career problem solving and decision making. The two activities that comprised the CIP-based intervention included use of *Improving Your Career Thoughts: A Workbook for the Career Thoughts Inventory* (CTI workbook; Sampson et al., 1996c) and the Self-Directed Search (SDS; Holland, 1994), a career interest inventory. The *Career Thoughts Inventory* (CTI; Sampson et al., 1996a) and the Vocational Identity scale from *My Vocational Situation* (Holland et al., 1980a), along with a two-item After Graduation Plans (AGP) questionnaire (see Appendix C) were used as pre-intervention and post-intervention assessments. There were three groups of participants in the study: a group that used both the CTI workbook and the SDS (workbook group), a group that used only the SDS (SDS group), and a control group that participated in neither activity. This chapter provides a pre-intervention comparison of these three groups, a description of the results of the study, a summary of the results, and ends with a discussion of the results.

Pre-Intervention Comparison of Groups

Examination of participants' characteristics (shown in Appendix D) after they had been randomly assigned to one of the three groups indicated the groups did not differ significantly in sex, age, race, and SES. All but one participant self-reported his or her race as "White." SES was determined using eligibility for free or reduced lunch as the criterion to classify students. Eligibility for free or reduced lunch was determined by the school using 185% of the Federal Poverty Guidelines as the upper bound for eligibility (specified in the National School Lunch Program by the U. S. Department of Agriculture, 2007). Chi-square tests were used to compare the participants' age, sex, race, and socioeconomic status (SES). Between the three groups there were no significant differences in: age [$\chi^2 (2, N = 55) = .14, p = .93$]; sex [$\chi^2 (2, N = 55) = 3.74, p = .15$]; race [$\chi^2 (2, N = 55) = 2.16, p = .34$]; or SES [$\chi^2 (2, N = 55) = .16, p = .92$].

In addition to demographic data, comparisons were made between the groups' pre-intervention levels of career decidedness, career aspirations, and five other dependent variables. The five dependent variables were Vocational Identity (VI), the CTI Total Score (CTI Total), CTI Decision Making Confusion (DMC), CTI Commitment Anxiety (CA), and CTI External Conflict (EC).

Pre-intervention Career Decidedness

Pre-intervention levels of career decidedness were assessed using a 4-point scale (see Appendix C) similar to that described by Kilk (1998) and Werner (2003). Choices on the scale ranged from being clearly undecided ("I have no idea what I want to do") to being very decided ("I know exactly what I want to

do”). The pre-intervention distribution of responses is shown in Table 1. Investigation of these data showed no significant difference in the pre-intervention level of career decidedness between the three groups [$\chi^2 (6, N = 55) = 7.73, p = .26$].

Table 1

Distribution of Pre-Intervention Career Decidedness Responses

<u>Level</u>	<u>Workbook Group</u>	<u>SDS Group</u>	<u>Control Group</u>	<u>Total</u>
No Idea	1	3	0	4
Vague idea	4	3	7	14
Pretty Sure	9	6	6	21
Know Exactly	4	7	5	16
Total	18	19	18	55

Pre-intervention Career Aspirations

Pre-intervention assessment of career aspirations was completed by asking students to identify one of seven choices (see Appendix C). The pre-intervention distribution of responses is shown in Table 2. Chi-square tests of these data showed no significant differences in pre-intervention career aspirations between the three treatment groups [$\chi^2 (12, N = 55) = 10.05, p = .61$].

Pre-intervention Vocational Identity and Dysfunctional Career Thoughts

The different pre-intervention levels of the five dependent variables associated with vocational identity and dysfunctional career thinking were

Table 2

Distribution of Pre-Intervention Career Aspirations

<u>Aspiration</u>	<u>Workbook Group</u>	<u>SDS Group</u>	<u>Control Group</u>	<u>Total</u>
Community College	4	3	1	8
Vocational/Technical Training	3	3	4	10
Four-Year College/University	9	11	11	31
Military Service	1	1	0	2
Work Full-time	0	0	1	1
Other	0	1	0	1
<u>I don't know yet</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>2</u>
<u>Total</u>	<u>18</u>	<u>19</u>	<u>18</u>	<u>55</u>

assessed using one-way ANOVAs. Pre-intervention group means for each variable are shown in Table 3. Analysis of pre-intervention data showed there were no significant differences between group means for any of the five variables.

Results

A series of five 3 x 2 mixed design ANOVAs (group x time) was used to examine the impact of three different treatments on five dependent variables. To recap these treatments and variables, the three groups and their associated treatments were (a) the workbook group which used both the CTI workbook and the SDS, (b) the SDS Group which used only the SDS, and (c) the control group which used neither the CTI workbook nor the SDS. The five dependent variables

assessed at pre-intervention and post-intervention were VI, CTI Total, DMC, CA, and EC. Table 3 shows the means and standard deviations for pre-intervention and post-intervention levels of the dependent variables for the treatment groups.

Table 3

Dependent Variable Descriptive Statistics

Variable	Group	Pre-intervention		Post-intervention		
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
CTI Total	Workbook	18	53.00	20.19	35.17	18.43
	SDS	19	44.68	22.47	40.74	20.09
	Control	18	50.00	17.53	42.17	23.17
DMC	Workbook	18	13.44	7.72	7.67	5.32
	SDS	19	10.11	8.12	9.05	7.27
	Control	18	11.00	4.84	9.22	6.29
CA	Workbook	18	14.28	4.65	10.33	5.52
	SDS	19	11.42	6.33	11.37	5.47
	Control	18	14.17	4.49	10.44	6.53
EC	Workbook	18	5.11	1.88	3.61	2.25
	SDS	19	4.89	2.31	3.63	2.34
	Control	18	5.33	2.83	4.11	2.61
VI	Workbook	18	9.39	4.26	13.83	3.67
	SDS	19	11.84	5.12	14.21	4.61
	Control	18	11.44	4.45	11.56	5.51

Note. DMC = Decision Making Confusion; CA = Commitment Anxiety;

EC = External Conflict; VI = Vocational Identity

Interactions and Main Effects

Main effects were found for each of the five dependent variables. Vocational identity had a main effect [$F(1, 52) = .02, p = .00$] and an interaction, [$F(2, 52) = 4.24, p = .02$]; effect sizes were $\eta^2 = .22$ and $\eta^2 = .14$, respectively. The CTI Total score had a main effect [$F(1, 52) = 20.25, p = .00$] and an interaction [$F(2, 52) = 3.56, p = .04$]; effect sizes were $\eta^2 = .28$ and $\eta^2 = .12$, respectively. The DMC variable had a main effect [$F(1, 52) = 15.05, p = .00$] and an interaction [$F(2, 52) = 3.93, p = .03$]; effect sizes were $\eta^2 = .23$ and $\eta^2 = .13$, respectively. CA also had a main effect [$F(1, 52) = .00, p = .03$] and an interaction [$F(2, 52) = 3.69, p = .03$]; effect sizes were $\eta^2 = .23$ and $\eta^2 = .12$, respectively. EC had a main effect [$F(1, 52) = 11.86, p = .00$]; the effect size was $\eta^2 = .19$. ANOVA tables for these data are presented in Appendix D.

Post Hoc Testing

Post hoc testing was based on Howell's (2002) recommendation to use separate repeated measures ANOVAs to investigate main effects and interactions. Post hoc test results are in the hypotheses section; complete ANOVA tables and interaction figures are presented in Appendix F, Tables F1 – F5 and Figures F1 – F5, respectively.

Hypotheses

Hypothesis 1

Upon completion of the interventions, the level of dysfunctional career thoughts (DCTs) for the treatment group that employed both the SDS and the

CTI workbook will be less than the level of DCTs for the treatment group that employed only the SDS.

Levels of DCTs were approximated using the CTI Total score and scores for the DMC, CA, and EC construct scales of the CTI. A comparison of the post-intervention mean scores between the workbook group and the SDS group shows there is support for this hypothesis. At post-intervention the mean for the CTI Total Score in the workbook group was 35.17 ($SD = 18.43$). The mean for the same score in the SDS group was 40.74 ($SD = 20.79$). In addition to the lower CTI Total score, mean scores for CTI construct scale scores (DMC, CA, and EC) for the workbook group were also lower than the respective scores for the SDS group (see Table 3).

Hypothesis 2

Upon completion of the interventions, the levels of DCTs for the treatment groups will be less than the level of DCTs for the control group.

Comparisons of post-intervention means for DCT scores for the workbook group and SDS group with those of the control group shows there is partial support for this hypothesis. Between pre-intervention and post-intervention, all workbook group DCT means for the CTI Total Score, DMC, CA, and EC decreased to levels lower than the mean scores for the same variables in the control group (see Table 3). Table 3 also shows that the SDS group mean scores for three of the four measures (CTI Total Score, DMC, and EC) were numerically less than the same scores for the control group when assessed at post-intervention.

Hypothesis 3

Upon completion of the interventions, the level of DCTs within each of the treatment groups will be less than the respective pre-intervention levels.

A series of ANOVAs used to compare pre-intervention and post-intervention means for each treatment group showed there is partial support for this hypothesis. ANOVA tables for these data are shown in Tables E1 – E4 (Appendix E).

CTI Total

Workbook Group: The mean for the CTI Total score in the workbook group decreased from 53.00 to 35.17 between pre-intervention and post-intervention. This decrease was significant [$F(1, 17) = 21.54, p = .00, \eta^2 = .56$].

SDS Group: The mean score for the SDS Group did not change significantly between pre-intervention and post-intervention [$F(1, 18) = .90, p = .36, \eta^2 = .05$].

Decision Making Confusion

Workbook Group: The mean for the DMC scores in the workbook group decreased from 13.44 to 7.67 between pre-intervention and post-intervention. This decrease was significant [$F(1, 17) = 14.09, p = .00, \eta^2 = .45$].

SDS Group: The differences in the DMC mean scores for the SDS group between pre-intervention and post-intervention were not significant [$F(1, 18) = .79, p = .39, \eta^2 = .04$].

Commitment Anxiety

Workbook Group: The mean for the CA scores in the workbook group decreased from 14.28 to 10.33 between pre-intervention and post-intervention. This decrease was significant [$F(1, 17) = 17.84, p = .00, \eta^2 = .51$].

SDS Group: SDS group mean CA scores stayed nearly the same between pre-intervention (11.42) and post-intervention (11.37). The difference was not significant [$F(1, 18) = .00, p = .97, \eta^2 = .00$].

External Conflict

Workbook Group: The pre-intervention mean score for EC in the workbook group decreased from 5.11 to 3.61 at post-intervention. This decrease was significant [$F(1, 17) = 6.23, p = .02, \eta^2 = .27$].

SDS Group: The pre-intervention and post-intervention decrease in mean EC scores for the SDS group (4.89 to 3.63) was not significant [$F(1, 18) = 3.11, p = .10, \eta^2 = .15$].

Hypothesis 4

Upon completion of the interventions, the level of VI for the treatment group that employed both the SDS and the CTI workbook will be greater than the level of VI for the treatment group that employed only the SDS.

A comparison of post-intervention means for the VI score between the workbook group and the SDS group (see Table 3) shows this hypothesis is not supported. The workbook group's post-intervention mean score (13.83; $SD = 3.67$) was 0.38 points less than the same mean score for the SDS group (14.21; $SD = 4.61$). Comparisons of the post-intervention increases in the means, the

effect sizes, and the magnitude of the F statistics for the VI score between both groups (see Table E5) show a more profound increase in the workbook group scores even though this group's post-intervention mean score was slightly less than the respective SDS group score.

Hypothesis 5

Upon completion of the interventions, the levels of VI for the treatment groups will be greater than the level of VI for the control group.

A comparison of post-intervention means for scores for the workbook group and SDS group with those of the control group shows there is support for this hypothesis. While control group mean VI scores remain nearly the same from pre-intervention and post-intervention (11.44 and 11.56, respectively), post-intervention means for both treatment groups were higher than the score for the control group (see Table 3). The post-intervention mean for the VI score in the workbook group increased over one standard deviation and the mean VI score for the SDS group increased by 2.37 points.

Hypothesis 6

Upon completion of the interventions, the level of VI within each of the treatment groups will be greater than the respective pre-intervention levels.

The results of the ANOVAs used to compare pre-intervention and post-intervention means for each treatment group showed there is support for this hypothesis. The mean for the VI score in the workbook group increased from 9.39 to 13.83 between pre-intervention and post-intervention. This increase was significant [$F(1, 17) = 22.19, p = .00, \eta^2 = .57$]. The mean VI score for the SDS

group also significantly increased between pre-intervention and post-intervention [$F(1, 18) = 5.24, p = .03, \eta^2 = .23$]. ANOVA tables for these data are shown in Table E5 (Appendix E).

Post-intervention Career Decidedness

Table 4 presents a summary of post-intervention responses to the question about students' levels of career decidedness that was asked as part of the After Graduation Plans questionnaire (see Appendix C). There were no significant differences between the responses by the workbook group, the

Table 4

Distribution of Post-Intervention Career Decidedness Responses

Level	Workbook Group	SDS Group	Control Group	Total
No Idea	0	1	0	1
Vague idea	2	4	6	12
Pretty Sure	8	7	5	20
<u>Know Exactly</u>	<u>8</u>	<u>7</u>	<u>7</u>	<u>22</u>
<u>Total</u>	<u>18</u>	<u>19</u>	<u>18</u>	<u>55</u>

SDS group, and the control group; [$\chi^2(6, N = 55) = 5.07, p = .54$].

One significant change was noted between pre-intervention and post-intervention responses for the groups. Responses were analyzed using the Wilcoxon Signed Ranks Test. For the workbook group, the level of career decidedness was significantly higher at post-intervention ($Mdn = 3.00$) than at pre-intervention ($Mdn = 3.00$), $T = 9.00, p < .05, r = .47$. The changes in career decidedness scores over time were not significant for the SDS group or the

control group. The results of the Wilcoxon Signed Ranks Test for these groups were: (a) SDS group pre-intervention *Mdn* = 3.00, post-intervention *Mdn* = 3.00, *T* = 9.50, *p* > .05, *r* = .18; and (b) control group pre-intervention *Mdn* = 3.00, post-intervention *Mdn* = 3.00, *T* = 6.00, *p* > .05, *r* = .24.

Post-intervention Career Aspirations

The post-intervention results of students' responses to the career aspirations question asked as part of the After Graduation Plans questionnaire (see Appendix C) showed no significant differences in the answers between the Workbook group, the SDS group, and the Control Group [χ^2 (12, *N* = 55) = 10.05, *p* = .61]. Table 5 shows the post-intervention distribution of responses. Pre-

Table 5

Distribution of Post-Intervention Career Aspirations

Aspiration	Workbook Group	SDS Group	Control Group	Total
Community College	6	3	3	12
Vocational/Technical Training	3	3	3	9
Four-Year College/University	8	11	11	30
Military Service	1	1	0	2
Working Full-time	0	1	0	1
Other	0	0	0	0
I don't know yet	0	0	1	1
Total	18	19	18	55

intervention to post-intervention comparisons within the three groups failed to show significant changes for any group. The results of the Wilcoxon Signed Ranks Test for these groups were: (a) workbook group pre-intervention $Mdn = 3.00$, post-intervention $Mdn = 2.50$, $T = 2.00$, $p > .05$, $r = .27$; (b) SDS Group pre-intervention $Mdn = 3.00$, post-intervention $Mdn = 3.00$, $T = 4.50$, $p > .05$, $r = .04$; and (c) Control Group pre-intervention $Mdn = 3.00$, post-intervention $Mdn = 3.00$, $T = 5.00$, $p > .05$, $r = .16$.

Summary of Results

Three groups of high school seniors participated in a seven-week career intervention based on the Cognitive Information Processing approach. The group that completed both the CTI workbook and the SDS made significant improvements in their levels of vocational identity and dysfunctional career thinking. The group that completed only the SDS made significant improvements in their levels of vocational identity, but to a lesser extent than the improvements made by the workbook group. The SDS group made no significant improvements in their levels of dysfunctional career thinking. The control group made no significant improvements in their levels of vocational identity, but made significant reductions in two aspects of dysfunctional career thinking (overall levels of dysfunctional career thinking and levels of anxiety surrounding career decision making). In both instances, improvements by the control group were less than or about the same as improvements made by the workbook group in these two areas.

Discussion

The underlying assumption for the six hypotheses in this study was that a CIP-based career intervention would have more positive effects on high school students' levels of dysfunctional career thinking and vocational identity than interventions which did not use all the components that were in the CIP intervention. Based on the study findings, there is consistent support for all six hypotheses. A fundamental question was how the three groups in this study changed from pre-intervention to post-intervention. The three groups of students in the study were: (a) a group that employed both the CTI workbook (Sampson et al., 1996c) and the SDS (Holland, 1994), (b) a group that employed only the SDS, and (c) a control group which participated in neither activity.

Changes in Dysfunctional Career Thoughts

All three groups in the study began with no significant differences between them in their levels of DCTs. After the interventions, the workbook group was the only one of the three to exhibit statistically significant improvements on every scale. In all cases, workbook group improvements were better than or equal to changes in either other group.

The length of the intervention for the workbook group was initially a concern based on the finding that dysfunctional career thoughts were resistant to change (Peterson et al., 1996) and Werner's (2003) judgment that an eight-week CIP-based intervention was not long enough to allow participants to integrate new career thinking. The five weekly sessions in this study appeared to provide adequate time to complete all workbook activities and integrate new information,

as reflected in students' reduced levels of DCTs. The activities in the CTI workbook are specifically focused on reducing the DCTs assessed by the CTI. Because of this focus, use of the workbook may be more time-efficient than other approaches to reducing DCTs.

Reed et al. (2000) noted that a testing effect may have influenced the positive reduction in CTI scores in their CIP-based study. In this study, all three groups were reassessed using the CTI (Sampson et al., 1996a) but groups' scores did not reflect the positive impact that a testing effect would be anticipated to produce. The workbook group scores decreased significantly for all CTI scales while scores for the other two groups did not exhibit this pattern. While it is possible a testing effect may have influenced the post-intervention CTI scores in this study, the intervention employed by the workbook group showed a more obvious influence. It can be inferred from the effect sizes obtained from the analyses that a large part of the overall variability in the CTI scores in the workbook group can be attributed to the intervention used for that group. Howell (2002) refers to the effect sizes obtained for the changes in the workbook group scores as "an unusually large amount of explained variation, reflecting the extreme nature of group differences" (p. 351).

Control group mean scores for the CTI Total and Commitment Anxiety (CA) scales were the only ones in the 15 scales which were not consistent with the hypothesized direction for changes. The CA scale items make up 10 of the 48 items on the CTI, so changes in the CA score could also be reflected in changes in the CTI Total score in the same direction—and this is what

happened. When the data for these two scales were examined there were no indications that the control group results were unusual in any respect. The reason for the unanticipated direction of the two control group mean scores remains unclear. It is possible that during the period between pre-intervention and post-intervention assessments a few students in this group changed their perceptions of their respective general anxiety levels about making a career choice. It is certainly true that the interventions in this study were not the only factors exerting influence on these students. Changing life events, including peer or parental influences, could have been confounding variables. Given the relatively small size of this group, substantial reductions in generalized anxiety surrounding the need to make career decisions for one or two students would have been enough to skew the results.

The workbook group activities incorporated remediation in all of the information processing domains (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). The CTI workbook was specifically designed to provide learning activities to reduce levels of DCTs (Sampson et al., 1996b). The workbook group's post-intervention scores reflected the efficacy of this intervention. This group was the only one of the three to exhibit significant reductions in every measure of dysfunctional career thinking assessed. The reductions in levels of DCTs for the high school students involved in this study are consistent with the findings in similar CIP-based studies of college students (e.g., Morano, 2005; Osborn et al., 2007; Reed et al., 2001). In addition to using high school students as participants, the notable difference between this study

and the ones cited is that for the first time, this study used the entire CTI workbook as a major element of a career intervention as was suggested by Sampson et al., (1996b). Werner (2003) also conducted a study based on the Pyramid of Information Processing Domains but did not find significant reductions in DCTs. However, Werner's study did not use the CTI workbook as part of the intervention.

The SDS impacts the self-knowledge and occupational knowledge domain of the CIP pyramid (Peterson et al., 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). Peterson et al. (1991) recommended the SDS for inclusion as an assessment in CIP-based interventions. By using this instrument as an intervention, the SDS group was given remediation only in the knowledge domain and none of this group's CTI scale scores changed significantly between pretest and posttest. It was, therefore, not surprising that the SDS group did not show improvement in levels of DCTs. Additionally, there were no earlier studies found that used the SDS as an intervention for DCTs. Because of the lack of change in any CTI scale score for the SDS group and the significant improvements by the workbook group on all scales, it is apparent that the workbook plus SDS intervention had more effect than the SDS-only intervention which just addressed the knowledge domain of the CIP pyramid.

Sampson et al. (1996b) recommended that local norms be developed rather than rely on the norms reported in the CTI manual. In comparing normative data reported in the CTI manual with group scores from this study, the only significant differences were in mean EC scores. Pre-intervention levels of

EC for the study groups were all significantly higher than the 3.84 mean score for high school students in the norm group. Post-intervention levels for the control group remained higher than the norm group level while EC levels for the workbook and SDS group had decreased to levels comparable to that of the norm group. The EC scale of the CTI has been shown to be relatively less stable over time for high school students than the other scales (Sampson et al.). In addition, in describing CTI validity for high school students Sampson et al. noted the relative lack of relationships between EC and convergent variables. These factors indicate that of the measurements of DCTs employed, EC may be the most unstable when assessing high school students, as was the case in this study.

Vocational Identity

It is a tenet of both Holland's (1997) theory of vocational personalities and the CIP approach (Sampson et al., 1996b) that an inverse relationship exists between levels of DCTs and VI. There are also numerous studies documenting the favorable impacts of the SDS on increasing levels of VI in high school students (e.g., Foley, 1999; Wiggins, 1987). This inverse relationship along with the efficacies shown in the studies cited led to the hypothesis that using both the SDS and a CIP-based career intervention would increase VI more than using the SDS by itself. In fact, this was the case.

Vocational identity scores for both the workbook group and the SDS group increased significantly while those for the control group did not. The workbook group, which used the CTI workbook and the SDS, had the greatest

improvement in VI scores in terms of both increases in mean scores and in the large amount of variance explained by the intervention. Increases in mean VI scores for the workbook group were more than one standard deviation of the scores in that group. As expected, the SDS group also experienced a significant increase in VI levels, but their scores were less than those exhibited by the workbook group.

The control group, which used neither the CTI workbook nor the SDS, showed essentially no change in mean VI scores from pre-intervention to post-intervention. These results seem to support the findings that there are numerous ways to use the SDS and/or broader CIP interventions to enhance VI (e.g., Barnes & Herr, 1998; Buescher et al., 1989; Folsom & Reardon, 2003). Furthermore, it appears that combining the SDS with the CTI workbook is a better way to increase levels of VI than using the SDS as the sole component of an intervention.

After Graduation Plans Questionnaire

All students participating in the study responded to two questions at pre-intervention and again at post-intervention. This was an attempt to see if students' responses to either question would change after the interventions had been completed. In the first question, students were asked to identify their general level of decidedness about their plans following high school graduation. At post-intervention, only the students in the workbook group, who took part in both the CTI workbook exercises and the SDS, reported being significantly more decided about their post-graduation plans than they reported at pre-intervention.

It appears that the combined effect of activities to reduce the impact of DCTs and to increase VI had a positive impact on this group's perceptions about their levels of career decidedness. Neither the SDS group nor the control group responses to this question changed.

The second question was more specific and goal-directed. In this question, students were asked to choose one of seven possible post-high school educational or occupational choices. The rationale for this question was based on the work of Sampson et al. (1996b) who noted the need for individuals to be able to set goals and follow through with action to increase the long-term impact of cognitive restructuring career interventions. None of the three groups exhibited significant changes in the way this question was answered. While the workbook group's responses to the first question indicated they had clarified their general perceptions of what to do after high school graduation, they did not reflect this change in terms their answers to a question regarding more specific post-graduation goals.

CHAPTER 5 - Summary, Conclusions, and Recommendations

Summary

This study examined the impact of a seven-week cognitive information processing intervention on the dysfunctional career thoughts and vocational identity of high school students. The intervention was based on the Cognitive Information Processing approach developed at Florida State University (CIP; Peterson et al. 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004). Data were gathered at pre-intervention and post-intervention.

Participants were 55 high school seniors from a small, rural mid-western town randomly assigned to three groups: (a) a group that employed both *Improving Your Career Thoughts: A Workbook for the Career Thoughts Inventory* (CTI workbook; Sampson et al., 1996c) and the Self-Directed Search (SDS; Holland, 1994), (b) a group that employed only the SDS, and (c) a control group that participated in neither activity. The participants were recruited from the 105 students in the senior class and were randomly assigned to one of the three groups; all students participating completed the study.

The research questions addressed by this study were:

1. Upon completion of the interventions, will the level of dysfunctional career thoughts (DCTs) for the treatment group that employed both the SDS and the CTI workbook be less than the level of DCTs for the treatment group that employed only the SDS?

2. Upon completion of the interventions, will the levels of DCTs for the treatment groups be less than the level of DCTs for the control group?

3. Upon completion of the interventions, will the level of DCTs within each of the treatment groups be less than the respective pretest levels?

4. Upon completion of the interventions, will the level of vocational identity (VI) for the treatment group that employed both the SDS and the CTI workbook be greater than the level of vocational identity for the treatment group that employed only the SDS?

5. Upon completion of the interventions, will the levels of VI for the treatment groups be greater than the level of VI for the control group?

6. Upon completion of the interventions, will the level of VI within each of the treatment groups be greater than the respective pretest levels?

A series of analyses of variance (ANOVA) and non-parametric tests were used to analyze data. The significance level for all tests was .05.

Conclusions

A series of five 3 x 2 mixed design ANOVAs (group x time) was used to examine the impact of three different interventions on five dependent variables. Main effects were found for each of the five dependent variables, and time x group interactions were found for all variables except commitment anxiety. Post hoc testing using repeated measures ANOVAs showed the group employing the CTI workbook and SDS (the workbook group) showed the greatest overall improvements in levels of DCTs and VI and that results for both treatment groups were in the direction predicted by the CIP approach.

Improvements in DCTs and VI for the workbook group were greater than improvements in the SDS group for all variables. In comparing changes in DCTs and VI between all three groups, improvements were greater for the two treatment groups than they were for the control group, with two exceptions. The control group showed more improvement in the overall measure of DCTs and in commitment anxiety than the SDS group did.

Finally, examination of the impact of each treatment group's intervention showed the intervention used by the workbook group had the most influence. The workbook group clearly showed significant improvement in all the measures of DCTs and VI. The SDS group did not significantly improve their scores for DCTs, but did significantly improve in VI. However, the VI improvements in the workbook group were substantially greater than those in the SDS group.

Effect sizes for workbook group data indicated that considerable amounts of variance were explained by the intervention (Howell, 2002). In applying Cohen's (1988) taxonomy to the data for the workbook group, large effect sizes were found for the CTI Total, DMC, CA, and VI variables, and a medium effect size was found for the EC variable. Effect sizes calculated from data from the other two interventions were smaller, with one exception. Commitment anxiety data for the control group unexpectedly produced an effect size approximately equal to the effect size for the same variable in the workbook group data. This may have been due to the influence of confounding variables.

In conclusion, the results of this study are encouraging. The combined use of the CTI workbook and the SDS seemed to be more effective than either of the other approaches examined. The statistically significant improvements in levels of vocational identity and dysfunctional career thinking suggest it is possible to provide successful career interventions to high school students using the CIP approach. The favorable impact on all dependent variables achieved by using a combination of the SDS and the CTI workbook indicate this approach may be an effective, efficient way to help high school students with career decision making. In addition, it is possible that this approach could also have favorable economic impacts. If students were able to reduce the number of times they made unsatisfying career decisions over the course of their lives by using the principles and skills learned from the CIP approach, it seems reasonable to conclude this could have some economic benefit to them. The magnitude of the improvements for the workbook group and the importance of this issue to students and their parents indicate that inclusion of this combined approach in high school counseling curricula may be worthy of consideration.

Recommendations

Results of this study suggest research should continue in the following areas:

1. Future studies of the CIP approach (Peterson et al. 1991; Peterson et al., 2002; Peterson et al., 1996; Sampson et al., 2004) should incorporate use of the CTI workbook.

2. Investigation into ways to optimize the presentation of information in the CTI workbook should take place. Specifically, the number and duration of sessions, and the content of each session should be explored.

3. Additional research should take place to determine if the CTI workbook is equally efficacious for both high school juniors and seniors. Also, with respect to either group, research should examine the best time during the school year to conduct a career intervention using the CTI workbook.

4. Research to clarify the nature of the external conflict construct for high school students should be undertaken.

5. A similar study using a larger number of participants could provide important validation of the findings in this study. If possible, participant groups should be geographically isolated to further reduce the possible influence of interaction between groups.

6. Research on the CTI workbook as a stand-alone career intervention should be undertaken to clarify its impact on reducing levels of DCTs or increasing levels of VI.

7. Longitudinal studies should examine the enduring efficacy of career interventions based on the Cognitive Information Processing (CIP) approach for different populations. Results of these studies could help describe how well the CIP approach fulfills its goal of providing individuals with career decision making and problem solving skills for their lifetimes.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Anderson, K. J. (1995). The use of a structured career development group to increase career identity: An exploratory study. *Dissertation Abstracts International*, 21 (4). (UMI No. 9520291)
- Austin, R. K., Wagner, B., & Dahl, D. (2003). Reducing negative career thoughts in adults. *International Journal of Disability Community and Rehabilitation*, 2(2). Retrieved September 15, 2006, from http://www.ijdcr.ca/VOL02_02_CAN/articles/austin.shtml
- Baldwin, Nettie (1998) The effect of a career development course on the career self-efficacy and vocational identity of community college students. *Dissertation Abstracts International*, 59 (03A), 732. (UMI No. 9826770)
- Bandura, A. (1977). *Social learning theory*. London: Pearson.
- Banglely, B. B. (1992). A comparison of self-efficacy and informational career counseling with undecided high school seniors. *Dissertation Abstracts International*, 54 (05), 1673A. (UMI NO. 9314152)
- Barnes, J. A., & Herr, E. L. (1998). The effects of interventions on career progress. *Journal of Career Development*, 24, 179-193.
- Bash, R. L. (1987). A study of selected cognitive structures, identity, and consistency in a university career planning experience. *Dissertation Abstracts International*, 48 (01), 590. (UMI No. 8711710)

- Beck, A. T. (1967). *Depression: Clinical, experimental and theoretical aspects*. New York: Harper & Row.
- Beck, A. T. (1976). *Cognitive theory and the emotional disorders*. New York: International Universities Press.
- Beck, A. T., Emery, G., & Greenberg, R. L. (1985). *Anxiety disorders and phobias: A cognitive perspective*. New York: Guilford Press.
- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York: Guilford Press.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *The Beck Depression Inventory II*. San Antonio, TX: The Psychological Corporation.
- Betz, N. E. (1992). Career assessment: A review of critical issues. In S. D. Brown & R. W. Lent (Eds.), *Handbook of counseling psychology* (pp. 513-547). New York: Wiley.
- Betz, N. E., Klein, K. L., & Taylor, K. M. (1996). Evaluation of a short form of the Career Decision Making Self-Efficacy Scale. *Journal of Career Assessment, 4*, 47-57.
- Brown, S. D., & Lent, R. W. (1996). A social cognitive framework for career choice counseling. *The Career Development Quarterly, 44*, 354-366.
- Buchanan, D. M. (1997). Unique contributions of differentiation, consistency, and identity in predicting congruence and job satisfaction. *Dissertation Abstracts International, 58* (3-A), 749. (UMI No. 9726414)

- Buescher, K. L., Johnston, J. A., Lucas, E. B., & Hughey, K. F. (1989). Early intervention with undecided college students. *Journal of College Student Development, 30*, 375-376.
- Caligiuri, J. A. (1997). A career workshop's effect on vocational identity, career indecision and self-efficacy of tenth graders. *Dissertation Abstracts International, 58* (01A), 93. (UMI No. 9719555)
- Carnevale, A. P., & Desrochers, D. M. (2003). Preparing students for the knowledge economy: What school counselors need to know. *Professional School Counseling, 6*, 228-236.
- Carr, D. (2004). *The effect of a workbook intervention on college students' reframes of dysfunctional career thoughts: Technical report no. 37*. Tallahassee, FL: Florida State University, The Center for the Study of Technology in Counseling and Career Development.
- Carson, A. D., & Mowesian, R. (1993). Moderators of the prediction of job satisfaction from congruence: A test of Holland's theory. *Journal of Career Assessment, 1*, 130-144.
- Chartrand, J. M., Robbins, S. B., Morrill, W. H., & Boggs, K. (1990). Development and validation of the Career Factors Inventory. *Journal of Counseling Psychology, 37*, 491-501.
- Ciechalski, J. C. (2001). Self-Directed Search. In J. T. Kapes & E. A. Whitfield (Eds.), *A counselor's guide to career assessment instruments* (4th ed., pp. 343-348). Columbus, OH: National Career Development Association.

- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). New York: Academic Press.
- Conneran, J. B. (1996). The predictive validity of the Self-Directed Search in identifying occupational instability among vocational high school students. *Dissertation Abstracts International*, 57 (3-A), 1011. (UMI No. 962559)
- Conneran, J. B., & Hartman, B. W. (1993). The concurrent validity of the Self-Directed Search in identifying chronic indecision among vocational education students. *Journal of Career Development*, 19, 197-208.
- Corbishley, M. A., & Yost, E. B. (1989). Assessment and treatment of dysfunctional cognitions in career counseling. *Career Planning and Adult Development Journal*, 5, 20-26.
- Conyers, L. M. (1996). The effectiveness of an integrated career intervention for college students with and without disabilities. *Dissertation Abstracts International*, 57 (5-A). (UMI No. 9627077)
- Costa, P. T., Jr., & McCrae, R. R. (1992). *The NEO Five Factor Inventory Form S*. Odessa, FL: Psychological Assessment Resources.
- Crites, J. O. (1978). *Administration and use manual for the Career Maturity Inventory* (2nd ed.). Monterey, CA: CTB/McGraw-Hill.
- Dagenhart, M. C. (2005). Relationship of college students' response styles on the Strong Interest Inventory to scores on the Beck Depression Inventory and the Career Thoughts Inventory. *Dissertation Abstracts International*, 65 (9-B) 4823. (UMI No. 3148285)

- Diemer, M. A., & Blustein, D. L. (2007). Vocational hope and vocational identity: Urban adolescents' career development. *Journal of Career Assessment*, 15, 98-118.
- Dipeolu, A., Reardon, R., Sampson, J., & Burkhead, J. (2002). The relationship between dysfunctional career thoughts and adjustment to disability in college students with disability. *Journal of Career Assessment*, 10, 413-427.
- Dodge, T. D. (2001). An investigation of the relationship between the family of origin and selected career development outcomes. *Dissertation Abstracts International*, 62 (2-B), 1140. (UMI NO. 3003081)
- Dryden, W. (1979). Rational-emotive therapy and its contribution to careers counselling. *British Journal of Guidance and Counselling*, 7, 181-187.
- Dubin, J. W. (1996). A descriptive study of career decision making, self-efficacy, career indecision, vocational identity, and the salience of Yalom's therapeutic factors in a psychoeducational group work context. *Dissertation Abstracts International*, 57 (06A), 2369. (UMI No. 9634987)
- Ellis, A. (1962). *Reason and emotion in psychotherapy*. New York: Lyle Stuart.
- Ellis, A. (1973). *Humanistic psychotherapy: The rational-emotive approach*. New York: Julian Press.
- Ellis, A. (1977). Rational-emotive therapy: Research data that support the clinical and personality hypothesis of RET and other modes of cognitive behavior therapy. *The Counseling Psychologist*, 7, 2-42.

- Eme, R., Maisiak, R., & Goodale, W. (1979). Seriousness of adolescent problems. *Adolescence, 14*, 93-99.
- Erikson, E. H. (1959). Identity and the life cycle. *Psychological Issues, 1*, 1-171.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.
- Eysenck, M. W., & Keane, M. T. (2005). *Cognitive psychology: A student's handbook* (5th ed.). London: Psychology Press.
- Feller, R. W. (2003a). Aligning school counseling, the changing workplace, and career development assumptions. *Professional School Counseling, 6*, 262-271.
- Feller, R. W. (2003b). Connecting school counseling to the current reality. *Professional School Counseling, 6*, i-v.
- Foley, K. A. L. (1999). Career development of rural adolescents. *Dissertation Abstracts International, 60* (6-B), 2941. (UMI No. 9935362)
- Fontaine, J. H. (2001). Career Thoughts Inventory. In B. S. Plake & J. C. Impara (Eds.), *The fourteenth mental measurements yearbook* (pp. 228-230). Lincoln, NE: Buros Institute of Mental Measurement.
- Folsom, B., & Reardon, R. (2003). College career courses: Design and accountability. *Journal of Career Assessment, 11*, 421-450.
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). Frost Multidimensional Perfectionism Scale. Northampton, MA: Author.
- Galinsky, M. D., & Fast, I. (1966). Vocational choice as a focus of the identity search. *Journal of Counseling Psychology, 13*, 89-92.

- Gati, I., Krausz, M., & Osipow, S. H. (1996). A taxonomy of difficulties in career decision making. *Journal of Counseling Psychology, 43*, 510-526.
- Gati, I., & Saka, N. (2001). High school students' career-related decision making difficulties. *Journal of Counseling & Development, 79*, 331-340.
- Gehlert, K., Timberlake, D., & Wagner, B. (1992). The relationship between vocational identity and academic achievement. *Journal of College Student Development, 33*, 143-48.
- Gilbert, H. B. (1997, January). *Career Thoughts Inventory: A review and critique*. Paper presented at the Annual Meeting of the Southwest Educational Research Association, Austin, TX. (ERIC Document Reproduction Service No. ED408526)
- Ginzberg, E., Ginzberg, S. W., Axelrad, S., & Herma, J. L. (1963). *Occupational choice*. New York: Columbia University.
- Graef, M. I., Wells, D. L., Hyland, A. M., & Muchinsky, P. (1985). Life history antecedents of vocational indecision. *Journal of Vocational Behavior, 27*, 276-279.
- Grotevant, H. D., & Thorbecke, W., L. (1982). Sex differences in styles of occupational identity formation in late adolescence. *Developmental Psychology, 18*, 396-405.
- Gushue, G. V., Clarke, C. P., Pantzer, K. M., & Scanlan, K. R. L. (2006). Self-efficacy, perceptions of barriers, vocational identity, and the career exploration behavior of Latino/a high school students. *The Career Development Quarterly, 54*, 307-317.

- Gushue, G. V., Scanlan, K. R. L., Pantzer, K. M., & Clarke, C. P. (2006). The relationship of career decision-making self-efficacy, vocational identity, and career exploration behavior in African American high school students. *Journal of Career Development, 33*, 19-28.
- Gysbers, N.C., & Henderson, P. (2000). *Developing & managing your school guidance program* (3rd ed.). Alexandria, VA: American Counseling Association.
- Hawkins, J.G., & Bradley, R.W. (1977). Anxiety and the process of deciding about a major and vocation. *Journal of Counseling Psychology, 24*, 398-403.
- Healy, C. C., Tullier, M., & Mourton, D. M. (1990). My Vocational Situation: Its relation to concurrent career and future academic benchmarks. *Measurement and Evaluation in Counseling and Development, 23*, 100-107.
- Hellmich, L. B. (1996). The effects of childhood sexual abuse on identity development and career decision making in college women. *Dissertation Abstracts International, 56* (11-B), 6392. (UMI No. 9607375)
- Henry, P. (1994). Effectiveness of career-development courses for nontraditional premedical students. *Psychological Reports, 73*, 915-920.
- Heppner, P. P., Kivlighan, D. M., & Wampold, B. E. (1992). *Research design in counseling*. Pacific Grove, CA: Brooks/Cole.
- Heppner, P. P., & Krieshok, T. S. (1983). An applies investigation of problem-solving appraisal, vocational identity, and career service requests,

- utilization, and subsequent evaluation. *Vocational Guidance Quarterly*, 31, 240-249.
- Herman, R., Olivo, T., & Gioia, J. (2003). *Impending crisis: Too many jobs, too few people*. Winchester, VA: Oakhill Press.
- Herr, E. L., & Cramer, S. H. (1996). *Career guidance and counseling through the life span* (5th ed.). New York: HarperCollins.
- Herr, E. L., & Shahnasarian, M. (2001). Selected milestones in the evolution of career development practices in the twentieth century. *The Career Development Quarterly*, 49, 225-232.
- Hinkelman, J. M., & Luzzo, D. A. (2007). Mental health and career development of college students. *Journal of Counseling & Development*, 85, 143-147.
- Holland, J. L. (1966). *The psychology of vocational choice: A theory of personality types and model environments*. Waltham, MA: Ginn.
- Holland, J. L. (1985). *Making vocational choices: A theory of vocational personalities and work environments* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Holland, J. L. (1994). *The Self-Directed Search: A guide to educational and vocational planning*. Odessa, FL: Psychological Assessment Resources.
- Holland, J. L. (1996). *The occupations finder*. Odessa, FL: Psychological Assessment Resources.
- Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources.

- Holland, J. L., Daiger, D. C., & Power, P. G. (1980a). *My Vocational Situation*. Palo Alto, CA: Consulting Psychologists Press.
- Holland, J. L., Daiger, D. C., & Power, P. G. (1980b). *My Vocational Situation: Description of an experimental diagnostic form for the selection of vocational assistance*. Palo Alto, CA: Consulting Psychologists Press.
- Holland, J. L., Gottfredson, D. C., & Power, P. G. (1980). Some diagnostic scales for research in decision making and personality: Identity, information, and barriers. *Journal of Personality and Social Psychology*, 39, 1191-1200.
- Holland, J. L., & Holland, J. E. (1977). Vocational indecision: More evidence and speculation. *Journal of Counseling Psychology*, 24, 404-414.
- Holland, J. L., Johnston, J. A., & Asama, N. F. (1993). The Vocational Identity scale: A diagnostic and treatment tool. *Journal of Career Assessment*, 1, 1-12.
- Hornak, J., & Gillingham, B. (1980). Career indecision: A self-defeating behavior. *Personnel and Guidance Journal*, 58, 252-253.
- Howell, D. C. (2002). *Using statistics in psychology* (5th ed.). Mason, OH: Thompson.
- Hoyt, K. B. (2001). Helping high school students broaden their knowledge of postsecondary education options. *Professional School Counseling*, 5, 6-12.
- Hunt, E. B. (1971). What kind of computer is man? *Cognitive Psychology*, 2, 57-98.

- Hurley, D., & Thorp, J. (Eds.). (2002). *Decisions without direction: Career guidance and decision making among American youth*. Big Rapids, MI: Ferris State University Career Institute for Education and Workforce Development. Retrieved January 25, 2004, from <http://www.ferris.edu/career institute/neds.htm>
- Jacobsen, B. R. (1995). The effect of CHOICES on the vocational identity and career indecision of low-achieving students. *Dissertation Abstracts International*, 55 (7-A), 1828. (UMI No. 9433251)
- Jarvis, P. S., & Keeley, E. S. (2003). From vocational decision making to career building: Blueprint, real games, and school counseling. *Professional School Counseling*, 6, 244-250.
- Jones, L. K. (1989). Measuring a three-dimensional construct of career indecision among college students: A revision of the Vocational Decision Scale—the Career Decision Profile. *Journal of Counseling Psychology*, 36, 477-486.
- Judge, T. A., & Locke, E. A. (1993). Effect of a dysfunctional thought process on subjective well-being and job satisfaction. *Journal of Applied Psychology*, 78, 475-490.
- Kansas State Department of Education. (n.d.). *K-12 school reports*. Retrieved June 15, 2007, from <http://www.ksde.org>
- Keim, J., Strauser, D. R., & Ketz, K. (2002). Examining the differences in career thoughts of women in three low socioeconomic status groups. *Journal of Employment Counseling*, 39, 31-43.

- Kilk, K. L. (1998). The relationship between dysfunctional career thoughts and choosing an academic major. *Dissertation Abstracts International*, 58 (8-A), 3038. (UMI No. 9806128)
- Kinnier, R. T., & Krumboltz, J. D. (1986). Procedures for successful career counseling. In N. Gysbers (Ed.), *Designing careers* (pp. 307-335). San Francisco: Jossey-Bass.
- Kleiman, T., Gati, I., Peterson, G. W., Sampson, J., Reardon, R., & Lenz, J. (2004). Dysfunctional thinking and difficulties in career decision making. *Journal of Career Assessment*, 12, 312-331.
- Kroger, J. (2007). *Identity development: Adolescence through adulthood* (2nd ed.). Thousand Oaks, CA: Sage.
- Krumboltz, J. D. (1983). *Private rules in career decision making* (Special Publications Series No. 38). Columbus OH: National Center for Research in Vocational Education, Advanced Study Center. (ERIC Document Reproduction Service No. ED229608)
- Krumboltz, J. D. (1991). *Manual for the Career Beliefs Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Lafin, K. S. (2005). Results based evaluation of career activities for high school freshmen in a comprehensive school counseling program. *Dissertation Abstracts International*, 67 (01-A). (UMI No. 3201791)
- Leong, F. T. L. (1991). Career development attributes and occupational values of Asian American and White American college students. *The Career Development Quarterly*, 39, 221-230.

- Leong, F. T. L., & Morris, J. (1989). Assessing the construct validity of Holland, Daiger, and Power's measure of vocational identity. *Measurement and Evaluation in Counseling and Development, 22*, 117-125.
- Leung, S. A. (1998). Vocational identity and career choice congruence of gifted and talented high school students. *Counseling Psychology Quarterly, 11*, 325-335.
- Lewis, R. A., & Gilhousen, M. R. (1981). Myths of career development: A cognitive approach to vocational counseling. *Personnel and Guidance Journal, 59*, 296-299.
- Loughead, T. A., & Black, D. R. (1990). Selection criteria for a career development program for the mentally ill: Evaluation of the Self-Directed Search. *Journal of Counseling & Development, 68*, 324-325.
- Lucas, E. B., Gysbers, N. C., Buescher, K. L., & Heppner, P. P. (1988). My Vocational Situation: Normative, psychometric, and comparative data. *Measurement and Evaluation in Counseling and Development, 20*, 172-170.
- Lum, S. K. S., Moyer, B. C., & Yuskavage, R. E. (2000). Improved estimates of gross product by industry for 1947-98. *Survey of Current Business, 80*, 24-54.
- Lumsden, J., A., Sampson, J. P., Jr., Reardon, R. C., & Lenz, J. G. (2002). A comparison study of the paper, personal computer (PC), and Internet versions of Holland's Self-Directed Search: Technical report no. 30.

Tallahassee, FL: Florida State University, The Center for the Study of Technology in Counseling and Career Development.

Lustig, D., & Strauser, D. (2002). The relationship between sense of coherence and career thoughts. *The Career Development Quarterly*, 51, 2-11.

Lustig, D., & Strauser, D. (2003). An empirical typology of career thoughts of individuals with disabilities. *Rehabilitation Counseling Bulletin*, 46, 98-107.

Mann, L., Harmoni, R., & Power, C. (1989). Adolescent decision making: The development of competence. *Journal of Adolescence*, 12, 265-278.

Marinelli, E. A. (1997). Holland type and vocational identity of college students participating in group career counseling. *Dissertation Abstracts International*, 59 (01A), 94. (UMI No. 9821267)

Mau, W. C. (1999). Effects of computer-assisted career decision making on vocational identity and career exploratory behaviors. *Journal of Career Development*, 25, 261-274.

Mauer, E. B., & Gysbers, N. C. (1990). Identifying career concerns of entering university freshmen using My Vocational Situation. *The Career Development Quarterly*, 39, 155-165.

McCharen, B. K. (1995). The effects of developing a four-year plan of study on the vocational identity of ninth-grade students (career planning). *Dissertation Abstracts International*, 56 (04-A), 1330. (UMI No. 9525425)

Meichenbaum, D. (1977). *Cognitive behavior modification*. New York: Plenum Press.

- Mitchell, L. K., & Krumboltz, J. D. (1987). The effects of cognitive restructuring and decision making training on career indecision. *Journal of Counseling & Development, 66*, 171-174.
- Montolio, J. J. (1988). The effects of a career and life planning course on adjustment to college, vocational identity and career planning. *Dissertation Abstracts International, 49* (11B), 5012. (UMI No. 8903138)
- Morano, M. M. (2005). How students choose a major: The effect of a college major decision making course on a student's anxiety. *Dissertation Abstracts International, 66* (11-A), (UMI No. 3195549)
- National Commission of the High School Senior Year. (2001a). *The lost opportunity of senior year: Finding a better way--summary of findings*. Retrieved February 6, 2004, from <http://www.woodrow.org/CommissionOnTheSeniorYear/>
- National Commission of the High School Senior Year. (2001b). *Raising our sights: No high school senior left behind*. Princeton, NJ: The Woodrow Wilson National Fellowship Foundation. (ERIC Document Reproduction Service No. ED459516)
- Nevo, O. (1987). Irrational expectations in career counseling and their confronting arguments. *The Career Development Quarterly, 35*, 239-250.
- Newell, A., & Simon, H. (1961). Computer simulation of human thinking. *Science, 134*, 2011-2017.
- Newell, A., & Simon, H. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.

- Newell, A., Shaw, J. C., & Simon, H. A. (1958). Elements of a theory of human problem solving. *Psychological Review*, 65, 151-166.
- Osborn, D. S. (1998). The relationships among perfectionism, dysfunctional career thoughts and career indecision. *Dissertation Abstracts International*, 59 (10-A), 3746. (UMI No. 9911447)
- Osborn, D. S. (2004). *Dysfunctional career thoughts reference list*. Tampa, FL: University of South Florida, College of Education.
- Osborn, D. S., Howard, D. K., & Leierer, S. J. (2007). The effect of a career development course on the dysfunctional career thoughts of racially and ethnically diverse college freshmen. *The Career Development Quarterly*, 55, 365-377.
- Osipow, S. H., Carney, C. G., & Barak, A. (1976). A scale of educational-vocational undecidedness: A typological approach. *Journal of Vocational Behavior*, 9, 233-243.
- Osipow, S. H., Carney, C. G., Winer, J., Yanico, B., & Koschier, M. (1987). *Career Decision Scale*. Odessa, FL: Psychological Assessment Resources.
- O'Shea, A. J., & Harrington, T. F. (2003). Using the Career Decision Making System-Revised to enhance students' career decisions. *Professional School Counseling*, 6, 280-286.
- Parsons, F. (1909). *Choosing a vocation*. Boston: Houghton Mifflin.
- Peeke, P. L. (1997). Vocational identity, racial identity, and personality typology: A study of African-American high school juniors and seniors in an urban

community. *Dissertation Abstracts International*, 57 (9-A), 3830. (UMI No. 9706547)

Peterson, G. W., Sampson, J. P., Jr., Lenz, J. G., & Reardon, R. C. (2002). A cognitive information processing approach to career problem solving and decision making. In D. Brown & Associates (Eds.), *Career choice and development* (4th ed., pp. 312-369). San Francisco: Jossey-Bass.

Peterson, G. W., Sampson, J. P., Jr., & Reardon, R. C. (1991). *Career development and services: A cognitive approach*. Pacific Grove, CA: Brooks/Cole.

Peterson, G. W., Sampson, J. P., Jr., Reardon, R. C., & Lenz, J. G. (1996). A cognitive information processing approach to career problem solving and decision making. In D. Brown, L. Brooks & Associates (Eds.), *Career choice and development* (3rd ed., pp. 423-475). San Francisco: Jossey-Bass.

Peterson, G. W., Sampson, J. P., Jr., Reardon, R. C., & Lenz, J. G. (2001). *Core concepts of a cognitive approach to career development and services*. Tallahassee, FL: Florida State University, The Center for the Study of Technology in Counseling and Career Development.

Peterson, G. W., & Swain, W. (1978). Critical Appreciation: An essential element in educating for competence. *Liberal Education*, 64, 293-301.

Prediger, D. J., & Sawyer, R. L. (1985). Ten years of career development: A nationwide study of high school students. *Journal of Counseling & Development*, 65, 45-49.

- Pusateri, M. L. (1995). The meaning of low flat Holland code profiles. *Dissertation Abstracts International*, 57 (9-B), 5929. (UMI No. 9705374)
- Railey, M. G., & Peterson, G. W. (2000). The assessment of dysfunctional career thoughts and interest structure among female inmates and probationers. *Journal of Career Assessment*, 8, 119-129.
- Rayman, J. R., Bernard, C. B., Holland, J. L., & Barnett, D. C. (1983). The effects of a career course on undecided college students. *Journal of Vocational Behavior*, 23, 346-355.
- Reardon, R. C., Lenz, J. G., Sampson, J. P., Jr., & Peterson, G. W. (2006). *Career planning and development*. Mason, OH: Thompson.
- Reed, C. A. (2006). The relationships among neuroticism, dysfunctional career thoughts and coping strategies. *Dissertation Abstracts International*, 66, (11-A). (UMI No. 3198249)
- Reed, C. A., Lenz, J. G., Reardon, R. C., & Leierer, S. J. (2000). *Reducing negative career thoughts with a career course: Technical report no. 25*. Tallahassee, FL: The Center for the Study of Technology in Counseling and Career Development, Florida State University.
- Reed, C. A., Lenz, J. G., Reardon, R. C., & Leierer, S. J. (2001). A cognitive career course: From theory to practice. *The Career Development Quarterly*, 50, 158-167.
- Ryan-Jones, R. E. (1990). The relationship of career indecision, vocational identity, and gender to career beliefs. (Doctoral dissertation, Florida State University, 1990). *Dissertation Abstracts International*, 51 (12A), 4025.

- Sampson, J. P., Jr., Lenz, J. G., Reardon, J. P., & Peterson, G. W. (1999). A cognitive approach to employment problem solving and decision making. *The Career Development Quarterly*, *48*, 3-18.
- Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1996a). *Career Thoughts Inventory*. Odessa, FL: Psychological Assessment Resources.
- Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1996b). *Career Thoughts Inventory: Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1996c). *Improving your career thoughts: A workbook for the Career Thoughts Inventory*. Odessa, FL: Psychological Assessment Resources.
- Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1998). The design and use of a measure of dysfunctional career thoughts among adults, college students, and high school students: The career thoughts inventory. *Journal of Career Assessment*, *6*, 115-134.
- Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., & Reardon, R. C. (1992). A cognitive approach to career services: Translating concepts into practice. *The Career Development Quarterly*, *41*, 67-74.
- Sampson, J. P., Jr., Peterson, G. W., Reardon, R. C., & Lenz, J. G. (2006). *Bibliography: A cognitive information processing approach to career development and services*. Tallahassee, FL: Florida State University, The Center for the Study of Technology in Counseling and Development.

- Sampson, J.P., Jr., Reardon, R.C., Peterson, G.L., & Lenz, J. L. (2004). *Career counseling and services: A cognitive information processing approach*. Belmont, CA: Brooks/Cole.
- Saunders, D. E. (1998). The contribution of depression and dysfunctional career thinking to career indecision. *Dissertation Abstracts International*, 58 (7-B). (UMI No. 9801259)
- Saunders, D. E., Peterson, G. W., Sampson, J. P., Jr., & Reardon, R. C. (2000). Relation of depression and dysfunctional career thinking to career indecision. *Journal of Vocational Behavior*, 56, 288-298.
- Savickas, M. L. (1985). Identity in vocational development. *Journal of Vocational Behavior*, 27, 329-337.
- Scott, E. S., Reppucci, N., & Woolard, J. (1995). Evaluating adolescent decision making in legal contexts. *Law and Human Behavior*, 19, 221-244.
- Seligman, M. E. P. (1998). *Learned optimism: How to change your mind and your life*. New York: Pocket Books.
- Shahnasarian, M. (1985). Use of a computer assisted career guidance system with prior schematic cognitive structuring. *Dissertation Abstracts International* 46 (10A), 2977. (UMI No. 8529560)
- Skorikov, V., & Vondracek, F. W. (1998). Vocational identity: Its relationship to other identity domains and to overall identity development. *Journal of Career Assessment*, 6, 13-35.

- Slaney, R. B., Palko-Nonemaker, D., & Alexander, R. (1981). An investigation of two measures of career indecision. *Journal of Vocational Behavior, 18*, 92-103.
- Soto, P. W. (1997). The relationship of curriculum program and gender to career maturity among older adolescents. *Dissertation Abstracts International, 58* (6-A), 2074. (UMI No. 9735631)
- Steinberg, A., & Allen, L. (2002). *From large to small: Strategies for personalizing the high school*. Boston: Jobs for the Future.
- Stone, G. L. (1983). Cognitive-behavioral theory and its application to career development. In L. W. Harmon, G. L. Stone, D. A. Jepsen, & R. A. Myers (Eds.), *Using information in career development: From cognition to computers* (Information Series No. 262). Columbus, OH: National Center for Research in Vocational Education. (ERIC Document Reproduction Service No. ED232084)
- Strausberger, S. J. (1998). The relationship of state-trait anger to dysfunctional career thinking and vocational identity. *Dissertation Abstracts International, 59* (10-A), 3747. (JMI No. 9910711)
- Strauser, D. R., Lustig, D. C., Cogdal, P. A., & Uruk, A. C. (2006). Trauma symptoms: Relationship with career thoughts, vocational identity, and developmental work personality. *The Career Development Quarterly, 54*, 346-350.
- Super, D. E. (1980). A life-span, life-space approach. *Journal of Vocational Behavior, 16*, 282-298.

- Tanouye, A. M. (1991). Effects of a career planning correspondence course on the career indecision of high school students. *Dissertation Abstracts International*, 52 (03-A), 857. (UMI No. 9108380)
- Taveira, M. D. C., Silva, M. C., Rodriguez, M. L., & Maia, J. (1998). Individual characteristics and career exploration in adolescents. *British Journal of Counselling and Guidance*, 23, 89-104.
- Thompson, A. P. (1976) Client misconceptions in vocational counseling. *Personnel and Guidance Journal*, 55, 30-33.
- Tiedeman, D. V., & O'Hara, R. P. (1963). *Career development: Choice and adjustment*. New York: College Entrance Examination Board.
- Tinsley, H. E. A., Bowman, S. L., & York, D. C. (1989). Career Decision Scale, My Vocational Situation, Vocational Rating Scale, and Decision Rating Scale: Do they measure the same constructs? *Journal of Counseling Psychology*, 36, 115-120.
- Toporek, R. L., & Pope-Davis, D. B. (2001). Comparison of vocational identity factor structures among African American and White American college students. *Journal of Career Assessment*, 9, 135-151.
- Tulving, E. (1972). Episodic and semantic memory. In E. Tulving & W. Donaldson (Eds.), *Organization of memory* (pp. 381-403). London: Oxford University Press.
- Tyler, L. E. (1958). Theoretical principles underlying the counseling process. *Journal of Counseling Psychology*, 5, 3-19.

- U. S. Department of Agriculture. (2007, February 27). Child nutrition programs—
Income eligibility guidelines. *Federal Register*, 72, 8685-8687.
- U.S. Department of Labor. (n.d.). *National employment, hours and earnings*.
Retrieved January 13, 2004, from
http://www.bls.gov/schedule/archives/empsit_nr.htm
- U.S. Department of Labor. (2006). *Occupational outlook handbook*. Washington,
DC: U. S. Department of Labor, Bureau of Labor Statistics.
- van Ecke, Y. (2007). Attachment style and dysfunctional career thoughts: How
attachment style can affect the career counseling process. *The Career
Development Quarterly*, 55, 339-350.
- Van Haveren, R. A. (1999). Levels of career decidedness and negative career
thinking by athletic status, gender, and academic class. *Dissertation
Abstracts International*, 61, (03-B). (UMI No. 9963589)
- Vernick, S. (2002, July). The application of Holland's career theory in modern day
career services: Integrating the Self-Directed Search and the Career
Thoughts Inventory. In *Careers Across America 2002: Best practices &
ideas in career development conference proceedings*. Paper presented at
the Careers Across America conference. Chicago. (ERIC Document
Reproduction Service No. ED 456921)
- Violato, C., & Holden, W. B. (1988). A confirmatory factor analysis of a four-
factor model of adolescent concerns. *Journal of Youth and Adolescence*,
17, 101-113.

- Vondracek, F. W. (1992). The construct of identity and its use in career theory and research. *The Career Development Quarterly*, 41, 130-144.
- Vondracek, F. W., & Porfeli, E. J. (2003). The world of work and careers. In G. R. Adams & M. D. Berzonsky (Eds.), *Blackwell handbook of adolescence* (pp. 109-128). Malden, MA: Blackwell.
- Wachs, P. M. (1986). Career planning course effects on vocational identity and related outcome measures. *Dissertation Abstracts International*, 47 (6-A), 2031. (UMI No. 8620978)
- Wanberg, C. R., & Muchinsky, P. M. (1992). A typology of career decision status: An extension of the vocational decision status model. *Journal of Counseling Psychology*, 30, 115-120.
- Werner, B.K. (2003). The impact of a career intervention in a learning community on the career thoughts and career decision self-efficacy of undeclared and undecided first-year university students. *Dissertation Abstracts International*, 65 (05-A), 1543. (UMI No. 3090389)
- Wiggins, J. D. (1987). Effective career exploration programs revisited. *The Career Development Quarterly*, 35, 297-303.
- Wright, L. K. (2000). The effects of self-efficacy, interest, and dysfunctional thoughts on levels of career decidedness, and satisfaction with occupational choice. *Dissertation Abstracts International*, 61(7), 3889B. (UMI No. 9880762)

- Wright, L. K., Reardon, R. C., Peterson, G. W., & Osborn, D. S. (2000). The relationship among constructs in the Career Thoughts Inventory and the Self Directed Search. *Journal of Career Assessment, 8*, 105-117.
- Yanchak, K. V., Lease, S. H., & Strauser, D. R. (2005). Relation of disability type and career thoughts to vocational identity. *Rehabilitation Counseling Bulletin, 48*(3), 130-138.
- Zener, T. B., & Schnuelle. L. (1976). Effects of the Self-Directed Ssearch on high school students. *Journal of Counseling Psychology, 23*, 353-359.

Appendix A - Informed Consent Letter

[date]

Dear _____

This letter is an invitation for you to take part in research designed to help you make better decisions about what to do after you graduate from Wamego High School. I was the school counselor for Juniors and Seniors at WHS from 1999-2001. This research is part of my Ph.D. program at Kansas State University.

The study will involve completing several career assessments and a workbook; Mrs. Kugler or Mrs. Rickstrew will conduct the career activities. Some of the students will meet once a week for nine weeks. Other students will meet less than nine times, but everyone will be invited to complete all the activities and exercises. Each session will be for 45 minutes during SIP/Club Time.

All information collected during this study will be kept strictly confidential. Your responses will not be revealed to anyone except you and your counselors. You will be given your results to keep and Mrs. Kugler will put copies in your counseling file. A summary of the results will be available on request.

Please sign below to indicate your willingness to participate (also have your parent/guardian sign to give their permission if you are younger than 18 years old). Your participation in this study is entirely voluntary; you may withdraw at any time without explanation, penalty, or loss of benefits or academic standing to which you were otherwise entitled.

Please let your parent(s)/guardian(s) read this letter. Parents or guardians may withdraw their consent at any time. If you have questions about this study, please call me at 785-537-4932 or Rick Scheidt, Ph.D. at the Kansas State University IRB (785-532-3224).

Please give or mail the signed form to Mrs. Kugler before [date] for you to participate. I look forward to working with you!

Sincerely,

David A. Strohm

I give my permission for _____ to participate in the career intervention research conducted by Mr. Strohm, Mrs. Kugler, and Mrs. Rickstrew.

Parent/Guardian Signature

Date

I am willing to participate in the career intervention research conducted by Mr. Strohm, Mrs. Kugler, and Mrs. Rickstrew. I understand the study will be conducted during SIP/Club Time.

Student Signature

Date

Appendix B - Weekly Activities Plan

Weekly Activities Plan

<u>Week</u>	<u>Activity</u>
1	<p>Administer pretest instruments to all three groups</p> <p><u>Materials:</u> After Graduation Plans Questionnaire, My Vocational Situation, Career Thoughts Inventory, pencils</p> <p><u>Time:</u> 30 minutes</p> <p>After students complete all pretest activities, collect material and make copies of MVS and CTI results for students' counseling files.</p>
2	<p>Session 1: Introducing Negative Career Thoughts</p> <p><u>Materials:</u> Students' CTIs, CTI workbooks, pencils</p> <p><u>Time:</u> 45 minutes</p> <p>The session introduces the concept of negative career thoughts and how to deal with them using the CTI workbook.</p> <ul style="list-style-type: none">- Introduce the concept of negative career thoughts (p.1).- Distribute workbooks to the students and overview the contents.- Refer to the CTI workbook and present the four steps to improving negative career thoughts: <i>identify</i>, <i>challenge</i>, <i>alter</i>, and <i>act</i> (p.1).- Distribute CTI results to each student.- Explain the CTI Total Score using Section 1 of the CTI workbook, then have students enter their CTI Total Score and the percentile in

their workbooks (p. 4).

- Help students understand the nature of their DCTs by explaining each subscale score using Section 2 of the CTI workbook. Have the students enter their subscales scores and the respective percentiles in the spaces provided (pp. 6-7).

- Collect both the CTIs and the CTI workbooks from each student and retain them for use in subsequent sessions.

3 Session 2: Identifying Negative Career Thoughts

Materials: Students' CTIs, CTI workbooks, pencils

Time: 45 minutes

The objective for this session is for students to review their CTI results and write personalized versions of the negative career thoughts they identified.

- Complete steps 1-3 of the cognitive reframing exercise in the CTI workbook (p. 11).

- At the end of the session, collect the CTIs and CTI workbooks.

4 Session 3: Challenging & Altering Negative Career Thoughts

Materials: Students' CTIs, CTI workbooks, pencils

Time: 45 minutes

The objective for this session is for students to reframe their negative career thoughts by rewriting them as new career thoughts.

- Complete steps 4-7 of the cognitive reframing exercise in the CTI workbook (p. 11).

- Collect the CTIs and the CTI workbooks.

5 Session 4: Acting

Materials: Students' CTIs, CTI workbooks, pencils

Time: 45 minutes

The objective for this session is for each student to develop an Individual Action Plan that creates manageable subtasks.

- Refer to the template in Section 3 of the CTI workbook (pp. 24-25) and have each student develop an Individual Action Plan that

includes:

1. A goal (e.g., go to a specific school, get a specific job, join the military);
2. Activities necessary to attain the goal (e.g., learn job training or admission requirements);
3. Information or people needed to complete each activity; and
4. A priority and completion date for each activity.

- Collect the CTIs and the CTI workbooks; make copies of the action plans for students' counseling files.

6 Session 5: Decision Making and Resources

Materials: Students' CTIs, CTI workbooks, pencils

Time: 45 minutes

This session will allow each student to: (a) identify the problematic aspects of career decision making indicated by his or her CTI results, and (b) relate this information to the elements of career choice and support available from school counselors.

- Explain the *knowing* and *doing* elements of career choice in Section 4 of the CTI workbook (pp. 28-29).
- Using the Decision Making Checklist in Section 4 of the CTI workbook (pp. 30-31), have students identify parts of their career decision making that CTI results indicate may be problematic.
- Using the six points listed in Section 5 of the CTI workbook (p. 35) as a discussion guide, summarize the ways school counselors can help students take action to solve their career problems.
- Collect both the CTIs and the CTI workbooks.

7 Session 6: The Self-Directed Search (Computer Lab)

Materials: Computer station with Internet access for each student, printer paper

Time: 45 minutes

This session is for students in the SDS Group and the CTI Workbook Group to complete the SDS using the online version (www.self-directed-search.com).

- Complete the online version of the SDS.

- Collect the SDS reports after the students print them.

8 Session 7: Self-Directed Search Interpretation (Computer Lab)

Materials: Students' SDS reports, computer station with Internet access for each student

Time: 45 minutes

This session is for students to review and understand their SDS reports, then use them to investigate occupational information and/or programs of study on the Internet.

- Explain the format and contents of each major section of the SDS report including: (a) General Information, (b) occupational personality types, (c) the hexagon diagram, (d) the Summary Code data and explanation, and (e) the sections describing occupations of possible interest.

- Have the students go to the *Occupational Outlook Handbook* on the Internet (www.bls.gov/oco) and demonstrate how to access occupational information using the alphabetical index.

- Have the students go to the Occupational Information Network (O*NET) on the Internet (www.online.onetcenter.org) and demonstrate how to: (a) access information on occupations using a keyword search, (b) match occupations with skills they have or intend to acquire, and (c) use the Crosswalk Search to find occupational information using DOT codes from their SDS reports.

- Direct students to review their SDS reports and research career information on the Internet while the counselor works with students individually.
- Collect SDS reports and make copies for the counseling files.

9 Administer posttest instruments to all three groups

Materials: MVS, CTI, After Graduation Plans Form, pencils

Time: 30 minutes

- After students complete the posttest instruments, collect them and distribute the originals of pretest MVS and CTI results, SDS reports, and CTI Workbooks to the students.
- Make copies of posttest results for the counseling files and return the originals to the students.

Appendix C - After Graduation Plans Questionnaire

Appendix D - Characteristics of Participants

Table D

Characteristics of Participants

	Workbook Group	SDS Group	Control Group	Total
Male	10	7	11	28
Female	8	12	7	27
17 years old	12	13	13	38
18 years old	6	6	5	17
White	18	18	18	54
Black	0	1	0	1
Income < 1.85 x FPG	4	5	5	14
Income > 1.85 x FPG	14	14	13	41

Note. FPG = Federal Poverty Guidelines

Appendix E - Mixed Design ANOVA Tables

Table E1

Mixed Design ANOVA of CTI Total Scores

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>	<u>η^2</u>
Time	2677.96	1	2677.96	20.25	.00***	.28
Time x Groups	940.99	2	470.49	3.56	.04*	.12
Error (Time)	6875.97	52	132.23			
Groups	212.04	2	106.02	.15	.86	.01
Error (Groups)	36532.82	52	702.55			

* $p < .05$. *** $p < .001$.

Table E2

Mixed Design ANOVA of Decision Making Confusion Scores

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>	<u>η^2</u>
Time	226.27	1	226.27	15.05	.00***	.23
Time x Groups	118.18	2	59.09	3.93	.03*	.13
Error (Time)	781.59	52	15.03			
Groups	17.71	2	8.86	.18	.89	.00
Error (Groups)	3924.71	52	75.48			

* $p < .05$. *** $p < .001$.

Table E3

Mixed Design ANOVA of Commitment Anxiety Scores

Source	SS	df	MS	F	p	η^2
Time	181.96	1	181.86	15.07	.00***	.23
Time x Groups	89.10	2	44.55	3.69	.03*	.12
Error (Time)	627.75	52	12.07			
Groups	20.63	2	10.32	.21	.81	.01
Error (Groups)	2583.86	52	49.69			

* $p < .05$. *** $p < .001$.

Table E4

Mixed Design ANOVA of External Conflict Scores

Source	SS	df	MS	F	p	η^2
Time	48.50	1	48.50	11.86	.00***	.19
Time x Groups	.41	2	.20	.05	.95	.00
Error (Time)	212.65	52	4.09			
Groups	4.28	2	2.14	.29	.75	.01
Error (Groups)	379.40	52	7.30			

*** $p < .001$.

Table E5

Mixed Design ANOVA of Vocational Identity Scores

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>	<u>η^2</u>
Time	146.39	1	146.39	14.69	.00***	.22
Time x Groups	84.55	2	42.28	4.24	.02*	.14
Error (Time)	518.32	52	9.97			
Groups	54.03	2	27.01	.81	.45	.03
Error (Groups)	1741.03	52	33.48			

* p < .05. *** p < .001.

Appendix F - Post Hoc ANOVA Tables and Interaction Graphs

Table F1

Repeated Measure ANOVA of CTI Total Scores

Source	SS	df	MS	F	p	η^2
Workbook Group						
Time	2862.25	1	2862.25	21.54	.00***	.56
Error (Time)	2259.25	17	132.90			
SDS Group						
Time	148.03	1	148.03	.90	.36	.05
Error (Time)	2971.47	18	165.08			
Control Group						
Time	552.25	1	552.25	5.71	.03*	.25
Error (Time)	1645.25	17	96.78			

* $p < .05$. *** $p < .001$.

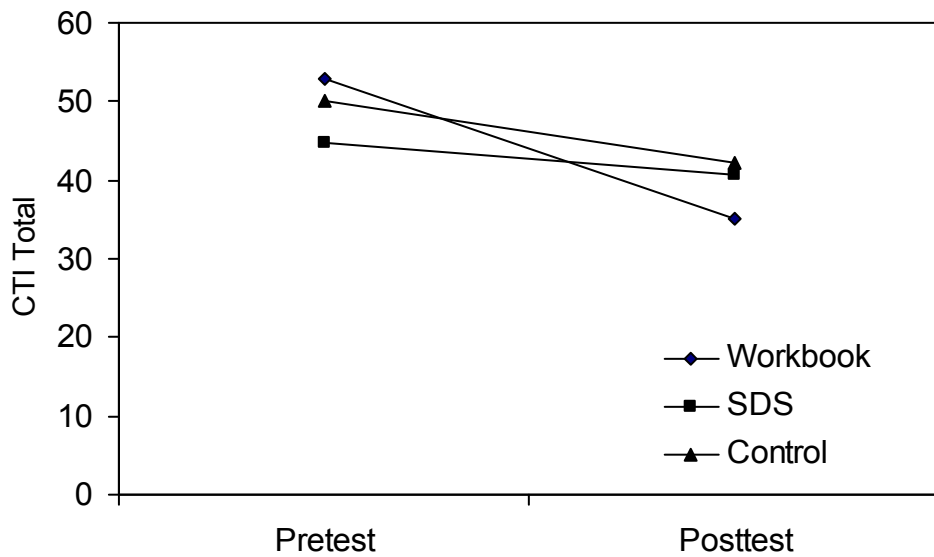


Figure F1. Time x Group interactions of CTI Total scores.

Table F2

Repeated Measure ANOVA of Decision Making Confusion Scores

Source	SS	df	MS	F	p	η^2
Workbook Group						
Time	300.44	1	300.44	14.09	.00**	.45
Error (Time)	362.56	17	21.33			
SDS Group						
Time	10.53	1	10.53	.79	.39	.04
Error (Time)	239.47	18	13.30			
Control Group						
Time	28.44	1	28.44	2.69	.12	.14
Error (Time)	179.56	17	10.56			

** $p < .01$.

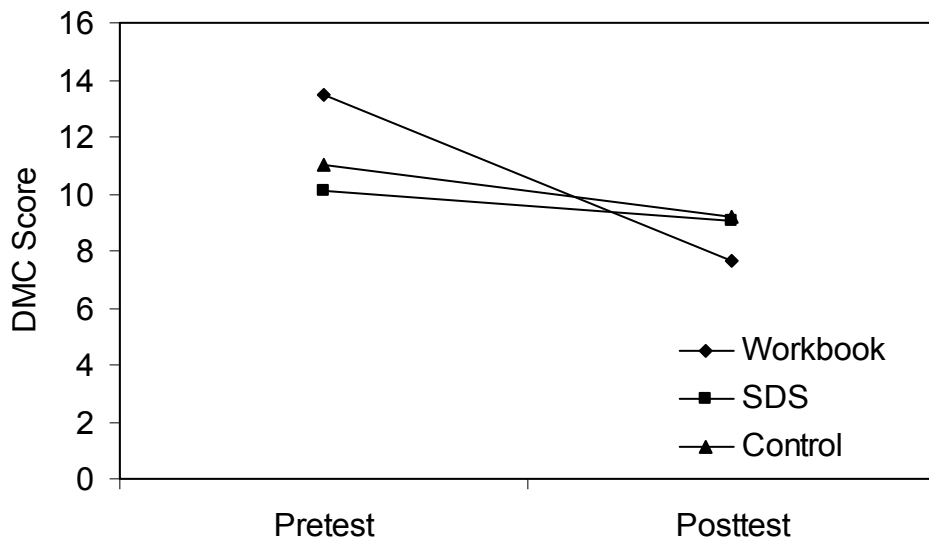


Figure F2. Time x Group interactions of Decision Making Confusion scores.

Table F3

Repeated Measure ANOVA of Commitment Anxiety Scores

Source	SS	df	MS	F	p	η^2
Workbook Group						
Time	140.03	1	140.03	17.84	.00**	.51
Error (Time)	133.47	17	7.85			
SDS Group						
Time	.03	1	.03	.00	.97	.00
Error (Time)	378.47	18	21.03			
Control Group						
Time	124.69	1	124.69	18.31	.00**	.52
Error (Time)	115.81	17	6.81			

** $p < .01$.

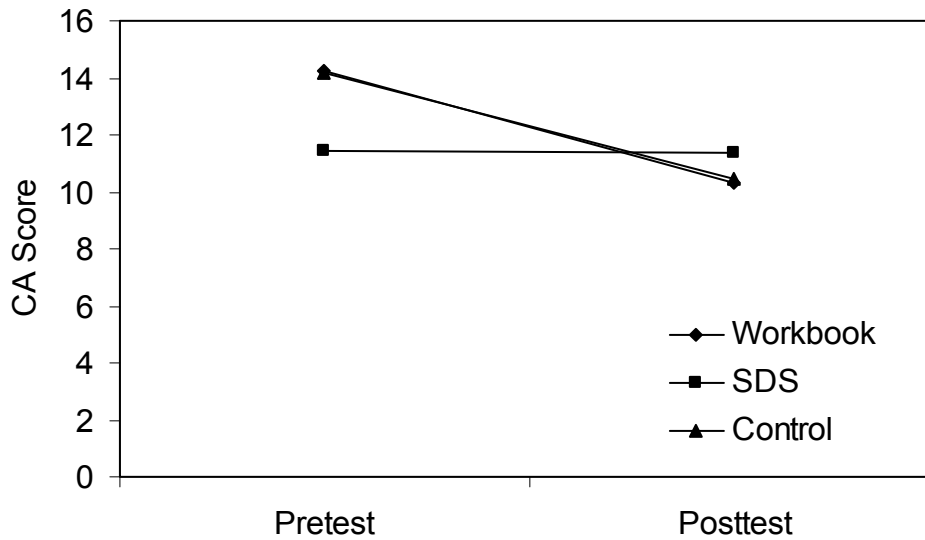


Figure F3. Time x Group interactions of Commitment Anxiety scores.

Table F4

Repeated Measure ANOVA of External Conflict Scores

Source	SS	df	MS	F	p	η^2
Workbook Group						
Time	20.25	1	20.25	6.23	.02*	.27
Error (Time)	55.25	17	3.25			
SDS Group						
Time	15.16	1	15.18	3.11	.10	.15
Error (Time)	87.84	18	4.88			
Control Group						
Time	13.44	1	13.44	3.29	.09	.16
Error (Time)	69.56	17	4.09			

* $p < .05$.

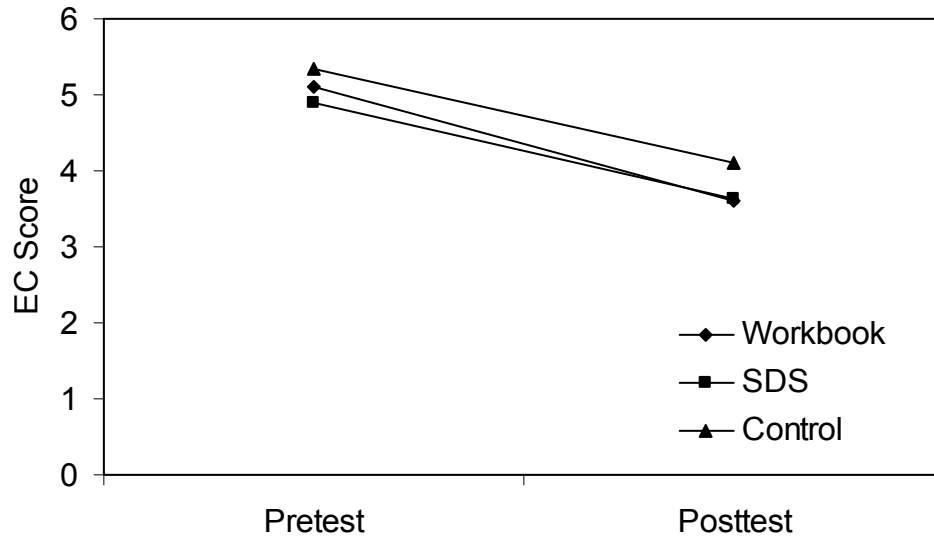


Figure F4. Time x Group interactions of External Conflict scores.

Table F5

Repeated Measure ANOVA of Vocational Identity Scores

Source	SS	df	MS	F	p	η^2
Workbook Group						
Time	177.78	1	177.78	22.19	.00***	.57
Error (Time)	136.22	17	8.01			
SDS Group						
Time	53.29	1	53.29	5.24	.03*	.23
Error (Time)	183.21	18	10.18			
Control Group						
Time	.11	1	.11	.01	.92	.01
Error (Time)	198.89	17	11.70			

* $p < .05$. *** $p < .001$.

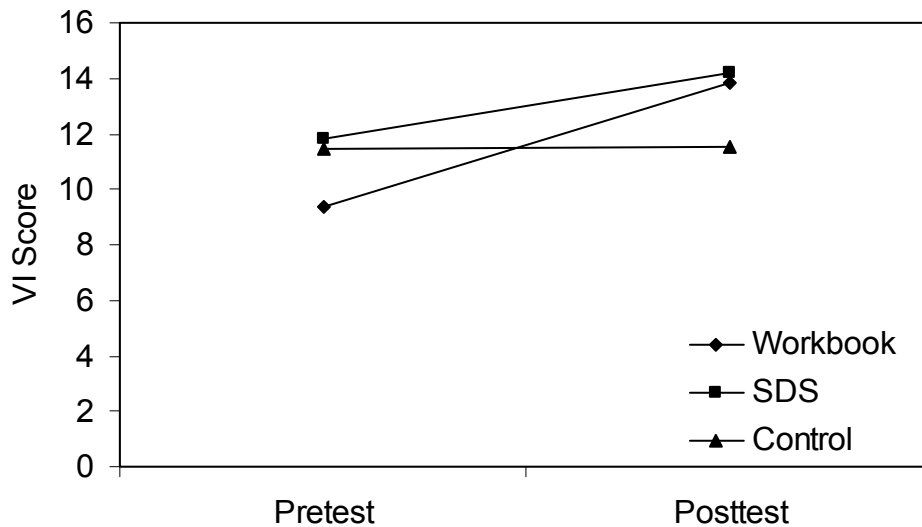


Figure F5. Time x Group interactions of Vocational Identity scores.