

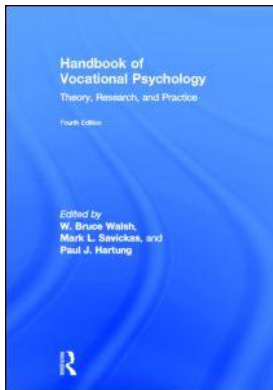
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Assessing Key Vocational Constructs

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Part III

Practice

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Assessing Key Vocational Constructs¹

Lisa M. Larson, Verena S. Bonitz, and Kathryn M. Pesch

A client walks into a career counselor's office. If the client is a parent, the issue might be concerns about a child's burgeoning interests and aspirations. If the client is in high school, the concern might be academic difficulties or apprehension about college entrance requirements. If the client is in college, the challenge might be choosing a major, finding an internship, or resolving academic struggles. If the client is entering the workforce, he or she might be concerned about finding a job that is rewarding. If the client is in the workforce, the issue might be job dissatisfaction, work–life imbalance, harassment, discrimination, job transfer, retirement, or the birth of a child.

In short, counselors need a framework for placing vocational assessment within the context of clients' individual life experiences. We have built this chapter around the vocational outcomes and processes as they become salient across the life span. These include secondary and post-secondary student achievement, educational choices concerning level of academic degree attainment, choices concerning educational major and occupation, seeking and finding employment, changing jobs, job satisfaction, and work–life–family balance.

Besides a framework structured around vocational outcomes and processes, counselor interventions also need to be grounded in research. That is, counselors need to know the variables that have been shown to predict these key outcomes. [Table 9.1](#) was built from the vocational literature review conducted by Larson (2012). It has been organized by vocational outcomes and processes (e.g., career decision making). For the outcomes section, empirically-supported predictors of those outcomes are listed. The predictors were generated and described by Larson (2012) based on 47 quantitative meta-analytic reviews covering the years 1991 through 2008. The list of predictors is not meant to be exhaustive. However, the list does provide a reasonable overview of key predictors that researchers and practitioners alike may want to consider.

The focus of this chapter is on the career counseling client rather than on the employer. This means that some outcomes reviewed by Larson (2012) are not being discussed (e.g., job

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Table 9.1 Predictors of Vocational Outcomes and Vocational Processes as Reviewed by Larson (2012)*Vocational Outcomes Across the Life Span*

1. Predictors of the Development of Interest
 - a. Genetics
 - b. Personality
 - c. RIASEC¹ self-efficacy
 - d. Outcome expectancies
2. Predictors of Educational Achievement
 - a. Cognitive ability
 - b. Conscientiousness
 - c. Past achievement
 - d. Parental variables (e.g., expectations/aspirations, grade expectations)
 - e. Moderators: grade level, ethnicity, socioeconomic status (SES), parental involvement
3. Predictors of Educational and Occupational Aspirations
 - a. RIASEC self-efficacy
 - b. Interest
 - c. Past achievement
 - d. Past educational aspirations
 - e. Gender
 - f. SES
 - g. Parental involvement
4. Predictors of Vocational Choice
 - a. Interest
 - b. Self-efficacy
 - c. Personality
 - d. Outcome expectancies
 - e. Educational aspirations
 - f. Occupational aspirations
 - g. Prestige
 - h. Sex role stereotypes
5. Predictors of Job Search Behaviors (number of times engaged in behaviors, hours spent)
 - a. Personality: extraversion and conscientiousness
 - b. Self-evaluation: self-efficacy and self-esteem
 - c. Situational antecedents: motives of financial need, employment commitment, and social support
6. Predictors of Job Search Outcomes (job search status, duration, number of job offers)
 - a. Job search behaviors
 - b. Personality: neuroticism, extraversion, openness, agreeableness with number of offers
 - c. Self-efficacy with number of offers; self-esteem with duration of search
 - d. Social support with job status
6. Predictors of Job Satisfaction
 - a. Genetics
 - b. Personality: positive affectivity, negative affectivity, affective disposition, neuroticism, extraversion, and conscientiousness
 - c. Locus of control
 - d. Person–organization fit
 - e. Perceived organizational support
 - f. Hindrance stressors (e.g., role ambiguity, organization politics)
 - g. Autonomy, nurse–physician collaboration, job stress (with nurses)
8. Predictors of Life Satisfaction and Subjective Well-being
 - a. Job satisfaction
 - b. Personality: Big Five excluding agreeableness
 - c. Subjective well-being with extraversion and neuroticism

*Vocational Processes*²

1. Career Exploration and Awareness
2. Career Decision Making
3. Career Maturity
4. Decision-Making Styles
5. Identification of Career Barriers

¹RIASEC = Six Holland domains; realistic, investigative, artistic, social, enterprising, and conventional.

²Larson (2012) did not identify predictors of these vocational processes.

performance) because they center on the employer. For more information related to these outcomes, readers should review Larson and one chapter in this handbook (Arnold and Cohen, 2013). Many of the constructs listed in [Table 9.1](#) will be familiar to the reader, and most are operationalized by well-established measures. The best example is the construct of vocational interest operationalized by the venerable Strong Interest Inventory (SII; Harmon, Hansen, Borgen, and Hammer, 1994; Donnay, Morris, Schaubhut, and Thompson, 2005). However, other constructs and their accompanying operational definitions may be less familiar. For example, career aspirations are not usually included when discussing vocational assessment. One purpose of this chapter, however, is to have the reader consider familiar and unfamiliar measures, as both have been identified as predictors of important vocational outcomes.

In addition to a framework built on vocational outcomes that identifies empirically grounded predictors, counselors need practical assistance with career assessment. They need to know the operational definitions of the constructs in order to translate this knowledge to their work with clients. Therefore, we have organized [Table 9.2](#) to parallel the structure of [Table 9.1](#), listing measures under their respective vocational outcomes and processes. A key person predictor section was also added to assist both researchers and counselors in operationalizing constructs that have been established as salient predictors of one or more vocational outcomes. One example from counseling psychology and industrial/organizational psychology is the role of personality traits, which have been shown to predict vocational choice, job search behaviors and outcomes, job satisfaction, and life satisfaction.

Table 9.2 Measures Operationalizing Key Person Predictors, Vocational Outcomes Across the Lifespan and Vocational Processes

Key Person Predictors

1. Objective Cognitive Abilities
 - a. College admission tests
 - b. Measures primarily used for career exploration
2. Personality
 - a. The Big Five: NEO-Personality Inventory-Revised, NEO Five Factor Inventory
 - b. The Big Three: Multidimensional Personality Questionnaire
3. Values
 - a. Minnesota Importance Questionnaire
 - b. Work Values Inventory
4. Self-efficacy Across Holland's Hexagon
 - a. Skills Confidence Inventory
 - b. Expanded Skills Confidence Inventory



Vocational Outcomes

1. Development of Interests
 - a. Strong Interest Inventory
 - b. Self-Directed Search
 - c. Campbell Interest and Skill Survey
2. Educational Achievement
 - a. Grade Point Average
 - b. Grade/exam score
 - c. High school rank
3. Educational and Occupational Aspirations
4. Vocational choice
5. Job Search Behaviors
 - a. Number of times engaged in behaviors
 - b. Hours spent in job search
 - c. Career Search Efficacy Scale
6. Job Search Outcomes
 - a. Job search status
 - b. Duration of job search
 - c. Number of job offers
7. Job Satisfaction
 - a. Minnesota Satisfaction Questionnaire
 - b. Job Satisfaction Survey
8. Life Satisfaction and Subjective Well-being

Vocational Processes

1. Career Exploration and Awareness
 - a. DISCOVER
 - b. CAPA Integrative Online System for College Major Exploration
 - c. Virtual Counseling Center
 - d. Vocopher: The Career Collaboratory
2. Career Decision Making
 - a. Career Decision Scale
 - b. Career Factors Inventory
 - c. Career Decision-Making Difficulties Questionnaire
 - d. Career Decision-Making Self-Efficacy Scale
3. Career Maturity/Career Adaptability/Vocational Identity
 - a. Career Maturity Inventory
 - b. My Vocational Situation
 - c. Adult Career Concerns
 - d. Career Development Inventory
 - e. Career Beliefs Inventory
4. Decision-Making Styles (Assessment of Career Decision Making)
5. Identification of Career Barriers (Career Barriers Inventory)

Finally, counselors and researchers alike may find it helpful to know the extent to which these vocational assessment measures have been used since 2000. We conducted literature searches on the measures listed in [Table 9.2](#) to evaluate how often the measures have been included in the literature. We searched using the measures as key search terms, limited the window from 2000 to the present, and excluded dissertations and languages besides English. The literature searches also provided information regarding the types of studies

that have been conducted. Some searches yielded few empirical articles (e.g., DISCOVER) while others yielded many (e.g., Self-Directed Search [SDS; Holland, Fritzsche, and Powell, 1994]). Selective meta-analyses were included if they specifically examined the measures of interest separately. The literature searches were not meant to be exhaustive but to provide some indication of the utilization rates from 2000 to 2012. While page limitations prevented us from discussing and referencing all articles found for each measure, a complete reference list is available from the first author.

The structure of the chapter mostly follows the outline provided in [Table 9.2](#). Key person predictors are presented first, followed by vocational outcomes, and then vocational processes. Within each section, we describe the construct and the measures commonly used to operationalize it. We provide a brief overview of the empirical articles since 2000 that have included the measures. Finally, we conclude the chapter by providing some suggestions for both researchers and counselors as we look ahead to the next decade.

COGNITIVE ABILITIES AS PREDICTORS OF EDUCATIONAL ACHIEVEMENT

Cognitive abilities, both general and domain-specific, have been shown to be strong predictors of academic achievement (e.g., Larson, 2012). The following section will review objective measures of cognitive abilities that have been used to predict academic achievement over the past ten years. These measures can be organized into two broad categories; namely college admission tests and instruments primarily used for career exploration. In addition, multiple meta-analyses presenting the link between cognitive abilities and academic achievement will be summarized here. It should be noted that we focus exclusively on objective measures of cognitive ability. Subjective measures that yield self-estimates of cognitive ability (e.g., the Kuder Skills Assessment) are not included. A meta-analysis by Freund and Kasten (2012) revealed that self-estimates of cognitive ability do not correlate highly ($r = .33$) with objectively measured abilities, but can nonetheless yield important incremental information.

College admission tests

The most commonly used objective measures of cognitive abilities are the standardized tests designed to assess students' aptitude with regard to readiness for college admission or advanced graduate study. These tests have been heavily researched, and data are easily available for large samples of diverse groups, which might explain their prevalence in the empirical literature. The SAT, formerly known as the Scholastic Aptitude Test, is taken by many high school students across the United States as a college entrance requirement. The SAT includes three main sections: Critical Reading (verbal ability), Mathematics (quantitative ability), and Writing. The SAT's competitor, the American College Testing (ACT) test, measures knowledge and ability in the domains of English, Mathematics, Reading, and Science. Other tests measure students' readiness to perform advanced graduate level work. These include measures of general aptitude such as the Graduate Record Examination (GRE) or the Miller Analogies Test (MAT), but also those required for admission into specific professional programs, such as the Graduate Management Admission Test (GMAT) and the Medical College Admission Test (MCAT). In general, these tests have been proven useful in predicting students' academic achievement in college and advanced graduate programs. For example, both SAT and ACT students' scores tend to be moderately correlated with their

grade point averages (GPAs) in the first year of college (Kobrin, Patterson, Shaw, Mattern, and Barbuti, 2008). The GRE has been shown to correlate with criteria such as first year GPA, graduate GPA, comprehensive examination scores, publication citation counts, and faculty ratings (e.g., Kuncel, Hezlett, and Ones, 2001). Further, the predictive validity of the MCAT for medical school performance and medical board licensing exam scores has been reported as small to moderate in effect (e.g., Donnon, Paolucci, and Violato, 2007). Finally, the GMAT seems to be a valid predictor of student performance in business programs (e.g., Kuncel, Credé, and Thomas, 2007).

Measures primarily used for career exploration

The second group of ability measures that have been used in vocational research over the past decade represents assessment instruments intended to guide individuals in the selection of career paths. The Armed Services Vocational Aptitude Battery and the Multidimensional Aptitude Battery are reviewed in terms of their predictive ability with regards to vocational outcomes.

The Armed Services Vocational Aptitude Battery (ASVAB; Defense Manpower Data Center, 2006) is an objective test of cognitive abilities used to determine one's qualification to enlist in the military and his or her subsequent job assignment. Aptitude in four broad domains is measured: Verbal, Math, Science/Technical, and Spatial. The ASVAB has been shown to predict subsequent performance in training and throughout soldiers' careers (e.g., Campbell and Knapp, 2001). Specifically, the ASVAB has been used to predict job performance of radiology students (Dunai and Porter, 2001) and enlisted air traffic controllers (Carretta and King, 2008), as well as the multitasking performance of Navy sailors (Hambrick et al., 2011).

The Multidimensional Aptitude Battery II (MAB-II; Jackson, 1998) is an objective aptitude test that includes ten subtests which yield verbal, performance, and full-scale IQ scores. It is typically used in counseling for career exploration with high school and college students. Only Boyd, Patterson, and Thompson (2005) used the MAB-II for performance prediction (e.g., air force pilots' flight training).

Meta-analytic studies of the link between cognitive abilities and educational achievement

Over the past decade, several meta-analyses were published that examined the correlation between cognitive abilities (assessed by a variety of different tests) and academic achievement. Brown and colleagues (2008) combined meta-analysis and structural equation modeling to evaluate an academic performance model. General cognitive ability, as measured by SAT/ACT scores, predicted college GPA both directly and indirectly through academic self-efficacy. Kuncel, Hezlett, and Ones (2004) used the Miller Analogies Test (MAT) to successfully predict a variety of academic criteria (e.g., GPA, faculty ratings, comprehensive examination scores, and time to degree) in their meta-analysis of 20,352 graduate students (average $r = .32$). Most recently, Richardson, Abraham, and Bond (2012) showed that cognitive ability, as measured by the SAT or ACT, had medium-sized correlations with college GPA.

PERSONALITY

NEO-Personality Inventory – Revised (NEO-PI-R)

The Big Five personality dimensions, namely neuroticism (N), extroversion (E), openness (O), agreeableness (A), and conscientiousness (C), are commonly measured by the NEO-PI-R (Costa and McCrae, 1992) and the NEO Five Factor Inventory (NEO-FFI; Costa and McCrae, 1992). As can be seen in [Table 9.1](#), personality traits are frequently examined in the vocational literature, and the most frequent measure used has been either the NEO-PI-R or the FFI. Recent meta-analyses have confirmed the cross-cultural validity of the N, O, and C dimensions, with A and E having some overlap (e.g., Rolland, 2002). Due to the massive literature base in this area, we will primarily discuss seven relevant meta-analyses and a sampling of articles addressing constructs not included in the meta-analyses.

One rich area of research has been the examination of personality-interest (P-I) linkages, with interest being predominantly framed as John Holland's Big Six; namely realistic, investigative, artistic, social, enterprising, and conventional, which are known by the acronym RIASEC. The RIASEC has been commonly measured by the following three inventories: 1) the six general occupational themes (GOTs) of the 1994 and 2005 SII; 2) six of the seven orientation scales of the Campbell Interest and Skill Survey (CISS; Campbell, Hyne, and Nilsen, 1992); or 3) the six RIASEC scores of the Self-Directed Search (SDS; Holland et al., 1994). Larson, Rottinghaus, and Borgen (2002) meta-analyzed the 30 potential relations of the NEO-PI-R Big Five with the Big Six as measured by the SII, CISS, or the SDS. Five relations emerged as salient, including extraversion with enterprising ($r = .41$) and social ($r = .31$), openness with artistic ($r = .48$) and investigative ($r = .28$), and agreeableness with social ($r = .19$). Barrick, Mount, and Gupta (2003) also identified these five relations with similar magnitude of the correlations.

The relation of job satisfaction to personality has also been examined enough to warrant meta-analyses. Across two meta-analyses, neuroticism seems to be the only Big Five trait to correlate $\geq |.2|$ with job satisfaction ($r = -.25$, Bruk-Lee, Khoury, Nixon, Goh, and Spector, 2009; $r = -.24$, Judge, Heller, and Mount, 2002). Bowling (2007) provided evidence that the relation of job satisfaction and job performance was reduced significantly by the Big Five acting as mediators. Likewise, life satisfaction related negatively to neuroticism, and positively to extraversion (e.g., Judge et al., 2002). Finally, Poropat (2009) examined academic performance and its relation to the Big Five. Conscientiousness was the most salient contributor to academic performance ($r = .19$).

Authors have also used the NEO-PI-R and the FFI in the examination of other vocational constructs. In perusing the literature we found a set of articles by Hirschi (e.g. Hirschi, 2012) that explored the vocational identity of Swiss adolescents. Two articles used the NEO-FFI to identify clusters of undecided students (e.g., Feldt et al., 2011). Rogers, Creed, and Glendon (2008) identified some relation between career planning and the Big Five. Kelly and Shin (2009) showed that negative career thoughts and feelings fully mediated the relation of neuroticism and lack of career information.

Multidimensional Personality Questionnaire (MPQ)

The MPQ (Tellegen, 2000) operationalizes 11 primary traits subsumed under three overarching traits labeled positive emotionality (well-being, social potency, achievement,

social closeness, absorption), negative emotionality (stress reaction, alienation, aggression, absorption), and constraint (control, harm avoidance, traditionalism). Three meta-analyses were located as well as five empirical articles.

A meta-analysis by Staggs, Larson, and Borgen (2003) expanded on the P-I linkages described above by using the 11 primary traits operationalized by the MPQ and the six GOTs of the 1994 SII. The substantive P-I relations above $|.20|$ included well-being with social interest, social potency with enterprising interest, achievement with investigative interest, social closeness with social and enterprising interests, aggression with social interest (negative), harm avoidance with realistic interest, traditionalism with social interest, and absorption with artistic interest. The other two meta-analyses provided evidence that job satisfaction moderately and positively related to positive emotionality ($r_s = .41, .49$), and negatively related to negative emotionality ($r_s = -.25$ and $-.33$) (Bruk-Lee et al., 2009; Connolly and Viswesvaran, 2000).

The five empirical articles concerned the relation of personality with interest and/or self-efficacy across the RIASEC. Three of the five were authored by Larson and colleagues and examined the MPQ as predictors of choice, interest, and the RIASEC domains of self-efficacy. For example, they showed that the positive emotionality traits correlated from $.15$ to $.52$ with all six RIASEC domains of self-efficacy (Larson and Borgen, 2006).

Overview

Personality traits, as measured by the NEO-PI-R and the MPQ, have infused the vocational literature by examining the overlap with interest and job satisfaction. Exploration of the relation between personality and the RIASEC has also begun. The clear explication of precise linkages between these traits and particular vocational outcomes will continue to provide greater understanding of the intersection of personality and the vocational sphere.

WORK VALUES

Work values can be conceptualized as stable motivational constructs that specify what people want and expect from work, and they are typically operationalized in terms of relative importance (Rounds and Armstrong, 2005). Two measures of work values will be reviewed here, namely the Minnesota Importance Questionnaire and the Work Values Inventory.

Minnesota Importance Questionnaire (MIQ)

The MIQ (Gay, Weiss, Hendel, Dawis, and Lofquist, 1971) measures six higher order work values derived from 20 basic vocational needs. The six values (achievement, comfort, status, altruism, safety, and autonomy) are grounded conceptually within Dawis and Lofquist's (1984) Theory of Work Adjustment (TWA). The TWA specifies that a high level of correspondence between an individual's needs/values and the reinforcers provided by the working environment leads to high levels of job satisfaction. The MIQ operationalizes work values in terms of their relative importance to the individual by using a forced-choice ranking procedure.

Only five empirical articles were located that used the MIQ in vocational research over the past decade. This research included validation of the underlying work value structure of

the MIQ and other studies reporting convergent and discriminant validity estimates of the instrument. Further, the MIQ has been used to quantify differences in work values among three worker generations, and as a guide to facilitate career counseling prior to retirement (e.g., Harper and Shoffner, 2004).

Super's Work Values Inventory-Revised (SWVI-R)

The SWVI-R (Zytowski, 2006) consists of 12 six-item work value scales representing achievement, co-workers, creativity, income, independence, lifestyle, mental challenge, prestige, security, supervision, work environment, and variety. Items are rated in terms of their importance on a five-point Likert scale. Ten empirical studies using the SWVI-R since 2000 were located. The primary goal of four of these studies was the psychometric validation (reliability and validity estimates) of the measure. Several studies focused on characterizing the work values endorsed by specific populations (e.g., counseling trainees, students in management training courses, highly educated working professionals). The samples used in these studies were fairly diverse; they included high school, college, and graduate students, as well as working adults. Two of the samples focused exclusively on African Americans, and one study included Italian adolescents.

SELF-EFFICACY ACROSS HOLLAND'S BIG SIX AND BEYOND

The Skills Confidence Inventory (SCI; Betz, Borgen, and Harmon, 1996, 2005) is anchored within social cognitive career theory (Lent, Brown, and Hackett, 1994) and measures self-efficacy across the RIASEC domains. Self-efficacy is defined by the authors as "the self-perceived ability to successfully complete a variety of tasks, activities, and types of coursework" (Betz et al., 1996, p. 1). The SCI was intended to operationalize six general confidence themes (GCTs) to complement the six GOTs of the 1994 and 2005 SII. The authors later expanded the SCI to include 17 Basic Confidence Scales (BCSs) to parallel the Basic Interest Scales (BISs) of the SII, which resulted in the Expanded Skills Confidence Inventory (ESCI; Betz et al., 2003).

In searching the literature over the past decade, we found one meta-analysis and 14 empirical articles that included the SCI, and eight additional articles that used the ESCI. The samples have been predominantly college students in the United States with the exception of one Taiwanese sample. One set of authors sampled adults, and two sets of authors sampled high school students. Three sets of authors sampled only African Americans and Mexican Americans. The sole meta-analytic review showed that the SCI GCTs correlated with the SII GOTs moderately, ranging from .42 to .67 (Rottinghaus, Larson, and Borgen, 2003).

As [Table 9.1](#) illustrates, self-efficacy across the RIASEC domains has been shown to predict vocational interest, educational aspirations, and choice. Choice has mostly been defined as choice of educational major although one study defined choice as occupational group (Betz, Borgen, and Harmon, 2006). Vocational interest and confidence across the RIASEC, as defined by the GOTs and the GCTs, are potent predictors of choice (e.g., Betz et al., 2003). Even more potent predictors of choice are the basic dimensions of interest and confidence defined by the BISs and the BCSs (e.g., Larson, Wu, Bailey, Borgen, and Gasser, 2010). The GCTs of the SCI have also been shown to predict career intentions (e.g., Rottinghaus, Gaffey, Borgen, and Ralston, 2006), and career exploratory behaviors (e.g., Nauta, 2007). Over the

past decade, the six GCTs of the SCI have also been shown to relate to positive emotionality (well-being, social potency, social closeness, achievement, and absorption), and to two of the Big Five traits, namely conscientiousness and extraversion (e.g., Larson and Borgen, 2006). The BCSs have also been shown to predict career decision-making self-efficacy (e.g., Paulsen and Betz, 2004). Four additional studies provided excellent validity estimates for the ESCI (e.g., Betz et al. 2003).

VOCATIONAL OUTCOMES

Development of interest

Construct overview

Vocational interest has been one of the most well-known and well-researched constructs in vocational psychology since the first interest inventory was developed 85 years ago (Strong, 1927). Hansen (2005) summarized definitions of vocational interest as incorporating components of interest (personality, motivation, self-concept) and determinants of interest (nurture and nature). The authors of the interest inventories themselves often define interest as “a preference for activities expressed as likes or dislikes” (Hansen, 2005, p. 281). Three interest inventories dominate this domain of research: the 1994 and 2005 Strong Interest Inventory, the Campbell Interest and Skill Survey and the Self-Directed Search.

The first two measures are somewhat parallel although there were differences in scale construction. They each contain general domains; the SII comprises the six GOTs while the CISS comprises seven Orientation scales in which six of the seven correlate highly with the GOTs. They also contain basic domains of interest with the 2005 SII having 25 BISs and the CISS having 29 Basic Interest Scales. The greatest level of specificity of interest is operationalized by both measures through occupational scales, with the SII having 109 and the CISS having 60. One of the biggest differences between them is that the CISS also measures self-estimates of skills while the SII only measures interest.

The SDS, authored by John Holland and colleagues (1994), is anchored conceptually in the person–environment fit model. The SDS includes four parts: work activities, self-estimated competencies, occupations, and self-estimates of abilities (Hansen, 2005). A person receives a score for each of the six RIASEC domains for each of the four parts. The scores are summed across the four parts and the three highest scores become one’s Holland code (e.g., ASE indicates the artistic score was highest, followed by the social and enterprising scores). Like the CISS, self-estimates of ability are incorporated into the SDS and approximate self-efficacy (e.g., Bullock-Yowell, Peterson, Wright, Reardon, and Mohn, 2011). The next sections will review the recent literature of these three measures.

Campbell Interest and Skill Survey (CISS)

Of the three measures, the CISS has been utilized the least, with 11 articles identified and one meta-analysis. The samples were comprised predominantly of college students. One interesting article provided evidence that the skills component of the CISS may be capturing self-efficacy (Hansen and Leuty, 2007), and another provided evidence that the RIASEC profile varies depending on the measure of interest used (Savickas and Taber, 2006). The

meta-analysis by Rottinghaus and colleagues (2003) reported strong correlations between the parallel orientation scales and the skills scales, as expected. Other articles provided validity estimates for the CISS (e.g., Sullivan and Hansen, 2004) and convergent validity estimates to other measures (e.g., SDS; Bullock-Yowell et al., 2011). Finally, the CISS was used to counter empirically the assumption that there is a gender dimension of occupational interest (Ashton and Lee, 2008) and to support the data–ideas and people–things dimensions (Prediger and Swaney, 2004).

Strong Interest Inventory (SII)

Researchers have generated a considerable amount of new information about vocational interest as measured by the SII. We identified six meta-analyses, and 30 empirical articles using the SII. The samples were diverse; they included racial and ethnic minority samples (e.g., Native Hawaiians, Asian Americans), international samples (e.g., Portuguese), low income samples, U.S. soldiers, specialty occupation samples (e.g., information technologists, medical students), and ages ranging from eighth grade students to employed adults. We will discuss the meta-analyses first.

Five meta-analyses included some independent examination of the SII since 2000. Rottinghaus and colleagues' (2003) meta-analysis showed moderate relations between the SCI GCTs and the SII GOTs. Larson and colleagues (2002) presented specific Big Five and Big Six relations, limiting examination to SII samples; the results were quite similar to the P-I linkages presented earlier when discussing the Big Five. Rottinghaus, Hees, and Conrath (2009) presented overwhelming meta-analytic evidence that the SII BISs over and above the SII GOTs could differentiate between satisfied and unsatisfied employees across 17 of 22 occupations utilizing a sample of 9,647 adults. Bubany and Hansen's (2011) meta-analysis used cohort analyses to examine whether levels of GOT interest may have changed from 1976 to 2004. They showed that enterprising interests for women had increased substantially and that realistic and investigative interests for men had decreased. Moreover, sex differences for investigative, enterprising, and conventional interests had significantly decreased. Finally, Tay, Su, and Rounds (2011) showed in a meta-analysis that the data–ideas and people–things dimensions were not bipolar, and that the relations specific within the SII yield modest negative correlations insufficient to support a bipolar argument. The remaining empirical articles can be organized according to studies with interest as a predictor, studies providing validity estimates, and studies presenting interventions.

Across several studies, the SII GOTs were used as a set of predictors to differentiate among major families (e.g., Gasser, Larson, and Borgen, 2007). Evidence clearly demonstrates that the more specific BISs are the most salient set of predictors of major choice. Personality, operationalized by the personal style scales of the SII, the Big Five, or the 11 primary traits of the MPQ, also contributed some variance in the discrimination among major families. General and specific confidence domains of the ESCI were included in some of these studies and also added unique variance (e.g., Betz et al., 2003). Related to choice of major, the SII also predicted occupational membership in three studies, with the most impressive article showing predictive validity of the BISs and occupational scales of the SII across eight- and 12-year time spans (Hansen and Dik, 2005). The SII along with the Big Five and self-efficacy across the RIASEC predicted educational aspirations (e.g., Rottinghaus, Lindley, Green, and Borgen, 2002), and the SII and the Big Five predicted major satisfaction (e.g.,

Logue, Lounsbury, Gupta, and Leong, 2007). The SII was also helpful in predicting career exploration behavior (Nauta, 2007). Finally, several intriguing articles were produced in the context of the workplace. Person–environment congruence was more or less related to job satisfaction depending on how invested people were in their jobs (e.g., Dik and Hansen, 2011). Van Iddekinge, Putka, and Campbell (2011) provided evidence that the SII had incremental validity beyond cognitive ability and the Big Five in job selection criteria. The SII also somewhat contributed to the prediction of work values and emotional intelligence, but not to the prediction of subjective well-being (e.g., Cotter and Fouad, 2011).

Validity studies were heterogeneous in nature and can only be sampled here. A set of these articles examined the RIASEC quasi-circular structure, finding support across racial and ethnic groups with some exceptions (e.g., Flores, Spanierman, Armstrong, and Velez, 2006). One promising development is that researchers seem to be moving beyond identifying differences across racial and ethnic groups, toward understanding how secondary traits such as cultural expectations may be contributing to those differences (Fouad and Walker, 2005). Another intriguing validity study examined person–environment fit by exploring the relation of general cognitive ability to interest depending on the cognitive complexity of the occupational domain (Reeve and Heggstad, 2004). Several authors examined sex differences in creative ways such as changes in interest as a function of hormones (Beltz, Swanson, and Berenbaum, 2011), and the genetic link between interest and approach motivation (Hansen, Sullivan, and Luciana, 2011). The 1994 and 2005 SII were mostly shown to be similar, despite the 2005 normative population being more representative, more diverse, and less educated (Bailey, Larson, Borgen, and Gasser, 2008).

The final set of articles used the SII as part of career interventions. The interventions were mostly aimed at improving understanding of the assessment results and increasing career decision-making confidence.

Self-Directed Search (SDS)

The SDS has been used extensively in research not only in the United States but internationally across ten countries (e.g., Iceland, Australia, Croatia, Greece, Lebanon, Turkey). Moreover, diverse participants have been examined including carpenters, physician assistants, adjudicated adolescent men, female offenders, and students with disabilities. We located two meta-analyses, 51 articles, and an additional seven articles utilizing the short form of the SDS.

The meta-analysis by Larson and colleagues (2002) examined the Big Five and Big Six P-I linkages by the SDS and the SII. Using a conservative Bonferroni adjustment (.05/30 correlations), the P-I linkage varied for eight of the 30 correlations. One of the larger differences was the relation of enterprising interest to extraversion, which was larger for the SDS ($r = .50$) than for the SII ($r = .22$). Two other differences in P-I correlations concerned the relation between enterprising and neuroticism (SDS: $r = -.24$) and between enterprising and conscientiousness (SDS: $r = .29$); the SII relations were near zero.

Many of the articles concerned the provision of validity estimates of the SDS. Some included evidence suggesting that the SDS provides, in essence, self-efficacy estimates (Bullock-Yowell et al., 2011), but others provided evidence to the contrary (e.g., Brown, Lent, and Gore, 2000). Other articles addressed issues related to online administration (e.g., Lumsden, Sampson, Reardon, Lenz, and Peterson, 2004) and the addition of a response

indecision option (Sampson, Shy, Hartley, Reardon, and Peterson, 2009). Several articles showed that the RIASEC profiles vary depending on whether the SDS or some other established interest measure was used (e.g., Savickas and Taber, 2006). Others addressed the stability of interest (as measured by the Holland code) by retrospectively examining early recollections of interests compared to current career interests (Kasler and Nevo, 2005) and by relating daydreams to SDS scores (Miller, Springer, Tobacyk, and Wells, 2004). The results were mostly supportive of stable interests. A few articles reported on congruence, consistency, and differentiation with mixed results. Differentiation between the first and second letter of the Holland code by at least eight points showed better concurrent validity (e.g., Glavin and Savickas, 2011). Some articles used the SDS to predict grades, choice of educational program, and choice of major (e.g. Fritzche, McIntire, and Yost, 2002). The short form of the SDS was used exclusively by Zhang and associates with Chinese samples, and focused on the relation of the SDS short form to thinking styles (e.g., Zhang, 2008). The SDS was also used in articles in which the primary goal was to validate another measure such as the Career Key (e.g., Levinson, Zeman, and Ohler, 2002). Finally, researchers continue to explore the relation between the SDS and personality traits. Interestingly, one study demonstrated that extraversion positively related to RIASEC profile elevation based on the SDS scores (Bullock and Reardon, 2008).

Overview

Since 2000, the three major measures of vocational interest have been well utilized internationally and across diverse samples within the United States. They have been used to predict important vocational outcomes, and to better understand the RIASEC dimensions and more specific interests. The three measures have accrued considerable validity evidence over many years and will serve researchers and practitioners alike into the next decade.

PREDICTORS OF EDUCATIONAL ACHIEVEMENT

As previously mentioned, the most important predictor of educational achievement (operationalized as GPA, exam scores, or class rank) is cognitive ability. However, a variety of non-cognitive predictors of educational achievement have been studied over the past decade. The state of this body of research has been summarized in a recent meta-analysis (Richardson et al., 2012), and the main results can be summarized as follows: When personality measures were used to predict GPA, the largest correlates were procrastination (negative correlation), conscientiousness, and need for cognition ($r_s = .19$ to $.22$). Medium positive correlations with GPA were reported for three motivational factors: academic self-efficacy, performance self-efficacy, and grade goal ($r_s = .31$ to $.59$). Two measures of self-regulatory capacity predicted GPA, with $r = .32$ for effort regulation, and $r = -.24$ for test anxiety. One approach-to-learning measure (strategic learning) had a correlation above $.20$ with GPA ($r = .23$).

Two additional meta-analyses were located that specifically examined the role of parental variables on students' educational achievement. Fan and Chen (2001) showed that parental involvement relates low to moderately with educational achievement. Specifically, parental aspiration/expectation had the strongest relation while parental home supervision had the weakest relation. Jeynes (2003) focused specifically on minority children's educational

achievement. The results mirrored Fan and Chen's findings except that, overall, African Americans and Latinos benefited more from parental involvement than Asian American children.

EDUCATIONAL AND OCCUPATIONAL ASPIRATIONS

Educational aspirations are often operationalized by a single-item demographic question in which participants are asked to endorse the level of education they are aspiring to complete (e.g., Rottinghaus et al., 2002). Response options typically include a general equivalence degree (GED), high school diploma, associate's degree, bachelor's degree, master's degree, doctoral degree, or professional degrees (e.g., medical, law, veterinary, dentistry). Johnson (1995) defined occupational aspirations as an individual's expressed career-related goals or choices. Literature searches for both terms yielded over 350 articles; clearly these constructs are being widely researched. We have already reviewed some of the predictors of educational aspirations such as domain-specific self-efficacy and interest. [Table 9.1](#) lists other predictors identified by Larson (2012). One measure used in counseling psychology is the Career Aspirations Scale (CAS; O'Brien, 1996). It measures the extent to which people aspire to leadership, supervision of others, and to attain education in a chosen field (O'Brien, 1996). Nine articles used the CAS, five of which examined female samples. The CAS was used with diverse U.S. samples as well as international samples. Predictors of occupational aspirations, as measured by the CAS, included masculinity, intercultural concerns, career uncertainty, multiple role planning, and maturation from junior high to high school.

VOCATIONAL CHOICE

Vocational choice has been defined in the literature primarily by choice of educational major (e.g., Bailey et al., 2008) or by occupational group membership (e.g., Betz et al., 2006). As [Table 9.1](#) illustrates, there are multiple predictors of occupational choice. We have already reviewed the predictors of interest, self-efficacy, personality, and educational and occupational aspirations.

Job search behaviors

Kanfer, Wanberg, and Kantrowitz (2001) defined job search behaviors as purposive, volitional patterns of action in which a person identifies and commits to pursuing an employment goal. They conducted a meta-analysis examining dispositional antecedents of job search behaviors, operationalized as frequency of job search activities or time spent searching. Three of the Big Five personality factors were significantly related to job search behaviors: extraversion ($r = .46$), conscientiousness ($r = .38$), and openness ($r = .27$). Job search behaviors also related above $|.20|$ with generalized expectancies (i.e., self-esteem, self-efficacy) and situational antecedents (i.e., employment commitment, social support, motives of financial need).

The Career Search Efficacy Scale (CSES; Solberg et al., 1994) was developed to assess individuals' beliefs about successfully engaging in job search behaviors. Seven empirical studies utilizing this measure since 2000 were located, the subjects of which were mostly college students. Reed, Bruch, and Haase (2004) found that conscientiousness and extraversion

were positively associated with CSES scores, which in turn were positively associated with job information-seeking behaviors. Openness, however, was negatively related to job information-seeking behavior. Upon examining Italian high school students, Nota, Ferrari, Solberg, and Soresi (2007) found that career search efficacy partially moderated the negative relation between family support and career indecision for males, while career search efficacy was negatively and directly related to career indecision for females. Fort, Jacquet, and Leroy (2011) found that career search efficacy positively correlated with planning and job search behaviors ($r = .67$ and $r = .52$, respectively) in a sample of French adults.

Job search outcomes

Job search outcomes can be defined as job status, number of job offers, and duration of the job search (Kanfer et al., 2001). Kanfer and colleagues' (2001) meta-analysis revealed several relations above $|.20|$ with job search outcomes. Engagement in job search behaviors was positively associated with employment status and number of job offers. Extraversion, conscientiousness, openness, agreeableness, and financial need were all associated with shorter duration of unemployment. In addition, job search self-efficacy and self-esteem were associated with both shorter duration of unemployment and more job offers. Results further indicated that younger individuals were more likely to become employed, higher education was related to shorter unemployment duration and greater likelihood of finding employment, and White persons were more likely to be unemployed for a shorter period of time than non-White persons.

JOB SATISFACTION

Construct overview

Job satisfaction can be defined as the extent to which someone likes her/his job (Spector, 2000). Multiple measures of job satisfaction abound. We have included two popular measures of job satisfaction, the Job Satisfaction Survey (JSS; Spector, 1985) and the Minnesota Satisfaction Questionnaire (MSQ; Weiss, Dawis, England, and Lofquist, 1967). The JSS operationalizes nine facets of job satisfaction (i.e., pay, promotion, supervision, fringe benefits, contingent rewards, operating procedures, co-workers, nature of work, and communication) and overall satisfaction. The MSQ has a long and short version, and operationalizes 20 facets of job satisfaction (i.e., activity, independence, variety, social status, human relations supervision, technical supervision, moral values, security, social service, authority, ability utilization, company policies and practices, compensation, advancement, responsibility, creativity, working conditions, co-workers, recognition, and achievement). The prior review has already summarized relations of job satisfaction with vocational interest and particular personality traits.

Job Satisfaction Survey (JSS)

We located 32 articles that had used the JSS. Amazingly, samples were taken from 17 countries. A notable feature of the literature using the JSS was that the occupations sampled were primarily public service related (i.e., home health care workers, staff working with

disabled clients, nurses, kindergarten teachers, welfare staff workers, speech language pathologists, hotel employees, prison guards, and police officers). Most studies were not anchored in theory but addressed a variety of practical questions. Findings showed that occupational stress in the workplace was negatively related to job satisfaction. Other variables that related to job satisfaction included emotional intelligence, job performance, salary, benefits, working relations with management, access to resources, working conditions, intrinsic rewards, and underemployment (negatively) (e.g., Parllalis, 2011). The JSS was also used to provide convergent validity estimates for job satisfaction scales tailored to particular audiences such as the police.

Minnesota Satisfaction Questionnaire (MSQ)

The MSQ is anchored in the TWA and has been used to measure people's satisfaction with the work environment. The literature search yielded 30 articles published since 2000. Some authors sampled internationally from China, Romania, Sweden, and the United Arab Emirates. Diverse samples in the United States that utilized the MSQ include Latino immigrants, lesbian, gay, and bisexual persons, and Alzheimer's care staff.

The articles fell mostly into four categories: MSQ as a criterion variable, as a predictor/mediator variable, as convergent validity evidence for a related scale, and as means to operationalize a construct embedded in a particular theory. The MSQ was shown to relate to job performance, career commitment, life satisfaction, subjective well-being, psychological empowerment, racial climate, perception of individual and unit level climate, and employee attendance and conduct. It also emerged as a mediator in three studies. For example, job satisfaction as measured by the JSS mediated the relation between job variety/significance and organizational citizenship behavior (i.e., contextual performance or interpersonal facilitation distinct from task performance on the job) (Chiu and Chen, 2005). The MSQ provided convergent validity estimates for the short form of the MSQ and for other job satisfaction measures. Finally, the MSQ was used in studies examining Holland's (1997) person-environment fit model as well as the TWA. For example, several articles showed the MSQ was positively related to person-organizational fit, a key tenet embedded in the TWA (e.g., Lyons and O'Brien, 2006).

PREDICTORS OF LIFE SATISFACTION AND WELL-BEING

Well-being can be described as the way in which one assesses his or her life in the moment and over time; life satisfaction is one indicator (Diener, 2000). Life satisfaction and subjective well-being (SWB) have received substantial attention in the literature. Regarding the relation between these constructs and job satisfaction, Bowling, Eschleman, and Wang's (2010) meta-analysis showed that dispositional SWB may be a powerful predictor of job satisfaction, not the other way around. This idea is corroborated by consistent associations found between personality traits and SWB. Steel, Schmidt, and Shultz (2008) conducted a meta-analysis of SWB-personality trait relations and found neuroticism to be the strongest predictor of quality of life, life satisfaction, and happiness ($\rho = -.72, -.45, \text{ and } -.51$, respectively), followed by extraversion ($\rho = .54, .35, \text{ and } .57$, respectively) and conscientiousness ($\rho = .51, .27, \text{ and } .27$, respectively).

The Satisfaction with Life Scale (Diener, Emmons, Larsen, and Griffin, 1985) was found to be a widely used inventory measuring life satisfaction and SWB. A search of empirical

studies that used this measure since 2000 yielded 2,570 results. A complete review of these articles is beyond the scope of this chapter; we will briefly mention a few of the more recent findings. For example, Lent, do Céu Taveira, Sheu, and Singley (2009) reported that academic satisfaction predicted life satisfaction in a 15-week longitudinal study of Portuguese college students. Similarly, other authors have found significant, positive associations between career decidedness and SWB in college students (e.g., Uthayakumar, Schimmack, Hartung, and Rogers, 2010). Several sets of authors reported relations between work–family conflict and SWB, including one meta-analysis that showed job satisfaction and family satisfaction correlate with life satisfaction ($r = .37$ and $.39$, respectively; Michel, Mitchelson, Kotrba, LeBreton, and Baltes, 2009).

The Work–Family Conflict Scale (Carlson, Kacmar, and Williams, 2000) was a common measure assessing the work–family relationship; it yielded 28 empirical studies since 2000. A recent study using this measure found work–family conflict to be the strongest antecedent of job burnout in Indian software developers, highlighting the importance of this construct (Singh, Suar, and Leiter, 2012).

VOCATIONAL PROCESSES

Career exploration and awareness

The practice of career exploration has changed drastically with the advent of the Internet. Students engaged in the career-decision process now face a multitude of online options offering assistance in exploring potential career paths, with some more credible than others. Fowkes and McWhirter (2007) drew attention to the paucity of empirical support for most online career guidance systems. The few empirically supported systems were not tested against control groups, and most researchers failed to investigate the programs' applicability across ethnicities, cultures, and socioeconomic statuses. Despite the lack of empirical support for most established online career exploration systems and the complete absence of support for the many novice systems available, ease and efficiency render them attractive options to individuals without access to professional vocational assistance.

DISCOVER (American College Testing, 2003) has been available for a number of years. Its components have been subject to research and have been established as reliable and valid resources (ACT, 2006). However, only two studies were found in the literature between 2000 and 2012 that have examined DISCOVER's effectiveness. The system was found to increase students' career decision-making self-efficacy significantly when compared to a control group (Maples and Luzzo, 2005). More recently, Horan (2010) introduced the Virtual Counseling Center which is a comprehensive system that is free to the public and provides resources for all stages of career development. Yet the system is still new and lacking empirical support. The CAPA Integrative Online System for College Major Exploration (Betz and Borgen, 2010) primarily serves college students choosing academic majors. Validity and reliability of the CAPA inventories have been established, but only one study of effectiveness currently exists. When compared to FOCUS (Career Dimensions, 2007), CAPA users had greater levels of career decision self-efficacy while both systems increased college major decidedness in ethnically diverse samples (Betz and Borgen, 2009). Finally, Vocopher: The Career Collaboratory (Glavin and Savickas, 2010) includes seven well-established inventories such as the Career Maturity Inventory (CMI; Crites and Savickas, 1996). It provides custom feedback to users

ranging from suggestions for further exploration to advice for seeking individual career counseling. The system also includes resources for vocational counselors to better assist clients. There are currently no published studies evaluating Vocopher's effectiveness.

Gati and Asulin-Peretz (2011) identified the lack of effectiveness research and professional monitoring of users as major issues for the field. With the proliferation of comprehensive career systems aiming to replace individual interventions with online algorithms, empirical research evaluating the effectiveness of these systems as stand-alone career interventions is sorely needed.

CAREER DECISION MAKING

One common problem for which a client may seek counseling is the inability to make a decision regarding the direction of his or her career. The process of career decision making is complicated due to the large number of factors influencing career choices. Multiple career decision-making theories have been proposed to outline the different stages of this process, and to describe different types of career-decision problems (see Larson, 2012, for an overview). In addition, a variety of measures have been developed that can help career counselors gain insight into their clients' decision-making styles and barriers. Here we review the utilization of the four most frequently used career decision-making measures in vocational research over the past decade.

Career Decision Scale (CDS)

The CDS (Osipow, Carney, Winer, Yanico, and Koschier, 1987) is an atheoretical, empirically derived measure originally intended to characterize different types of indecision in high school and college students. Clients indicate the extent to which each item is characteristic of their own career decision-making process using a four-point Likert scale. The CDS has two subscales: certainty and indecision.

Overall, 46 empirical studies using the CDS were located that had been published since 2000. Seven studies primarily focused on the validation of the CDS itself or measures of related constructs. In addition, the CDS has been used frequently to study theoretical and conceptual issues related to the structure and process of career indecision (e.g., Porfeli and Skorikov, 2010). Furthermore, many empirical studies have examined the correlates, predictors, and outcomes of the career-decision process. These included the relation between career indecision and constructs such as career adaptability, college adjustment, lifestyle attributes, perceptions of discrimination, and life satisfaction (e.g., Creed, Patton, and Hood, 2010). Another area of research focused on the career concerns of specific populations such as students with disabilities, adult students pursuing distance education, and youth living with HIV (e.g., Lightfoot and Healy, 2001). Finally, the CDS has been used to assess the effectiveness of a variety of career interventions (e.g., Borges, 2007). Most participant samples in these studies were composed of U.S. college or high school students, but the CDS has also been used internationally (i.e., in Iran, Italy, Australia, South Africa, the Bahamas, South Korea, and Taiwan).

Career Factors Inventory (CFI)

The CFI (Chartrand, Robbins, Morrill, and Boggs, 1990) is a rationally-derived multidimensional measure of career indecision utilizing a five-point Likert scale. The 21-item CFI contains four subscales, namely career choice anxiety, generalized indecisiveness, need for career information, and need for self-knowledge.

Seventeen empirical articles were found that were published between 2000 and 2012, most of which were based on samples of U.S. college students. Four articles were devoted to the structural validation of the CFI, and to establish the convergent validity of scales measuring related constructs. The goal of five studies was to learn more about the structure and theoretical basis of the career-indecision construct. Other articles looked at correlates and predictors of career indecision such as gender, personality, parental attachment, and other career related variables (e.g., Downing and Nauta, 2010).

Career Decision-Making Difficulties Questionnaire (CDDQ)

The CDDQ (Gati, Krausz, and Osipow, 1996) is a theoretically derived measure that operationalizes Gati et al.'s taxonomy of career indecision using a nine-point Likert scale. The 44-item CDDQ was developed to diagnose the types of difficulties a client is experiencing.

Out of the 24 empirical articles that used the CDDQ, the majority were devoted to psychometric questions such as factor structure, reliability, cross-cultural validation, or administration format comparisons (e.g., Creed and Yin, 2006). Further, many studies sought to characterize and compare the particular career-indecision patterns across gender, culture, and other demographics (e.g., Zhou and Santos, 2007). About a third of the studies included cross-national samples, predominantly from Israel and China.

Career Decision-Making Self-Efficacy Scale (CDMSE)

The CDMSE (Taylor and Betz, 1983), conceptually rooted in social cognitive career theory, measures people's perceived confidence regarding their own ability to complete tasks related to making career decisions. There are five subscales: self-appraisal, occupational information, goal selection, planning, and problem solving. There are several short forms of the CDMSE available, the most common being the CDMSE – Short Form (Betz, Klein, and Taylor, 1996).

Overall, 60 articles (including one meta-analysis) referencing the CDMSE or its short forms were located that have been published since 2000. About half of these studies examined correlates and predictors of career decision-making processes and outcomes, and many of these models were based on SCCT, the framework from which the CDMSE was derived. For example, researchers have looked at factors such as parental/social support, occupational aspirations, career locus of control, and cognitive style (e.g., Restubog, Florentino, and Garcia, 2010).

Eighteen studies primarily focused on psychometric questions. This included the validation of the original instrument and its short form as well as the validation of other measures (e.g., Betz, Hammond, and Multon, 2005). A meta-analysis of 20 unique sets of reliability estimates by Nilsson, Schmidt, and Meek (2002) showed that internal consistency was high ($\alpha > .80$) across all subscales of the CDMSE. In addition, reliability varied as a function of participant demographics such as age and race. In addition, the CDMSE and

its short form have been validated in international samples from Mexico, Australia, South Africa, South Korea, and France (e.g., Gaudron, 2011).

In 12 studies the CDMSE was used as the dependent variable in career intervention outcome research. Such interventions included career counseling or workshops, and structured online career exploration systems (e.g., Betz and Borgen, 2009). A few studies used the CDMSE to better understand the specific career constraints and decision-making styles of various target populations, such as students with disabilities or unemployed battered women (e.g., Creed, Tilbury, Buys, and Crawford, 2011).

Overview

A good selection of well-utilized scales is available to measure constructs related to the career decision-making process. Over the past decade, research involving these scales has focused on several key areas: 1) validation of the original scales or scales of related constructs; 2) research on the structure, correlates, and predictors of career indecision; 3) characterization of the decision-making process of special target populations; and 4) process and outcome research for career interventions. The measures reviewed here have been shown to be useful to scholars and career counselors in many different contexts, and it is likely that their use will increase even more in the future.

CAREER MATURITY, CAREER ADAPTABILITY, AND VOCATIONAL IDENTITY

Career Maturity Inventory (CMI)

The CMI measures the multidimensional construct of career adaptability, defined as “an individual’s psychosocial readiness and resources for coping with current and imminent vocational development tasks, occupational transitions, and work traumas” (Savickas and Porfeli, 2011, p. 357). Over the years, the CMI has undergone extensive changes related to its conceptual underpinnings as well as the content and number of items (see Savickas and Porfeli, 2011, for an overview). The most current version, the CMI Form C, is based on Savickas’ (2005) career construction theory. It consists of 18 items scored in a dichotomous format that yield four subscores (concern, curiosity, confidence, and consultation) reflecting different aspects of career adaptability. The subscores can be combined into a total score, providing an indicator of career choice readiness. Different forms of the CMI can be used as an exploration tool in career counseling and for scholarly research.

Our literature search yielded 26 empirical studies that have used various forms of the CMI. About half of these studies (many by Hirschi) focused on understanding the different variables that help or hinder the development of career adaptability and maturity, and to gain a better understanding of the career development process in children and adolescents (e.g., Creed, Patton, and Prideaux, 2007; Hirschi, 2012). Most studies have been conducted on adolescents and high school students in the U.S. and other countries (e.g., Switzerland, Iran, South Korea, India, and Norway), and many were longitudinal in design. A handful of studies using the CMI were conducted to characterize the unique career development patterns of specific groups, including trauma survivors, student athletes, and girls with learning disabilities (e.g., Kornspan and Etzel, 2001). In addition, research has been conducted in order to develop new forms of the CMI, and to obtain validity and reliability

evidence (e.g., Busacca and Taber, 2002). Finally, the CMI has been used as a dependent measure in examining the effectiveness of career interventions aimed at facilitating students' career development processes (e.g., Legum and Hoare, 2004).

My Vocational Situation (MVS)

The purpose of MVS (Holland, Gottfredson, and Power, 1980) is to diagnose problems in career decision making. MVS is rationally constructed and operationalizes the construct of vocational identity, defined as the "possession of a clear and stable picture of one's goals, interests, and talents" (Holland et al., 1980, p. 1191). The 26-item inventory is used primarily in career counseling to identify problems in career decision making along three dimensions, namely vocational identity, need for occupational information, and barriers. Clients respond to the items in a true/false format, but MVS also provides the opportunity for open-ended responses.

Only six empirical articles that included MVS were found that have been published since 2000. Two studies were devoted to the cross-cultural validation of the measure, and two others explored the vocational identity of specific groups such as international students and adults with disabilities (e.g., Yanchak, Lease, and Strauser, 2005). One study evaluated the outcome of a career and life planning course (Johnson, Nichols, Buboltz, and Riedesel, 2002); the other examined the effect of vocational identity on well-being (Strauser, Lustig, and Ciftci, 2008).

Adult Career Concerns Inventory (ACCI)

The ACCI (Super, Thompson, Lindeman, Myers, and Jordaan, 1988) is based on Super's (1957) life-stage theory of career development. It measures the extent to which clients are concerned about the different developmental tasks of Super's four main career stages, namely exploration, establishment, maintenance, and disengagement. The ACCI has 61 five-point Likert items; five items are allocated to each of Super's 12 substages, and one item measures concern regarding a change in career status. Only three empirical studies since 2000 could be found. Two studies used the ACCI for scale validation (e.g., Perrone, Gordon, Fitch, and Civiletto, 2003), and the remaining study (Hess and Jepsen, 2009) sought to determine how employees in different cohorts and career stages compare in terms of their psychological contract perceptions.

Career Development Inventory (CDI)

The CDI (e.g., Super, Thompson, Lindeman, Jordaan, and Myers, 1979) measures the vocational maturity (i.e. the readiness to make suitable career decisions) of adolescents based on Super's (1955) developmental model of career choice. The CDI has 120 items that fall into two sections. The first section is career orientation, which has four subscales (career planning, career exploration, career decision making, and world-of-work information), and the second section is the knowledge of preferred occupational groups. Both the ACCI and the CDI are available online at www.vocopher.com.

The CDI has been used frequently since 2000, and 30 empirical articles that referenced the instrument were found. About one third of these studies used the CDI to obtain a better

understanding of the nature and trajectory of career development in different populations. For example, Creed, Patton, and Hood (2010) contrasted the career development of work-bound students and university-bound students. They found that work-bound students fared worse in terms of various dimensions of career development (e.g., exploration, job knowledge) and personal functioning (e.g., well-being, self-esteem). Other populations studied included urban youth of color, medical students in traditional versus accelerated programs, Native American adolescents, and disadvantaged premedical students.

Ten studies have used the CDI primarily to test models that specify predictors of successful career development, including demographic variables such as gender or grade level (e.g., Janeiro, 2010) as well as psychological constructs such as work values, perception of barriers, personality, and various SCCT variables (e.g., Rogers et al., 2008). Many of these studies were longitudinal in design. Furthermore, six studies used the CDI as an outcome measure evaluating different career interventions aimed at increasing adolescents' career exploration behaviors and decision-making skills (e.g., Vilhjálmsdóttir, 2007). Finally, a few studies reported efforts to develop short forms of the CDI (e.g., Sadeghi, Baghban, Bahrami, Ahmadi, and Creed, 2011), and attempts at cross-validation of the CDI with international samples such as Australia or Thailand (e.g., Hughes and Thomas, 2006).

Career Beliefs Inventory (CBI)

The CBI was designed to identify career clients' beliefs and assumptions that cause them to limit their career options (Krumboltz, 1994). The CBI includes 25 scales organized into five categories that help to expose clients' assumptions; these can then be evaluated for accuracy. The 96 items are scored on a five-point Likert scale.

Eight empirical studies using the CBI within the last decade were found. Five of these articles focused on the validation of the CBI itself, its short forms, or its international versions (e.g., Hess, Tracey, Nota, Ferrari, and Soresi, 2009). The remaining studies were culturally and methodologically diverse. For example, Mahadevan (2010) used the CBI to explore the relation between acculturation and career beliefs of Asian international students. Turner and Ziebell (2011) reported the results from a descriptive study that explored the career beliefs of inner-city adolescents. In addition, a single subject study by Schnorr and Ware (2001) examined the relation between career beliefs and career maturity of underperforming students.

Overview

Several measures are available to counselors that can provide information regarding aspects of their clients' career development processes and expected outcomes. These include career maturity, adaptability, and vocational identity, among others. There is a large discrepancy in the utilization rates of these measures for research purposes. For example, the CDI has been used frequently while only three empirical articles were found that referenced the ACCI. One possible reason for this finding is that some of these measures have been designed explicitly for use in career counseling rather than for research purposes. Overall, the available literature base is very diverse in terms of research design and populations sampled. Many studies have looked in detail at the career development process of specific target populations. Given the complexity of the labor market in a globalized society, it is likely that research will continue to address these types of questions in the future.

CAREER DECISION-MAKING STYLES

The way in which individuals approach and make career decisions is an important cognitive variable to consider with vocational counseling clients. Harren (1979) identified three decision-making styles: rational, intuitive, and dependent. He developed the Assessment of Career Decision Making (ACDM; Harren, 1979), which is used to measure the degree to which an individual endorses each of the three decision-making styles. The outcome literature is mixed however, suggesting that context is important when evaluating how these decision-making styles relate to vocational outcomes.

Two empirical studies assessing decision-making styles with the ACDM were found since 2000. Lim, Kim, Kim, Kim, Lee, and Ko (2010) tested a cognitive behavioral career maturity intervention in a sample of Korean college students. No differences in career decision-making styles were found between treatment and control groups after the eight one-hour intervention sessions. Mau (2000) examined decision-making styles in samples of American and Taiwanese college students. Regardless of culture, the majority of participants endorsed the rational style, and more females endorsed the dependent style than males. Culturally-dependent results emerged as well. For Taiwanese students, higher rational scores were associated with higher career decision-making self-efficacy, while for U.S. students, higher dependent scores were associated with lower self-efficacy.

IDENTIFICATION OF CAREER BARRIERS

Identifying barriers perceived by individuals during the career choice process is receiving greater attention in the literature, possibly due to increased interest in diversity and globalization. In creating the Career Barriers Inventory (CBI), Swanson, Daniels, and Tokar (1996) stated that perceived barriers are useful predictors of career choice when assessed in tandem with the more traditional vocational constructs such as interest, self-efficacy, and outcome expectations. Since 2000, ten empirical studies using the CBI have been published. Seven out of ten studies sampled from undergraduate college student populations, and most studies examined ethnically diverse samples such as those from Portugal and China, and American Hispanic and Black student populations. Three sets of authors reported that females participants tended to report more perceived barriers than males. However, in a sample of ethnic minority premedical students, females reported more perceived barriers on the sex discrimination scale only (Henry, 2006). Perceived barriers and self-efficacy were examined in nine of the ten studies. Coping efficacy was found to mediate the relation between perceived barriers and career goals (Byars-Winston and Fouad, 2008), and perceived barriers were found to significantly predict career choice behavior after controlling for career self-efficacy (Tien, Wang, and Liu, 2009). Furthermore, perceived barriers negatively correlated with career planning selectively in females with low self-efficacy (Cardoso and Moreira, 2009).

CONCLUSION

We embarked upon writing this chapter with four goals in mind. First, we provided a framework for vocational assessment that was embedded in vocational outcomes and processes as they occur across a client's life span. Second, we anchored vocational assessment constructs in the vocational literature by identifying predictors established from

meta-analytic reviews. Third, the constructs were operationally defined by reliable and valid measures. Finally, we provided a sampling of the kinds of research that was being conducted using these measures.

Over 500 articles were identified. The findings reviewed here were based on both international and ethnically diverse U.S. samples. Multiple occupations were included when working adults were sampled. Researchers identified a range of predictors of the vocational outcomes, and some mediators and moderators were examined. Multiple validity studies were conducted. New measures were located that were tailored for specific populations. Cross-fertilization with personality psychology and industrial organizational psychology was evident across multiple constructs (e.g., personality, vocational interest, domain-specific self-efficacy, and job satisfaction). In short, the vocational literature is burgeoning with vitality and renewed focus.

In looking to the future, we envision all of the trends mentioned above continuing. We encourage researchers to continue to consider potential mediators between the relations of vocational constructs. For example, researchers have examined if the relation between self-efficacy and performance was mediated by cognitive ability. Researchers have also examined if personality traits mediated the relation between job satisfaction and job performance. Researchers may want to continue to search for moderators of relations in order to understand the conditions under which some relations change. For example, it may be that the relation of career decision-making self-efficacy to career indecision depends on the cultural context.

Some areas are especially in need of attention. Online career exploration systems like DISCOVER need to be evaluated empirically. In general, more intervention studies using well-validated measures are needed. More interventions aimed at both improving vocational outcomes (e.g., increasing job satisfaction) and vocational processes (e.g., increasing career exploration) would be a welcome addition to the literature.

Career practitioners may find this chapter helpful in a number of ways. First, [Table 9.1](#) was intended to be a concise snapshot of vocational outcomes across the client's life span. The identified predictors may be helpful for counselors as they conceptualize the client's particular concern within the larger context. As with any research application to an individual, caution is warranted and the information should be used in hypothesis generation with the client. [Table 9.2](#) may be helpful for the counselor in planning how particular vocational assessment tools may be helpful in the counseling process. Some of those tools (e.g., the SII) have already been widely used by counselors, but other tools like the Career Maturity Inventory may be less familiar. The utilization of the measures may provide ideas for counselors to consult particular articles because of the overlap with client populations they are working with or because of interventions that they are using or considering. Counselors may be the authors of future studies that empirically investigate online career exploration systems that are commercially available and popular but have insufficient evidence to support their validity. Finally, though minimally discussed in this chapter, we encourage counselors to select measures that have reliable and valid estimates for their particular settings.

REFERENCES

- ACT, Inc. (2006). *DISCOVER effectiveness for career exploration and planning*. Iowa City, IA: Author.
- American College Testing (2003). *DISCOVER*. Iowa City, IA: Author.

- Arnold, J. and Cohen, L. (2013). Careers in Organizations. In W. B. Walsh, M. L. Savickas, and P. J. Hartung (eds.), *Handbook of Vocational Psychology* (4th edn). New York: Routledge.
- Ashton, M. C. and Lee, K. (2008). Gender-related occupational interests do not define a masculinity-femininity factor. *Journal of Individual Differences*, 29, 25–34.
- Bailey, D. C., Larson, L. M., Borgen, F. H., and Gasser, C. E. (2008). Changing of the guard: Interpretive continuity of the 2005 Strong Interest Inventory. *Journal of Career Assessment*, 16, 135–55.
- Barrick, M. R., Mount, M. K., and Gupta, R. (2003). Meta-analysis of the relationship between the five-factor model of personality and Holland's occupational types. *Personnel Psychology*, 56, 45–74.
- Beltz, A. M., Swanson, J. L., and Berenbaum, S. A. (2011). Gendered occupational interests: Prenatal androgen effects on psychological orientation to Things versus People. *Hormones and Behavior*, 60, 313–17.
- Betz, N. E. and Borgen, F. H. (2009). Comparative effectiveness of CAPA and Focus on-line career assessment systems with undecided college students. *Journal of Career Assessment*, 17, 351–66.
- (2010). The CAPA integrative online system for college major exploration. *Journal of Career Assessment*, 18, 317–27.
- Betz, N. E., Borgen, F. H., and Harmon, L. W. (1996). *Skills Confidence Inventory Manual*. Palo Alto, CA: CPP Books.
- (2005). *Skills Confidence Inventory Manual*. Palo Alto, CA: CPP Books.
- (2006). Vocational confidence and personality in the prediction of occupational group membership. *Journal of Career Assessment*, 14, 36–55.
- Betz, N. E., Borgen, F. H., Rottinghaus, P. J., Paulsen, A., Halper, C. R., and Harmon, L. W. (2003). The Expanded Skills Confidence Inventory: Measuring basic dimensions of vocational activity. *Journal of Vocational Behavior*, 62, 76–100.
- Betz, N. E., Hammond, M. S., and Multon, K. D. (2005). Reliability and validity of five-level response continua for the Career Decision Self-Efficacy Scale. *Journal of Career Assessment*, 13, 131–49.
- Betz, N. E., Klein, K. L., and Taylor, K. M. (1996). Evaluation of a short form of the Career Decision-Making Self-Efficacy scale. *Journal of Career Assessment*, 4, 47–57.
- Borges, N. J. (2007). Behavioral exploration of career and specialty choice in medical students. *Career Development Quarterly*, 55, 351–8.
- Bowling, N. A. (2007). Is the job satisfaction–job performance relationship spurious? A meta-analytic examination. *Journal of Vocational Behavior*, 71, 167–85.
- Bowling, N. A., Eschleman, K. J., and Wang, Q. (2010). A meta-analytic examination of the relationship between job satisfaction and subjective well-being. *Journal of Occupational and Organizational Psychology*, 83, 915–34.
- Boyd, J. E., Patterson, J. C., and Thompson, B. T. (2005). Psychological test profiles of USAF pilots before training vs. type aircraft flown. *Aviation, Space, and Environmental Medicine*, 76, 463–8.
- Brown, S. D., Lent, R. W., and Gore, P. A. (2000). Self-rated abilities and self-efficacy beliefs: Are they empirically distinct? *Journal of Career Assessment*, 8, 223–235.
- Brown, S. D., Tremayne, S., Hoxha, D., Telander, K., Fan, X., and Lent, R. W. (2008). Social cognitive predictors of college students' academic performance and persistence: A meta-analytic path analysis. *Journal of Vocational Behavior*, 72, 298–308.
- Bruk-Lee, V., Khoury, H. A., Nixon, A. E., Goh, A., and Spector, P. E. (2009). Replicating and extending past personality/job satisfaction meta-analyses. *Human Performance*, 22, 156–89.
- Bubany, S. T. and Hansen, J. C. (2011). Birth cohort change in the vocational interests of female and male college students. *Journal of Vocational Behavior*, 78, 59–67.
- Bullock, E. E. and Reardon, R. C. (2008). Interest profile elevation, Big Five personality traits, and secondary constructs on the Self-Directed Search: A replication and extension. *Journal of Career Assessment*, 16, 326–38.
- Bullock-Yowell, E., Peterson, G. W., Wright, L. K., Reardon, R. C., and Mohn, R. S. (2011). The contribution of self-efficacy in assessing interests using the self-directed search. *Journal of Counseling and Development*, 89, 470–8.
- Busacca, L. A. and Taber, B. J. (2002). The Career Maturity Inventory – Revised: A preliminary psychometric investigation. *Journal of Career Assessment*, 10, 441–55.
- Byars-Winston, A. M. and Fouad, N. A. (2008). Math and science social cognitive variables in college students: Contributions of contextual factors in predicting goals. *Journal of Career Assessment*, 16, 425–40.
- Campbell, D. P., Hyne, S. A., and Nilsen, D. L. (1992). *Manual for the Campbell Interest and Skill Survey*. Minneapolis, MN: National Computer Systems, Inc.
- Campbell, J. P. and Knapp, D. J. (2001). *Exploring the limits in personnel selection and classification*. Mahwah, NJ: Lawrence Erlbaum.
- Cardoso, P. and Moreira, J. M. (2009). Self-efficacy beliefs and the relation between career planning and perception of barriers. *International Journal for Educational and Vocational Guidance*, 9, 3, 177–88.
- Career Dimensions, Inc. (2007). FOCUS. Monterey, CA: CTB/McGraw Hill. <http://www.focuscareer2.com>
- Carlson, D. S., Kacmar, K. M., and Williams, L. J. (2000). Construction and initial validation of a multidimensional measure of work–family conflict. *Journal of Vocational Behavior*, 56, 249–76.
- Carretta, T. R. and King, R. E. (2008). Improved military air traffic controller selection methods as measured by subsequent training performance. *Aviation, Space, and Environmental Medicine*, 79, 36–43.

- Chartrand, J. M., Robbins, S. B., Morrill, W. H., and Boggs, K. (1990). Development and validation of the Career Factors Inventory. *Journal of Counseling Psychology, 37*, 491–501.
- Chiu, S. and Chen, H. (2005). Relationship between job characteristics and organizational citizenship behavior: The mediational role of job satisfaction. *Social Behavior and Personality, 33*, 523–40.
- Connolly, J. J. and Viswesvaran, C. (2000). The role of affectivity in job satisfaction: A meta-analysis. *Personality and Individual Differences, 29*, 265–81.
- Costa, P. and McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) manual*. Odessa, FL: Psychological Assessment Resources.
- Cotter, E. W. and Fouad, N. A. (2011). The relationship between subjective well-being and vocational personality type. *Journal of Career Assessment, 19*, 51–60.
- Creed, P. A., Patton, W., and Hood, M. H. (2010). Career development and personal functioning differences between work-bound and non-work bound students. *Journal of Vocational Behavior, 76*, 37–41.
- Creed, P. A., Patton, W., and Prideaux, L.-A. (2007). Predicting change over time in career planning and career exploration for high school students. *Journal of Adolescence, 30*, 377–92.
- Creed, P. A., Tilbury, C., Buys, N., and Crawford, M. (2011). The career aspirations and action behaviours of Australian adolescents in out-of-home-care. *Children and Youth Services Review, 33*, 1720–9.
- Creed, P. A. and Yin, W. O. (2006). Reliability and validity of a Chinese version of the Career Decision-Making Difficulties Questionnaire. *International Journal for Educational and Vocational Guidance, 6*, 1, 47–63.
- Crites, J. O. and Savickas, M. L. (1996). Revision of the Career Maturity Inventory. *Journal of Career Assessment, 4*, 131–8.
- Dawis, R. V. and Lofquist, L. H. (1984). *A psychological theory of work adjustment: An individual differences model and its applications*. Minneapolis, MN: University of Minnesota Press.
- Defense Manpower Data Center (2006). *The Armed Services Vocational Aptitude Battery (ASVAB) technical bulletin series: Technical bulletin 1 – CAT ASVAB Forms 1 and 2*. Seaside, CA: Defense Manpower Data Center.
- Diener, E. (2000). The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34–43.
- Diener, E., Emmons, R. A., Larsen, R. J., and Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 49*, 71–5.
- Dik, B. J. and Hansen, J. C. (2011). Moderation of P-E fit – Job satisfaction relations. *Journal of Career Assessment, 19*, 35–50.
- Donnay, D. A. C., Morris, M. L., Schaubhut, N. A., and Thompson, R. C. (2005). *Strong Interest Inventory Manual (Revised Ed.)*. Palo Alto, CA: Consulting Psychologists Press.
- Donnon, T., Paolucci, E. O., and Violato, C. (2007). The predictive validity of the MCAT for medical school performance and medical board licensing examinations: A meta-analysis of the published research. *Academic Medicine, 82*, 1, 100–6.
- Downing, H. M. and Nauta, M. M. (2010). Separation-individuation, exploration, and identity diffusion as mediators of the relationship between attachment and career indecision. *Journal of Career Development, 36*, 207–7.
- Dunai, F. A. and Porter, R. D. (2001). Armed Services Vocational Aptitude Battery predictors of entry-level radiography students' success. *Military Medicine, 166*, 422–6.
- Fan, X. and Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review, 13*, 1, 1–22.
- Feldt, R. C., Ferry, A., Bullock, M., Camarotti-Carvalho, A., Collingwood, M., Eilers, S., and Nurre, E. (2011). Personality, career indecision, and college adjustment in the first semester. *Individual Differences Research, 9*, 2, 107–14.
- Flores, L. Y., Spanierman, L. B., Armstrong, P. I., and Velez, A. D. (2006). Validity of the Strong Interest Inventory and Skills Confidence Inventory with Mexican American high school students. *Journal of Career Assessment, 14*, 183–202.
- Fort, I., Jacquet, F., and Leroy, N. (2011). Self-efficacy, goals, and job search behaviors. *Career Development International, 16*, 469–81.
- Fouad, N. A. and Walker, C. M. (2005). Cultural influences on responses to items on the Strong Interest Inventory. *Journal of Vocational Behavior, 66*, 104–23.
- Fowkes, K. M. and McWhirter, E. H. (2007). Evaluation of computer-assisted career guidance in middle and secondary education settings: Status, obstacles, and suggestions. *Journal of Career Assessment, 15*, 388–400.
- Freund, P. A. and Kasten, N. (2012). How smart do you think you are? A meta-analysis on the validity of self-estimates of cognitive ability. *Psychological Bulletin, 138*, 296–321.
- Fritzche, B. A., McIntire, S. A., and Yost, A. P. (2002). Holland type as a moderator of personality-performance predictions. *Journal of Vocational Behavior, 60*, 422–36.
- Gasser, C. E., Larson, L. M., and Borgen, F. H. (2007). Concurrent validity of the 2005 Strong Interest Inventory: An examination of gender and major field of study. *Journal of Career Assessment, 15*, 23–43.
- Gati, I. and Asulin-Peretz, L. (2011). Internet-based self-help career assessments and interventions: Challenges and implications for evidence-based career counseling? *Journal of Career Assessment, 19*, 259–73.
- Gati, I., Krausz, M., and Osipow, S. H. (1996). A taxonomy of difficulties in career decision making. *Journal of Counseling Psychology, 43*, 510–26.
- Gaudron, J. (2011). A psychometric evaluation of the Career Decision Self-Efficacy Scale–Short Form among French university students. *Journal of Career Assessment, 19*, 420–30.

- Gay, E. G., Weiss, D. J., Hendel, D. D., Dawis, R. V., and Lofquist, L. H. (1971). Manual for the Minnesota Importance Questionnaire. *Minnesota Studies in Vocational Rehabilitation*, 28.
- Glavin, K. W. and Savickas, M. L. (2010). Vocopher: The career collaboratory. *Journal of Career Assessment*, 18, 345–54.
- (2011). Interpreting Self-Directed Search profiles: Validity of the “Rule of Eight.” *Journal of Vocational Behavior*, 79, 414–18.
- Hambrick, D. Z., Rench, T. A., Poposki, E. M., Darowski, E. S., Roland, D., Bearden, R. M., and Brou, R. (2011). The relationship between the ASVAB and multitasking in Navy sailors: A process-specific approach. *Military Psychology*, 23, 365–80.
- Hansen, J. C. (2005). Assessment of interests. In S. D. Brown and R. W. Lent (eds.), *Career development and counseling: Putting theory and research to work* (pp. 281–304). Hoboken, NJ: John Wiley & Sons.
- Hansen, J. C. and Dik, B. J. (2005). Evidence of 12-year predictive and concurrent validity for SII Occupational Scale scores. *Journal of Vocational Behavior*, 67, 365–78.
- Hansen, J. C. and Leuty, M. E. (2007). Evidence of validity for the skill scale scores of the Campbell interest and skill survey. *Journal of Vocational Behavior*, 71, 23–44.
- Hansen, J. C., Sullivan, B. A., and Luciana, M. (2011). A social neuroscientific model of vocational behavior. *Journal of Career Assessment*, 19, 216–27.
- Harmon, L. W., Hansen, J. C., Borgen, F. H., and Hammer, A. L. (1994). *Strong Interest Inventory: Applications and technical guide*. Palo Alto, CA: Consulting Psychologists Press.
- Harper, M. C. and Shoffner, M. F. (2004). Counseling for continued career development after retirement: An application of the Theory of Work Adjustment. *Career Development Quarterly*, 52, 272–284.
- Harren, V. A. (1979). A model of career decision making for college students. *Journal of Vocational Behavior*, 14, 119–133.
- Henry, P. (2006). Educational and career barriers to the medical profession: Perceptions of underrepresented minority students. *College Student Journal*, 40, 429–41.
- Hess, N. and Jepsen, D. M. (2009). Career stage and generational differences in psychological contracts. *Career Development International*, 14, 261–83.
- Hess, T. R., Tracey, T. J. G., Nota, L., Ferrari, L., and Soresi, S. (2009). The structure of the Career Beliefs Inventory on a sample of Italian high school students. *Journal of Career Assessment*, 17, 232–43.
- Hirschi, A. (2012). Vocational identity trajectories: Difference in personality and development of well-being. *European Journal of Personality*, 26, 1, 2–12.
- Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd edn). Odessa, FL: Psychological Assessment Resources.
- Holland, J. L., Fritzsche, B. A., and Powell, A. B. (1994). *Self-Directed Search: Technical manual*. Odessa, FL: Psychological Assessment Resources.
- Holland, J. L., Gottfredson, D. C., and Power, P. G. (1980). Some diagnostic scales for research in decision making and personality: Identity, information and barriers. *Journal of Personality and Social Psychology*, 39, 1191–200.
- Horan, J. J. (2010). The Virtual Counseling Center: Its niche, resources, and ongoing research and development activity. *Journal of Career Assessment*, 18, 328–35.
- Hughes, C. and Thomas, T. (2006). Adapting the Career Development Inventory-Australia for cross-cultural research. *Journal of Vocational Behavior*, 69, 276–88.
- Jackson, D. N. (1998). *Multidimensional Aptitude Battery – II manual*. Port Huron, MI: SIGMA Assessment Systems, Inc.
- Janeiro, I. N. (2010). Motivational dynamics in the development of career attitudes among adolescents. *Journal of Vocational Behavior*, 76, 170–7.
- Jeynes, W. H. (2003). The effects of Black and Hispanic 12th graders living in intact families and being religious on their academic achievement. *Urban Education*, 38, 1, 35–57.
- Johnson, L. (1995). A multidimensional analysis of the vocational aspirations of college students. *Measurement and Evaluation in Counseling and Development*, 28, 25–44.
- Johnson, P., Nichols, C. N., Buboltz, W. C., and Riedesel, B. (2002). Assessing a holistic trait and factor approach to career development of college students. *Journal of College Counseling*, 5, 1, 4–14.
- Judge, T. A., Heller, D., and Mount, M. K. (2002). Five-factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology*, 87, 530–41.
- Kanfer, R., Wanberg, C. R., and Kantrowitz, T. M. (2001). Job search and employment: A personality-motivational analysis and meta-analytic review. *Journal of Applied Psychology*, 86, 837–855.
- Kasler, J. and Nevo, O. (2005). Early recollections as predictors of study area choice. *Journal of Individual Psychology*, 61, 217–232.
- Kelly, K. R. and Shin, Y. (2009). Relation of neuroticism and negative career thoughts and feelings to lack of information. *Journal of Career Assessment*, 17, 201–13.
- Kobrin, J. L., Patterson, B. F., Shaw, E. J., Mattern, K. D., and Barbuti, S. M. (2008). *Validity of the SAT™ for predicting first-year college grade point average (College Board Research Rep. No. 2008-5)*. New York: The College Board.
- Kornspan, A. S. and Etzel, E. F. (2001). The relationship of demographic and psychological variables to career maturity of junior college student-athletes. *Journal of College Student Development*, 42, 2, 122–32.

- Krumboltz, J. D. (1994). *The Career Beliefs Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Kuncel, N. R., Credé, M., and Thomas, L. L. (2007). A meta-analysis of the predictive validity of the Graduate Management Admission Test and undergraduate grade point average for graduate student academic performance. *Academy of Management Learning and Education*, 6, 1, 51–68.
- Kuncel, N. R., Hezlett, S. A., and Ones, D. S. (2001). A comprehensive meta-analysis of the predictive validity of the graduate record examinations: Implications for graduate student selection and performance. *Psychological Bulletin*, 127, 162–181.
- (2004). Academic performance, career potential, creativity, and job performance: Can one construct predict them all? *Journal of Personality and Social Psychology*, 86, 148–61.
- Larson, L. M. (2012). Worklife across the lifespan. In E. M. Altmaier and J. I. Hansen (eds.), *The Oxford Handbook of Vocational Psychology* (pp. 128–178). New York: Oxford University Press.
- Larson, L. M. and Borgen, F. H. (2006). Do personality traits contribute to vocational self-efficacy? *Journal of Career Assessment*, 14, 295–311.
- Larson, L. M., Rottinghaus, P. J., and Borgen, F. H. (2002). Meta-analyses of Big Six interests and Big Five personality factors. *Journal of Vocational Behavior*, 61, 217–39.
- Larson, L. M., Wu, T. F., Bailey, D. C., Borgen, F. H., and Gasser, C. E. (2010). Male and female college students' educational majors: The contribution of basic vocational confidence and interests. *Journal of Career Assessment*, 18, 16–33.
- Legum, H. L. and Hoare, C. H. (2004). Impact of a career intervention on at-risk middle school students' career maturity levels, academic achievement, and self-esteem. *Professional School Counseling*, 8, 2, 148–55.
- Lent, R. W., Brown, S. D., and Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, 45, 79–122.
- Lent, R. W., do Céu Taveira, M., Sheu, H., and Singley, D. (2009). Social cognitive predictors of academic adjustment and life satisfaction in Portuguese college students: A longitudinal analysis. *Journal of Vocational Behavior*, 74, 190–8.
- Levinson, E. M., Zeman, H. L., and Ohler, D. L. (2002). A critical evaluation of the Web-based version of the Career Key. *Career Development Quarterly*, 51, 26–35.
- Lightfoot, M. and Healy, C. (2001). Career development, coping, and emotional distress in youth living with HIV. *Journal of Counseling Psychology*, 48, 484–9.
- Lim, J. Y., Kim, M. A., Kim, S. Y., Kim, E. J., Lee, J. E., and Ko, Y. K. (2010). The effects of a cognitive-behavioral therapy on career attitude maturity, decision making style, and self-esteem of nursing students in Korea. *Nurse Education Today*, 30, 731–6.
- Logue, C. T., Lounsbury, J. W., Gupta, A., and Leong, F. T. L. (2007). Vocational interest themes and personality traits in relation to college major satisfaction of business students. *Journal of Career Development*, 33, 269–95.
- Lumsden, J. A., Sampson, J. P., Reardon, R. C., Lenz, J. G., and Peterson, G. W. (2004). A comparison study of the paper-and-pencil, personal computer, and internet versions of Holland's Self-Directed Search. *Measurement and Evaluation in Counseling and Development. Special Issue: Use of Technology in Assessment*, 37, 2, 85–94.
- Lyons, H. Z. and O'Brien, K. M. (2006). The role of person–environment fit in the job satisfaction and tenure intentions of African American employees. *Journal of Counseling Psychology*, 53, 387–96.
- Mahadevan, L. (2010). Acculturation and career beliefs – Is there a relationship for international university students? *College Student Journal*, 44, 633–58.
- Maples, M. R. and Luzzo, D. A. (2005). Evaluating DISCOVER's effectiveness in enhancing college students' social cognitive career development. *Career Development Quarterly*, 53, 274–85.
- Mau, W. C.. (2000). Cultural differences in career decision-making styles and self-efficacy. *Journal of Vocational Behavior*, 57, 365–78.
- Michel, J. S., Mitchelson, J. K., Kotrba, L. M., LeBreton, J. M., and Baltes, B. B. (2009). A comparative test of work–family conflict models and critical examination of work–family linkages. *Journal of Vocational Behavior*, 74, 199–218.
- Miller, M. J., Springer, T. P., Tobacyk, J., and Wells, D. (2004). Congruency between occupational daydreams and SDS scores among college students. *College Student Journal*, 38, 1, 57–60.
- Nauta, M. M. (2007). Career interests, self-efficacy, and personality as antecedents of career exploration. *Journal of Career Assessment*, 15, 162–80.
- Nilsson, J. E., Schmidt, C. K., and Meek, W. D. (2002). Reliability generalization: An examination of the Career Decision-Making Self-Efficacy Scale. *Educational and Psychological Measurement. Special Issue: Reliability generalization as a measurement meta-analytic method*, 62, 647–58.
- Nota, L., Ferrarri, L., Solberg, V. S. H., and Soresi, S. (2007). Career search self-efficacy, family support, and career indecision with Italian youth. *Journal of Career Assessment*, 15, 181–93.
- O'Brien, K. M. (1996). The influence of psychological separation and parental attachment on the career development of adolescent women. *Journal of Vocational Behavior*, 48, 257–74.
- Osipow, S. H., Carney, C. G., Winer, J., Yanico, B., and Koschier, M. (1987). *Career Decision Scale*. Odessa, FL: Psychological Assessment Resources.
- Parlalis, S. K. (2011). Organizational changes and job satisfaction among support staff. *Journal of Social Science Research*, 37, 197–216.

- Paulsen, A. M. and Betz, N. E. (2004). Basic confidence predictors of career decision-making self-efficacy. *Career Development Quarterly*, 52, 354–62.
- Perrone, K. M., Gordon, P. A., Fitch, J. C., and Civiletto, C. L. (2003). The Adult Career Concerns Inventory: Development of a short form. *Journal of Employment Counseling*, 40, 4, 172–80.
- Porfeli, E. J. and Skorikov, V. B. (2010). Specific and diverse career exploration during late adolescence. *Journal of Career Assessment*, 18, 46–58.
- Poropat, A. E. (2009). A meta-analysis of the Five-Factor Model of personality and academic performance. *Psychological Bulletin*, 135, 322–38.
- Prediger, D. J. and Swaney, K. B. (2004). Work task dimensions underlying the world of work: Research results for diverse occupational databases. *Journal of Career Assessment*, 12, 440–59.
- Reed, M. B., Bruch, M. A., and Haase, R. F. (2004). Five-Factor Model of personality and career exploration. *Journal of Career Assessment*, 12, 223–38.
- Reeve, C. L. and Heggestad, E. D. (2004). Differential relations between general cognitive ability and interest–vocation fit. *Journal of Occupational and Organizational Psychology*, 77, 385–402.
- Restubog, S. L. D., Florentino, A. R., and Garcia, P. R. J. M. (2010). The mediating role of career self-efficacy and career decidedness in the relationship between contextual support and persistence. *Journal of Vocational Behavior*, 77, 186–95.
- Richardson, M. S., Abraham, C., and Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, 138, 353–87.
- Rogers, M. E., Creed, P. A., and Glendon, A. I. (2008). The role of personality in adolescent career planning and exploration: A social cognitive perspective. *Journal of Vocational Behavior*, 73, 132–42.
- Rolland, J. P. (2002). Cross-cultural generalizability of the Five-Factor Model of personality. In R. R. McCrae and J. Allik (eds.), *The Five-Factor Model of personality across cultures* (pp. 7–28). New York: Kluwer Academic/Plenum Publishers.
- Rottinghaus, P. J., Gaffey, A., Borgen, F. H., and Ralston, C. (2006). Diverse pathways of psychology majors: Vocational interests, self-efficacy, and intentions. *Career Development Quarterly*, 55, 85–93.
- Rottinghaus, P. J., Hees, C. K., and Conrath, J. A. (2009). Enhancing job satisfaction perspectives: Combining Holland themes and basic interests. *Journal of Vocational Behavior*, 75, 139–51.
- Rottinghaus, P. J., Larson, L. M., and Borgen, F. H. (2003). The relation of self-efficacy and interests: A meta-analysis of 60 samples. *Journal of Vocational Behavior*, 62, 221–36.
- Rottinghaus, P. J., Lindley, L. D., Green, M. A., and Borgen, F. H. (2002). Educational aspirations: The contribution of personality, self-efficacy, and interests. *Journal of Vocational Behavior*, 61, 1–19.
- Rounds, J. B. and Armstrong, P. I. (2005). Assessment of needs and values. In D. S. Brown and R. W. Lent (eds.), *Career development and counseling: Putting theory and research to work* (pp. 305–29). Hoboken, NJ: John Wiley & Sons Inc.
- Sadeghi, A., Baghban, I., Bahrami, F., Ahmadi, A., and Creed, P. A. (2011). Validation of the short form of the Career Development Inventory with an Iranian high school sample. *International Journal for Educational and Vocational Guidance*, 11, 1, 29–38.
- Sampson, J. P., Shy, J. D., Hartley, S. L., Reardon, R. C., and Peterson, G. W. (2009). The influence of item response indecision on the Self-Directed Search. *Journal of Career Development*, 35, 427–43.
- Savickas, M. L. (2005). The theory and practice of career construction. In S. D. Brown and R. W. Lent (eds.), *Career development and counseling: Putting theory and research to work* (pp. 42–70). Hoboken, NJ: John Wiley & Sons.
- Savickas, M. L. and Porfeli, E. J. (2011). Revision of the Career Maturity Inventory: The adaptability form. *Journal of Career Assessment*, 19, 355–74.
- Savickas, M. L. and Taber, B. J. (2006). Individual differences in RAISEC profile similarity across five interest inventories. *Measurement and Evaluation in Counseling and Development*, 38, 203–10.
- Schnorr, D. and Ware, H. W. (2001). Moving beyond a deficit model to describe and promote the career development of at-risk youth. *Journal of Career Development*, 27, 247–263.
- Singh, P., Suar, D., and Leiter, M. P. (2012). Antecedents, work-related consequences, and buffers of job burnout among Indian software developers. *Journal of Leadership and Organizational Studies*, 19, 1, 83–104.
- Solberg, V. S., Good, G. E., Nord, D., Holm, C., Hohner, R., Zima, N., and Malen, A. (1994). Assessing career search expectations: Development and validation of the Career Search Efficacy Scale. *Journal of Career Assessment*, 2, 111–23.
- Spector, P. E. (1985). Measurement of human service staff satisfaction: Development of the Job Satisfaction Survey. *American Journal of Community Psychology*, 13, 693–713.
- (2000). *Industrial and organizational psychology: Research and practice*. New York: John Wiley & Sons.
- Staggs, G. D., Larson, L. M., and Borgen, F. H. (2003). Convergence of specific factors in vocational interests and personality. *Journal of Career Assessment*, 11, 243–61.
- Steel, P., Schmidt, J., and Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological Bulletin*, 134, 138–61.
- Strauser, D. R., Lustig, D. C., and Ciftci, A. (2008). Psychological well-being: Its relation to work personality, vocational identity, and career thoughts. *Journal of Psychology: Interdisciplinary and Applied*, 142, 1, 21–35.

- Strong, E. K., Jr. (1927). *Vocational Interest Blank*. Stanford, CA: Stanford University Press.
- Sullivan, B. A. and Hansen, J. C. (2004). Evidence of construct validity of the interest scales on the Campbell Interest and Skill Survey. *Journal of Vocational Behavior*, 65, 179–202.
- Super, D. E. (1955). The dimensions and measurement of vocational maturity. *Teachers College Record*, 57, 151–63.
- (1957). *The psychology of careers*. New York: Harper and Row.
- Super, D. E., Thompson, A. S., Lindeman, R. H., Jordaan, J. P., and Myers, R. A. (1979). *Career Development Inventory: School form*. Palo Alto, CA: Consulting Psychologists Press.
- Super, D. E., Thompson, A. S., Lindeman, R. H., Myers, R. A., and Jordaan, J. P. (1988). *The Adult Career Concerns Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Swanson, J. L., Daniels, K. K., and Tokar, D. M. (1996). Assessing perceptions of career-related barriers: The Career Barriers Inventory. *Journal of Career Assessment*, 4, 219–244.
- Tay, L., Su, R., and Rounds, J. B. (2011). People–things and data–ideas: Bipolar dimensions? *Journal of Counseling Psychology*, 58, 424–40.
- Taylor, K. M. and Betz, N. E. (1983). Applications of self-efficacy theory to the understanding and treatment of career indecision. *Journal of Vocational Behavior*, 22, 63–81.
- Tellegen, A. (2000). *Manual of the Multidimensional Personality Questionnaire*. Minneapolis, MN: University of Minnesota Press.
- Tien, H. L. S., Wang, Y., and Liu, L. (2009). The role of career barriers in high school students' career choice behavior in Taiwan. *Career Development Quarterly*, 57, 274–88.
- Turner, S. L. and Ziebell, J. L. C. (2011). The career beliefs of inner-city adolescents. *Professional School Counseling*, 15, 1, 1–14.
- Uthayakumar, R., Schimmack, U., Hartung, P. J., and Rogers, J. R. (2010). Career decidedness as a predictor of subjective well-being. *Journal of Vocational Behavior*, 77, 196–204.
- Van Iddekinge, C. H., Putka, D. J., and Campbell, J. P. (2011). Reconsidering vocational interests for personnel selection: The validity of an interest-based selection test in relation to job knowledge, job performance, and continuance intentions. *Journal of Applied Psychology*, 96, 1, 13–33.
- Vilhjalmssdottir, G. (2007). Outcomes of two different methods in careers education. *International Journal for Educational and Vocational Guidance*, 7, 2, 97–110.
- Weiss, D. J., Dawis, R. V., England, G. W., and Lofquist, L. H. (1967). Manual for the Minnesota Satisfaction Questionnaire. *Minnesota Studies in Vocational Rehabilitation (No. XXII)*, 1–119. Minneapolis: University of Minnesota, Industrial Relations Center.
- Yanchak, K. V., Lease, S. H., and Strauser, D. R. (2005). Relation of disability type and career thoughts to vocational identity. *Rehabilitation Counseling Bulletin*, 48, 3, 130–8.
- Zhang, L. (2008). Revisiting the Big Six and the Big Five among Hong Kong university students. *Educational Psychology*, 28, 1, 1–14.
- Zhou, D. and Santos, A. (2007). Career decision-making difficulties of British and Chinese international university students. *British Journal of Guidance and Counseling*, 35, 219–35.
- Zytowski, D. G. (2006). Super's Work Values Inventory-Revised user's manual. http://www.kuder.com/solutions/kuderassessments.html#supers_work_values_inventory