CAREER DECISION-MAKING COMPETENCE: FORMULATION AND TESTING OF A MEASUREMENT MODEL

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

SHAWN TIMOTHY BUBANY

IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

JO-IDA C. HANSEN, PH.D., ADVISOR

NOVEMBER, 2011

ACKNOWLEDGEMENTS

The completion project represents the final step in a long journey towards reaching my dream of completing my doctorate in counseling psychology at a school like the University of Minnesota. I have been extremely privileged to receive support from many people and in many ways along the way.

First of all, I offer my gratitude to my parents, Tim and Midge Bubany. They have been my greatest teachers in life. They taught me how to work and love through their example, guidance, sacrifices, and unconditional love and support.

One of my greatest teachers, mentors, and role models during my formal education has been Dr. Jo-Ida Hansen, my doctoral advisor. I had the privilege of working with Jo-Ida as an undergraduate psych major and then the fortune of continuing my education under her advisement during my doctoral work. Jo-Ida fostered my development as a scholar and as a person in countless ways. As an undergraduate, working on her research team fueled my interest in vocational psychology and laid a foundation for my subsequent interest and understanding of psychological measurement. As a graduate student, she patiently and generously shared her wisdom, knowledge, and skill in how to conduct rigorous research and craft clear manuscripts. Jo-Ida helped to finance opportunities for me spend time tackling intriguing research questions and to travel to conferences. Jo-Ida‘s masterful guidance along with the support and autonomy she offered has had an invaluable impact on my abilities, confidence, and identity as a counseling psychologist.

I had the fortune of working as a master‘s student with Dr. Thomas Krieshok, my advisor at the University of Kansas. Tom‘s passion for his scholarship and his profound way of thinking about the nature of career decision making has inspired me tremendously. This project certainly bears his influence.

I am grateful to my dissertation committee that included Dr. James Butcher, Dr. David Weiss, and Dr. Darwin Hendel. They took time out of their full lives to help steer this project for the better. I am also extremely grateful to Jim for providing me a research assistantship with the MMPI project for nearly all of my time as graduate student at Minnesota.

I want to thank my partner in crime, Kristin Antin. Kristin was always there to share in the celebrations and get through the hardships. I owe her many dinners of butternut squash ravioli.

My thanks goes to Amy Kranz for helping to make sure that really important things got done.

I am extremely grateful to Andrew Huff, Kelsey Brooks, Tony Tian, and Alex Bartley for their diligent help collecting and entering my data.

Lastly, I want to acknowledge that my dissertation work was supported by the John Holland Research Fellowship. The funds provided by this fellowship allowed me the amazing opportunity to spend a summer working on my dissertation. The fellowship also supported travel for my defense. The opportunity of devoting a summer to work on my dissertation made this project more meaningful to me and I hope the end result a more meaningful contribution to the literature on career decision-making.

DEDICATION

To my parents Tim and Midge Bubany.

ABSTRACT

The study of career decision-making (CDM) has generated a number of constructs and assessment tools that have served to inform and facilitate the delivery of effective interventions. With the intention of promoting greater conceptual clarity and consistency, the construct CDM competence is proposed and defined here as success in completing CDM tasks typically required of individuals during certain developmental periods and within a specific sociocultural context. Toward the central goal of developing a valid measurement model of CDM competence, this study first used EFA to explore the structure of CDM competence to guide the formulation of a measurement model and then tested the CDM model in relation to latent constructs of social and general competence with structural equation modeling (SEM). For female (n= 228), male (n = 143), and entire (n = 371) samples, the EFA resulted in the retention of two factors that were interpreted as a general CDM competence factor and a distress and inadequacy of information factor. Comparison of separate EFA results for females and males suggested the variable of self-exploration may play a greater role in the structure of CDM competence for females than males. From the SEM, fit indices suggested that the data poorly fit the models with scales representing CDM, interpersonal and general competence latent factors for the female, male, and total samples.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

Most individuals spend a bulk of their lives between the ages of 18 and 65 working in either paid employment or at home. The parlance used to describe one's area of work as "one's occupation" conveys the sense that one's life is mainly consumed or occupied by one's work. Indeed, many career paths demand individuals divert considerable time and energy away from leisure activities and relationships with family and friends. Economically privileged individuals living in the United States often devote tens to hundreds of thousands of dollars to gain years of post-secondary and graduate level education required to obtain high skilled and preferable work. For those with fewer resources, career decisions are more restricted, but no less costly to individuals and their families. These investments often are made on the pragmatic grounds that work is the primary vehicle for gaining cultural and financial capital. Additionally, individuals may seek particular career paths to achieve a greater sense of satisfaction, fulfillment, meaning, or self-expression. The notion that work affords a primary means of self-expression and conveys one's identity is perhaps most apparent by the common observation that first meetings between two people typically begin with the question of "what do you do?".

The high stake of career decisions is perhaps matched by the inherent difficulty of making informed decisions. Truly informed career choices require a sense of one's current preferences that actually contribute to a sense of satisfaction; a clear sense of one's aptitudes and capabilities; accurate prediction of such preferences or abilities that

will continue over the course of their life, those that will diminish, and those that will develop; and adequate knowledge of vocations that number in the thousands. Yet, most individuals are faced with these weighty decisions during the transition to adulthood when they must invest in a specific area of education and training, prior to having knowledge of the world of work or any actual work experience from which to draw, and in the midst of developing one's sense of identity (Grotevant & Durrett, 1980). Further complicating these tasks is the growing turbulence of the job market caused by rapid advances in technology and by globalization of business operations. Thus, not only are career decisions limited by self-understanding and knowledge of current occupations, but also by the ability to forecast job market changes and by the expectation that one will likely incur involuntary transitions over the course of one's career.

The inherent stakes and complexity of career decision-making (CDM) notwithstanding, the ultimate importance of career decisions depends on the extent to which one's work-related experiences actually affect one's well-being. Indeed, revered scholars and artists have long considered work to be a primary source of happiness. The Russian author Leo Tolstoy wrote in 1856 "One can live magnificently in this world if one knows how to work and how to love." (Troyat, 1967, p. 158). Over the last 25 years, psychological research has scientifically supported such claims. For example, meta-analytic findings indicate substantive correlations (r = .35) between work satisfaction and well-being (e.g., Tait, Padgett, & Baldwin, 1989). Prospective longitudinal research suggests that losing one's job can have a strong and lasting effect on well-being that is tantamount to the impact of losing a life partner (Lucas, Clark, Georgellis, & Diener,

2004). Moreover, longitudinal research suggests that chronic work-related stress significantly contributes to deterioration of psychological and physical health (de Lange, Taris, Komier, Houtman, & Bongers, 2003; Maslach & Leiter, 2008). In addition, scientific research has demonstrated that the fit between characteristics of the person and the work environment plays a role in determining satisfaction (Rounds, Dawis, & Lofquist, 1987; Taris & Feij, 2001).

Empirical research has offered compelling evidence to support the belief that career decisions are pivotal developmental tasks determining experiences that either greatly enhance or detract from one's psychological and physical well-being. To assist individuals with the inherent difficulty of CDM, counselors can direct one's exploratory bearings toward suitable work environments through collaborative and sophisticated assessment of one's interests (e.g., Harmon, Hansen, & Borgen, & Hammer, 1994), personality characteristics, work values, and abilities. In addition, counselors can support the CDM of individuals by assessing one's ability to effectively engage in the tasks of CDM. Indeed, psychology has long recognized individual differences in the resources and barriers that determine success in adaptively responding to developmental tasks and challenges such as CDM (e.g., Freud, 1900/1953; Erickson, 1968; Loevinger, 1976). From this point of view, assessment and interventions that augment client skills and insight relevant to the process of CDM have been highlighted as necessary interventions for many clients (e.g., Williamson, 1950). With the ultimate goal of supporting this practice, psychologists studying CDM behavior have made progress over the last century in developing influential theoretical models, constructs, and assessment instruments.

Theoretical Models of Career Decision Making

Frank Parsons proposed in 1909 that one's ability to wisely choose a vocation depends on one's self-knowledge, one's knowledge of the world of work, and "true reasoning". Since Parsons formulated this elegant model, a vast number of theoretical perspectives addressing CDM have been put forth in the literature (e.g., Bordin, Nachmann, & Segal, 1963; Gati, 1986; Gelatt, 1962; Gelatt, 1989; Hilton, 1962; Hsu, 1970; Janis & Mann, 1977; Kitson, 1925; Katz, 1963, Kaldor & Zytowski, 1969; Krieshok, 1998; Krieshok, Black, McKay, 2009; Krumboltz & Hamel, 1977; Mitchell, Levin, & Krumboltz, 1999; Patterson & Darley, 1936; Pitz & Harren, 1980; Tiedeman, 1961).

CDM models predominately describe a sequential process involving a series of phases or tasks that typically include recognizing the need for a decision, gathering information, generating alternatives, evaluating alternatives, and committing to an alternative (Phillips & Pazienza, 1988; Jepsen & Dilley, 1974). Researchers often distinguish between models that emphasize a rational, scientific, and analytical approach (i.e., rational models) and those that emphasize an intuitive, experiential, and emotional approach (i.e., alternative models) (Gelatt, 1989; Phillips, 1997; Hartung & Blustein, 2002). Although purely rational CDM has been historically presumed to be most adaptive (e.g., Gati, 1986; Gelatt, 1962; Pitz & Harren, 1980), studies comparing rational and intuitive decision making styles have not consistently supported this assumption (e.g., Phillips, Pazienza, & Walsh, 1984; Phillips & Strohmer, 1982). Furthermore, compelling explanations of the limitations of purely rational approaches and arguments for the

incorporation of non-rational decision making methods have been put forth by CDM theorists (Gelatt, 1989; Krieshok, 1998; Krieshok, Black, & McKay, 2009; Krumboltz, 1992; Mitchell, Levin, Krumboltz, 1999; Phillips, 1997) as well as prominent decision making scholars, including the Nobel laureate Herbert Simon (1955). These perspectives parallel two dominant viewpoints in the larger decision making literature that emphasize either the limitations of intuition by highlighting the prevalence of cognitive biases (i.e., Heuristics and Biases perspective) or the virtues of intuition by pointing out the use of intuition by experts to make effective decisions (i.e., naturalistic decision making view)(Kahneman & Klein, 2009).

Conceptual Definitions of CDM Constructs

Informed by models describing the process of CDM, researchers have offered several constructs intended to describe individual differences in CDM behavior. Prominent constructs hypothesized to reflect these differences include career exploration, career indecision, CDM difficulties, career maturity, and career adaptability.

Career maturity/career adaptability. In accord with his stage theory of career development and longitudinal Career Pattern Study, Super (1953; 1955) proposed the construct of career maturity. Super and Jordaan (1973) defined career maturity as "readiness to cope with the developmental tasks of one's life stage, to make socially required decisions, and to cope appropriately with the tasks which society confronts the developing youth and adult" (p. 4). Career maturity has been more simply defined as the extent to which one is equipped to make career decisions (Phillips & Blustein, 1994; Savickas, 1997; Super & Kidd, 1979). Super and colleagues (1953; 1973; 1979) were

initially focused on the career maturity of adolescents, but later incorporated career transitions experienced throughout adulthood into their theorizing (Super, 1977; Super & Kidd, 1979).

Super and colleagues (1973; 1979; 1983) hypothesized that career maturity is evident in one's attitudes toward planning and exploring as well as one's competencies evident in one's fund of information, decision making knowledge and skills, and reality orientation. Super (1983) described planfulness as the extent to which one has sense of control over one's life and engages in "reflection on the experience of the past and anticipation of the future" (p. 557). Exploration was described by Super (1983) as "asking questions about one's self and one's situation" (p. 557). Super explained that information dimension reflects the fund of information one has accumulated about the world of work in general and occupational preferences. The decision making dimension was intended by Super to reflect one's knowledge of the principals and methods of making decisions, ability to apply this knowledge, and decision making styles. Lastly, Super described reality orientation as the accuracy of one's self-knowledge, realistic views of outlets for one's preferences, consistency of preferences, crystallization of preferences, and one's work experience. Crites (1965) also theorized that career maturity is determined by one's attitudes toward making a career decision and a set of competencies. Similar to Super's model, these competencies included one's ability to accurately appraise one's work-related preferences and abilities, gather information about various occupations, identify one's career-related goals, make plans for one's career, and engage in problem solving.

Later, Super and Knasel (1981) proposed that the term career adaptability supplant the term career maturity. They explained that career maturity inadvertently implied biological development occurring in the early years of one's life, whereas career adaptability connotes one's readiness to cope with career transitions faced across the life span. In accord with the view that career maturity is determined by one's time perspective (Super & Overstreet, 1960; Super, 1977), Super and colleagues (Super, Thompson, & Lindemann, 1988) emphasized that one's adaptability is primarily determined by one's "planfulness and foresight in looking and thinking ahead about one's work and working life" (p. 5). Planfulness has since been maintained to be an essential means of coping with normative transitions, theoretically described by Super (1983), as well as unanticipated career transitions (Fouad & Bynner, 2008; Savickas, 1997).

Carrying on the work of Super and colleagues (e.g., Super et al., 1988), Savickas (1997) defined career adaptability as ''the readiness to cope with the predictable tasks of preparing for and participating in the work role and with the unpredictable adjustments prompted by changes in work and working conditions" (p. 254). Savickas (1997) hypothesized that career adaptability encompasses planfulness, exploration of one's self and environments, and decision-making. Similarly, the sociologist Clausen (1991) put forward the construct of planful competence as one's ability to effectively engage in thoughtful decision making. Clausen hypothesized that planful competence comprises a constellation of adaptive characteristics to include realistic goal setting, intellectual investment and capacity, dependability, productivity, self-confidence, and self-control.

Although career maturity and career adaptability often are defined in terms of the

resources (i.e., readiness, preparedness) one brings to CDM tasks (e.g., Savickas, 1997; Super & Jordaan, 1973), career adaptability also has been conceptualized in terms of adaptive CDM behavior (i.e., adaptively addressing CDM tasks). For example, Creed, Fallon, and Hood (2009) stated "career adaptability includes looking around at the opportunities available (exploring), looking ahead to the future (planning), making suitable and viable choices (deciding), and managing all of the intrapersonal, interpersonal, and environmental factors that impinge on achieving one's goals…" (p. 220).

Career exploration. Whereas scholars have championed the role of planfulness in determining one's readiness for CDM (e.g., Clausen, 1991; Savickas, 1997; Super, 1977), others have emphasized the role of career exploration. Akin to planfulness, the construct of career exploration is rooted in developmental views advanced by Super (1953, 1980). Definitions of career exploration commonly describe the extent to which individuals actively seek out, clarify, and integrate information about themselves and the world of work (e.g., Bartley & Robitschek, 2000; Flum & Blustein, 2000; Jordaan, 1963).

In an influential chapter, Jordaan (1963) defined career exploration as involving "Activities, mental or physical, undertaken with the avowed or unconscious purpose or hope of eliciting information about oneself or one's environment, or of verifying, or arriving at a basis for a decision, conclusion, solution, or hypothesis, or of being entertained, challenged, or stimulated."(p. 59). Jordaan's definition highlights the view that exploration can be described along a number of dimensions and does not draw a

distinction between career-specific and general exploratory behavior. Also evident is the view that exploratory behavior serves multiple functions including informing decisions.

Drawing from Jordaan's (1963) model, Blustein (1997) hypothesized that one's exploratory attitudes and skills are a central determinant of one's ability to adaptively cope with career transitions, where the term career was broadly used to describe the collection of one's work and social roles. Using qualitative methods to explore characteristics that contribute to career adaptability, Blustein, Phillips, Jobin-Davis, and Roarke (1997) found that individuals who achieved relatively higher levels of satisfaction following the school-to-work transition tend to be purposeful, be active, be assertive, explore themselves, and explore work environments. In addition, they found that individuals with clear sense of identity gained more from exploration of work environments. Elaborating on this model, Flum and Blustein (2000) described career exploration as a process involving "the appraisal of internal attributes (e.g., values, personality characteristics, interests, and abilities) and exploration of external options and constraints from relevant educational, vocational, and relational contexts" (p. 381). They explained that exploration yields both cognitive and affective information about one's preferences. The authors emphasized that by engaging in a lifelong process of gathering information while holding an attitude of "openness to natural vicissitudes of life experiences" (p. 382) one can develop a clear sense of identity that promotes an ability to adaptively cope with life transitions.

Career indecision/decision making difficulties. Like career maturity, career indecision has been identified as a central construct in the study of CDM (e.g., Dickinson

& Tokar, 2004; Osipow, 1999). However, investigations of indecision have been hampered by conceptual and methodological problems (Hall, 1992; Tinsely, 1992; Osipow, 1999). These problems commonly have been attributed to narrowly focusing on measurement and empirical relations and not adequately attending to conceptual definitions and frameworks (Gati, Krausz, & Osipow, 1996; Hall, 1992; Tinsley, 1992). In a striking example, Slaney (1988) highlighted that researchers often have not distinguished individuals who are undecided while effectively engaging in CDM from those who exhibit trait-like indecisiveness.

Conceptual definitions have rarely been explicitly stated in the literature. Typically, career indecision simply has been defined as the presence of difficulty with making decisions. Toward gaining greater clarity, researchers have argued that a distinction must be drawn between the multiple types and dimensions of indecision (Hartman, Fuqua, & Jenkins, 1986; Martin, Sabourin, Laplante, & Coallier, 1991; Vondracek, Hostetler, Schulenberg, & Shimizu, 1990). Dimensions commonly put forth include lack of information, trait indecision, and choice anxiety. Thus, career indecision commonly is defined both in terms of the current difficulty with CDM tasks (e.g., choice anxiety, lack of information) and also variables that can explain difficulty (e.g., trait indecision).

Summary. The CDM literature is replete with rich conceptual descriptions of CDM behavior. However, few intensive efforts to clarify conceptual relations have been reported in the literature. As a result, areas of overlap and distinction between often studied constructs remain unknown. In particular, researchers have not drawn a clear

distinction between constructs that reflect adaptive CDM behavior (i.e., effectively addressing CDM tasks) and constructs considered to have a causal impact on adaptive CDM behavior (i.e., predictors). For example, the constructs of career maturity and career adaptability represent predictors of adaptive CDM behavior when defined in terms of one's *readiness* (i.e., the resources one brings) to engage in CDM tasks (e.g., Super & Jordaan, 1973; Savickas, 1997). However, career adaptability also has been defined as the extent to which one is engaging in planning, exploring, and gaining information (e.g., Creed et al., 2009; Duffy & Blustein, 2005; Kenny & Bledsoe, 2005; McArdle, Waters, Briscoe, & Hall, 2007). Defined in this way, career adaptability takes on a different meaning by representing adaptive CDM behavior. In short, the distinction between indicators of adaptive CDM behavior and predictors of adaptive CDM behavior has been blurred across prominent conceptual and empirical definitions and across publications.

Likewise, indecision has been defined as a multidimensional construct in terms of characteristics that predict maladaptive CDM behavior (e.g., trait indecision) as well as indicators of maladaptive CDM behavior (e.g., choice anxiety) without recognizing this distinction (e.g., Hartman et al., 1986). Also problematic is not distinguishing between individuals who are simply uncertain while effectively engaging in CDM tasks from those who are uncertain while avoiding CDM tasks. Further, defining indecision as invariably maladaptive and decidedness as always adaptive fails to account for the individuals who make hasty decisions and prematurely foreclose on CDM as a means of avoiding the associated difficulty (Jordaan, 1963). In addition, this view does not recognize the importance of ongoing and extensive exploration of one's preferences and

work environments (Gelatt, 1989; Jordaan, 1963; Krumboltz, 1992). Additionally, career maturity, career adaptability, career indecision, and career exploration have not been clearly recognized as similarly addressing adaptive and maladaptive aspects CDM behavior. Whereas dimensions of career indecision indicate maladaptive CDM behavior (i.e., choice anxiety), career exploration and career planfulness represent adaptive CDM behavior. Thus, these constructs overlap in describing a broader construct of competency in addressing CDM tasks.

Furthermore, an open question is whether constructs representing adaptive CDM behavior are distinct facets of developmental competency and, moreover, determined by unique factors and processes. In the developmental psychology literature, a conceptual distinction is made between constructs believed to affect developmental outcomes, known as protective and risk factors, and constructs reflecting one's current adaptive behavior (i.e., adaptively addressing developmental tasks; adaptive functioning), termed competence. Masten and Coatsworth (1998) defined competence as "a pattern of effective adaptation to the environment, either broadly defined in terms of reasonable success with major developmental tasks expected for a person of a given age and gender in the context of his or her culture, society, and time, or more narrowly defined in terms of specific domains such as academics, peer acceptance, or athletics" (p. 206). Further, competence is described as "a family of constructs" that integrate cognitive, emotional, physical, and social aspects of behavior and is hypothesized to be influenced by a wide variety of processes (Masten & Curtis, 2000). By contrast, the construct of resilience

refers to “the emergence of good adaptation in the context of high-risk exposure or significant threats to development” (Masten & Curtis, 2000, p. 530).

As has been suggested by Blustein (1997), Clausen (1991), Jordaan (1963), and Flum and Blustein (2000), it stands to reason that adaptive CDM behavior overlaps with constructs reflecting other domains of developmental competence. In a study of the structure of competence with structural equation modeling, Masten, Coatsworth, Neeman, Gest, Tellegen, and Garmezy (1995) found support for broad dimensions of social, academic, and work competence. Masten et al. (1995) stated “the dimension of competence corroborated by this study are consistent with widely held beliefs about the major developmental tasks of middle childhood and adolescence in modern industrial societies.” (p. 1653). Although CDM represents a prominent developmental task (i.e., “key criteria by which adjustment in society is assessed”, Masten & Coatsworth, 1998, p. 206), there has been very little exchange of theoretical ideas and empirical findings between the study of CDM behavior and developmental psychology. As a result, the study of CDM behavior precisely defined as a domain of competency is a remarkable gap in the vocational psychology and developmental psychology literatures.

Operational Definitions, Reliability, and Structural Validity

Career maturity and career adaptability. To assess constructs put forth in the CDM literature, numerous assessment instruments have been developed. These include the Career Development Inventory (Super & Thompson, 1979), My Vocational Situation (Holland, Daiger, & Power, 1980), the Career Maturity Inventory (Crites, 1978), Assessment of Career Decision Making (ACDM; Harren, 1979), the Career Factors

Inventory (Chartrand, Robins, Morrill, & Boggs, 1990), Mapping Vocational Challenges (MVC; Lapan & Turner, 1997), the Career Decision Scale (Osipow, Carney, Winer, Yanico, & Koschir, 1976), the Career Exploration Survey (Stumpf, Colarelli, & Hartman, 1983), and the Career Decision Profile (Jones, 1989).

To provide a means of assessing Super's model of career maturity, Super and Thompson (1979) constructed the Career Development Inventory (CDI) for use with adolescents. Later, versions of the CDI were created for use with college students and adults (Super, Zelkowitz, & Thompson, 1975). The CDI consists of 120 items that are divided into two parts. Part I includes four scales intended to assess the four areas of competency proposed by Super. Part II was designed to measure one's knowledge of occupations of interest. Subscale scores can be compiled to indicate global levels of mature career-related attitudes, knowledge, and orientation. Levinson et al. (1998) reported internal consistency estimates for the Career Development Inventory ranging from α = .53 to α = .90. The structure of the CDI has been supported by principal components and factor analyses (Savickas & Hartung, 1996).

Based on his model, Crites (1971) developed the Career Maturity Inventory (CMI) using rational and empirical methods of scale construction. Crites initially formed a large pool of items based on statements from counseling case records. The CMI attitudes scale consists of 50 items and each competency scale is made up of 20 items; all items require a true/false response. Crites and Savickas (1996) constructed a revised version of the CMI by eliminating items from the original version and revising items for use with students and nonstudents. Items have an agree/disagree response format. Each

of the two attitude and competency scales consists of 25 items and each subscale is made up of 5 items. Westbrook, Cutts, Madison, and Arcia (1980) reported KR-20 reliability coefficients for the CMI Self-Appraisal (.76), Occupational Information (.76), Goal Selection (.73), Planning (.80), Problem Solving (.65), Total Competency (.90), and Attitude scale (.78) scores. The hypothesized structure of CMI scale scores has been supported (e.g., Savickas, 1984).

Until recently, the measurement of career adaptability has received scarce attention. To examine the structure of career adaptability, Creed et al. (2009) used confirmatory factor analysis with measures of career planning, self-exploration, environmental exploration, indecision, and self-regulation. The authors reported that a measurement model with the five latent constructs had an acceptable level of fit. Similarly, to test the specific hypothesis that time perspective is a central facet of career maturity and career decision making, Savickas, Silling, and Schwartz (1984) conducted an exploratory factor analysis with CDI scales, the Vocational Decision-Making Difficulty scale (VDMD; Holland, Gottfredson, & Nafziger, 1973) along with two measures of time perspective (i.e., the extent to which one's attention focuses on future, present, or past time periods). Savickas et al. (1984) concluded from the factor analysis that time perspective was a central facet of career maturity and career decision making difficulties.

Rottinghaus, Day, and Borgen (2000; 2005) constructed the Career Futures Inventory (CFI) to assess positive career planning attitudes using rational and empirical methods. The CFI's 25 items have a Likert-type response options ranging from 1

(strongly disagree) to 5 (strongly agree) and are scored in terms of three subscales: career adaptability, career optimism, and perceived knowledge. Rottinghaus et al. (2005) stated career adaptability scale scores reflect "the way an individual views his or her capacity to cope with and capitalize on change in the future, level of comfort with new work responsibilities, and ability to recover when unforeseen events alter career plans." (p. 11). They proposed that career optimism scale scores capture "A disposition to expect the best possible outcome or to emphasize the most positive aspects of one's future career development, and comfort in performing career planning tasks." (p. 11). Lastly, they hypothesized that perceived knowledge of job market scale scores indicate "perceptions of how well an individual understands job market and employment trends." (p. 11).

Rottinghaus et al. (2005) reported alpha coefficients of α = .85 (Career Adaptability), α = .87 (Career Optimism), and α = .85 (Perceived Knowledge). To examine the structure of the Career Futures Inventory, the authors conducted a principal-axis factor analysis using promax rotation and found that CFI items cleanly loaded on three factors fitting with the proposed CFI subscales. A confirmatory factor analysis was used to further evaluate the three factor structure of the CFI and the researchers reported acceptable values for the comparative fit index (.95) and SRMSR (.07).

Career exploration. Operational definitions of career exploration often capture the extent to which individuals engage in activities with the intention of either gathering information about areas of work or reflecting on their own personal characteristics, within a given amount of time (e.g., Aiken & Johnston, 1973; Bruch, Giordano, & Pearl, 1986; Germeijs & Verschueren, 2006; Greenhaus & Connolly, 1982; Solberg, Good,

Fischer, Brown, & Nord, 1995; Stumpf, Colarelli, & Hartman, 1983). The Career Exploration Survey (CES; Stumpf et al., 1983), the most commonly used measure of self and environment exploration, was created with a rational-empirical approach to capture multiple dimensions of career exploration described by Jordaan (1963). By refining scale items with analysis of internal consistencies and factor analysis, Stumpf et al. (1983) constructed 16 scales categorized in terms of the career exploration process, reactions to career exploration, and beliefs about career exploration. Item response options vary from 1 "very little" to 5 "a great deal". Stumpf et al. (1983) examined internal consistencies and factor structure of the CES scales. They reported alpha coefficients for the self-exploration and environment exploration scale of $\alpha = .87$ and $\alpha = .88$, respectively, as well as four-week test-retest coefficients ($N = 55$) of $r = .54$ and $r = .24$, respectively. In a factor analysis of CES items with varimax rotation, Stumpf et al. (1983) retained 12 factors mirroring CES scales.

Career indecision/ decision making difficulties. To capture the multiple dimensions of CDM difficulty, many multidimensional measures of career indecision have been developed. These include the Career Decision Profile (CDP; Jones, 1989), Career Factors Inventory (CFI; Chartrand, Robbins, Morrill, & Boggs, 1990), Career Decision Difficulties Questionnaire (CDDQ; Gati et al., 1996), The Career Assessment Diagnostic Inventory (CADI; Vidal-Brown & Thompson, 2001), and the Emotional and Personality-related Career decision-making Difficulties scale (EPCD; Saka, Gati, & Kelly, in press).

Together, these measures include scales intended to reflect multiple reasons for career decision-making difficulty, but the instruments differ in the domains of difficulties they address. Reasons for difficulty commonly addressed by these measures include lack of information about one's self (CDDQ; CDP; CFI) and occupations (CADI; CDP; CDDQ; CFI), trait indecisiveness (CDDQ; CFI; CDP), and choice anxiety (CFI, CADI, EPCD). Reasons uncommon across measures include dysfunctional myths (CDDQ); family conflict (CADI); emotional independence (CADI); identity development (CADI); career decision-making self-efficacy (CADI); choice-work salience (CDP); lack of motivation (CDDQ); lack of information about process (CDDQ); lack of information about obtaining information (CDDQ); unreliable information (CDDQ); internal conflicts (CDDQ); external conflicts (CDDQ); pessimistic views about the process, the world of work, and about one's control (CPCD); anxiety about the process, uncertainty, and outcomes (CPCD); general anxiety (CPCD); self-esteem (CPCD); uncrystalized identity (CPCD); and conflictual attachment and separation (CPCD).

Evidence suggests that the reliability of indecision scale scores vary. Jones (1989) reported alpha coefficients ranging from α = .68 (Occupational Knowledge) to α = .85 (Decidedness) and three week test-retest coefficients ranging from r = .58 (Comfort) to r = .80 (Self-clarity), respectively for the Career Decision Profile. Similarly, Gati et al. (1996) reported alpha coefficients ranging from α = .53 (Lack of Motivation) to α = .95 (Lack of Information) and test-retest coefficients ranging from r =.50 (Lack of Information about Ways Obtaining Additional Information) to r = .80 (Inconsistent Information Total) for the Career Decision Making Difficulties Questionnaire (CDDQ).

In the indecision literature, a prominent question investigated with mixed results is whether the structure of CDS scores is unidimensional or multidimensional. Hypothesizing that inconsistencies in this literature can be attributed to differences in factor analysis techniques, Shimizu et al. (1988) recalculated coefficients of congruence with data from seven previous studies using oblique rotation. They found intercorrelations between factors, which justified use of oblique rotation; they also found greater consistency and simplicity in factor solutions. Further, the authors conducted an exploratory factor analysis with new data using oblique rotation and found strong evidence for a four factor solution matching the four CDS scales. These factors were interpreted as reflecting diffusion (i.e., feeling confused and discouraged, lacking information and experience), support (i.e., decided, need to obtain support for decision), approach-approach (i.e., feeling positive about choices, but several options perceived as appealing), and external barriers (i.e., external barriers to choice, low motivation). This structure was later supported by a confirmatory factor analysis (Schulenberg, Shimizu, Vondracek, & Hostetler, 1988).

In an examination of relations across measures of indecision, Stead and Watson (1993) used principal-axis factor analysis with measures of career indecision including Career Decision Scale, the Career Factors Inventory, and the Career Decision Profile. They retained four factors they interpreted to reflect undecideness, need for self/career information, career choice anxiety, and general indecisiveness. Kelly and Lee (2002) also examined relations between measures of indecision including the Career Decision Scale, Career Factors Inventory, and Career Decision Difficulties Questionnaire. Using

principal-axis factor analysis, the authors retained six factors representing lack of information, need for information, trait indecision, disagreement with others, identity diffusion, and choice anxiety. They then performed a cluster analysis with scores representing these six factors and found three clusters reflecting information deficit/identity diffusion, decision process inhibitors, and choice inhibitors.

A multidimensional structure of indecision has been supported further by other cluster analyses. For example, cluster analyses support the expected conceptual distinction between individuals who engage in appropriate CDM tasks with various levels of uncertainty and individuals who are chronically indecisive (Larson, Heppner, Ham, & Dugan, 1988; Rojewski, 1994; Savickas & Jarjoura, 1991). Savickas and Jarjoura (1991) conducted a cluster analysis with the Career Decision Scale (CDS; Osipow, Carney, Winer, Yanico, & Koschier, 1976) and concluded that CDS scores clustered into five types of CDM difficulty. The authors interpreted three types as difficulty with the tasks of implementing a decision, specifying a choice, and clarifying preferences; the fourth type as holding unrealistic or idealistic aspirations; and the fifth as general indecisiveness. Taken together, cluster analyses consistently indicate differences between individuals who are undecided but engaged in decision making tasks and individuals who are undecided and avoiding decision making tasks. Further, these studies suggest a distinction between individuals who are decided and either confident or informed and individuals who are decided but not confident or uninformed.

Summary. Vocational psychologists have generated a number of useful assessment tools with evidence, by and large, supporting their reliability and structural

validity. Taken together, studies using factor and cluster analysis have commonly indicated several factors and clusters representing adaptive and maladaptive CDM behavior: planfulness (e.g., Creed et al., 2009; Rottinghaus et al., 2005; Savickas et al., 1984), information regarding preferred areas of work (Kelly & Lee, 2002; Larson et al., 1988; Stead & Watson, 1993; Stumpf et al., 1983; Shimizu et al., 1988), activeness in exploratory tasks (Creed et al., 2009; Larson et al., 1988; Rojewski, 1994; Savickas & Jarjoura, 1991; Stumpf et al., 1983), comfort or distress with CDM (Stumpf et al., 1983), and CDM confidence (Larson et al., 1988; Rojewski, 1994). In addition, research has indicated factors that can be considered to be predictors of adaptive and maladptive CDM behavior: trait indecision (Creed et al., 2009; Kelly & Lee, 2002; Rojewski, 1994; Savickas & Jarjoura, 1991; Stead & Watson, 1993), unclear identity (Kelly & Lee, 2002), support (Shimizu et al., 1988), and external barriers (Shimizu et al., 1988). Further, researchers have identified an independent factor reflecting one's decidedness or certainty (Rojewski, 1994; Stead & Watson, 1993). Although research largely supports the reliability and structure of scores from these instruments, evidence for the construct validity of CDM constructs remains insufficient.

Convergent and Discriminant Relations

In their elucidating article, Cronbach and Meehl (1955) defined construct validity as the veracity of the hypothesis that a theoretical construct occupies a unique position in the nomological net of psychological constructs. Based on this view, validity is defined in *The Standards for Educational and Psychological Testing* (AERA, APA, NCME, 1999) as the extent to which evidence supports the intended interpretation of test scores. A

primary avenue for gaining evidence for validity is examination of relations between scores hypothesized to reflect similar constructs, known as convergent relations, and relations between scores hypothesized to represent conceptually dissimilar constructs, termed discriminant relations. Thorough testing of hypotheses concerning convergent and discriminant relations provides an essential means of evaluating whether a construct actually holds an exclusive position in the nomological net (Cronbach & Meehl, 1955). That said, the evaluation of evidence for the validity of scores hypothesized to reflect distinct CDM constructs is informed by relations between CDM constructs, themselves, and relations between CDM constructs and other individual difference constructs.

Relations among CDM constructs. Toward a greater understanding of relations between CDM constructs, Jepsen and Prediger (1981) examined factors underlying relations between Career Maturity Inventory (CMI), Career Development Inventory (CDI), Cognitive Vocational Maturity Test (CVMT), Assessment of Career Development (ACD), and Career Skills Assessment Program (CSAP) using principal-axis factor analysis with varimax rotation. The authors reported four orthogonal factors they interpreted as a cognitive resources for decision making, decision making style (i.e., rational vs. intuitive), systematic involvement in decision making (i.e., information seeking), and decision-making certainty. The researchers noted the cognitive resources factor was akin to the Decision-Making and Information dimensions of Super's (1955) model of career maturity and that the systematic involvement factor was similar planfulness and exploration dimensions.

Building on this research, Blustein (1988) examined the relations between Career Developmental Inventory (CDI), Career Decision Scale (CDS), and Career Commitment Scale scores, using canonical analysis. The author reported that the CDI Planfulness scale significantly related to the CDS scale and Career Commitment Scale scores. Likewise, Fuqua and Newman (1989) used principal components analysis to examine relations between My Vocational Situation (MVS; Holland et al., 1980), Career Decision Scale (CDS; Osipow et al., 1976), Career Maturity—Attitude scale (CMI-A; Crites, 1971), Career Decision Profile (CDP; Jones, 1989), and State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) scores. The authors reported three components reflecting decidedness, indecision, and comfort with career state. Also using principal components analysis with varimax rotation, Tinsley, Bowman, and York (1989) tested whether My Vocational Situation (MVS; Holland et al., 1980), Career Decision Scale (CDS; Osipow et al., 1976), Vocational Rating Scale (Barrett & Tinsley, 1977a), and Decisional Rating Scale (Barrett & Tinsely, 1977b) scores reflect a common construct of CDM difficulty. In contrast to this hypothesis, they reported three factors they determined to represent decision confidence and certainty, decision making obstacles (i.e., low information, internal and external barriers), and indecision.

Gender and relations between CDM constructs. In accord with theoretical frameworks positing distinct gender norms around work roles (e.g., Eagly, 1987) and research supporting mean differences in CDM constructs (e.g., Chartrand, Robbins, Morrel, & Boggs, 1990; Herr & Enderlein, 1976; Luzzo, 1995; Patton & Creed, 2001; Phillips & Imhoff, 1997; Rojewski, Wicklein, Schell, & Lokan, 1984; Westbrook, Cutts,

Madison, & Arcia, 1980), gender may moderate the relations between CDM constructs. For example, the results of the studies by Blustein (1988) and Jepsen and Prediger (1981) may have differed across gender such that certain variables related more highly for females than males and vice-versa (See Appendix A for a review of the literature regarding gender differences in CDM behavior).

However, very few studies if any have examined differences between females and males in the structure of CDM constructs by conducting separate factor analyses for males and females or the moderating effects of gender on bivariate relations between CDM constructs. No studies could be found that separately examined the structure of female and male scores representing career maturity, career adaptability, career exploration, career indecision, or career decision-making difficulties. No studies could be found that examined the moderating effect of gender on relations between career maturity, career adaptability, career exploration, career indecision, and career decision making difficulties.

Relations between CDM and non-CDM individual difference constructs. Many studies have examined relations between CDM constructs and conceptually dissimilar constructs often with the intention of studying antecedents of CDM behavior and rarely to determine evidence for construct validity by testing convergent and discriminant relations. For example, career indecision scores have been found to significantly relate to the Big Five trait neuroticism (Chartrand, Rose, Elliott, Marmarosh, & Caldwell, 1993; Meyer & Winer, 1993; Page, Bruch, & Haase, 2008), attachment style (Tokar, Withrow, Hall, & Moradi, 2003), autonomy support (Guay, Senecal, Gauthier, & Fernel, 2003),

trait anxiety (Betz & Serling, 1993; Lucas & Wanberg, 1995), state anxiety (Saunders, Peterson, Sampson, & Reardon, 2000), depression (Saunders et al., 2000), locus of control (Saunders et al., 2000), low self-esteem (Betz & Serling, 1993), low hardiness (Betz & Serling, 1993; Leong & Chervinko, 1996), fear of commitment (Betz & Serling, 1993; Leong & Chervinko, 1996; Lucas & Wanberg, 1995), low optimism (Lucas & Wanberg, 1995), and negative affectivity (Multon, Heppner, & Lapan, 1995).

In addition, research has found that career maturity scores significantly relate to a number of constructs including self-esteem (Crook, Healy, & O'Shea, 1984), internal locus of control (Luzzo, 1993a) intrinsic work values (Miller, 1974), intelligence (Lawrence & Brown, 1976), social class (Lawrence & Brown, 1976), cognitive complexity (Winer, Cesari, Haase, & Bodden, 1979), grade point average (Crook et al., 1984), work achievement (Crook et al., 1984), and Scholastic Aptitude Test (SAT) scores (Westbrook et al., 1980). For example, Crook et al. (1984) reported Career Maturity Inventory-Attitude Scale scores significantly correlated with self-esteem *(r* = .39), grade point average *(r* = .40), and work achievement (*r* = .38) scores.

To a lesser extent, research has examined relations with career exploration. Studies have indicated career exploration scores are significantly related to scores reflecting attachment style (Ketterson & Blustein, 1998), conscientiousness (Nauta, 2007; Rogers, Creed, & Glendon, 2008), coping style (Robitschek & Cook, 1999), ego-identity status (Bartley & Robitschek, 2000), and goal setting (Bartley & Robitschek, 2000; Blustein, 1989; Rogers, Creed, & Glendon, 2008).

Very few studies have examined career adaptability with non-CDM constructs. Rottinghaus et al. (2005) reported significant correlations of career adaptability scores with all the Big Five personality traits (e.g., r = .41, Conscientiousness), problem solving confidence (r = .51), and trait affect (e.g., r = .40, positive affect).

Gender and relations between CDM and non-CDM individual difference constructs. Just as gender may moderate relations between CDM constructs, gender also may moderate relations between CDM constructs and non-CDM individual difference constructs such that the relations may be substantially different for females and males. However, no studies could be found that examined moderating effects of gender on these relations.

Summary. Factor analytic evidence indicates substantial overlap across CDM constructs and, as a result, casts doubt on hypotheses concerning the validity of CDM constructs. Specifically, studies examining relations across CDM constructs have indicated factors representing core facets of adaptive and maladaptive CDM behavior that include activeness in exploratory tasks (Jepsen & Prediger, 1981) and decisional confidence (Fuqua & Newman, 1989). Identified factors that reflect CDM resources and barriers include cognitive resources (Jepsen & Prediger, 1981) and trait indecision (Fuqua & Newman, 1989). Other reported factors include certainty (Fuqua & Newman, 1989; Jepsen & Prediger, 1981; Tinsley et al., 1989) and decision making style (Jepsen & Prediger, 1981). Furthermore, bivariate correlations suggest substantial overlap between CDM constructs and other individual difference constructs. Moreover, very little is known about how the overlap between CDM constructs might differ between females and

males. Together, these empirical relations underscore the need to more thoroughly examine discriminant relations between CDM constructs, themselves, and relations between CDM constructs and other individual difference constructs as well as examination of moderating effects of variables representing meaningful group differences such as gender.

Opportunities for Research

The study of career decision-making (CDM) has generated an impressive body of literature and assessment tools that have undoubtedly served to inform and facilitate the delivery of effective interventions. However, the evidence for the validity of scores intended to represent CDM constructs such as career maturity, career indecision, career adaptability, career exploration, and CDM style remains in question. Given the conceptual similarity and empirical relations between CDM constructs, it is surprising that areas of overlap and distinction have not been more actively investigated. Towards the goal of examining evidence for the validity of scores intended to reflect CDM constructs, a number of opportunities exist for research.

Specifically, there is a striking opportunity to elucidate the relations between CDM constructs, themselves, and relations between CDM constructs and other individual difference constructs. One avenue for this investigation is to comprehensively explore the structure underlying relations between scores from CDM measures that address various aspects of CDM behavior with techniques such as exploratory factor analysis. An exploratory factor analysis with relations between measures of indecision, exploration, and adaptability could lead to a comprehensive and more accurate description of the core

aspects of adaptive/maladaptive behavior. Another avenue is to test hypothesized convergent and discriminant relations using rigorous analytic methods such as confirmatory factor analysis and structural equation modeling (SEM). In particular, there is a marked need for researchers to use confirmatory approaches in examining whether constructs reflecting adaptive CDM behavior are distinct from constructs representing adaptive behavior in other domains (e.g., social, cognitive, academic). Conducting this research could test the long held notion that one's success in adaptively addressing CDM tasks may be due to a unique developmental competency rather than the alternative hypothesis that one's adaptive CDM behavior represents one's fundamental aspects of general competence or competency in social and academic domains (e.g., Masten et al., 1995; Morrison & Masten, 1991).

In addition, there is an opportunity to clarify interpretation of findings from such efforts by distinguishing between constructs hypothesized to reflect adaptive CDM behavior (i.e., competence) and to have a causal effect on adaptive CDM behavior (i.e., protective and risk factors). For example, the constructs of career maturity and career adaptability have been inconsistently defined as either "readiness" for CDM tasks by capturing the extent to which one has resources that predict adaptive CDM behavior or the extent to which one is actually succeeding in adaptive CDM behavior or a blend of the two. Also, an opportunity exists for greater conceptual clarity by recognizing overlap across constructs capturing adaptive (e.g., career adaptability) and maladaptive (e.g., career indecision) aspects of CDM behavior. In addition, interpretation of findings can be further clarified by not making erroneous judgments of what is adaptive or

maladaptive CDM behavior. Specifically, researchers have conveyed the assumption that undecidedness invariably reflects maladaptive behavior and that decidedness is always a sign of optimal functioning and have not recognized that both decidedness as well as undecidedness can be a maladaptive means of coping when individuals are avoiding difficulty associated with CDM (Gelatt, 1989; Jordaan, 1963; Krumboltz, 2002). Moreover, the CDM behavior of females and males may differ in meaningful ways, however the examination of gender differences has rarely extended beyond mean differences in scale scores toward examining potential moderating effects of gender on relations between CDM constructs as well as gender differences in the structure of CDM constructs. Examination of such differences while considering the aforementioned issues may allow for more valid measurement of CDM behavior.

By pursuing opportunities to shed more light on the validity of CDM constructs, research will contribute to greater clarity, consistency, and integration within and across literatures relevant to adaptive CDM behavior. In particular, accurate and comprehensive measurement of CDM behavior will better position the investigation of developmental factors and processes that affect adaptive CDM behavior. Moreover, a clearer understanding of the relations between adaptive CDM behavior and other domains of developmental competence may provide opportunities for researchers to incorporate theory and findings from the developmental psychology literature. Together, greater clarity, consistency, and integration of CDM research will accelerate the generation of knowledge relevant to CDM and, ultimately, inform the use of cost-effective assessment tools and interventions that stand to positively impact the lives of many.

Overview of Present Study

With the intention of promoting greater conceptual clarity and consistency as well as integration across areas of psychological study, the construct CDM competence is proposed to describe features of adaptive CDM behavior. Drawing from Masten and Coatsworth's (1998) definition of competence, CDM competence is defined here as success in completing CDM tasks typically required of individuals during certain developmental periods and within a specific sociocultural context. Whereas Masten and Coatsworth (1998) emphasize the age-specific nature of developmental tasks, the term developmental period is used to reflect the normative and non-normative nature of career transitions. For example, individuals between the ages of 18 and 25 within a middle-class American context typically face the task of choosing a career, whereas many individuals over the age of 18 within the same context face unexpected and/or involuntary career transitions due to job loss, child birth, marriage, divorce, loss of family, and financial loss or gain.

By taking a broadband view of adaptive CDM behavior, CDM competence differs from constructs that have emphasized specific aspects of adaptive behavior (e.g., career exploration, career planfulness) or exclusively focused on maladaptive behavior (e.g., career indecision). CDM competence stands in contrast to constructs that capture resources (i.e., protective factors) or barriers (i.e., risk factors) that influence adaptive CDM behavior and that include cognitive functioning, personality traits, clarity or security of identity, and supportive relationships. In this regard, career maturity (Super, 1955) and career adaptability (Super & Knasel, 1981) differ from CDM competence

when defined as one's *readiness* to effectively cope with career transitions. CDM competence, in essence, is proposed as a means of more comprehensively and accurately measuring adaptive CDM behavior and, thereby, facilitating study of variables and processes that predict adaptive completion of CDM tasks (i.e., CDM competence) in a manner that inclusively draws from and informs the psychological literature at large.

Study aims, analytic approach, and hypotheses. Toward the central goal of developing a valid measurement model of CDM competence, the general aim of this study included the exploration of facets of CDM behavior with exploratory factor analysis (i.e., EFA) for separate samples of female and male participants. Further, the general aim included the use of factors indicated by the exploratory factor analyses to formulate a measurement model of CDM competence that could be tested in terms of structure and discriminant relations with structural equation modeling.

More specifically, the first aim was to identify core aspects of CDM competence by comprehensively investigating factors underlying relations between scale scores hypothesized to represent CDM behavior with exploratory factor analysis. In keeping with the proposed conceptual definition of CDM competence, scales included in the EFA represented constructs indicating CDM behavior. Likewise, scales indicating resources and barriers relevant to CDM competence were not included. Mindful of the erroneous assumption that decidedness invariably reflects adaptive CDM behavior, scales reflecting uncertainty or decidedness were not included in the EFA. Likewise, scales reflecting decision making style were not included in the EFA due to a lack of clear evidence indicating that certain styles are more adaptive than others.

On the basis of reviewed theoretical and empirical work, selected scales represented exploring work environments (i.e., environmental exploration), reflecting on work related preferences and abilities (i.e., self-exploration), anticipating and preparing for transitions (i.e., planfulness), amount of information , career decision making self-efficacy, decisional comfort (i.e., comfort with committing to a decision), and explorational comfort (i.e., comfort with exploring options). The EFA was conducted in accord with the guidelines of Fabrigar, Wegener, MacCallum, and Strahan (1999). Although this analysis was explorational in nature, tentative predictions that were made for the structure yielded by the EFA follow.

H_1: All scale scores will load greater than .30 on a general competency factor.

H_2: Scale scores indicating self exploration and environment exploration will load greater than .45 on independent factors.

H_3: Scores reflecting the amount of information one has concerning work environments and ways of gaining further information will load greater than .45 on an independent factor.

H_4: Scale scores representing engagement in planning will load greater than .45 on an independent factor.

H_5: Scores indicating confidence in engaging in decision making tasks will load greater than .45 on an independent factor.

H_6: Scale scores reflecting one's comfort with decision making and exploration will load greater than .45 on an independent factor

H_7: All retained factors will be moderately related to each other.

Guided by the results from the EFA, the second aim was to test a measurement model of CDM competence against models of general, social, and academic competence with maximum likelihood structural equation modeling. Doing so offers a rigorous test of (1) the hypothesized structure of CDM competence and (2) hypothesized discriminant relations with general, social, and academic competence constructs. Based on research supporting the validity of domain-specific areas of competence (e.g., Masten et al., 1995; Morrison & Masten, 1991), the hypothesized latent factors included general, CDM, social, and academic competence.

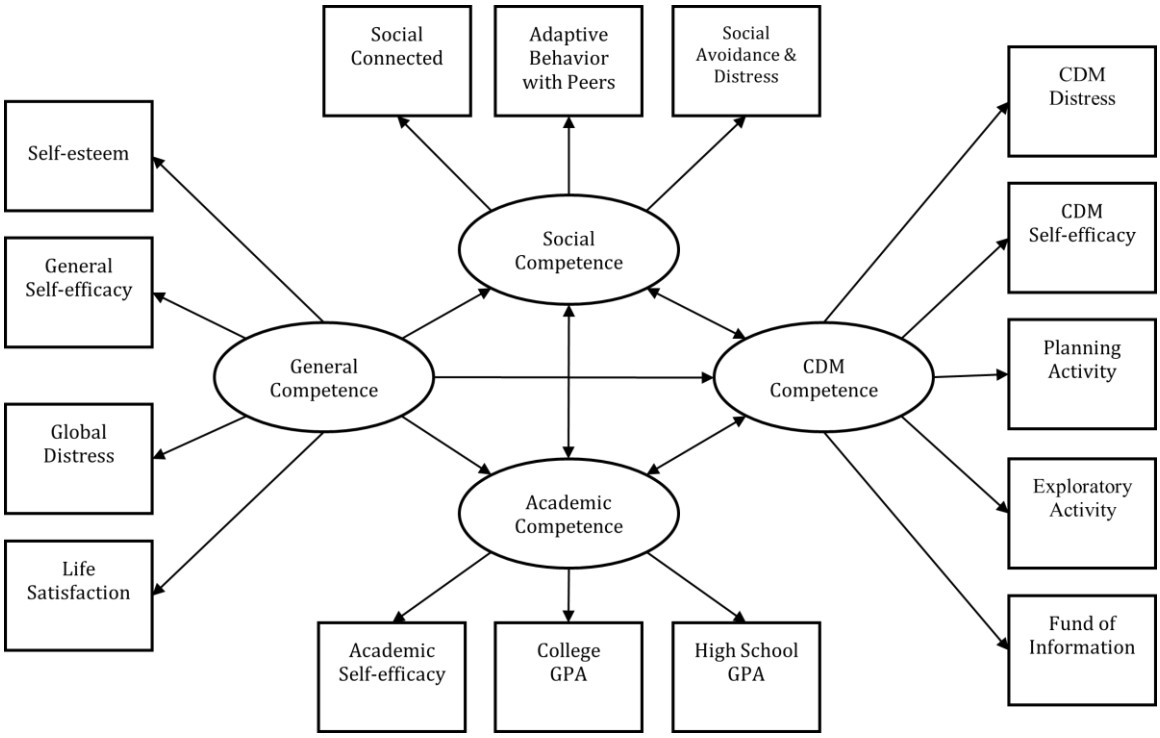

Figure 1.

Figure 1 depicts a preliminary model based upon tentatively hypothesized features of CDM competence and variables indicating social and academic competence (Masten et al., 1995; Masten et al., 2004). Evidence supports the validity of the construct of social

competence defined in terms of closeness in relationships with peers and romantic partners, acceptance by others, and satisfaction with relationships (Neeman, Hubbard, & Masten, 1995; Masten et al., 1995; Morrison & Masten, 1991; Shaffer, Burt, Obradovic, Herbers, & Masten, 2009). Empirical findings also support the validity of the construct of academic competence defined in terms of academic achievement (e.g., Masten et al., 1995; Morrison & Masten, 1991). Hence, the latent factor of social competence was hypothesized, in the present study, to reflect (i.e., be indicated by) social connectedness, interpersonal behavior with peers, and social avoidance/distress scale scores. The latent factor of academic competence was hypothesized to represent high school grade point average, college grade point average, and academic self-efficacy (i.e., judgments of one's own academic abilities) scores. The indicators of CDM competence were based on factors indicated by the EFA and canonical correlation analysis. A general competence latent factor was hypothesized to reflect overarching adaptive behavior that has effects across specific domains of competence (Masten & Coatsworth, 1998). Namely, Masten and Coatsworth (1998) stated that fundamental aspects of competence include self-efficacy (i.e., confidence in one's abilities in general; sense of agency), attachment style (i.e., core relational system determined by relations with caregivers), and self-regulation (i.e., regulating attention, emotions, and behavior). On this basis, the general competence factor was hypothesized in the present study to reflect general self-efficacy, self-esteem, general distress, and life satisfaction scale scores. The SEM was conducted in accord with guidelines suggested by Anderson and Gerbing (1988) and Kline (2005) using the LISREL program (Jöreskog & Sörbom, 2003). Hypotheses for the SEM follow.

H_8: The SEM will show an adequate level of fit for the proposed measurement model. Specifically, the root mean square error of approximation (RMSEA) value will be less than .05 and the standardized root mean square residual (SRMR) value will be less than .10.

H_9: Factors reflecting core aspects of CDM competence, based on EFA and canonical correlations, will significantly contribute to a CDM competence latent factor.

H_{10}: Social connectedness, Social Avoidance/Distress, Adaptive behavior with Peer Relationships scores will significantly contribute to a social competence latent factor.

H_{11}: High school grade point average, college grade point average, and academic self-efficacy will significantly contribute to a academic competence latent factor.

H_{12}: Self-esteem, general self-efficacy, general distress, and life satisfaction will significantly contribute to a general competence latent factor.

H_{13}: Path coefficients between latent variables will be significant and moderate in magnitude.

CHAPTER TWO

METHOD

Sample

Three hundred and seventy three participants volunteered to participate in this study. Two participants did not complete a substantial number of questions across measures in the survey packet and were deemed to be invalid and were not included in the final sample of data. Thus, participants with responses used in the data analysis included 228 female and 143 male students (Total N = 371) attending a large Midwestern University. The average age of the sample was 19.85 (SD = 3.19). Two hundred and twenty four (60.4%) identified as 1st year students, 75 (20.2%) as 2nd year, 34 (9.1%) as 3rd year, 18 (4.9%) as 4th year, and 19 (5.2%) as 5th year and beyond. Sixty eight % identified their race as Caucasian, 24.5 % as Asian American, 3.2% as African American, 1.9% as Pacific Islander, and 1.9% as Multicultural. Among all participants, 30% identified as first-generation college students.

Procedure

The University of Minnesota's Internal Review Board granted approval for this study's use of 500 human subjects. Participants were recruited through a research experience program (i.e., REP) in the University of Minnesota's Department of Psychology that provides compensation in the form of extra-credit to students participating in certain psychology courses. Participants were awarded 3 REP points for completing the survey packet. Completion of the packet was determined to take approximately 30 to 45 minutes, on average. The order in which the scales were

presented randomly varied across packets to prevent effects of response sets owing to order. Participants completed the paper and pencil survey packet in one sitting in classrooms and conference rooms with minimal noise. The survey pack included a page of general instructions.

Missing responses to questions that appeared to occur in single and rare instances were replaced with the participants' mean response for the scale. If the scales were scored by taking the mean of item scores, then no value was replaced.

Excluded Measures

Survey items measuring high school GPA and college GPA as well as the Career Exploration Survey (CES; Stumpf et al., 1983) Self-exploration scale, and the Rosenberg Self-esteem scale (Rosenberg, 1965), for a variety of reasons, were administered and were deemed inadequate for use in this study and were excluded in further analyses. High school GPA was excluded due to the observation that many individuals reported GPA's that were not on traditional 4.0 scales. A portion of individuals reported the scale of their high school GPA, however it is not known how many students reported a GPA not in accord with the 4.0 scale and did not provide the actual scale. Thus, the decision was made to not include high school GPA. College GPA was not included in the analysis because many individuals (n = 61) did not respond to this item along with the observation that many students (60.4%) in this study were in their first year of college, thus their GPA would be based on only one semester of coursework. As a result, the latent factor of academic competence and the academic self-efficacy scale (Fouad & Smith, 1996) were not included in the SEM analysis because not including college GPA and high school

GPA in the SEM left only academic self-efficacy to represent this latent factor, which would have resulted in having an inadequate number of indicator variables.

The Career Exploration Survey Self exploration scale and Rosenberg Self-esteem scale were found to have alpha coefficients of α = .61 and α = .60, respectively. After closely inspecting item responses to these scales for data entry and scoring errors, the decision was made to not include either of these scales in further analyses due to the alpha coefficients not meeting the minimal acceptable level of α = .70 and neither scale being essential to conducting this study's analyses.

Summary of Operational Definitions

CDM competence variables. Nine measuring instruments were used to represent CDM competence. The Career Exploration Survey (CES; Stumpf et al., 1983) Environment exploration scale was used to measure one's activeness in seeking information about work environments (i.e., environmental exploration). The Student Choice Task Inventory (SCTI; Germeijs & Verschuren, 2006) Self-exploration scale was used to measure one's activeness in evaluating one's work related characteristics (i.e., self-exploration). Gould's (1979) Career Planning Scale was used to measure current level of career planning behavior. The Career Decision Making Self-efficacy Scale (CDMSE; Betz et al., 1996) was used to measure one's confidence in one's career decision-making abilities. The Career Decision-Making Difficulties Questionnaire (CDDQ; Gati et al., 1996) Lack of Information and Inconsistent Information scales and the CES (Stumpf et al., 1983) Satisfaction with Information scale were used to quantify the perceived adequacy of career-related information one has. The CES (Stumpf et al.,

1983) Decisional Stress scale was used to measure the experience of distress related to decision making. The CES (Stumpf et al., 1983) Exploration Stress scale was used to measure the experience of distress related to exploration.

Social competence variables. Three measuring instruments representing social competence were used. The Social Connectedness Scale-Revised (Lee, Draper, & Lee, 2001) was used to measure one sense of interdependent connection. The Social Avoidance and Distress Scale (SADS; Watson & Friend, 1969) was used to measure social avoidance behavior and distress associated with social interaction. The Interpersonal Competence Questionnaire (ICQ; Buhrmester, Furman, Wittenberg, & Reis, 1988) was used to measure level of adaptive interpersonal behavior in peer relationships.

General Competence variables. The Depression, Anxiety, Stress Scales (DASS; Lovibond & Lovibond, 1995) will be used to assess level of general levels distress. The Satisfaction with Life Scale (Diener, Emmons, Larson, & Griffin, 1985) was used to measure one's overall life satisfaction. The New General Self-efficacy Scale (Chen, Gully, & Eden, 2001) was used to measure overall sense of confidence in accomplishing tasks and goals.

Measures

Demographic questionnaire. A series of questions was used to determine demographic variables including age, gender, race/ethnicity, year in school, high school GPA, college GPA, and parents' education level.

Career Exploration Survey (CES; Stumpf et al., 1983). The CES scale items were created through a process that began with interviewing individuals about their career decision-making and then with reliability analysis and exploratory factor analysis. Sixteen CES subscales were created. Seven scales address the exploration process and include environmental exploration, self-exploration, intended-systematic exploration, frequency, amount of information, number of occupations considered, and focus. Four of the CES scales address reactions to exploration and include satisfaction with information, explorational stress, and decisional stress. Six scales have to do with beliefs about career decision-making and include employment outlook, certainty of CE outcome, external search instrumentality, internal search instrumentality, method instrumentality, and importance of obtaining preferred position. With the exception of the a scale consisting of one item addressing frequency of exploration and number of occupations considered, scales consist of multiple 7-point Likert-like items.

Exploratory factor analysis with orthogonal rotation supported the proposed structure of the self exploration, environment exploration, decisional stress, and explorational stress scales. However, items from the amount of information and satisfaction with information loaded on the same factor along with the focus scale. Acceptable coefficient alpha values indicating internal consistency reliability were reported for the environmental exploration (α = .88), self-exploration (α = .87), explorational stress (α = .77), decisional stress (α = .85), satisfaction with information (α = .92), and amount of information (α = .79). A 4-week test-retest correlation over the course of class designed to enhance the career exploration and job search of graduate

students in business were reported to range from $r = .26$, $p > .05$ (decisional stress) to $r = .54$, $p < .001$ (self-exploration). Social desirability scale scores were found to be related weakly and nonsignificantly to all CES scales (Stumpf et al, 1983). With data from the entire sample of this study, coefficient alpha values for the Environment Exploration, Exploration Distress, Decision Distress, and Satisfaction with information were .84, .73, .87, and .89, respectively.

The Student Choice Task Inventory (SCTI; Germeijs & Verschuren, 2006). The SCTI was designed to measure three phases of the career decision making process referred to by the instrument authors as orientation (i.e., awareness of need for CDM and motivation to engage in CDM), exploration (i.e., self-appraisal and information searching activities), and commitment (i.e., confidence and attachment to particular choice). Six scales were designed to capture these three phases called orientation of choice, self-exploration behavior, broad exploration of the environment, in-depth exploration behavior of the environment, decision status, and commitment. Convergent validity and structure of the SCTI scales has been empirically supported (Germeijs & Verschueren, 2006). Reported Cronbach's alpha's coefficients range from $\alpha = .75$ (in-depth exploration) to $\alpha = .90$ (orientation to choice). With data from the entire sample of this study, the coefficient alpha value for the Self-exploration scale was .88.

The Career Planning Scale (CPS; Gould, 1979). The CPS was constructed to assess the extent to which individual change plans, plans exist, plans are clear, and strategy exists for achieving career-related goals. A Cronbach's alpha coefficient was reported to be .80 (Gould, 1979). Empirical evidence from exploratory factor analysis

and Pearson's correlations supports the convergent and discriminant validity of the CPS (Gould, 1979). With data from the entire sample of this study, the coefficient alpha value for the Career Planning scale was .89.

Career Decision-making Difficulties Questionnaire (CDDQ; Gati et al., 1996). The CDDQ is composed of 10 scales that were designed to represent 10 categories of career decision-making difficulty labeled lack of motivation, indecisiveness, dysfunctional myths, lack of knowledge about process, self knowledge, occupational knowledge, ways of obtaining information, unreliable information, internal conflicts, and external conflicts. Gati et al. (1996) also hypothesized that these 10 categories can be further grouped into categories in terms of reasons for lack of readiness (lack of motivation, indecisiveness, dysfunctional myths, and lack of knowledge about process), areas of lacking information (self, occupations, and ways of obtaining information), and reasons for inconsistent information (unreliable information, internal conflicts, and external conflicts).

Correlations between scales were found to support scale structure with samples of students residing in the United States and students in Israel. Internal consistency coefficients in the form of Cronbach alpha's were reported to range from $\alpha = .40$ (dysfunctional myths) to $\alpha = .91$ (information about self) with U.S. students and from $\alpha = .29$ (dysfunctional myths) to $\alpha = .90$ (information about occupations). Three day test-retest coefficients were reported to range from $r = .50$ (lack of information about obtaining information) to $r = .72$ (indecisiveness) with a sample of Israeli students. Notably, reliability analyses do not support the internal consistency of the dysfunctional

myths scale. With regard to structure, cluster analyses support the hypothesized scale structure (Gati et al., 1996; Lancaster, Rudolph, Perkins, & Patten, 1999). For example, an ADDTREE analysis supported the scale structure with the empirical structure accounting for 98% of the variance in the data (Gati et al., 1996). With data from the entire sample of this study, the coefficient alpha values for the Lack of Information and Inconsistent Information scales were .94 and .88, respectively.

Social Connectedness Scale-Revised (SCS-R; Lee, Draper, & Lee, 2001). The SCS-R was designed to measure a global sense of social connectedness that includes one's perceived closeness with others as well as the extent to which one is seeking and maintaining social connections. The SCS-R is made up of 20 items that have six point Likert-type format. Ten of the items are positively worded and 10 items are negatively worded and reversed scored for the generation of a total score. The hypothesized unidimensional nature of SCS-R scores was supported by an exploratory factor analysis (Lee et al., 2001). An alpha coefficient for SCS-R scores of $\alpha = .94$ was found to support the internal consistency reliability of SCS-R scores (Lee et al., 2001). Evidence from partial correlations with self-esteem and social avoidance suggests that loneliness scores and SCS-R scores are distinct (Lee et al., 2001). The construct validity of the SCS-R has been supported by correlations between SCS-R scores and self-esteem, social avoidance, and social distress(Lee et al., 2001). With data from the entire sample of this study, the coefficient alpha value for the Social Connectedness scale scores was .93.

Social Avoidance and Distress Scale (SADS; Watson & Friend, 1969). The SADS was designed to measure the construct of social anxiety that the authors conceptually

defined as distress experienced in social interactions and efforts to avoid the distress. The SADS consists of 28 true/false items that measure one factor. The reliability of SADS scores has been supported with internal consistency coefficients from biserial correlation of r = .77 and a test-retest coefficient of r = .68 (Watson & Friend, 1969). The structural validity of the SADS has been supported by factor analyses with college student and clinical samples (Oei, Kenna, & Evans, 1991; Rodebaugh, Woods, Thissen, Heimberg, Chambless, & Rapee, 2004). With data from the entire sample of this study, the coefficient alpha value for the SADS scores was .87.

Interpersonal Competence Questionnaire (ICQ; Buhrmester, Furman, Wittenberg, & Reis, 1988). The ICQ was designed to measure five domains of interpersonal tasks that include initiation of interactions and relationships, assertion of personal rights and displeasure with others, self-disclosure of personal information, emotional support of others, and management of interpersonal conflicts. The ICQ consists of 40-items with 8 items measuring each of the five domains. The items involve a five point Likert-type rating scale with the response options of 1 = I'm poor at this, 2 = I'm only fair at this, 3 = I'm ok at this, 4 = I'm good at this, and 5 = I'm excellent at this. The structure has been considered to be supported by results from confirmatory factor analysis with scale items (Buhrmester et al., 1988). Internal consistency reliability of the 5 scales has been found to be within acceptable levels with alpha coefficients ranging from α = .77 (Conflict) to α = .87 (Support with a date). Four-week test-retest reliability coefficients were reported to be r = .89 (Initiation), r = .79 (Negative Assertion), r = .75 (Disclosure), r = .76 (Emotional Support) and r = .69 (Conflict Management). With data

from the entire sample of this study, the coefficient alpha value for the ICQ scores was .92.

Depression, Anxiety, Stress Scales (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 was designed to measure the constructs of general distress, anxiety, depression, and stress. The DASS consists of 21 Likert-type items that are scored to measure one general distress factor and three subscales that measure anxiety, depression, and stress. Internal consistency reliability has been supported with values for the depression, anxiety, and stress of $\alpha = .94$, $\alpha = .87$, and $\alpha = .94$. The structural validity of DASS-21 scores has been supported with factor analytic results (Antony, Bieling, Cox, Enn, & Swinson, 1998; Gloster, Rhoades, Novy, Klotsche, Senior, Kunik, Wilson, & Stanley, 2008). With data from the entire sample of this study, the coefficient alpha value for the DASS scores was .91.

Satisfaction with Life Scale (Diener, Emmons, Larson, & Griffin, 1985). The SLS was designed to measure one's self-reported level of satisfaction with one's life. The SLS consists of 5 Likert-type items with 7 response options ranging from 1 = strongly disagree to 7 strongly agree. Internal consistency reliability was reported with Cronbach's alpha to be $\alpha = .87$ and a two month test-rest coefficient was reported to be $r = .82$ (Diener et al., 1985). The single factor structure of the scale was supported with factor analysis results and convergent and discriminant validity has been supported by correlations with other measures of well-being (Diener et al., 1985). With data from the entire sample of this study, the coefficient alpha value for the Satisfaction with Life scale scores was .86.

New General Self-efficacy Scale (Chen, Gully, & Eden, 2001). The NGSS was designed to measure the construct of general self-efficacy that the author's conceptually defined as "differences among individuals in their tendency to view themselves as capable of meeting task demands in a broad array of contexts" (Chen et al., 2001, p. 63). The NGSS consists of eight Likert-type items (e.g., Even when things are tough, I can perform quite well). The reliability of NGSS scores has been supported by test–retest coefficients spanning three times of survey completion of $r_{t1 - t2} = .65$, $r_{t2 - t3} = .66$, $_{rt1 - t3} = .62$; the mean time intervals between completing the first and second sessions and between the second and third sessions were 22 and 46 days, respectively (Chen et al., 2001). In addition, the internal consistency reliability of NGSS scores has been supported by alpha coefficients of .87, .88, and .85 for the three data collections (Chen et al., 2001). The structural validity of the NGSS has been supported by result from a principal component analysis (Chen et al., 2001). Scherbaum, Cohen-Charash, and Kern (2006) compared item response theory parameters between the NGSES, the Scherer General Self-Efficacy Scale, and the General Perceived Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) and concluded that all three measures demonstrated acceptable levels of information and discrimination, and that the NGSES outperformed the others across these parameters. With data from the entire sample of this study, the coefficient alpha value for the NGSS scores was .88.

Analyses

Exploratory factor analysis. Exploratory factor analysis (i.e., EFA) is a statistical technique that is used to identity factors underlying patterns of bivariate correlations. In

this study, EFA was used to explore the factor structure underlying relations between the nine CDM competence variables and was conducted in accord with the guidelines of Fabrigar, Wegener, MacCallum, and Strahan (1999). The decision to use EFA for this study was made given that it is most appropriately used as a method of understanding the structure underlying patterns of correlations and incorporates the unique variance of the variables as well as random error, whereas a principal components analysis (i.e., PCA) is most appropriately used as a data reduction technique and does not incorporate either unique variance of the variables or random error. Factors were extracted with the principal-axis method and the decision of how many factors to retain was made with parallel analysis. The advantages of using the principal-axis extraction include not being based on the assumption of multivariate normality and relatively less likely to lead to improper solutions, such as failing to converge on a set of estimates (Fabrigar et al., 1999). Based on evidence for potential gender differences in CDM variables and no substantial evidence to the contrary, separate EFA's were performed for females and males to examine whether differences exist in the structure of CDM competence between females and males. The adequacy of the sample size was evaluated by examining the extent to which the extracted factors are determined or over-determined by measured variables and the communalities. Fabrigar et al. highlight research suggesting that accurate results can be obtained with a sample as low as 100 participants when the extracted factors are overdetermined and the communalities are on average greater than .70. The retained factors were obliquely rotated with a Direct Oblimin procedure because substantive relationships between the factors were anticipated based on previous

literature. Rotated loadings greater than .45 were used to interpret the retained factors. Results were examined in terms of pattern matrix loadings (i.e., unique relations between each variable and factor), communalities, eigenvalues, and percentage of variance accounted for with scale scores.

Structural equation modeling. Structural equation modeling (i.e., SEM) is a family of statistical techniques that are used to test the extent to which hypothesized models, that are intended to represent relationships between latent factors and measured variables and relationships between latent factors, accurately reflect patterns of bivariate correlations or covariances. In this study, the SEM was used to test a measurement model of CDM competence in relation to latent factors of interpersonal and general competence and conducted in accord with guidelines suggested by Anderson and Gerbing (1988) and Kline (2005) using the LISREL program (student version 8.8; Jöreskog & Sörbom, 2003). To obtain model specification, a minimum of two indicators was assigned to each latent factor. Factor loadings were scaled by setting one path between an indicator variable and latent variable to a value of 1 for each latent variable. Akin to the construct of socio-economic status (i.e., SES), the latent factor of competency can be considered to be caused by the indicator variables. Thus, the latent competency variables can be more accurately classified as composite variables, and the measured variables described as cause indicators. The models were evaluated with goodness-of-fit indices selected to represent several types of indices differing in statistical methods. These included normal theory weighted least squares Chi-square (χ^2), Adjusted Goodness-of-fit Index (AGFI), Comparative Goodness-of-fit Index (CFI), Root Mean Square Error of Approximation

(RMSEA), standardized root mean square residual (SRMR). General criteria for good fit include AGFI and CFI values greater than .90, RMSEA and SRMR values less than 10, and nonsignificant chi-square values (Kline, 2005).

CHAPTER THREE

RESULTS

The following results include findings from descriptive analysis; separate exploratory factor analyses (i.e., EFAs) with female, male, and entire samples; and SEM analyses with female, male, and entire samples. The descriptive analysis involved examination of descriptive statistics that included means, standard deviations, kurtosis, skewness, and alpha coefficients. In addition, differences between female and male scale scores were tested for statistical significance using MANOVA.

Descriptive Analyses

With all scales included in the analyses, skewness, kurtosis, and alpha coefficient values were computed separately for females and males and can be found in Table 1. For the entire sample, mean, standard deviation, skewness, kurtosis, and alpha coefficient values can be found in Table 2. Means, standard deviations, and 95% confidence intervals for females and males can be found in Table 4. All scales used in the analyses and presented in the table were found to have alpha coefficient values that exceeded the minimum acceptable level of $\alpha = .70$ that is standard in the psychological literature and were included in further analyses.

Table 1

Number of participants completing each scale (N), means (M), standard deviations (SD), skewness, kurtosis, alpha coefficient (α) values for females and males

	Females				Males			
Scale	N	Skewness	Kurtosis	*α*	N	Skewness	Kurtosis	*α*
Distress, Anxiety, Depression, Stress	228	1.07	1.17	.91	142	1.40	1.87	.90
Satisfaction with Life	228	-.40	-.51	.92	142	-.54	-.56	.86
General Self-efficacy	228	-.37	.05	.89	142	-.36	-.50	.90
Social Connectiveness	228	-.53	-.46	.93	143	11.73	139.34	.92
Social Avoidance and Distress	228	-.45	1.99	.88	143	8.36	68.94	.86
Interpersonal Competence	228	-.11	.46	.91	142	.38	.23	.94
Academic Self-efficacy	226	-.13	.06	.95	139	.01	-.44	.94
Career Planning	228	-.44	-.55	.88	143	-.44	-.63	.91
Self-exploration	228	-.09	-.42	.88	143	.04	-.62	.88
Environment exploration	228	.16	-.64	.84	143	.20	-.77	.86
CDM Self-efficacy	228	-.18	-.11	.92	142	.18	-.73	.92
Exploration Distress	228	-.29	-.32	.74	142	-.10	-.69	.72
Decision Distress	228	-.40	-.58	.87	142	-.17	-.83	.87
Satisfaction with Information	228	-.57	.30	.90	143	-.53	-.55	.88
Lack of Information	228	.29	-.98	.93	143	.31	-.82	.95
Inconsistent Information	228	.27	-.76	.88	143	.38	-.55	.87

Table 2

Number of participants completing each scale (N), means (M), standard deviations (SD), skewness, kurtosis, alpha coefficient (α) values for the entire sample

Scale	N	*M*	*SD*	Skewness	Kurtosis	*α*
Distress, Anxiety, Depression, Stress	370	14.04	10.78	1.20	1.42	.91
Satisfaction with Life	370	5.00	1.22	-.48	-.47	.86
General Self-efficacy	370	4.13	.57	-.35	-.18	.90
Social Connectiveness	370	4.57	.86	-.32	-.16	.93
Social Avoidance and Distress	369	42.38	2.26	-.72	3.30	.87
Interpersonal Competence	370	3.61	.51	.12	.37	.92
Academic Self-efficacy	368	4.20	.87	.37	1.36	.94
Career Planning	371	4.34	1.09	-.44	-.57	.89
Self-exploration	371	2.23	.39	-.05	-.53	.88
Environment exploration	371	2.66	.95	.19	-.68	.84
CDM Self-efficacy	370	3.84	.56	-.02	-.39	.92
Exploration Distress	370	3.91	1.25	-.22	-.51	.73
Decision Distress	370	4.22	1.53	-.31	-.71	.87
Satisfaction with Information	371	3.63	.81	-.55	-.06	.89
Lack of Information	371	3.96	1.98	.29	-.92	.94
Inconsistent Information	371	3.54	1.61	.31	-.69	.88

Among the scales, alpha coefficients ranged from α = .73 (total sample, Exploration Distress) to α = .95 (male sample, Lack of Information). Social Avoidance and Distress scale scores (e.g., Skewness = -1.15, Kurtosis = 5.21 for males) and DASS scale scores (e.g., Skewness = 1.40, Kurtosis = 1.87 for males) were the only scales found to deviate from being normally distributed for the female, male, and total samples. This deviation was taken into account when formulating SEM measurement models as well as in interpreting Pearson correlations and results of the SEM.

Table 3

Gender comparison on scores from all scales included in the analyses.

	Females		Males		95% CI			
Scale	*M*	*SD*	*M*	*SD*	Females	Males	*F*	*p*
Distress, Anxiety, Depression, Stress	14.85	10.94	13.61	.97	12.94, 16.75	11.71, 15.52	.82	.37
Satisfaction with Life	5.03	1.22	4.83	.11	4.82, 5.25	4.62, 5.05	1.64	.20
General Self-efficacy	**4.06**	**.56**	**4.23**	**.05**	**3.96, 4.16**	**4.13, 4.33**	**5.86**	**.02**
Social Connectedness	**4.70**	**.81**	**4.45**	**.07**	**4.55, 4.84**	**4.31, 4.60**	**5.60**	**.02**
Social Avoidance and Distress	42.73	2.02	62.95	14.74	13.72, 71.75	33.94, 91.97	.94	.33
Interpersonal Competence	3.66	.44	3.60	.04	3.57, 3.74	3.51, 3.68	.95	.33
Academic Self-efficacy	4.15	.75	4.22	.07	4.01, 4.28	4.09, 4.36	.62	.43
Career Planning	4.46	.09	4.41	.09	4.28, 4.64	4.23, 4.59	.14	.71
Self-exploration	**2.31**	**.03**	**2.18**	**.03**	**2.24, 2.37**	**2.12, 2.25**	**6.73**	**.01**
Environment Exploration	2.69	.08	2.71	.08	2.52, 2.85	2.55, 2.88	.05	.82
CDM Self-efficacy	3.89	.05	3.84	.05	3.79, 3.98	3.74, 3.93	.54	.46
Exploration Distress	**4.08**	**.11**	**3.75**	**.11**	**3.87, 4.29**	**3.54, 3.96**	**4.78**	**.03**
Decision Distress	4.39	.13	4.04	.13	4.13, 4.65	3.77, 4.30	3.51	.06
Satisfaction with Information	3.77	.07	3.57	.07	3.63, 3.91	3.43, 3.71	3.87	.05
Lack of Information	3.77	.17	3.93	.17	3.44, 4.10	3.60, 4.26	.44	.51
Inconsistent Information	3.45	.14	3.50	.14	3.18, 3.72	3.23, 3.77	.06	.80

Note. Boldface indicates a significant difference between female and male means. n = 131 for both females and males. CI = confidence interval.

Mean differences between female and male scale scores of all scales used in the EFA and SEM analyses were examined with a MANOVA. Means, standard deviations, 95% Confidence Intervals, F-statistic values, and p-values are presented in Table 3. To meet the assumption of equal sample sizes (131 females and 131 males), 97 female participants were randomly dropped from those included in the MANOVA. Frequencies of sample groupings (e.g., race) for the resulting sample were examined and determined to be very consistent with the characteristics of the complete sample (See Table 4 for comparison of percentages between reduced and full samples). Sixty eight percent of the reduced sample identified as white, 23.8% as Asian American, 3.1% as multicultural, 2.4% as African American, and 1.7% as Pacific Islander. Likewise, 60% identified as first year students, 22% as second year, 8% as third year, 4% as fourth year, and 6% as fifth year and beyond. For the variable of race, differences between the reduced and full samples were not significant, χ^2 (4) = .29, $p > .99$. For the variable of number of years in college, differences between the reduced and full sample were not significant, χ^2 (4) = .86, $p > .93$ with the entire sample having slightly more students who identified in their fifth year or beyond of college and slightly less third year students than the entire sample. The entire and reduced samples did not significantly differ in age, t (602) = .26, $p > .001$. The overall F-value from the MANOVA was found to be significant, $F(15, 24) = 2.66$, $p < .01$. With regard to the individual dependent variables, significant differences between mean scores of females and males were found for the General Self-efficacy, Social Connectedness, SCTI Self-exploration, and CES Exploration Distress scale scores. Specifically, females had significantly higher SCTI Self-exploration scores ($M = 2.31$)

than males (M = 2.18), $F(1, 260) = 6.73$, $p < .05$; significantly higher Social Connectedness scores (M = 4.70) than males (M = 4.45), $F(1, 260) = 5.60$, $p < .05$; and significantly higher Exploration Distress scale scores (M = 4.08) than males (M = 3.75), $F(1, 260) = 4.78$, $p < .05$. Males, on average, had significantly higher General Self-efficacy scale scores (M = 4.23) than did females (M = 4.06), $F(1, 260) = 5.86$, $p < .05$.

Table 4

Comparison of Percentages of Groupings and Mean Age between the Full and Reduced Sample.

	Reduced	Full
Race		
Multiracial	3.1	3.2
Asian American	23.8	24.5
African American	2.4	1.9
Pacific Islander	1.4	1.9
White	68.5	68.2
Year in College		
1st	59.1	60.4
2nd	20.9	20.2
3rd	10.4	9.1
4th	4.8	4.9
5th or more	4.0	5.2
Gender		
Female	50.0	61.5
Male	50.0	38.5
Mean Age (SD)	19.78 (3.24)	19.85 (3.20)

Table 5

Pearson Correlations of Study Variables for Entire Sample

	1	2	3	4	5	6	7	8
1. GPA	—							
2. Depression, Stress, Anxiety	-.13*	—						
3. Satisfaction with Life	.13*	-.40***	—					
4. General Self-efficacy	.13*	-.29***	.39***	—				
5. Social Connectedness	.10	-.42***	.48***	.38***	—			
6. Social Avoidance & Distress	.06	-.13*	.00	-.08	.12*	—		
7. Interpersonal Competence	-.08	-.16**	.30***	.45***	.53***	-.05	—	
8. Academic Self-efficacy	.01	-.11*	.18***	.41***	.19***	-.08	.29***	—
9. Career Planning	.11*	-.13*	.15**	.29***	.22***	.05	.17***	.25***
10. Self-exploration	.02	-.06	.25***	.24***	.37***	.02	.38***	.21***
11. Environment-exploration	-.06	.04	.10*	.16***	.10	-.09	.19***	.15**
12. CDM Self-efficacy	.04	-.21***	.34***	.53***	.34***	-.09	.48***	.40***
13. Exploration Distress	-.14*	.13*	-.03	-.08	-.02	-.01	.01	-.04
14. Decision Distress	-.14*	.15**	-.09	-.16**	-.07	-.05	-.04	-.13*
15. Satisfaction with Info	.01	-.11*	.20***	.24***	.27***	.02	.34***	.18
16. Lack of Information	-.08	.27***	-.18***	-.24***	-.28***	-.15**	-.19***	-.28***
17. Inconsistent Information	-.15**	.31***	-.18***	-.22***	-.25***	-.18***	-.19***	-.17**

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6

Pearson Correlations of Study Variables for Entire Sample (Continued)

	9	10	11	12	13	14	15	16	17
1. GPA									
2. Depression, Stress, Anxiety									
3. Satisfaction with Life									
4. General Self-efficacy									
5. Social Connectedness									
6. Social Avoidance & Distress									
7. Interpersonal Competence									
8. Academic Self-efficacy									
9. Career Planning	—								
10. Self-exploration	.21***	—							
11. Environment-exploration	.32***	.23***	—						
12. CDM Self-efficacy	.59***	.34***	.41***	—					
13. Exploration Distress	-.19***	.14**	.15**	-.16**	—				
14. Decision Distress	-.49***	.01	-.09	-.35***	.61***	—			
15. Satisfaction with Info	.59***	.29***	.49***	.59***	-.08	-.28***	—		
16. Lack of Information	-.65***	-.19***	-.28***	-.56***	.27***	.55***	-.54***	—	
17. Inconsistent Information	-.60***	-.07	-.14**	-.52***	.33***	.54***	-.44***	.75***	—

Note . * p < .05, ** p < .01, *** p <.001

Table 6

Pearson Correlations of Study Variables for Females and Males

	1	2	3	4	5	6	7	8
1. GPA	—	-.15	.16	.14	.16	.09	-.08	-.06
2. Depression, Stress, Anxiety	-.12	—	-.44***	-.34***	-.53***	-.16	-.18*	-.12
3. Satisfaction with Life	.10	-.37***	—	.34***	.51***	-.04	.30***	.21*
4. General Self-efficacy	.14	-.25***	.44***	—	.37***	-.12	.45***	.44***
5. Social Conn	.04	-.36***	.46***	.42***	—	.04	.47***	.12
6. Social Avoidance & Distress	.03	-.11	.01	-.04	.16*	—	.01	-.09
7. Interpersonal Competence	-.08	-.14*	.30***	.47***	.57***	-.10	—	.33***
8. Academic Self-efficacy	.08	-.10	.17**	.38***	.25***	-.06	.27***	—
9. Career Planning	.10	-.04	.19**	.23***	.18**	.07	.17**	.25***
10. Self-exploration	.07	-.03	.21**	.19**	.36***	.05	.36***	.21**
11. Environment-exploration	-.08	.11	.16*	.15*	.08	-.04	.23***	.20**
12. CDM Self-efficacy	.04	-.14*	.37***	.51***	.31***	-.07	.48***	.36***
13. Exploration Distress	-.13	.14	-.09	-.07	-.06	-.10	.03	.00
14. Decision Distress	-.16*	.07	-.07	-.09	-.06	-.13*	-.04	-.11
15. Satisfaction with Info	.02	-.02	.23***	.22***	.20**	-.01	.34***	.18**
16. Lack of Info	-.05	.17**	-.15*	-.19**	-.26***	-.21**	-.20**	-.26***
17. Inconsistent Info	-.12	.19**	-.14*	-.15*	-.21**	-.22	-.21**	-.10

Note . Values from female scores are below the diagonal and values from male scores are above the diagonal; * indicates $p < .05$, ** indicates $p < .01$, *** indicates $p < .001$

Table 6

Pearson Correlations of Study Variables for Females and Males (Continued)

	9	10	11	12	13	14	15	16	17
1. GPA	.12	-.05	-.03	.05	-.15	-.14	-.01	-.12	-.19***
2. Depression, Stress, Anxiety	-.26*	-.11	-.04	-.32***	.11	.28***	-.25**	.43	.50
3. Satisfaction with Life	.09	.30***	.04	.30***	.02	-.13	.15	-.24**	-.26**
4. General Self-efficacy	.38***	.35***	.16*	.57***	-.06	-.26**	.29***	-.33***	-.34***
5. Social Conn	.28***	.37***	.14	.39***	.01	-.10	.35***	-.31***	-.32***
6. Social Avoidance & Distress	.03	-.05	-.14	-.12	.08	.05	.03	-.04	-.12
7. Interpersonal Competence	.18*	.41***	.14	.49***	-.02	-.06	.34***	-.17*	-.15
8. Academic Self-efficacy	.26**	.25**	.07	.46***	-.07	-.16	.19*	-.32***	-.29***
9. Career Planning	—	.20*	.30***	.58***	-.13	-.49***	.59***	-.61***	-.53***
10. Self-exploration	.22***	—	.09	.33***	.06	-.01	.24**	-.17*	-.07
11. Environment-exploration	.33***	.34***	—	.37***	.26**	-.05	.44***	-.23**	-.05
12. CDM Self-efficacy	.60***	.35***	.43***	—	-.17	-.39	.60***	-.55***	-.50***
13. Exploration Distress	-.24***	.17**	.09	-.16*	—	.57***	-.06	.19*	.27***
14. Decision Distress	-.49***	.01	-.12	-.33***	.62***	—	-.35***	.53***	.50***
15. Satisfaction with Info	.60***	.32***	.53***	.58***	-.11	-.25***	—	-.50***	-.36***
16. Lack of Info	-.67***	-.20**	-.31***	-.57***	.33***	.57***	-.56***	—	.76***
17. Inconsistent Info	-.65***	-.07	-.20**	-.53***	.37***	.57***	-.50***	.75***	—

Note . Values from female scores are below the diagonal and values from male scores are above the diagonal; * indicates $p < .05$, ** indicates $p < .01$, *** indicates $p < .001$

Pearson correlations for the entire sample are presented in Table 5 and for females and males in Table 6. In accord with Cohen's (1988) criteria, *r* values between .10 and .29 were considered to be small in size, *r* values between .30 and .49 were considered to be medium in size, and *r* values above .50 were considered to be large. As was expected, medium to large correlations were found between many of the scales. For example, the Career Planning scale scores had correlations that exceeded .40 with Lack of Information ($r = -.65$, $p < .001$), Inconsistent Information ($r = .59$, $p < .001$), CDM self-efficacy ($r = .59$, $p < .001$), and Exploration Distress ($r = -.49$, $p < .001$) scale scores. Also, CDM self-efficacy scale scores highly correlated with Satisfaction with Information ($r = -.59$, $p < .001$), Lack of Information ($r = -.56$, $p < .001$), and Inconsistent Information ($r = -.52$, $p < .001$).

Notably, moderate relations between scales representing different domains of competence were found. For example, a correlation of .48, $p < .001$ was found between CDM self-efficacy scale scores and interpersonal competence scale scores for the total sample. Similarly, a correlation of .37, $p < .001$ was found between SCTI Self-exploration scale and Social Connectedness scale scores for the total sample. In addition, Social Connectedness scale scores had a strong relation with Life Satisfaction ($r = .48$, $p < .001$) and a fairly strong relation with DASS (i.e., Distress, Anxiety, Stress) scale scores ($r = -.42$, $p < .001$). Also, moderate to strong cross-over relations were observed between CDM Self-efficacy and General Self-efficacy ($r = .53$, $p < .001$); CDM Self-efficacy and Interpersonal Confidence ($r = .48$, $p < .001$) scores; Social Connectedness and DASS ($r = .42$, $p < .001$) scores; Interpersonal Competence and Self-exploration ($r =$

.38, $p < .001$) scores; Self-exploration and Social Connectedness ($r = .37$, $p < .001$) scores; Satisfaction with Information and Interpersonal Competence ($r = .34$, $p < .001$) scores; and Self-exploration and Inconsistent Information and DASS ($r = .31$, $p < .001$) scores. Furthermore, DASS scale scores correlated moderately with Inconsistent Information ($r = .31$, $p < .001$) and Lack of Information ($r = .27$, $p < .001$) scores.

The strongest relations among all the computed correlations were found between Lack of Information scale scores and Inconsistent Information scale scores, $r = .76$, $p < .001$ (males), $r = .75$, $p < .001$ (females), and $r = .75$, $p < .001$ (total). The size of the correlations is not equivalent to the internal consistencies (e.g., $\alpha = .94$, Lack of Information, total; $\alpha = .88$, Inconsistent Information, total) and suggests the variables may be highly related, yet represent distinct constructs. Nevertheless, the magnitude of these correlations raises some concern about multicollinearity (i.e., scales hypothesized to represent different variables actually represent the same variable) and warrants consideration in the interpretation of the results from the Exploratory Factor Analyses. Also of note, correlations of all the variables with Social Avoidance and Distress (i.e., SAD) scale scores did not reach moderate levels of magnitude, including Interpersonal Competence and Social Connectedness scale scores. This observation was unexpected because SAD scores were considered to reflect a latent variable of interpersonal competence along with Social Connectedness and Interpersonal Competence scale scores. This finding was taken into account in the formulation of the SEM measurement model for interpersonal competence.

Exploratory Factor Analyses

Three principal-axis factor analyses were performed with data from females, males, and the entire sample. Based on the descriptive analyses, the nine scales included in the EFA's were the Career Planning Scale, SCTI Self-exploration Scale, Career Decision-making Self-efficacy Scale, the CES Environment Exploration Scale, the CES Satisfaction with Information Scale, CES Decision Distress Scale, CES Exploration Distress Scale, CDDQ Inconsistent Information Scale, and the CDDQ Lack of Information Scale. Tables 7, 8, and 9 include the rotated factor loadings from the pattern matrices (i.e., unique relations between each measured variable and retained factor), communalities, eigenvalues, and percentage of variance accounted for by the factors for the entire sample, females, and males, respectively.

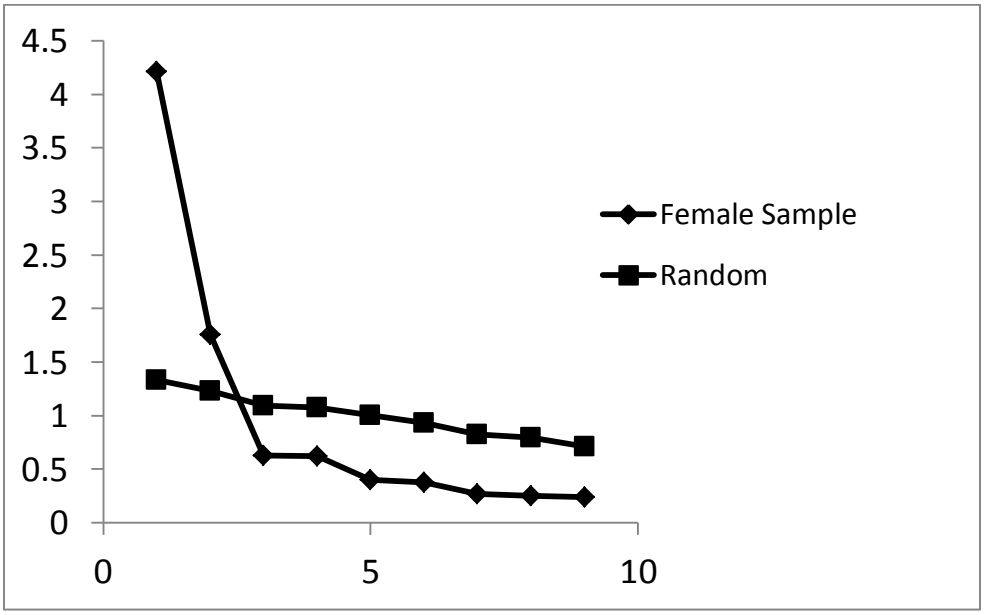

Figure 1. Eigenvalues for extracted factors from the female sample data and simulated data for the parallel analysis.

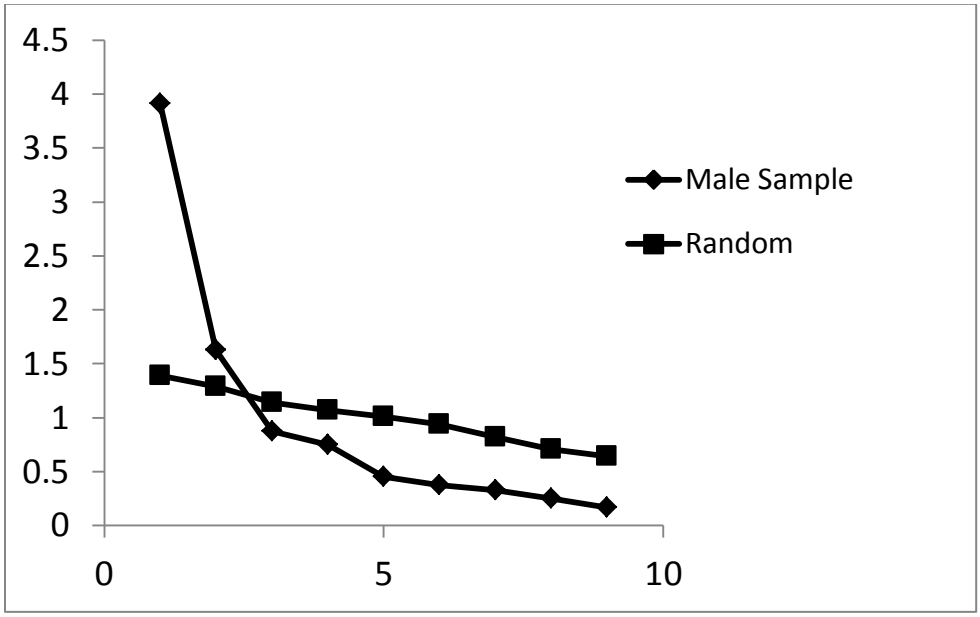

Figure 2. Eigenvalues for extracted factors from the male sample data and simulated data for the parallel analysis.

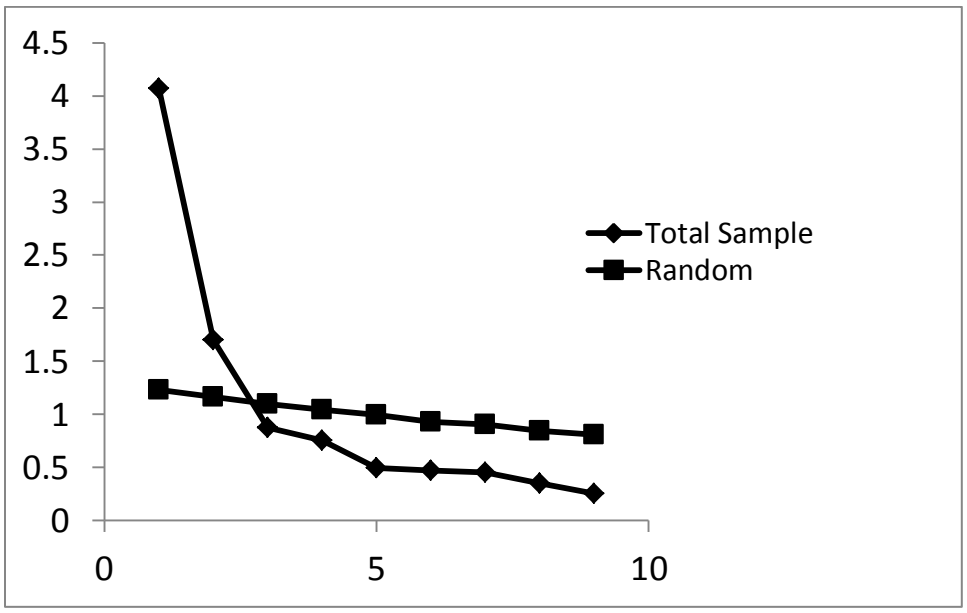

Figure 3. Eigenvalues for extracted factors from the actual total sample data and simulated data for the parallel analysis.

The factorability of the correlation matrices for the females, males, and total was supported by Kaiser-Meyer-Olkin values of KMO = .84, KMO =.79, KMO = .83, respectively, which are well above the minimum acceptable level of .60 (Kaiser & Rice, 1974). Parallel analysis provided a means of determining the retention of extracted factors (See Figures 1, 2, and 3). The parallel analysis was conducted according to guidelines recommended by Hayton, Allen, and Scarpello (2004). In general, parallel analysis first generating a simulated data set that parallels the actual data set with regard to the number of variables, variable score range, and the number of cases. A factor analysis is then conducted using simulated random variables is conducted. Eigenvalues for the factors extracted using the analysis with the simulated variables and with our actual data are then plotted in the form of a skree plot. Factors from the actual data set with eigenvalues greater than the point at which the two plotted lines intersect are retained (i.e., Factors from actual data with eigenvalues greater than corresponding the eigenvalues for corresponding factors from the simulated data.) For all three EFA's in this study, the point of intersection occurred between the 2nd and 3rd extracted factors. This point of intersection was consistent with a point that would have been selected by examining a simple skree plot. Based on the parallel analysis, the first two extracted factors were retained. The factors were obliquely rotated with the direct oblimin method because the factors were expected to be related based on previous literature and the correlations among the included scales. The resulting factors in all three EFA's were overdetermined with factors represented by 3 to 6 measured variables. The mean communalities (i.e., variance of the variables accounted for by the factors) for the EFA's

with the total, female, and male samples were h^2 = .54, h^2 = .57, and h^2 = .51, respectively. The percent of variance accounted for in the solution by the retained factors for the total, female, and male samples were 64.17%, 66.35%, and 61.47%, respectively. The adequacy of the sample sizes for the analyses is generally supported by the factors being overdetermined (i.e., factors represented by 3 to 6 measured variables) and communalities that are moderately large in magnitude. Rotated factor loadings greater in value than .45 were used for interpretation of factors, based on Comrey and Lee's (1992) view that .45 was a "fair" level.

Table 7

Pattern matrix loadings, communalities, eigenvalues, percentage of variance, and factor correlations for entire sample

	Factor		
Scale	1	2	h^2
Satisfaction with Information	**.73**	-.15	.61
CDM Self-efficacy	**.68**	-.25	.60
Environment Exploration	**.60**	.13	.35
Career Planning	**.58**	-.42	.63
Lack of Information	**-.50**	**.56**	.69
Self-exploration	**.45**	.15	.19
Decision Distress	-.04	**.81**	.68
Exploration Distress	.25	**.72**	.50
Inconsistent Information	-.37	**.62**	.62
Eigenvalue	4.07	1.70	
% of Variance	45.26	18.91	
Factor 1	1.00	-.22	
Factor 2	-.22	1.00	

Note. Boldface values indicate loadings met specified cutoffs for factor interpretation. Factor 1 = CDM competence; Factor 2 = CDM distress; h^2 = communality

Table 8

Pattern Matrix Loadings, Communalities, Eigenvalues, Percentage of Variance, and Factor Correlations for Females

	Factor		
Scale	1	2	h^2
Satisfaction with Information	**.74**	-.17	.63
CDM Self-efficacy	**.66**	-.26	.58
Environment Exploration	**.65**	.09	.40
Career Planning	**.55**	**-.47**	.64
Self-exploration	**.53**	.20	.27
Lack of Information	**-.47**	**.60**	.71
Decision Distress	.00	**.82**	.67
Exploration Distress	.24	**.73**	.51
Inconsistent Information	-.35	**.67**	.67
Eigenvalue	4.21	1.76	
% of Variance	46.80	19.55	
Factor 1	1.00	-.23	
Factor 2	-.23	1.00	

Note. Boldface values indicate loadings met specified cutoffs for factor interpretation. Factor 1 = CDM competence; Factor 2 = CDM distress & information indequacy; h^2 = communality

Table 9

Pattern Matrix Loadings, Communalities, Eigenvalues, Percentage of Variance, and Factor Correlations for Males

	Factor		
Scale	1	2	h^2
Satisfaction with Information	**.74**	-.07	.56
CDM Self-efficacy	**.73**	-.18	.61
Career Planning	**.67**	-.28	.61
Lack of Information	**-.60**	.44	.66
Environment Exploration	**.58**	.30	.36
Inconsistent Information	**-.45**	**.52**	.56
Decision Distress	-.22	**.74**	.65
Exploration Distress	.18	**.72**	.50
Self-exploration	.30	.07	.09
Eigenvalue	3.91	1.63	
% of Variance	43.39	18.08	
Factor 1	1.00	-.19	
Factor 2	-.19	1.00	

Note. Boldface values indicate loadings met specified cutoffs for factor interpretation. Factor 1 = CDM competence; Factor 2 = CDM distress; h^2 = communality

The EFA conducted with the entire sample (i.e., both females and males) resulted in six measured variables with loadings that exceeded a magnitude of .45 for Factor 1 and four variables with loadings exceeding a magnitude of .45 for the Factor 2. Thus, these variables and their loadings were considered for the interpretation of the retained factors. Namely, measured variables included in the interpretation of Factor 1 with positive

loadings were Satisfaction with Information (.73), CDM Self-efficacy (.68), Environmental Exploration (.60), Career Planning (.58), and Self-exploration (.45). Lack of Information was the only variable included in the factor interpretation that negatively loaded on Factor 1 (-.50). For Factor 2, measured variables included in the interpretation were Decision Distress (.82), Exploration Distress (.73), Inconsistent Information (.67), and Lack of Information (.60). All measured variables used in the EFA were included in the interpretation of the factors with the entire sample. The correlation between Factors 1 and 2 with the entire sample was found to be small to moderate in magnitude, r = -.22.

Similarly, the EFA conducted with the female participants resulted in six measured variables with loadings greater in magnitude than .45 for Factor 1 and five measured variables with loadings exceeding a magnitude of .45 for Factor 2. The measured variables included in the interpretation of Factor 1 with positive loadings were Satisfaction with Information (.74), CDM Self-efficacy (.66), Environment Exploration (.65), Career Planning (.55), and Self-exploration (.53). Lack of Information was the only included variable for the interpretation of Factor 1 with a negative loading (-.47). The variables included in the interpretation were Decision Distress (.82), Exploration Distress (.73), Inconsistent Information (.67), Lack of Information (.60), and Career Planning (-.47). All measured variables used in the EFA were included in the interpretation of the factors with the female sample. The correlation between Factors 1 and 2 with the female sample was found to be small to moderate in magnitude, r = -.22.

With regard to males, the EFA resulted in six measured variables with loadings greater than .45 in magnitude for Factor 1 and three measured variables with loadings

exceeding .45 for Factor 2. The variables included in the interpretation of Factor 1 with positive loadings were Satisfaction with Information, CDM Self-efficacy, Career Planning, and Environment Exploration. Variables included in the interpretation of Factor 1 with negative loadings were Lack of Information (-.60) and Inconsistent Information (-.45). The variables included in the interpretation of Factor 2 were Decision Distress (.74), Exploration Distress (.72), and Inconsistent Information (.52). Thus, the EFA results for males differed from EFA results with the female and entire samples by the Self-exploration scale not being included in the interpretation of Factor 1 and the Lack of Information and Career Planning scales not being included in the interpretation of Factor 2. Additionally, Inconsistent Information scale was included in the interpretation of Factor 1 for males, but not for the female and entire samples. The correlation between Factors 1 and 2 with the male sample was found to be small to moderate in magnitude, r = -.22. All the measured variables were included in the interpretation of the factors with the exception of the Self-exploration scale. Self-exploration scores loaded positively on Factor 1 (.30) and minimally on Factor 2 (.07).

Structural Equation Modeling

Given the differences in the EFA results between the female and male samples, three structural models were hypothesized in accord for the three samples (i.e., females, males, and the entire sample). The structural model that was originally hypothesized was modified based on results from the descriptive and exploratory analyses. The final models that were tested with associate parameter estimates for female, male, and entire samples are presented in Figures 5, 6, and 7, respectively. In contrast to the original model hypothesized, the decision was made not to include the Social Avoidance and

Distress (SAD) scale in the tested structural equation models based on the observation that SAD scores did not significantly relate to nearly all of the other measured variables.

The tested measurement model for CDM competence was formulated in accord with results from the EFA. Specifically, the final measurement model for CDM competence for the total and female samples included Career Planning, Self-exploration, Environment Exploration, CDM Self-efficacy, Satisfaction with Information, and Lack of Information. The final measurement model for CDM competence for the male sample also included Career Planning, Environment Exploration, CDM Self-efficacy, Satisfaction with Information, and Lack of Information, however the model for males included Inconsistent Information instead of Self-exploration. Like the model originally hypothesized, the tested models included General Competence as an exogenous latent variable and Interpersonal Competence and CDM Competence as endogenous latent variables. The relation between Interpersonal and CDM Competence was estimated based on sizeable correlations between measured variables representing each of the latent variables as well as previous literature suggesting overlap between scales reflecting interpersonal and CDM constructs. Each of the models was overidentfied with 11 measured variables and three latent variables. Paths between measured and latent variables were scaled by setting one path per latent factor to 1.

Evaluation of the models involved examining several goodness-of-fit indices differing in statistical methods. Absolute and relative fit indices included the Normal Theory Weighted Least Squares Chi-square (χ^2), Goodness-of-Fit Index (GFI), the Adjusted Goodness-of-Fit Index (AGFI), Root Mean Square Error of Approximation

(RMSEA), and Comparative Fit Index (CFI). Indices of parsimony include the Aikaike Information Criteria (AIC) and Consistent Aikaike Information Criteria (CAIC). The CAIC accounts for sample size, whereas the AIC does not. Low values of χ^2 ($p > .05$), RMSEA (<10), AIC, and CAIC suggest good fit, whereas high values of GFI (>.90), AGFI (>.90), and CFI (>.90) suggest good fit. Models also were evaluated by considering the magnitude and significance of path coefficients.

Table 10

Goodness-of-fit Values from the SEM

Model	*χ2* (df)	GFI	AGFI	CFI	RMSEA	AIC	CAIC
Females	348.62 (42	.85	.77	.88	.14	396.62	514.67
Males	550.00(41	.79	.66	.86	.18	600.00	722.97
Total	315.98(41	.87	.78	.89	.13	365.98	488.95

Note: χ2(df) - Normal theory least squares chi-square and degrees of freedom; GFI = Goodness-of-fit Index; Adjusted Goodness-of-fit Index; Comparative Goodness-of-fit Index; RMSEA = root mean square error of approximation; AIC = Akaike information criteri

Goodness-of-fit index values are presented in Table 10 for all three models. These values suggest that none of the tested models were adequate for the collected data. The model with the best fit was the model for the total sample, which nearly met acceptable levels of fit concerning certain indices. For this model, values for indices reflecting absolute and relative fit were $\chi^2 = 315.98(41)$, $p < .001$; GFI = .87; AGFI = .87; CFI = .89; and RMSEA = .13. Values from indices representing parsimony were AIC = 365.98 and CAIC = 488.95. For the female model, values for indices reflecting absolute and relative fit were $\chi^2 = 346.0(42)$, $p < .001$; GFI = .85; AGFI = .77; CFI = .88; and RMSEA

= .14. Values from indices representing parsimony were AIC = 397.01 and CAIC = 520.0. For the male model, values for indices reflecting absolute and relative fit were χ^2 = 550.0(42), $p < .001$; GFI = .79; AGFI = .66; CFI = .86; and RMSEA = .18. Values from indices representing parsimony were AIC = 600.00 and CAIC = 722.97.

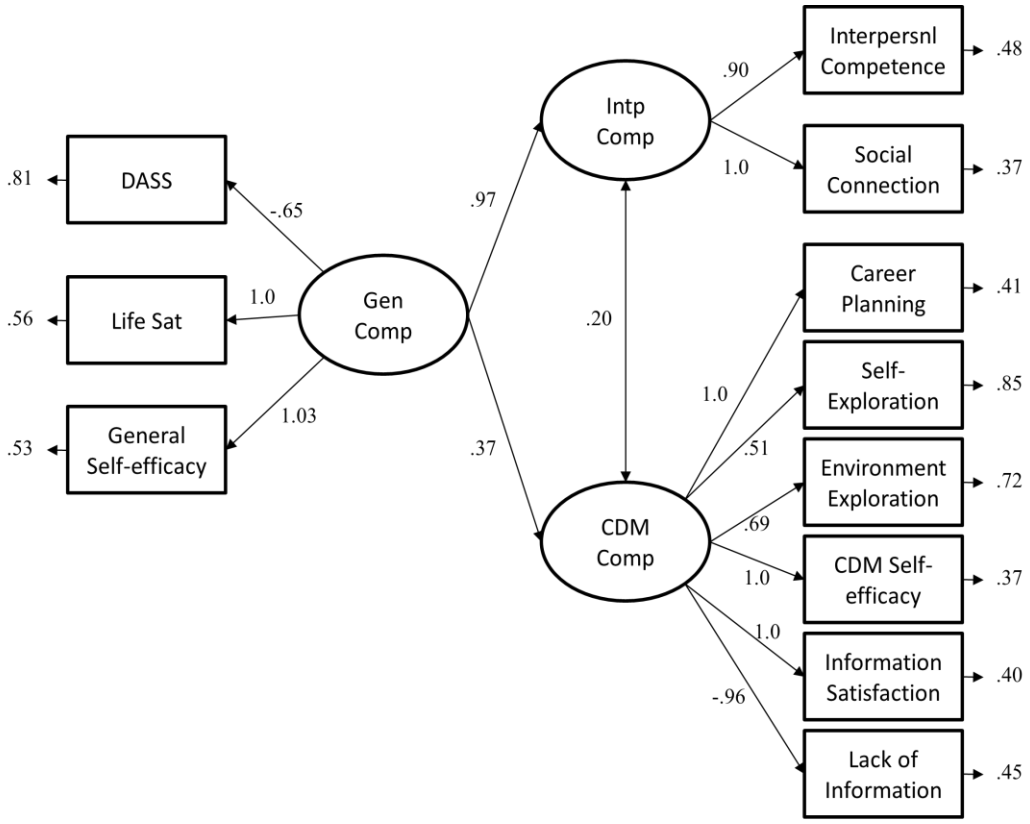

Figure 5. Structural model with path coefficients and error variances for females.

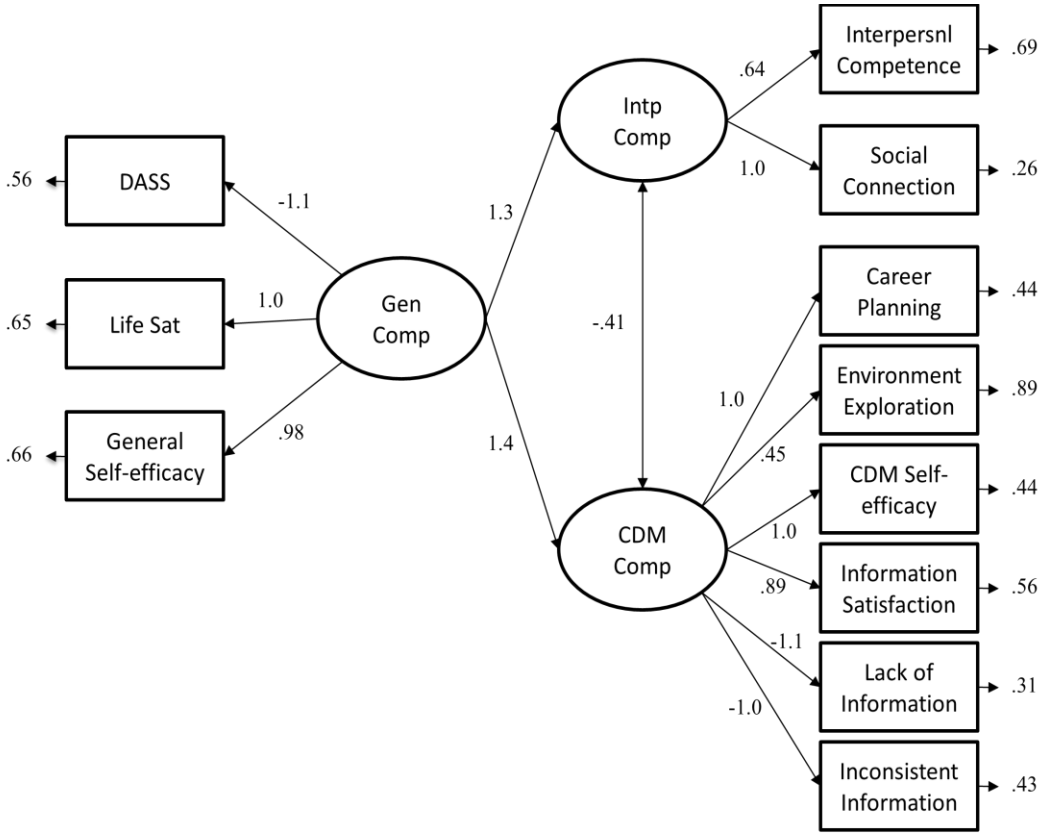

Figure 6. Structural model with path coefficients and error variances for males.

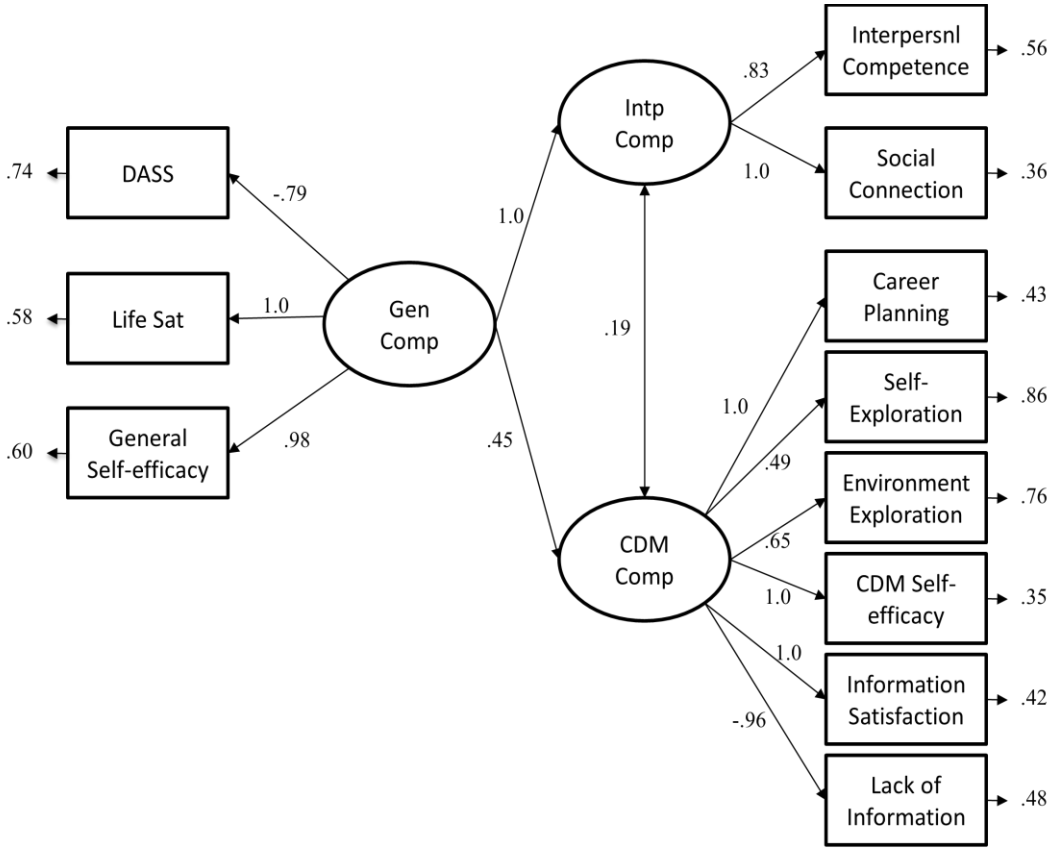

Figure 7. Structural model with path coefficients and error variances for the entire sample.

Standardized path coefficients and error variances are depicted for models for female, male, and entire samples in Figures 5, 6, and 7, respectively. The t-values generated by LISREL indicate that all the path coefficients were significant at an alpha level of .001. For the total sample model, standardized path coefficients between the General Competence latent factor and the measured variables were 1.0 (Life Satisfaction), .98 (General Self-efficacy), and -.79 (DASS). Coefficients between the Interpersonal Competence latent factor and measured variables were .83 (Interpersonal Competence) and 1.0 (Social Connectedness). Coefficients between the CDM

Competence latent factor ranged from 1.0 (CDM Self-efficacy) to .49 (Self-exploration). For the female model, standardized path coefficients between the General Competence latent factor and the measured variables were 1.03 (General Self-efficacy), 1.0 (Life Satisfaction), and -.65 (DASS). Coefficients between the Interpersonal Competence latent factor and measured variables were .90 (Interpersonal Competence) and 1.0 (Social Connectedness). Coefficients between the CDM Competence latent factor ranged from 1.0 (CDM Self-efficacy, Career Planning, Satisfaction with Information) to .51 (Self-exploration). For the male model, standardized path coefficients between the General Competence latent factor and the measured variables were -1.1 (DASS), 1.0 (Life Satisfaction), and .98 (General Self-efficacy). Coefficients between the Interpersonal Competence latent factor and measured variables were .64 (Interpersonal Competence) and 1.0 (Social Connectedness). Coefficients between the CDM Competence latent factor ranged from -1.1 (Lack of Information) to .45 (Environment Exploration).

Modification indices were used as statistical means for determining the extent to which model fit could be improved by respecifying parameters estimated by the model. For example, goodness-of-fit may improve by allowing a particular measured variable (e.g., career planning) to freely load on a latent factor not originally estimated (e.g., interpersonal competence). The Lagrange Multiplier (LM) test is statistic commonly used as a modification index that can be interpreted to indicate the extent to which the overall model chi-square statistic value would decrease if a path was freely estimated rather than fixed. For this study, the LM values suggested that statistical model fit could be improved by allowing paths between the measured CDM competence variables and the

Interpersonal Competence latent factor be estimated and by allowing the paths between the measured Interpersonal competence variables and the CDM latent factor to be estimated. For the female model, drops in χ^2 of 32.53, 27.28, 18.02, and 13.10 are predicted to occur by the LM test by freeing the path coefficients of the CDM Self-efficacy, Self-exploration, Career Planning, and Interpersonal measured variables to be estimated for the nonpredicted latent factor. For the male model, drops in χ^2 of 20.91, 8.10, 6.51, and 2.49 are predicted to occur by the LM test by freeing the path coefficients of the CDM Self-efficacy, Lack of Information, Career Planning, and Satisfaction with Information measured variables to be estimated for the nonpredicted latent factor. With the total sample model, drops in χ^2 of 32.81, 26.14, 18.03, 8.79, 8.79, and 5.07 are predicted to occur by the LM test by freeing the path coefficients of the Self-exploration, CDM Self-efficacy, Career Planning, Social Connectedness, Interpersonal Competence, and Environment Exploration measured variables to be estimated for the nonpredicted latent factor. Given the size of the chi-square values (χ^2 = 316, entire sample), these modifications would likely not make a substantive difference to overall fit of the models.

Although allowing for covariance between the residuals of measured variables would likely improve the statistical fit for the models, there is not a sound conceptual or theoretical rationale for doing so. One reason for the decision to allow covariance of residuals is if there is reason to suspect the presence of response sets across measured variables. However, this author is not aware of any reason to suspect a particular response set for the measured variables. Anderson and Gerbing (1988) highlight that respecifying models by allowing residuals to correlate can only be justified with a priori hypotheses

and doing so without a priori hypotheses takes advantage of chance, thus casting significant doubt on the meaning of results.

CHAPTER FOUR

DISCUSSION

The purpose of this study was to formulate and test a measurement model for the construct of career decision-making (CDM) competence. CDM is conceptually defined as one's success in completing CDM tasks typically expected of individuals during certain developmental periods (e.g., emerging adulthood) and within a specific sociocultural context. Conceptually, CDM competence stands in contrast to constructs representing specific aspects of CDM behavior (e.g., career planning) as well as constructs reflecting the resources (i.e., protective factors) and hindrances (i.e., risk factors) (e.g., cognitive abilities, personality traits, clarity or security of identity, and salient relationships) that are considered to influence engagement in adaptive CDM behavior.

Toward the goal of developing a valid measurement model of CDM competence, this study first used EFA to explore the structure of CDM competence by examining the patterns of correlations between scale scores reflecting CDM behavior fitting with the conceptual definition of CDM. Because gender differences in the structure of CDM constructs rarely have been examined, separate EFAs were conducted for females, males, and the entire sample to explore possible differences. Lastly, a measurement model of CDM competence was formulated from EFA findings and tested in relation to social and general competence with structural equation modeling (SEM). Separate models were tested for females, males, and the entire sample given EFA results indicating possible meaningful gender differences in the structure of CDM competence. For all the tested models, the three latent factors of CDM competence, interpersonal competence, and

general competence were included. The measurement model of general competence consisted of DASS, Life Satisfaction, and General Self-efficacy scale scores as indicator variables. The measurement model for interpersonal competence included Interpersonal Competence and Social Connectedness scale scores as indicator variables. The measurement models for CDM behavior differed between females and males as indicated by the EFA analyses.

Exploratory Factor Analyses

In each of the EFA's conducted with the female, male, and entire samples, two factors were retained. Interpretation of retained factors was made on the basis of variables selected for interpretation (i.e., loadings greater than .45) and the magnitude of corresponding factor loadings. The EFA's with the female and entire sample led to the identical measured variables being selected and remarkably similar patterns of loadings. Across all three samples, the variables of CDM Self-efficacy, Career Planning, Satisfaction with Information, and Environment Exploration substantively loaded on the first factor, whereas Decision Distress, Exploration Distress, and Inconsistent Information loaded on the second factor.

The EFA results with the male sample differed from those of the female and total samples by having the Inconsistent Information (-.45) variable being selected instead of the Self-exploration (.30) variable (that was selected for the female and entire samples) for the interpretation of Factor 1. In addition, the EFA results with the male sample differed from results with the female sample with the Lack of Information (.44) and Career Planning (-.28) variables not being interpreted for Factor 2. Further, the Self-

exploration variable did was not selected for interpretation of Factor 1 or 2 with the male sample. The difference between the female and male EFA results regarding Self-exploration suggests that females may perceive self-exploration (i.e.,) as a more salient CDM task than males. These results along with the finding that females reported significantly greater Self-exploration scale scores indicate a meaningful gender difference in the CDM competence variable of self-exploration. This result is consistent with previous research findings indicating that females engage in more self-exploration than do males (e.g., Vignoli et al., 2005). One explanation is that females perceive self-exploration as a more salient part of successfully engaging in CDM than males do and thus are more motivated to engage in self-exploration. This explanation is in accord with research regarding prominent gender norms (i.e., social expectations for acceptable or unacceptable behavior for men and women) in United States culture. For example, researchers have found that a primary masculine norm is pursuit of status (Mahalik, Locke, Ludlow, Diemer, Scott, Gottfried, & Freitas, 2003). Thus, the greater a male conformed to this norm, the less likely the individual would be motivated or willing to identify occupations that offer intrinsic fulfillment and develop greater understanding of sources of intrinsic fulfillment through self-exploration. Future research that incorporates measures of both CDM competence along with measures of conformance to gender norms and ideals (e.g., Mahalik et al., 2003) would allow researchers to test these hypothesis.

With all three samples, the variables that substantively loaded on the first factor could clearly be considered to be indicators of one's level of activeness and success in

engaging in CDM tasks. Thus, the first factor fit quite well with the proposed conceptual definition of CDM competence and was consistent with the a priori tentative hypothesis (H_1) that a general CDM competence factor would be found. However, in contrast to a priori tentative hypotheses, the EFA results did not include independent factors for exploration (H_2), adequacy of information (H_3), career planning (H_4), CDM confidence (H_5), and CDM distress (H_6). Notably, the general CDM competence factor encompassed different kinds of indicators [i.e., Satisfaction with Information (female, male, total), CDM Self-efficacy (female, male, total), Career planning (female, male, total), Environment Exploration (female, male, total), Lack of Information (female, male, total), Self-exploration (female, total), and Inconsistent Information (male)]. Therefore, the results for the EFA's support the validity of manifold views of adaptive CDM behavior and the usefulness of CDM competence as a construct consistent with such view. The observation of a manifold general factor and not independent factors may be due to overlap between variables that reflect CDM competence. This explanation is supported by the strong to moderate relations between scales representing CDM competence. For example, the Career Planning scale scores had correlations that exceeded .40 with a number of scales scores (i.e., Lack of Information, Inconsistent Information, CDM self-efficacy, and Exploration Distress).

The finding of a general CDM competence factor also means that measurement models of CDM competence for the purpose of studying development predictors and processes need only include a minimal number of indicator variables that have been found to strongly load on CDM competence. The high correlations of career planning

with many of the other CDM variables suggests that the planning scale may be most representative of the CDM competence factor. This result supports the contentions of Super and colleagues (Super, Thompson, & Lindemann, 1988) that one's readiness to cope with career transitions (i.e., career adaptability) is primarily determined by "one's planfullness and foresight in looking and thinking ahead about one's work and working life" (p. 5). The results of the EFA also are in accord with Clausen's (1991) construct of planful competence, defined as one's constellation of adaptive characteristics that include realistic goal setting, intellectual investment and capacity, dependability, productivity, self-confidence, and self-control. A manifold view of CDM competence (i.e., reflects a combination of variables) is also consistent with models of career maturity (Super et al., 1973) and career adaptability (Super & Knasel, 1981) that considered those constructs to be comprised of multiple components that included planfullness, exploration, and fund of information, among others. Furthermore, the finding of a general CDM competence factor comprised of career planning and exploration is quite consistent with previous research. Namely, Jepsen and Prediger (1981) found a factor they labeled as systematic involvement in decision making from an EFA with multiple measures of CDM behavior. The researchers described the systematic involvement factor as similar to planfulness and exploration dimensions.

Variables informing the interpretation of the second factor can be considered to reflect one's distress in engaging in CDM and one's sense of having inadequate information. Namely, these variables included Decision Distress (female, male, total), Exploration Distress (female, male, total), Inconsistent Information (female, male, total),

Lack of Information (female, total), and Career Planning (female, total). Given that the distress scale scores more strongly loaded on the second factor (e.g., .81, Decision Distress, total) than the inadequate information scale scores (e.g., .62 Inconsistent Information, total), the second factor can be interpreted to be primarily a CDM distress factor. However, the meaning of both distress scale scores and inadequate information scores strongly loading on the second factor as well as the meaning of an empirical distinction the two factors, warrants consideration of how factor 2 may reflect adaptive or maladaptive CDM behavior.

From one viewpoint, greater distress and greater inadequacy of information may be considered to directly reflect less success in engaging in CDM tasks (i.e., poor CDM competence). This perspective is akin to the view that greater undecidedness and uncertainty directly reflect less CDM success. However, as was previously discussed, individuals may report high levels of decidedness and certainty after having hastily engaged in CDM tasks and prematurely foreclosed on CDM as a means of avoiding the associated challenge and distress. In contrast, individuals may report greater uncertainty and little decidedness while actively engaging in CDM tasks toward making a better informed decision. Thus, there is an alternative view that one can be successfully engaging in CDM tasks while experiencing distress and perceiving one's information to be inadequate. When considering the inherent and daunting challenges in striving to make truly informed career decisions previously outlined (e.g., developing knowledge of one's current preferences that actually contribute to a sense of satisfaction), endeavoring to engage in CDM tasks can be understood to be inherently stressful and fraught with

uncertainty (Gelatt, 1989). From this perspective, individuals who score high on scales representing Factors 1 and 2, could be described as actively engaging in CDM tasks (e.g., planning, exploring, confidence in exploring and planning) *while* experiencing the inherent distress and sense of having inadequate information that would naturally arise from realistically acknowledging the actual magnitude of the challenge in making a truly informed decision. By not bypassing CDM tasks or minimizing the challenge or stakes of CDM as a means of reducing the inherent distress, actively engaging in CDM tasks despite experiencing the inherent distress and limits of certainty could be considered to be the most adaptive means of approaching CDM tasks and the truest form of CDM competence. This view is essentially the view that was described and proposed under the moniker of the Positive Uncertainty model by Gelatt (1989). Of course, a number of factors likely contribute to levels of CDM distress and uncertainty, and how to distinguish between adaptive and maladaptive forms of CDM distress and uncertainty remains an open question. Thus, future research is needed to develop means for empirically distinguishing forms of reported distress and uncertainty that can be deemed to reflect a dimension of CDM competence.

Structural Equation Modeling

From the SEM, fit indices suggest that the data poorly fit the models for the female, male, and total samples. Therefore, the SEM results were inconsistent with a priori hypotheses that the models would be found to have adequate fit (H_8). Consistent with hypotheses, all measured variables significantly loaded on the latent factors (H_9-H_{13}). The poor fit found for the models is consistent with a previous study that found

poor fit using SEM with a sample of young adults to examine models with multiple competence latent factors that included a work competence factor (Masten, Desjardins, McCormick, Kuo, & Long, 2010), prior to allowing error variances to covary. These findings stand in contrast to similar research finding adequate fit of structural models with multiple competency latent factors (Masten et al., 1995), however the extent to which error variances were allowed by Masten et al (1995) to correlate or possible moderating effects of age is not clear.

The poor fit found for the models in the current study may be explained by the substantial overlap between the measured variables considered to represent distinct areas of developmental competency. This overlap is indicated by the SEM modification indices values that predict a slightly better fit may be obtained by allowing measured variables to freely load on both the endogenous latent variables (i.e., social and CDM competence). Additionally, empirical overlap was reflected in moderate to strong Pearson correlations between scale scores representing different areas of competency (i.e., cross-over relations). For example, strong cross-over relations were observed between Social Connectedness and Life Satisfaction ($r = .48$, $p < .001$) scores and between Social Connectedness and DASS (i.e., Distress, Anxiety, Stress) scale scores ($r = -.42$, $p < .001$). These results suggesting poor fit of the structural models and the substantial cross-over correlations of measurement variables raises concerns about the validity of models with latent variables based solely on currently used domain specific areas of competence (i.e., social, CDM, academic, and general).

The observation of the substantial relations between variables considered to reflect different areas of competency is consistent with theories and empirical findings in the developmental psychology literature. Developmental theories of personality and psychological problems have long proposed that difficulties in different domains and throughout out life can be traced back to protective and risk factors that occurred earlier in life (e.g., Freud, 1900/1953; Erickson, 1968). Moreover, modern developmental research has longitudinally examined the developmental pathways spanning childhood to early adulthood and reported strong concurrent and longitudinal relations between competency areas (e.g., Caspi, Wright, Moffitt, & Silva, 1998). These findings have been interpreted to represent effects of underlying psychological processes that manifest in different ways across developmental phases (i.e., heterotypic continuity) (Cicchetti & Rogosch, 2002). Cicchetti and Rogosch (2002) explain that while the maladaptive behaviors can take different forms, underlying psychological processes lead to consistency in the meaning, organization, and function of the maladaptive behavior. The observation of lasting psychological difficulties taking different forms across developmental phases also has been interpreted to reflect the cascading effects of experiences (Masten, Roisman, Long, Burt, Obradovic, Riley, et al., 2005). Masten et al. (2005) explained that "failures in major domains of competence also may spill over to influence other domains of function, including psychological well-being and symptoms of psychopathology"(p. 680).

Given the substantial overlap of CDM, interpersonal, and general competence constructs, future research that can identity and examine alternative models and

constructs of developmental competence that account for the overlap may lead to more valid SEM models of competence constructs. For example, constructs that incorporate underlying developmental processes specific to certain sociocultural contexts such as individuation and differentiation (e.g., Bowlby, 1969) may account for overlap across current domains of competence and lead to more valid measurement models of developmental competence.

Summary

Findings from the EFAs suggested that the structure of CDM competence is made up of one primary CDM competence factor. In accord with the proposed conceptual definition of CDM competence, the CDM competence factor found in this study was comprised of variables that clearly reflect one's success in engaging in the task of CDM. In addition, comparison of separate EFA results for females and males suggested a meaningful difference in the structure of CDM competence. Namely, the variable of self-exploration may play a greater role in the structure of CDM competence for females than males. The SEM results did not support a structural model with discriminant relations of CDM competence with general competence and interpersonal competence latent factors. The poor fit of the model appears most likely due to the substantial relations between variables considered to reflect different areas of competency.

Limitations

Given the exploratory nature of this study, replication of this research is needed to accumulate the evidence needed to form sound conclusions about the structure of CDM competence, distinctions and overlap with other areas of competence, and, ultimately, the

construct validity of CDM competence. The ability to generalize the findings of this research is limited by homogenous characteristics of the sample. As college students, the vast majority of participants have the cognitive and financial resources to attend a large university. Moreover, the majority of the sample identified as being Caucasian and originally from the United States. Future research can address this limitation by examining the structure of CDM competence and relations to variables representing other domains of competence with more diverse groups of individuals such as 1st generation college students, international students, individuals of differing educational level, individuals differing in birth cohort, individuals differing in age, individuals differing in race, and individuals from differing cultural heritages. Indeed, evidence suggests that differences in CDM behavior exist between social groups such as social class (e.g., Blustein, Chaves, Diemer, Gallagher, Marshall, Sirin, & Bhati, 2002) and ethnic background (e.g., Gushue, 2006; Juntunen, Barraclough, Broneck, Seibel, & Winrow, 2001).

Implications for Counseling Practice

Although the limitations of this study warrant caution in making inferences, the findings of this study have several implications useful to counseling practice. A primary way this research may be useful to counselors is that the construct of CDM competence could be useful to conceptualization and assessment of client's career-related concerns. Based on the EFA results, counselors may be able to view CDM competence on a global level, rather than needing to assess and consider several largely unrelated facets of CDM competence. Further, EFA results indicate that the assessment of a client's global level of success (or difficulty) in engaging in CDM behavior can be conducted by measuring

the client's level of engagement in career planning, environment exploration, and self-exploration as well as the client's confidence in engaging in CDM activities and satisfaction with information. Moreover, a valid assessment of a client's CDM competence may be able to be quickly achieved through the use of a brief measure of a client's career planning such as Gould's (1979) career planning scale based on the finding that career planning appeared to be most representative of the general CDM competence factor. This would be especially useful to counselors who may not have the time or resources to use a battery of measures reflecting CDM competence.

Findings from the EFA also suggest that during the assessment and conceptualization process a client's level of distress and certainty should not be taken to be representative of one's success in dealing with CDM tasks. In other words, counselors should conceptualize and assess client behavior indicative of one's CDM competence (e.g., Career planning, environment exploration) as distinct from behavior indicative of a client's level of distress and uncertainty. Furthermore, these particular results are consistent with the view that the truest form of CDM competence may be actively engaging in CDM tasks despite the inherent distress and limits of certainty [e.g., See Gelatt's (1989) Positive Uncertainty model] and *not* bypassing the CDM tasks or minimizing the challenge or stakes of CDM as a means of reducing the inherent distress.

In addition, the results have implications regarding differences in the CDM competence between females and males that may be important for counselors to assess for. Specifically, results from the EFA suggest that male clients, in general, may not perceive self-exploration as an important part of making good career decisions compared

to females. This gender difference may be understood to be in part due to the masculine norm of pursuit of status (e.g., Mahalik et al., 2003). From this view, the greater a male client conforms to the masculine norms and, in particular, pursuit of status, the less likely that client will be apt to engage in self-exploration.

Results from the structural equation modeling also bear useful implications for counseling practice. In particular, findings from the SEM along with the substantial correlations between variables reflecting CDM competence and variables reflecting interpersonal and general competence (i.e., correlations between variables reflecting different competence constructs) suggests that counselors may find through a thorough assessment that difficulty (or success) in dealing with CDM tasks tends to co-occur with difficulty (or success) in dealing with interpersonal developmental tasks or in generally dealing with developmental tasks. Thus, conceptualization of client concerns that span multiple domains of competency may be informed by consideration of developmental processes such as cascade effects (i.e., failures and success in dealing with tasks at one point in time may cause disadvantages that contribute to success or failure later in time; failure or success in one domain of tasks may spill over to affect other areas of tasks) and heterotypic continuity (i.e., psychological processes that manifest in different ways across developmental phases).

CHAPTER 5

SUMMARY

Most individuals spend a bulk of their lives between the ages of 18 and 65 working in either paid employment or at home. The high stake of career decisions is perhaps matched by the inherent difficulty of making informed decisions. With the ultimate goal of developing the means for supporting individuals' efforts to engage in CDM, psychologists studying CDM behavior have made progress over the last century in developing influential theoretical models, constructs, and assessment instruments. The CDM literature is replete with rich conceptual descriptions of CDM behavior. However, few intensive efforts to clarify conceptual relations have been reported in the literature. As result, areas of overlap and distinction between often studied constructs remain unknown. Furthermore, an open question is whether constructs representing adaptive CDM behavior are distinct facets of developmental competency and, moreover, determined by unique factors and processes.

Vocational psychologists have generated a number of useful assessment tools with evidence, by and large, supporting their reliability and structural validity. Taken together, studies using factor and cluster analysis have commonly indicated several factors and clusters representing adaptive and maladaptive CDM behavior. Factor analytic evidence indicates substantial overlap across CDM constructs and, as a result, casts doubt on hypotheses concerning the construct validity of all the proposed CDM constructs. Moreover, very little is known about how the overlap between CDM constructs might differ between females and males.

With the intention of promoting greater conceptual clarity and consistency as well as integration across areas of psychological study, the construct CDM competence is proposed to describe features of adaptive CDM behavior. Drawing from Masten and Coatsworth's (1998) definition of competence, CDM competence is defined here as success in completing CDM tasks typically required of individuals during certain developmental periods and within a specific sociocultural context.

Toward the central goal of developing a valid measurement model of CDM competence, this study first used exploratory factor analysis (EFA) to examine the structure of CDM competence and to guide the formulation of a measurement model and then tested the CDM model in relation to models of social and general competence with structural equation modeling (SEM).

Participants included 228 female and 143 (Total N = 371) male students attending a large Midwestern University. Participants were recruited through a research experience program that provides compensation in the form of extra-credit to students participating in certain psychology courses. Participants completed the paper and pencil survey packet in one sitting in classrooms and conference rooms with minimal noise.

On the basis of reviewed theoretical and empirical work, selected scales for the EFA represented exploring work environments (i.e., environmental exploration), reflecting on work related preferences and abilities (i.e., self-exploration), anticipating and preparing for transitions (i.e., planfulness), adequacty of information (i.e., satisfaction with information, lack of information, consistency of information), career decision making self-efficacy, decisional distress, and explorational distress. For the

SEM, the latent factor of social competence was measured by social connectedness and interpersonal competence with peers. The general competence factor was measured with general self-efficacy, general distress, and life satisfaction scale scores.

As was expected from examination of bivariate correlations, substantial correlations were found across many of the scales. Notably, strong relations between scales representing different domains of competence were found.

In all three EFA's, the first two extracted factors were retained based on a clear demarcation between the eigenvalues of the 2nd and 3rd extracted factors that was observed via skree plots. The EFA conducted with the entire sample (i.e., both females and males) resulted in six measured variables with loadings that exceeded a magnitude of .45 for Factor 1 (Satisfaction with Information, Environmental Exploration, Career Planning, and Self-exploration) and four variables with loadings exceeding a magnitude of .45 for the Factor 2 (Decision Distress, Exploration Distress, Inconsistent Information, and Lack of Information.

Similarly, the EFA conducted with the female participants resulted in six measured variables with positive loadings greater in magnitude than .45 for Factor 1 [Satisfaction with Information, CDM Self-efficacy, Environment Exploration, Career Planning, Self-exploration, and Lack of Information (negative loading)] and five measured variables with loadings exceeding a magnitude of .45 for Factor 2 [Decision Distress, Exploration Distress, Inconsistent Information, Lack of Information, and Career Planning (negative loading)].

The EFA results for males differed from EFA results with the female and entire samples by the Self-exploration scale not being included in the interpretation of Factor 1 and the Lack of Information and Career Planning scales not being included in the interpretation of Factor 2. Additionally, Inconsistent Information scale was included in the interpretation of Factor 1 for males, but not for the female and entire samples.

Given the differences in the EFA results between the female and male samples, three structural models were hypothesized in accord for the three samples (i.e., females, males, and the entire sample). Goodness-of-fit index values from the SEM suggested that none of the tested models were adequate for the collected data.

From the EFA with all three samples, the variables that substantively loaded on the first factor could clearly be considered to be indicators of one's level of success in engaging in CDM tasks. Thus, the first factor fit quite well with the proposed conceptual definition of CDM competence. Further, the results for the EFA's support the validity of manifold views of adaptive CDM behavior and the usefulness of CDM competence as a construct consistent with such view. The high correlations of career planning with many of the other CDM variables suggests that the planning scale may be most representative of the CDM competence factor. Variables informing the interpretation of the second factor can be considered to reflect one's distress in engaging in CDM and one's sense of having inadequate information. Comparison of separate EFA results for females and males suggested that the variable of self-exploration may play a greater role in the structure of CDM competence for females than males.

Regarding the SEM, the poor fit found for the models in the current study may be explained by the substantial overlap between the measured variables considered to represent distinct areas of developmental competency. Empirical overlap was reflected in moderate to strong Pearson correlations between scale scores representing different areas of competency (i.e., cross-over relations). The observation of the substantial relations between variables considered to reflect different areas of competency is consistent with theories and empirical findings in the developmental psychology literature.

Given the exploratory nature of this study, replication of this research is needed to accumulate the evidence needed to form sound conclusions about the structure of CDM competence, distinctions and overlap with other areas of competence, and, ultimately, the construct validity of CDM competence. The ability to generalize the findings of this research is limited by homogenous characteristics of the sample.

A main way this research may be useful to counselors is that the construct of CDM competence may aid the conceptualization and assessment of client's career-related concerns. Findings from the SEM along with the substantial correlations between variables reflecting CDM competence and variables reflecting interpersonal and general competence (i.e., correlations between variables reflecting different competence constructs) suggests that counselors may find through a comprehensive assessment that difficulty in dealing with CDM tasks tends to co-occur with difficulty in coping with interpersonal developmental tasks or in generally dealing with developmental tasks.

REFERENCES

Please note that references marked with an asterisk were used in Appendix A.

Aiken, J., & Johnston, J.A. (1973). Promoting career information seeking behaviors in college students. *Journal of Vocational* Behavior, *3*, 81–87.

Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*, 411-423.

Antony, M.M., Bieling, P.J., Cox, B.J., Enns, M.W., & Swinson, R.P. (1998). Psychometric properties of the 42-item and 21-item version of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176-181.

American Educational Research Association, American Psychology Association, & National Council on Measurement in Education. (1999). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.

*Armstrong, P.I., & Crombie, G. (2000). Compromises in adolescents' occupational aspirations and expectations from Grades 8 to 10. *Journal of Vocational Behavior, 56*, 82–98.

Barrett, T.C., & Tinsley, H.E.A. (1977a). Measuring vocational self-concept crystallization. *Journal of Vocational Behavior, 11*, 305-313.

Barrett, T.C., & Tinsley, H.E.A. (1977b). Vocational self-concept crystallization and vocational indecision. *Journal of Counseling Psychology, 24*, 301-307.

Bartley, D.F., & Robitschek, C., 2000. Career exploration: A multivariate analysis of predictors. *Journal of Vocational Behavior, 56,* 63–81.

*Betz, N.E., & Hackett, G. (1981). The relationship of career-related self-efficacy expectations to perceived career options in college women and men. *Journal of Counseling Psychology, 28,* 399-410.

Betz, N.E., Klein, K.L., & Taylor, K.M. (1996). Evaluation of a short form of the Decision-Making Self-Efficacy Scale. *Journal of Career Assessment, 4*, 47-57.

Betz, N.E., & Serling, D.A. (1993). Construct validity of fear of commitment as an indicator of career indecisiveness. *Journal Career Assessment, 1*, 21-34.

*Betz, N.E., & Voyten, K.K. (1997). Efficacy and outcome expectations influence career exploration and decidedness. *Career Development Quarterly, 46*, 179-189.

Blustein, D.L. (1988). A canonical analysis of career choice crystallization and vocational maturity. *Journal of Counseling Psychology, 35*, 294-297.

Blustein, D.L. (1989). The role of goal instability and career self-efficacy in the career exploration process. *Journal of Vocational Behavior, 35*, 194-203.

Blustein, D.L. (1997). A context-rich perspective of career exploration across the life roles. *The Career Development Quarterly, 45*, 260-274.

Blustein, D.L., Chaves, A.P., Diemer, M.A., Gallagher, L.A., Marshall, K.G., Sirin, S., & Bhati, K.S. (2002). Voices of the forgotten half: The role of social class in the school-to-work transition. *Journal of Counseling Psychology, 49*, 311-323.

Blustein, D.L., Phillips, S.D., Joben-Davis, K., Finkelberg, S.L., & Roarke, A.E. (1997). A theory-building investigation of the school-to-work transition. *The Counseling Psychologist, 25*, 364-402.

Bordin, E.S., Nachmann, B., & Segal, S.J. (1963). An articulated framework for vocational development. *Journal of Counseling Psychology, 10*, 107-I 16.

Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. New York: Basic Books.

Bruch, M. A., Giordano, S., & Pearl, L. (1986). Differences between fearful and self-conscious shy subtypes in background and current adjustment. *Journal of Research in personality, 20*, 172-186.

Buhrmester, D., Furman, W., Wittenberg, M.T., & Reis, H.T. (1988). Five domains of interpersonal competence in peer relationships. *Journal of Personality and Social Psychology, 55*, 991-1008.

Caspi, A., Wright, B., Moffitt, T.E., & Silva, P.A. (1998). Early failure in the labor market: Childhood and adolescent predictors of unemployment in the transition to adulthood. *American Sociological Review, 63*, 424-451.

*Cejka, M.A., & Eagly, A.H. (1999). Gender-stereotypic images of occupations correspond to the sex segregation of employment. *Personality & Social Psychology Bulletin, 25*, 413-423.

*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.

Chartrand, J.M., Rose, M.L., Elliott, T.R., Marmarosh, C., & Caldwell, S. (1993). Peeling back the onion: Personality, problem solving, and career decision making style correlates of career indecision. *Journal of Career Assessment, 1*, 66-82.

Chen, G., Gully, S.M., & Eden, D. (2001).Validation of a new General Self-Efficacy Scale. *Organizational Research Methods, 4,* 62-83.

*Chung, Y.B. (2002). Career decision-making self-efficacy and career commitment: Gender and ethnic differences among college students. *Journal of Career Development, 28*, 277-284.

Cicchetti, D., & Rogosch, F. (1996). Equifinality and multifinality in developmental psychopathology. *Development & Psychopathology, 8*, 597-600.

Clausen, J.S. (1991). Adolescent competence and the shaping of the life course. *American Journal of Sociology, 96*, 805-842.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New Jersey: Lawrence Erlbaum.

Coscarelli, W.C. (1983). Development of a decision making inventory to assess Johnson's decision making styles. *Measurement and Evaluation in Guidance, 16*, 149-160.

Creed, P.A., Fallon, T., & Hood, M. (2009). The relationship between career adaptability, person and situation variables, and career concerns in young adults. *Journal of Vocational Behavior, 74*, 219-229.

Crites, J.O. (1965). Measurement of vocational maturity in adolescence: I. Attitude Test of the Vocational Development Inventory. *Psychological Monographs, 79*, 2.

Crites, J.O. (1971). *The maturity of vocational attitudes in adolescence.* Washington, DC: American Personnel and Guidance Association.

Crites, J.O. (1978). *Career Maturity Inventory theory and research handbook*. Monterey, CA: CTB/McGraw-Hill.

Crites, J. O., & Savickas, M. L. (1996). Revision of the Career Maturity Inventory. *Journal of Career Assessment, 4,* 131–138.

Cronbach, L.J., & Meehl, P.E. (1955). Construct validity of psychological tests. *Psychological Bulletin, 52,* 281-302.

Crook, R.H., Healy, C.C., & O'Shea, D.W. (1984). The linkage of work achievement to self-esteem, career maturity, and college achievement. *Journal of Vocational Behavior, 25,* 70-79.

Diener, E., Emmons, R., Larson, J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49,* 71-75.

de Lange, A.H., Taris, T.W., Komier, M.A.J., Houtman, I.L.D., & Bongers, P.M. (2003). The very best of the millennium: Longitudinal research and the demand-control-(support) model. *Journal of Occupational Health Psychology, 8,* 282-305.

Dickinson, J., & Tokar, D.M. (2004). Structural and discriminant validity of the career factors inventory. *Journal of Vocational Behavior, 65,* 239-254.

Duffy, R.D., & Blustein, D.L. (2005). The relationship between spirituality, religiousness, and career adaptability. *Journal of Vocational Behavior, 67,* 429–440.

*Eagly, A.H. (1987). *Sex differences in social behavior: A social role interpretation*.

Hillsdale, NJ: Erlbaum.

*Eagly, A.H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist, 54*, 408-423.

*Eagly, A.H., Wood, W., & Diekman, A.H. (2000). *Social role theory of sex differences and similarities: A current appraisal.* In T. Eckes & H. M. Trautner (Eds.), The developmental social psychology of gender (pp. 123-174). Mahwah, NJ: Erlbaum.

Erickson, E.H. (1968). *Identity: Youth and Crisis*. New York: W.W. Norton and Company.

Fabrigar, L.R., Wegener, D.T., MacCallum, R.C., & Strahan, E.J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*, 272-299.

*Feingold, A. (1994). Gender differences in personality: A meta-analysis. Psychological Bulletin, 116, 429-456.

Flum, H., & Blustein, D.L.(2000).Reinvigorating the study of vocational exploration: A framework for research. *Journal of Vocational Behavior, 56*, 380-404.

Fouad, N.A., & Bynner, J. (2008). Work transitions. *American Psychologist, 63*, 241-251.

Fouad, N.A., & Smith, P.L. (1996). A test of a social cognitive model for middle school students: Math and science. *Journal of Counseling Psychology, 43*, 338-346.

Freud, S. (1900/1953). The interpretation of dreams. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vols. 4 and 5). London: Hogarth.

Fuqua, D.R., & Newman, J.L. (1989). An examination of the relations among career subscales. *Journal of Counseling Psychology, 36,* 487-491.

Gati, I. (1986). Making career decisions: A sequential elimination approach. *Journal of Counseling Psychology, 33,* 408-417.

Gati, I., Krausz, M., & Osipow, S.H. (1996). A taxonomy of difficulties in career decision-making. *Journal of Counseling Psychology, 43*, 510-526.

Gelatt, H.B. (1962). Decision-making: A conceptual frame of reference for counseling. *Journal of Counseling Psychology, 36,* 252-256.

Gelatt, H.B. (1989). Positive uncertainty: A new decision-making framework for counseling. *Journal of Counseling Psychology, 36*, 252-256.

Germeijs, V., & Verschueren, K. (2006). High school students' career decision-making process: Development and validation of the Study Choice Task Inventory. *Journal of Career Assessment, 14,* 449-471.

Gloster, A.T., Rhoades, H. M., Novy, D., Klotsche, J., Senior, A., Kunik, M., et al. (2008). Psychometric properties of the Depression Anxiety and Stress Scale-21 in older primary care patients. *Journal of Affective Disorders, 110,* 248-259.

*Gottfredson, L.S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. *Journal of Counseling Psychology, 28,* 545-579.

Gould, S. (1979). Characteristics of Career Planners in Upwardly Mobile Occupations. *Academy of Management Journal, 22*, 539-520.

Greenhaus, J.H., & Connolly, T.F. (1982). An investigation of career exploration among undergraduate business students. *Journal of College Student Personnel, 23*, 314-319.

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

Guay, F., Senecal, C., Gauthier, L., & Fernet, C. (2003). Predicting career indecision: A self-determination theory perspective. *Journal of Counseling Psychology, 50*, 165-177.

Gushue, G. (2006). The relationship of ethnic identity, career decision-making self-efficacy and outcome expectations among Latino/a high school students. *Journal of Vocational Behavior, 68*, 85-95.

Hall, D.T. (1992). Career indecision research: Conceptual and methodological problems. *Journal of Vocational Behavior, 41*, 245-250.

*Hardin, E.E., Varghese, F.P., Tran, U.V., & Carlson, A.Z. (2006). Anxiety and career exploration: Gender differences in the role of self- construal. *Journal of Vocational Behavior, 69*, 346-358.

Harmon, L.W., Hansen, J.C., Borgen, F.H., & Hammer, A.L. (1994). *Strong interest inventory: Applications and technical guide.* Palo Alto, CA: Consulting Psychologists Press.

*Harren, V.A. (1979). A model of career decision making for college students. *Journal of Vocational Behavior, 14*, 119-133.

Hartman, B.W., Fuqua, D.R., & Jenkins, S.J. (1986). The reliability/generalizability of the construct of career indecision. *Journal of Vocational Behavior, 28*, 142-148.

Hartung, P.J., & Blustein, D.L. (2002). Reason, intuition, and social justice. Elaborating on Parson's career decision making model. *Journal of Counseling and Development, 80*, 41-47.

Hayton, J.C., Allen, D.G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organization Research Methods, 7*, 191-205.

*Herr, E.L., & Enderlein, T.E. (1976). Vocational maturity: The effects of school grade, curriculum and sex. *Journal of Vocational Behavior, 8*, 227-238.

Hilton, T.L. (1962). Career decision-making. *Journal of Counseling Psychology*, *19*, 291-298.

*Hirschi, A., & Läge, D. (2007). The relation of secondary student's career choice readiness to a six-phase model of career decision-making. *Journal of Career Development, 34*, 164–191.

Holland, J.L., Daiger, D.C., & Power, P.G. (1980). *My Vocational Situation*. Palo Alto, CA: Consulting Psychologists Press.

Holland, J. L., Gottfredson, G. D., & Nafziger, D. H. (1973). *A diagnostic scheme for specifying vocational assistance (Research Rep. No. 164)*. Baltimore Md.: Johns Hopkins University Center for the Social Organization of Schools.

Hsu, C.C. (1970). A conceptual model of vocational decision-making. *Experimental Publication System, 8*, 270-276.

Janis, I.L., & Mann, L. (1977). *Decision making*. New York: Free Press.

Jepsen, D.A., & Dilley, J.S. (1974). Vocational decision making models: A review and comparative analysis. *Review of Educational Research, 44*, 331-349.

Jepsen, D.A., & Prediger, D.J. (1981). Dimensions of adolescent career development: A multi-instrument analysis. *Journal of Vocational Behavior, 19*, 350-368.

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.

Jordaan, J.P. (1963). Exploratory behavior: The formation of self and occupational concepts. In D.E. Super (Ed.), *Career Development: Self-concept theory* (pp. 42-78). New York: College Entrance Examination Board.

Jöreskog, K. G., & Sörbom, D. (2003). LISREL 8.54 [Computer software]. Chicago: Scientific Software.

Juntunen, C.L., Barraclough, D.J., Broneck, C.L., Seibel, G.A., Winrow, S.A., & Morin, P.M. (2001). American Indian perspectives on the career journey. *Journal of Counseling Psychology, 48*, 274-285.

Kahneman, D. & Klein, G. (2009). Conditions for intuitive expertise: A failure to disagree. *American Psychologist, 64*, 515-526

Kaiser, H.F. & Rice, J. (1974). Little jiffy Mark IV. *Educational and Psychological Measurement, 34*, 111-117.

Kaldor, D.R., & Zytowski, D.G. (1969). A maximizing model of occupational decision-making. *Personnel and Guidance Journal, 47*, 781-788.

Katz, M.R. (1963). *Decisions and values: A rationale for secondary school guidance.* New York: College Entrance Examination Board, 1963.

Kelly, K.R., & Lee, W. (2001). Mapping the domain of career decision problems. *Journal of Vocational Behavior, 61,* 302-326.

Kenny, M.E., & Bledsoe, M. (2005). Contributions of the relational context to career adaptability among urban adolescents. *Journal of Vocational Behavior, 66,* 257–272.

Ketterson, T.U., & Blustein, D.L. (1997). Attachment relationships and the career exploration process. *Career Development Quarterly, 46,* 167-189.

Kitson, H.D. (1925). *The psychology of vocational adjustment*. Oxford, England: Lippincott.

Kline, R.B. (2005). *Principles and Practice of Structural Equation Modeling (2nd ed.).* New York: The Guilford Press.

*Kling, K.C., Hyde, J.S., Showers, C.J., & Buswell, B.N. (1999). Gender differences in self-esteem: A meta-analysis. *Psychological Bulletin, 125,* 470-500.

Krieshok, T.S. (1998). An anti-introspectivist view of career decision making. *Career Development Quarterly, 46,* 210-229.

Krieshok, T.S., Black, M.D., & McKay, R.A. (2009). Career decision making: The limits of rationality and the abundance of non-conscious presses. *Journal of Vocational Behavior, 75,* 275-290.

Krumboltz, J.D. (2002). The wisdom of indecision. *Journal of Vocational Behavior, 41,* 239-244.

Krumboltz, J.D., & Hamel, D.A. (1977). *Guide to career decision making skills*. New York: College Entrance Examination Board.

Lancaster, B.P., Rudolph, C.E., Perkins, T.S., & Patten, T.G. (1999). The reliability and validity of the Career Decision Difficulties Questionnaire. *Journal of Career Assessment, 7,* 393–413.

Lapan, R.T., & Turner, S. (1997). *Mapping Vocational Challenges Career Development Program*. All Rights Reserved.

Larson, L.M., Heppner, P.P., Ham, T., & Dugan, K. (1988). Investigating multiple subtypes of career indecision through cluster analysis. *Journal of Counseling Psychology, 35*, 439-446.

Lawrence, W., & Brown, D. (1976). An investigation of intelligence, self-concept, socioeconomic status, race, and sex as predictors of career maturity. *Journal of Vocational Behavior, 9*, 43-52.

Lee, R.M., Draper, M., & Lee, S. (2001). Social connectedness, dysfunctional interpersonal behavior, and psychological distress: Testing a mediator model. *Journal of Counseling Psychology, 48,* 310-318.

*Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior, 45*, 79-122.

Leong, F.T.L., & Chervinko, S. (1996). Construct validity of career indecision: Negative personality traits as predictors of career indecision. *Journal of Career Assessment, 4*, 315-329.

Levinson, E.M., Ohler, D.L., Caswell, S., & Kiewra, K. (1998). Six approaches to the assessment of career maturity, *Journal of Counseling and Development, 76*, 475–482.

Loevinger, J. (1976). *Ego development*. San Francisco: Jossey-Bass.

*Lokan, J. (1984). Career development inventory Australia. Hawthorn, Vic.: Australian Council for Educational Research.

Lovibond, S.H., & Lovibond, P.F. (1995). *Manual for the Depression, Anxiety, Stress Scales (2nd ed.)* Sydney: Psychology Foundation.

Lucas, J.L., & Wanberg, C.R. (1995). Personality correlates of Jones' three-dimensional model of career indecision. *Journal of Career Assessment, 3*, 315-329.

Lucas, R.E., Clark, A.E., Georgellis, Y., & Diener, E. (2004). Unemployment alters the set point for life satisfaction. *Psychological Science, 15*, 8-12.

Luzzo, D.A. (1993a). Predicting the career maturity of undergraduates: A comparison of personal, educational, and psychological factors. *Journal of College Student Developmental, 34*, 271-275.

*Luzzo, D. A. (1993b). Reliability and validity testing of the Career Decision-Making Self-Efficacy Scale. *Measurement and Evaluation in Counseling and Development, 26*, 137-142.

*Luzzo, D.A. (1995). Gender differences in college students' career maturity andperceived barriers in career development. *Journal of Counseling & Development, 73*, 319-322.

*Luzzo, D.A., & McWhirter, E.H. (2001). Sex and ethnic differences in the perceptions of educational and career-related barriers and levels of coping efficacy. *Journal of Counseling and Development, 79*, 61–67.

*Mahalik, J.R., Locke, B.D., Ludlow, L.H., Diemer, M., Scott, R.P.J., Gottfried, M., & Freitas, G. (2003). Development of the Conformity to Masculine Norms Inventory. *Psychology of Men & Masculinity, 4*, 3-25.

Martin, F., Sabourn, S., Laplante, B., & Coallier, J. (1991). Diffusion, support, approach, and external barriers as distinct theoretical dimensions of the Career Decision Scale: Disconfirming evidence? *Journal of Vocational Behavior, 38*, 187-197.

Maslach, C., & Leiter, M. P. *(*2008*).* Early predictors of job burnout and engagement. *Journal of Applied Psychology, 93*, 498-512.

Masten, A.S., Burt, K.B., Roisman, G.I., Obradovic, J., Long, J.D., & Tellegen, A. (2004). Resources and resilience in the transition to adulthood: Continuity and change. *Development and Psychopathology, 16*, 1071-1094.

Masten, A.S., & Coatsworth, J.D. (1998). Lessons from research on successful children. The development of competence in favorable and unfavorable environments. *American Psychologist, 53*, 205-220.

Masten, A.S., Coatsworth, J.D., Neeman, J., Gest, S.D., Tellegen, A., & Garmezy, N. (1995). The structure and coherence of competence from childhood through adolescence. *Child Development, 66*, 1635-1659.

Masten, A.S., & Curtis, W.J. (2000). Integrating competence and psychopathology: Pathways toward a comprehensive science of adaptation in development. *Development and Psychopathology, 12*, 529-550.

Masten, A.S., Desjardins, C. D., McCormick, C. M., Kuo, S. I., & Long, J.D. (2010). The significance of childhood competence for adult success at work: A developmental cascade analysis. *Development and Psychopathology, 22*, 679–694.

Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., et al. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology, 41*, 733-746.

McArdle, S., Waters, L., Briscoe, J.P., & Hall, D.T. (2007). Employability during unemployment: Adaptability, career identity and human and social capital. *Journal of Vocational Behavior, 71*, 247–264.

*McWhirter, E.H. (1997). Perceived barriers to education and career: Ethnic and gender differences. *Journal of Vocational Behavior, 50*, 124-140.

Meyer, B.W., & Winer, J.L. (1993). The Career Decision Scale and neuroticism. *Journal of Career Assessment, 1*, 171-180.

Miller, M.P. (1974). Relationship of vocational maturity to work values. *Journal of Vocational Behavior, 5*, 367-371.

Mitchell, K.E., Levin, A.S., & Krumboltz, J.D. (1999). Planned happenstance. Constructing unexpected career opportunities. *Journal of Counseling and Development, 77*, 115-124.

Morison, P., & Masten, A.S. (1991). Peer reputation in middle childhood as a predictor of adaptation in adolescence: A seven-year follow-up. *Child Development, 62,* 991-1007.

Multon, K.D., Heppner, M.J., & Lapan, R.T. (1995). An empirical derivation of career decision subtypes in a high school sample. *Journal of Vocational Behavior, 47,* 76-92.

*National Science Foundation (2004). Women, minorities, and persons with disabilities in science and engineering: 2004. Arlington, VA: National Science Foundation.

Nauta, M.M. (2007). Career interests, self-efficacy, and personality as antecedents of career exploration. *Journal of Career Assessment, 15*, 162-180.

Neeman, J., Hubbard, J., & Masten, A.S. (1995). The changing importance of romantic relationship involvement to competence from late childhood to late adolescence. *Development and Psychopathology, 7*, 727-750.

*Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin, 115*, 424-443.

Oei, T. P.S., Kenna, D., & Evans, L. (1991). The reliability, validity, and utility of the SAD and FNE scales for anxiety disorder patients. *Personality & Individual Differences, 12*, 111-116.

*Oliver, M. B., & Hyde, J.S. (1993). Gender differences in sexuality: A meta-analysis. *Psychological Bulletin, 114*, 29-51.

Osipow, S.H. (1999). Assessing career indecision. *Journal of Vocational Behavior, 55*, 147-154.

Osipow, S.H., Carney, C.G., & Barak, A. (1976). A scale of educational-vocational undecidedness: A typological approach. *Journal of Vocational Behavior, 9*, 233-324.

Osipow, S.H., Carney, C.G., Winer, J.L., Yanico, B.J., & Koschier, M. (1976). *Career Decision Scale* (3rd ed. Rev.). Odessa, FL: PAR, Inc.

Page, J., Bruch, M.A., & Haase, R.F. (2008). Role of perfectionism and Five-Factor model traits in career indecision. *Personality and Individual Differences, 45*, 811-815.

Parsons, F. (1909). *Choosing a vocation*. Boston: Houghton Mifflin.

Patterson, D.G., & Darley, J.G. (1936). *Men, women, and jobs.* Minneapolis: University of Minnesota Press.

*Patton, W., & Creed, P.A. (2001). Developmental issues in career maturity and career decision status. *Career Development Quarterly, 49*, 336-351.

*Patton, W., & Lokan, J. (2001). Perspectives on Donald Super's construct of career maturity. *International Journal of Educational and Vocational Guidance, 1*, 31-48.

Phillips, S.D. (1997). Toward an expanded definition of adaptive decision making. *The Career Development Quarterly, 45*, 275-287.

Phillips, S.D., & Blustein, D.L. (1994). Readiness for career choices: Planning, exploring, and deciding. *Career Development Quarterly, 43,* 63–73.

*Phillips, S.D., Friedlander, M.L., Pazienza, N.J., & Kost, P. (1985). A factor analytic investigation of career decision-making styles. *Journal of Vocational Behavior, 26,* 106-115.

Philips, S.D., & Imhoff, A. (1997). Women and career development: A decade of research. *Annual Review of Psychology, 48*, 31-59.

Phillips, S.D., Pazienza, N.J., & Walsh, D.J. (1984). Decision-making styles and progress in occupational decision making. *Journal of Vocational Behavior, 25,* 96-105.

Phillips, S.D., & Pazienza, N.J. (1988). History and theory of the assessment of career development and decision making. Career decision making. In B.W Walsh & S.H. Osipow (Eds). *Career decision making. Contemporary topics in vocational psychology.* (pp. 1-31). Hillsdale, NJ, England: Lawrence Erlbaum Associates.

Phillips, S.D., & Strohmer, D.C. (1982). Decision-making style and vocational maturity. *Journal of Vocational Behavior, 20*, 215-222.

Pitz, G.F., & Harren, V.A. (1980). An analysis of career decision making from the point of view of information processing and decision theory. *Journal of Vocational Behavior, 16,* 320-346.

Rassin, E., & Muris, P. (2005). To be or not to be…indecisive: Gender differences, correlations with obsessive-compulsive complaints, and behavioural manifestation. *Personality and Individual Differences, 38*, 1175-1181.

Robitschek, C., & Cook, S.W. (1999). The influence of personal growth initiative and coping styles on career exploration and vocational identity. *Journal of Vocational Behavior, 54*, 127-141.

Rodebaugh, T.L., Woods, C.M., Thissen, D.M., Heimberg, R.G., Chambless, D.L., & Rapee, R. M. (2004). More information from fewer questions: The factor structure and item properties of the original and Brief Fear of Negative Evaluation Scale. *Psychological Assessment, 16*, 169-181.

Rogers, M.E., Creed, P.A., & Glendon, A.I. (2008). The role of personality in adolescent career planning and exploration: A social cognitive perspective. *Journal of Vocational Behavior, 73*, 132-142.

Rosenberg, M. (1965). *Society and the adolescent child*. Princeton, NJ: Princeton University Press.

Rojewski, J.W. (1994). Career indecision types for rural adolescents from disadvantaged and non-disadvantaged backgrounds. *Journal of Counseling Psychology, 41*, 356-363.

*Rojewski, J.W., Wicklein, R.C., & Schell, J.W. (1995). Effects of gender and academic risk behaviour on the career maturity of rural youth. *Journal of Research in Rural Education, 11*, 92-104.

Rottinghaus, P.J., Day, S.X., & Borgen, F.H. (2000, August). *The Career Futures Inventory: A measure of adaptability and optimism.* Poster presented at the annual meeting of the American Psychological Association, Washington, DC.

Rottinghaus, P.J., Day, S.X., & Borgen, F.H. (2005). The Career Futures Inventory: A Measure of career-related adaptability and optimism. *Journal of Career Assessment, 13*, 3-24.

Rounds, J., Dawis, R.V., & Lofquist, L.H. (1987). Measurement of Person-Environment Fit and Prediction of Satisfaction in the Theory of Work Adjustment. *Journal of Vocational Behavior, 31*, 297-318.

Saka, N., Gati, I., & Kelly, K.R. (2008). Emotional and personality-related aspects of career decision-making difficulties. *Journal of Career Assessment, 16*, 403-424.

Saunders, D.E., Peterson, G.W., Sampson, J.P., & Reardon, R.C. (2000). Relation of depression and dysfunctional career thinking to career indecision. *Journal of Vocational Behavior, 56*, 288-298.

Savickas, M.L. (1984). Career maturity: The construct and its measurement. *The Vocational Guidance Quarterly*, *32*, 222–231.

Savickas, M.L. (1997). Career adaptability: An integrative construct for life-span, life-space theory. *The Career Development Quarterly*, *45*, 247-259.

Savickas, M.L., & Hartung, P.J. (1996). The Career Development Inventory in review: Psychometric and research findings. *Journal of Career Assessment, 4*, 171-188.

Savickas, M.L., & Jarjoura, D. (1991). The Career Decision Scale as a type indicator. *Journal of Counseling Psychology, 38*, 85-90.

Savickas, M.L., Silling, S.M., & Schwartz, S. (1984). Time perspective in vocational maturity and career decision making. *Journal of Vocational Behavior*, *25*, 258–269.

Scherbaum C.A., Cohen-Charash Y., Kern M.J. (2006) Measuring general self efficacy. A comparison of three measures using item response theory. *Educational and Psychological Measurement, 66*, 1047–1063.

Schulenberg, J.E., Shimizu, K., Vondracek, F.W., & Hostetler, M. (1988). Factorial invariance of career indecision dimensions across junior high and high school males and females. *Journal of Vocational Behavior, 33*, 63-81.

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio*. Causal and control beliefs (pp. 35-37). Windsor, UK: NFER-NELSON.

Shaffer, A., Burt, K.B., Obradovic, J., Herbers, J.E., & Masten, A.S. (2009). Intergenerational continuity, in parenting quality: The mediating role of social competence. *Developmental Psychology, 45*, 1227-1240.

Shimizu, K., Vondracek, F.W., Schulenberg, J.E., & Hostetler, M. (1988). The factor structure of the Career Decision Scale: Similarities across selected students. *Journal of Vocational Behavior, 32*, 213-225.

Simon, H.A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics, 69*, 99-118.

Solberg, V.S., Good, G.E., Fischer, A.R., Brown, S.D., & Nord, D. (1995). Career decision-making and career search activities: Relative effects of career search self-efficacy and human agency. *Journal of Counseling Psychology, 42*, 448-455.

Spielberger, C.D., Gorsuch, R.L., & Lushene, R. (1970). *STAI manual*. Palo Alto, CA: Consulting Psychologists Press.

Stead, G.B., & Watson, M.B. (1993). How similar are the factor structures of the Career Decision Scale, the Career Decision Profile, and the Career Factors Inventory? *Educational and Psychological Measurement, 53*, 281-290.

*Strong, E.K., Jr. (1943). *Vocational interests of men and women.* Stanford: Stanford Univer. Press, 1943.

*Stumpf, S.A., Colarelli, S.M., & Hartman, K. (1983). Development of the Career Exploration Survey (CES). *Journal of Vocational Behavior, 22,* 191-226.

Super, D.E. (1953). A theory of vocational development. *American Psychologist, 8,* 185-190.

Super, D.E. (1955). The dimensions and measurement of vocational maturity. *Teachers College Record, 57,* 151-163.

Super, D.E. (1977). Vocational maturity in midcareer. *Vocational Guidance Quarterly, 25,* 294-302.

Super, D.E. (1983). Assessment in career guidance: Toward truly developmental counseling. *Personnel and Guidance Journal, 61,* 555-562.

Super, D.E., & Jordaan, J.P. (1973). Career development theory. *British Journal of Guidance and Counseling, 1,* 3–16.

Super, D.E., & Kidd, J.M. (1979). Vocational maturity and adulthood: Toward turning a model into a measure. *Journal of Vocational Behavior, 14,* 255-270.

Super, D.E., & Knasel, E.G. (1981). Career development in adulthood: Some theoretical problems and possible solutions. *British Journal of Guidance and Counseling, 9,* 194-201.

*Super, D., & Nevill, D. (1984). Work role salience as a determinant of career maturity in high school students. *Journal of Vocational Behavior, 25,* 30-44.

Super, D.E., & Overstreet, P.L. (1960). *The vocational maturity of ninth grade boys*. New York: Teachers College, Columbia University.

Super, D.E., & Thompson, A.S., (1979). A six-scale, two-factor, measure of adolescent career or vocational maturity. *Vocational Guidance Quarterly 28,* 6–15.

Super, D.E., Thompson, A.S., & Lindeman, R.H. (1988). *Adult Career Concerns Inventory: Manual for research and exploratory use in counseling*. Palo Alto, CA: Consulting Psychologists Press.

Super, D.E., Thompson, A.S., Lindeman, R.H., Jordaan, J.P., & Myers, R.A. (1981). *The career development inventory*. Palo Alto, CA: Consulting Psychologists Press.

Super, D.E., Zelkowitz, R.S., & Thompson, A.S. (1981). *Career development inventory: Adult form I*. New York: Columbia University.

*Swanson, J.L., & Tokar, D.M. (1991). College students' perceptions of barriers to career development. *Journal of Vocational Behavior, 38*, 92-106.

Tait, M., Padgett, M.Y., & Baldwin, T.T. (1989). Job satisfaction and life satisfaction: A reexamination of the strength of the relationship and gender effects as a function of the date of the study. *Journal of Applied Psychology, 74,* 502-507.

Taris, T.W., & Feij, J.A. (2004). Learning and strain among newcomers: A three-wave study on the effects of job demands and job control. *The Journal of Psychology, 138*, 543-563.

*Taylor, K.M., & Betz, N.E. (1983). Applications of self-efficacy theory to the understanding and treatment of career indecision. *Journal of Vocational Behavior, 22*, 63-81.

*Taylor, K.T., & Pompa, J. (1990). An examination of the relationships among career decision-making self-efficacy, career salience, locus of control, and vocational indecision. *Journal of Vocational Behavior, 37,* 17-31.

Tiedeman, D.V. (1961) Decision and vocational development: A paradigm and its implications. *Personnel and Guidance Journal, 40,* 15-21.

Tinsely, H.E.A. (1992). Career decision making and career indecision. *Journal of Vocational Behavior, 41*, 209-211.

Tinsley, H.E.A., Bowman, S.L., & York, D.C. (1989). Career Decision Scale, My Vocational Situation, Vocational Rating Scale, and Decisional Rating Scale: Do they measure the same constructs? *Journal of Counseling Psychology, 36,* 115-120.

Tokar, D. M., Withrow, J. R., Hall, R. J., & Moradi, B. (2003). Psychological separation, attachment security, vocational self-concept crystallization, and career indecision: A structural equation analysis. *Journal of Counseling Psychology, 50*, 3-19.

Troyat, H. (Ed.) (1967). *Tolstoy.* New York: Doubleday.

*U. S. Bureau of the Census. (1925–2000). Statistical abstract of the United States (Eds. 45-119). Washington, DC: U.S. Government Printing Office.

Vidal-Brown, S.A., & Thompson, B. (2001). The Career Assessment Diagnostic Inventory: A new career indecision assessment tool. *Journal of Career Assessment, 9,* 185-202.

*Vignoli, E., Croity-Belz, S., Chapeland, V., de Fillipis, A., & Garcia, M. (2005). Career exploration in adolescents: The role of anxiety, attachment, and parenting style. *Journal of Vocational Behavior, 67*, 153-168.

Vondracek, F.W., Hostetler, M., Schulenberg, J.E., & Shimizu, K. (1990). Dimensions of career indecision. *Journal of Counseling Psychology, 37*, 98-106.

Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting & Clinical Psychology, 33*, 448-457.

*Westbrook, B.W., Cutts, C.C., Madison, S.S., & Arcia, M.A. (1980). The validity of the Crites model of career maturity. *Journal of Vocational Behavior, 16*, 249-281.

Williamson, E.G. (1950). *Counseling adolescents*. New York: McGraw-Hill.

Winer, J.L., Cesari, J., & Haase, R.F. (1979). Cognitive complexity and career maturity among college students. *Journal of Vocational Behavior, 15*, 186-192.

APPENDIX A

GENDER DIFFERENCES

Gender differences in human behavior have been extensively examined and observed across many forms of behavior such as personality traits (Feingold, 1994), sexuality (Oliver & Hyde, 1993), self-esteem (Kling, Hyde, Showers, Buswell, 1999), and psychological disorders (e.g., Nolen-Hoeksema & Girgus, 1994). Likewise, gender differences in behavior concerning the process and content of career decision-making have been hypothesized and empirically observed (e.g., Betz & Hackett, 1981; Chartrand, Robbins, Morrel, & Boggs, 1990; Gottfredson, 1981; Herr & Enderlein, 1976; Luzzo, 1995; Patton & Creed, 2001; Phillips & Imhoff, 1997; Rojewski, Wicklein, & Schell, 1995; Strong, 1943; Westbrook, Cutts, Madison, & Arcia, 1980).

Differences in the behavior of females and males widely are considered to be, at least in part, determined by experiences of gender role socialization. Social role theory (Eagly, 1987) is a prominent and well established framework (e.g., Cejka & Eagly, 1999; Eagly, 1987; Eagly & Wood, 1999; Eagly, Wood, & Diekman, 2000) that offers hypotheses based on the construct of gender stereotypes. According to social role theory, differences in the occupations between males and females perpetuate gender stereotypes that, in turn, promote gender differences in the attributes of females and males. Further, social role theory holds that gender stereotypes result from a correspondence bias that involves making the assumption that individuals hold the characteristics demanded by their roles and the assumption that the roles demand the characteristics of individuals who typically hold the roles. For example, one is likely to assume that males have

characteristics that make men more capable leaders (e.g., assertiveness) and assume that leadership positions require masculine characteristics based on the observation that males hold the vast majority of leadership positions across various settings.

The most apparent and researched gender differences related to CDM are differences in the areas of education and work females and males choose to pursue (e.g., Cejka & Eagly, 1999). Hypotheses around why females and males differ in areas of career choice have been extensively investigated over the last 20 years and have found that differences in areas of career and educational choice substantially correlate with differences in interests, self-efficacy, expectations for success, and holding stereotypic views of gender (e.g., Armstrong & Crombie, 2000; Cejka & Eagly, 1999; Lent, Brown, & Hackett, 1994). Less apparent and rarely systematically researched are gender differences in the extent to which individuals engage in CDM tasks (i.e., CDM competence).

In accord with theoretical frameworks positing gender norms around work roles (e.g., Eagly, 1987) and actual occupational disparities between males and females (e.g., U.S. Bureau of the Census, 1925–2000; National Science Foundation, 2004), a primary explanation for potential gender differences observed in areas of CDM competence is that work tends to be viewed as a relatively more salient part of one's life (e.g., Super & Nevill, 1984) and meeting expectations for acceptable masculine behavior (Mahalik, Locke, Ludlow, Diemer, Scott, Gottfried, & Freitas, 2003) by males than females. As a result, males may be more likely to engage in CDM behavior to a greater extent in comparison with females. Another primary masculine norm (i.e., expectations for

acceptable masculine behavior) that could shape CDM behavior is pursuit of status. The greater a male conformed to this norm of pursuit of status, the less likely that individual would be motivated to engage in the self-exploration required to find occupations that could offer the greatest intrinsic fulfillment.

Another reason for potential gender difference is that females are more likely to expect greater discrimination and prejudice as well as fewer resources (e.g., role models, mentors) in many prestigious areas of work traditionally dominated by males (e.g., management, science, engineering, technology)(Luzzo & McWhirter, 2001; McWhirter, 1997; Swanson & Tokar, 1991). Further, females are more likely to be exposed to gender stereotypes throughout their development and, as results, internalize beliefs about the attributes of females and males that limit the development of their preferences and ability self-estimates in many prestigious and rewarded areas of work (e.g., Cejka & Eagly, 1999; Eagly, 1987; Eagly &Wood, 1999; Eagly, Wood, & Diekman, 2000). The prospect of such barriers may be an additional influence contributing to disparities in work role salience between females and males, and thus differences in CDM competence.

Despite the existence of parsimonious hypotheses for gender differences in CDM competence, gender differences in scales scores representing CDM competence have not been thoroughly examined (e.g., Patton & Lokan, 2001). Beyond mean differences in scale scores, few studies have examined differences in structure of CDM constructs. In one study to do so, Phillips et al. (1985) examined the structure of Harren's (1979) career decision-making style scale scores separately for females and males with exploratory factor analysis and reported the structure for the two groups was equivalent.

Much of the empirical findings from research examining gender differences in scale scores representing CDM competence have been mixed. One area of consistency, however, is the observation of insignificant differences between females and males in career decision-making self-efficacy (Betz & Voyten, 1997; Chung, 2002; Luzzo, 1993b; Taylor & Betz, 1983; Taylor & Pompa, 1990). In contrast, significant differences have been found in career maturity and career indecision. Specifically, researchers have reported that females report significantly higher career maturity scores than males (e.g., Herr & Enderlein, 1976; Lokan, 1984; Luzzo, 1995; Rojewski, Wicklein, & Schell, 1995; Westbrook, Cutts, Madison, & Arcia, 1980). In particular, females were found to report higher levels of knowledge of career development. This difference is reasoned to be due to maturation occurring earlier for females and males. Despite these findings, females have been found to report higher levels of career indecision than males (Chartrand, Robbins, Morrill, & Boggs, 1990; Patton & Creed, 2001). More specifically, females were found to report higher scores in general indecisiveness than males (Chartrand et al., 1990). This is consistent with other data indicating that female college students report significantly higher levels of general indecisiveness than male college students (Rassin & Muris, 2005) and that females report significantly higher reliance on others when making decisions (Phillips, Friedlander, Pazienza, & Kost, 1985). Whereas certain studies have found that females report greater career exploration than males (Vignoli, Croity-Belz, Chapeland, de Fillipis, & Garcia, 2005), others have not (Hardin, Varghese, Tran, & Carlson, 2006; Hirschi & Lage 2007). Research has found that females reported less

favorable views of employment outlook , less favorable views of exploration outcomes, and more explorational stress than males (Stumpf, Colarelli, & Hartman, 1983).

These mixed findings in gender differences in CDM variables may be because the magnitude of differences depends on age, due to general gender differences in onset and rate of maturational change, with differences being greater between adolescent females and males than adult females and males. In addition, mixed findings and little integration of research concerning gender differences in scale scores representing areas of CDM competence may be in part due to deficiencies in the conceptual and operational definitions of theoretical CDM constructs themselves.