CHAPTER 8

Advances in Vocational Psychology Theory and Research

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The emergence of vocational psychology as a field of study occurred in response to pressing social concerns early in the twentieth century: children's welfare and the resultant labor laws, the industrial revolution, population shifts from rural to urban areas, large-scale immigration, and preparing youth for labor force participation. Likewise, changing economic and social conditions fueled evolution of the field of vocational psychology throughout the remainder of this century. Vocational psychologists were, by definition, applied psychologists. An implication is that practice often preceded theory, as scholars and practitioners addressed real-world concerns of individuals, such as youth entering the workforce, returning veterans, or unemployed adults during economic depressions or recessions.

As we enter the new millenium, we are confronted by new challenges. The very nature of the workforce is changing—increasing diversity in terms of race/ethnicity, sex, and age, temporary versus permanent workers, and part-time versus full-time workers. Rapid technological changes make workers' skills obsolete. Moreover, global economic and market factors influence the nature of competition and job opportunities.

Few vocational psychologists would question the significant impact of Parsons's (1909/1989) work; we are now poised to make equally significant contributions to the twenty-first century. To retain a vital role, though, we need to address these concerns in a fashion worthy of our predecessors—that is, in a way that accounts for the complexity of human experience, across the variety of intersecting roles throughout the life span, and with a balance of theoretical insight and pragmatic solutions.

Our goal is to review theory and research regarding vocational psychology, keeping in mind the connections between our past and our future. We address two interconnected bodies of literature. First, we focus on established and emergent theories of career development and vocational behavior, emphasizing new theoretical formulations as well as recent empirical study. Second, we summarize theoretical and empirical literature regarding vocational interests. We decided to include the latter section based on the volume of work that has been conducted since the last major review of vocational interests in the first edition of the *Handbook* (Hansen, 1984). These two bodies of literature represent the scholarly traditions of vocational psychology: Theories of career development were proffered in an attempt to explain observed behavior regarding vocational choice and adjustment over the life span, and the sustained focus on vocational interests exemplifies the atheoretical, empirically driven origins of vocational psychology.

MAJOR THEORETICAL PERSPECTIVES

For many years, vocational psychology has been dominated by several enduring theoretical approaches. Hackett, Lent, and Greenhaus (1991) observed that the theoretical traditions within

vocational psychology could be classified as trait-factor, developmental, or social learning/social cognitive. Most of the established theories have received considerable attention from researchers, including efforts at theoretical reformulation (e.g., Super, Savickas, & Super, 1996). Additionally, efforts are underway to explore possible points of convergence among career theories and to more clearly explicate the relationship between career theory and practice. In this section, we review and discuss recent theoretical advances and research on career theory, focusing specifically on theoretical and empirical developments that have occurred since the publication of the second edition of the *Handbook of Counseling Psychology* (Brown & Lent, 1992).

We chose to exclude theories that have received little recent empirical attention. For example, Krumboltz's social learning theory of career decision making continues to suffer from the same lack of empirical attention that was noted in the last edition of the *Handbook* (Hackett & Lent, 1992). On the other hand, Krumboltz has taken seriously the challenge of developing a theory of career counseling, and therefore of melding career theory with career practice. The learning theory of career counseling, developed from his theory of career development, is discussed in the chapter by Brown and Ryan in the current volume.

Holland's Theory

John Holland's theory continues to enjoy empirical attention as it celebrates its fortieth anniversary (Holland, 1959). Holland's person-environment typology and theory of career choice clearly is the most widely studied career theory in history. Moreover, the concepts that derive from this theory are integral to the vocabulary, tools, and processes of career counseling. Study of Holland's hypotheses shows no signs of diminishing, and the publication of a sixth major theoretical statement (Holland, 1997) attests both to the theory's and its author's vitality. Briefly, Holland suggests that (1) persons and environments can be categorized according to six types (realistic, investigative, artistic, social, enterprising, and conventional; RIASEC); (2) persons tend to seek environments that will allow them to implement the characteristics of their work personality; and (3) behavior is a product of the interaction between personality types and environments. Supplementing these basic notions are hypotheses regarding consistency, differentiation, identity, congruence, and calculus. The consistency, differentiation, and identity hypotheses outline the relationships between the clarity of person and environment definitions and important career outcomes, such as educational and vocational choice, stability, and achievement. Congruence, or the degree of fit between person and environment, is also hypothesized to predict similar career outcomes. Finally, Holland's calculus hypothesis describes the relationships among the six model person/environment types—relationships that are arranged according to a hexagonal structure.

Most empirical tests of Holland's theory during the last decade have focused on the calculus and congruence hypotheses and cross-cultural applications of Holland's theory. The empirical studies related to Holland's notion of calculus, and most of the cross-cultural work, has taken place in the context of interest measurement, and so these topics are covered in a later section. This section focuses on recent investigations of the congruence hypothesis and other direct tests of Holland's theory.

Empirical Support

Perhaps no other aspect of Holland's theory has generated as much empirical data and controversy as has Holland's congruence hypothesis. The crux of the controversy, often traced back to a review by Spokane (1985), surrounds the predictive validity of congruence. In his review, Spokane noted that correlations between congruence and predicted academic and career outcomes rarely exceeded .25. The evidence that congruence predicts important academic and career outcomes, even at this level, is still somewhat equivocal. Some investigators have reported significant relationships

between congruence and outcomes. Sutherland, Fogarty, and Pithers (1995), for example, reported correlations between various congruence measures and occupational stress (*r*s ranging from .11 to .27) and personal strain (*r*s ranging from .04 to .30). Similarly, Oleski and Subich (1996) found significant relationships between congruence and current job satisfaction ($r = .33$) in a sample of career changers. In contrast, other authors failed to find significant relationships or reported inconsistent relationships between congruence measures and work satisfaction among employed adults. For example, Upperman and Church (1995) reported correlations ranging from .06 to .12 between congruence and job satisfaction in a sample of enlisted military men. Similarly, Young, Tokar, and Subich (1998) reported relationships between 11 different congruence measures and 2 measures of job satisfaction that did not exceed .09.

In a review of 41 congruence studies, Assouline and Meir (1987) reported average effect size estimates between congruence and achievement ($r = .06$), stability ($r = .15$), and satisfaction ($r = .21$). A more recent meta-analysis echoed those findings (Tranberg, Slane, & Ekeberg, 1993), reporting a mean correlation between congruence and satisfaction of .17. These authors also identified a number of variables that appear to moderate the relationship between congruence and satisfaction, including the type of satisfaction measured, quality of the empirical study, and type of congruence index used. Moderation of the congruence-satisfaction relationship continues to receive empirical attention (Carson & Mowsesian, 1993; Richards, 1993; Tokar & Subich, 1997; Young et al., 1998).

That the type of congruence index used moderates the relationship between congruence and criterion variables is not surprising given that the original congruence index (Holland, 1963) has been supplemented by a host of congruence measures over the last four decades (for reviews see Brown & Gore, 1994, and Camp & Chartrand, 1992). These indices range from the computationally simple to the mathematically complex and incorporate different elements of Holland's original theory.

In an interesting series of studies, several authors have examined the adequacy of congruence measurement. Camp and Chartrand (1992) used 13 different indices to calculate congruence between career interests and several academic and career variables. Consistent with many previous findings, they reported small to moderate relationships between congruence and outcome variables (*r*s ranging from −.09 to .44). Their results suggest that the relationship between congruence and academic and career outcomes is moderated by the type of index used. More interesting, perhaps, was the observed heterogeneity of index intercorrelations in this study. These findings have potentially serious ramifications in that measures of a unitary construct should relate highly to one another and should uniformly predict outcomes. Camp and Chartrand's findings may suggest that extant congruence indices are actually measures of more than one underlying construct.

In a related study, Brown and Gore (1994) simulated all possible person-environment combinations to characterize the distributional properties of congruence indices. They detected serious flaws in many of the measures of congruence with most measures generating distributions that were positively skewed, and some distributions that were noticeably incomplete. Like Camp and Chartrand (1992), intercorrelations among congruence measures varied widely (.14 to .92), suggesting that not all congruence measures are created equal. Brown and Gore proposed a new index (C-index) that yields a symmetrical distribution and closely adheres to Holland's theory.

There are clearly fundamental problems with a number of extant indices that may be alleviated by the use of more theoretically consistent and psychometrically sound measures (e.g., Brown & Gore, 1994; Kwak & Pulvino, 1982). Should investigators continue exploring the predictive utility of career congruence, they are well advised to use these more desirable indices and to attend to methodological recommendations on conducting congruence research (Brown & Gore, 1994; Camp & Chartrand, 1992; Holland, 1997). Further, it remains to be seen how researchers will integrate recent findings on the three-dimensional, spherical structure of interests (Tracey & Rounds, 1996) into calculations of congruence.

Holland's notion that people tend to inhabit work and leisure environments that match their personalities has received strong support (Hansen & Sackett, 1993; Miller, 1991; Oleski & Subich, 1996). Hansen and Sackett (1993), for example, reported that up to 70% of a sample of undergraduate students demonstrated a high degree of fit between their interest profiles and college majors. As some authors have pointed out, however, people's tendency to be attracted to environments that are congruent with their interests may not always be possible. Downes and Kroeck's (1996) findings suggest that there is a mismatch between the availability of jobs in today's society and the normative pattern of primary interests in the population of workers. To put it succinctly, we can't always get what we want.

In sharp contrast to the volume of research on congruence, considerably less attention has been focused recently on the constructs of differentiation, consistency, and identity. Holland (1997) outlined a number of limitations with studies that have attempted to explore these constructs in recent years, such as the use of small or homogeneous samples in studies designed to explore the predictive validity of differentiation. Moreover, he called for increased attention to the relationships among differentiation, consistency, and identity, with the understanding that these are secondary constructs and that their unique contribution to understanding vocational behavior should be assessed after controlling for more central factors.

Holland (1997) hypothesized that differentiation, consistency, and identity are related to degree of vocational clarity and stability of vocational goals. Moreover, differentiation and consistency are hypothesized to predict stability of vocational choice, vocational persistence, and overall satisfaction. Several research groups have explored these relationships. Carson and Mowsesian (1993), for example, calculated correlations between differentiation, consistency, vocational identity, and job satisfaction. Vocational identity was most highly related to job satisfaction ($r = .45$), whereas the relationships between satisfaction and differentiation and consistency were less robust (rs = $-.03$ and $-.12$, respectively). Leong, Austin, Sekaran, and Komarraju (1998) made similar observations in a sample of employed adults from India, reporting correlations between differentiation, consistency, and job satisfaction ranging from $-.18$ to .04.

As with the construct of congruence, researchers have focused attention on refining the measurement of consistency and differentiation. These efforts have resulted in a number of specific suggestions for improving the manner in which the constructs are operationalized, such as dealing with ties in primary codes to determine consistency (Strahan & Severinghaus, 1992) and using more profile information in calculating differentiation (Sackett & Hansen, 1995; Swanson & Hansen, 1986). Researchers seem to be embracing the utility of these constructs, and the newer indices may hold promise for future researchers. In addition, some evidence suggests that differentiation is related to personality factors (De Fruyt & Mervielde, 1997; G.D. Gottfredson & Jones, 1993; Holland, Johnston, & Asama, 1994), a finding that may provide new research directions.

Research regarding vocational identity has demonstrated convergent and discriminant validity between Holland's Vocational Identity scale and measures of other career-related constructs (Holland, 1997). For example, identity correlated strongly with career self-efficacy (.54) and career decision-making self-efficacy (.61) (Solberg, Good, Fischer, Brown, & Nord, 1995). However, some authors have concluded that the construct of vocational identity is "fuzzy" and does not reflect its rich developmental underpinnings (Leung, Conoley, Scheel, & Sonnenberg, 1992; Vondracek, 1992).

Finally, a number of authors addressed the practical applications of Holland's theory. Mobley and Slaney (1996) suggest that gay men and lesbian women may intentionally enter incongruent occupations as a result of either real or perceived discrimination and homophobia in society. Additionally, these authors speculated about how heterosexuals' perceptions of stereotypic gay and lesbian work environments may influence the career paths of gays in our society.

Mahalik (1996) noted differential patterns by Holland type in a study of the relationship between client interest patterns and perceptions of counselor intentions in counseling. For example,

Enterprising clients tended to interpret interventions as challenges, and investigative clients responded more positively to prescriptive interventions as compared with experiential interventions. Further, a group of investigators have observed differential preferences for activities in career counseling based on Holland personality type (Boyd & Cramer, 1995; Lenz, Reardon, & Sampson, 1993; Niles, 1993), although these preferences were not always in the expected direction. Clearly, additional research is needed in this area before counselors can begin to tailor their interventions to their client's work personalities. Nevertheless, well-documented relationships between work personality and perceptions of counselor intentions not only would have clear implications for traditional career counseling but also for personal counseling.

Summary

Holland's theory of career choice continues to influence research and practice. Hexagons abound and career centers frequently organize their materials using the RIASEC model. Holland's person and environment organizational schemes continue to receive explicit endorsement from counselors and from test publishers. Research supporting Holland's typology is extremely strong (see the later section on vocational interests), and counselors may feel confident in their use of the hexagon as an organizing scheme for clients. The perceived failure of other hypotheses seems only to result in more intense empirical effort or elucidation of measurement issues. At first glance, the weak support for some of Holland's fundamental hypotheses (e.g., consistency and differentiation) and the small correlations often obtained in congruence studies suggest that career counselors should exercise caution when using these concepts with clients. Alternatively, perhaps our research efforts have been misdirected, and our outcome expectations have been set too high.

Researchers are encouraged not to dismiss what might appear to be lackluster findings with respect to Holland's major theoretical tenets. There are a number of statistical and methodological issues to consider when interpreting bivariate correlations in any body of research. First, investigators often attempt to explain variance in complex and multidimensional constructs (e.g., job satisfaction). Some researchers might argue that explaining 4% to 8% of the variance in an outcome using only one predictor is remarkable given the multitude of direct and indirect influences on behavior. Although higher correlations would be encouraging, lead to a more parsimonious explanation of psychological processes, and perhaps simplify the career counseling process, they might also be reflective of high levels of shared method variance.

Traditionally, researchers have judged the adequacy of correlational data using either statistical or practical significance. Such interpretation, as has been the case with research on Holland's theory, often results in attacks on theory or attempts to improve measurement. Rosenthal and Rubin (1982), however, suggested that correlations may be interpreted as direct measures of predictive accuracy. For example, a correlation of .20 allows us to predict an outcome 20% more accurately than would be possible without the use of that predictor. In fact, biomedical researchers routinely terminate studies when effect sizes reach .10–.20 on the grounds that it would be unethical to withhold such an effective treatment from participants in the control group (Rosenthal, 1990). A 20% increase in our ability to predict important vocational outcomes would seem like a "significant" gain, and when applied to career counseling, could considerably improve the quality of many people's lives.

Range restriction is another important statistical constraint to consider when interpreting findings from Holland's theory. His theory suggests, and the data confirm, that people naturally gravitate toward congruent environments. Further, survey data consistently indicate that the vast majority of individuals are satisfied with their jobs. Thus, the "modest" relationships often observed in congruence research may simply reflect range restriction in predictors, criteria, or both sets of variables (e.g., in studies of employed adults, there may be so little variance in satisfaction to predict that small correlations are inevitable). Researchers are strongly encouraged to scrutinize their data for potential range restriction, and to employ corrections for such restriction when population variance estimates are available.

Although researchers have spent considerable effort on increasing the specificity of congruence measurement, we seem to have forgotten how coarse our measures of persons and environments really are. We are attempting to improve our description of the relationship between two extremely global typologies by tinkering with the finer points of congruence measures. In essence, we are examining the interaction between persons and environments as though under a high-powered microscope, yet our view of each individual entity, person, or environment is based on a low-resolution magnifying glass: We know the overall structure of each, but we do not know their specific characteristics. Moreover, the intensity of our focus on environments seems not to match the scrutiny with which we have examined the person side of the equation (Holland, 1997). Efforts to define carefully the structure underlying interests, described later in this chapter, have no parallel in structural representations of environmental types. Environments are defined by the people that inhabit them, a somewhat circular definition that prevents independent description and investigation.

Finally, recent evidence suggests that a spherical structure (Tracey & Rounds, 1996) may more adequately describe occupational interests. The added third dimension of occupational prestige might serve as an important component in the description of both persons and environments. How this dimension will be, or already is, incorporated into existing measures of work personality and environments remains to be described. Investigators are urged not only to attend to variability in prestige across Holland types but also to variability in prestige within types. Moreover, additional research is needed to characterize how prestige is incorporated into the measurement of congruence and how it may affect the relationship between congruence and important career and academic outcomes.

Theory of Work Adjustment

The Theory of Work Adjustment (TWA) first appeared in a monograph as part of the Minnesota Studies on Vocational Rehabilitation (Dawis, England, & Lofquist, 1964) and has been elaborated on and extended a number of times (Dawis, 1996; Dawis & Lofquist, 1984; Lofquist & Dawis, 1991). The theory describes the dynamic interaction that occurs between persons and their work environments, and was developed to describe aspects of individuals and work environments that influence vocational adjustment. TWA evolved from a series of empirical investigations, and has given rise to a number of sound instruments (e.g., Rounds, Henly, Dawis, Lofquist, & Weiss, 1981; Weiss, Dawis, England, & Lofquist, 1967).

According to the theory, people have certain requirements for their work environment (work needs) and offer the environment a certain set of skills or abilities. Similarly, work environments have certain requirements of their employees (ability requirements) and can meet certain worker needs (reinforcement system). Correspondence between an employee's abilities and the ability requirements of the job predict satisfactoriness (a perception of satisfaction from the perspective of the employer). Correspondence between an employee's needs and the reinforcement system of the employer, on the other hand, predict satisfaction (a perception from the perspective of the employee). Together, satisfaction and satisfactoriness predict the length of time spent with a given employer (tenure). When employer and employee needs are being met, there exists a state of equilibrium. In contrast, when the needs of either the employee or employer are not being met, adjustment styles come into play. TWA describes these adjustment styles as flexibility (tolerance for discorrespondence before enacting adjustment behaviors), activeness (the tendency to attempt to change the other), reactiveness (the tendency to attempt to change self), and perseverance (the duration of adjustment behaviors before terminating employment).

Some authors have argued that TWA suffers from a number of nonempirical shortcomings. For example, Holland (1994) argued that TWA suffered not so much from a lack of empirical support as it did from serious "marketing" deficiencies. Other authors have noted that the theory continues to evade the awareness of some researchers (Hackett et al., 1991; Tinsley, 1993). In a recent special

issue of the *Journal of Vocational Behavior* (Volume 43), Brown (1993), Tinsley (1993), Tenopyr (1993), and Hesketh (1993) noted that TWA fails to incorporate concepts from recent work in the area of personality theory. In contrast, P.C. Morrow (1993) and Murphy (1993) concentrated on possible precision problems with several of TWA's constructs, and the weak links that exist between TWA and other relevant disciplines (e.g., industrial-organizational psychology). In short, TWA continues to suffer from empirical neglect. Other than the special issue described above, only a handful of direct empirical tests of TWA have appeared in the literature in the last decade.

Empirical Evidence

From counseling psychology's perspective, perhaps the most germane aspect of TWA is the hypothesis that job satisfaction is inversely related to job turnover, a hypothesis that has received considerable support from organizational psychology research (for example see Carsten & Spector, 1987) and research specifically focusing on TWA. Breeden (1993) gathered satisfaction and correspondence data immediately prior to and two years following an occupation change in a large sample of employed adults. Changes in satisfaction ranged from 1 to 1.3 standard deviations from the intake to follow-up conditions. Further, the increases in satisfaction observed in participants who changed occupations were not observed in participants who elected to make no change in their employment status. Hesketh, McLachlan, and Gardner (1992) also reported positive correlations between satisfaction and tenure (.17) and intentions to stay on the job (.35).

Other investigators have focused on the theoretical relationships between correspondence and tenure or correspondence and satisfaction. For example, Bretz and Judge (1994) gathered data on satisfaction, success, correspondence, and job tenure from a large sample of employed adults. They used indices of person-environment fit that included correspondence between abilities and ability requirements and between needs and the organizational reinforcement system. Bretz and Judge reported a correlation of .09 between person-organization fit and tenure and a correlation of .36 between person-organization fit and job satisfaction. Moreover, person-organizational fit accounted for a significant portion of the variance in both tenure (1% to 5%) and job satisfaction (5% to 22%) after other variables, such as type of industry, education and organizational attainment level, and demographics, had been partialed out.

Melchiori and Church (1997) reported correlations ranging from .08 to .27 when assessing the relationship between need-reinforcer correspondence and job satisfaction in dual samples of mentally retarded and nondisabled workers. The observed relationship between these variables was higher in absolute magnitude for disabled workers (.27) than for nondisabled workers (.11). In a large sample of bank employees, Hesketh et al. (1992) reported correlations of .44 to .58 between need-reinforcer correspondence and job satisfaction (correlations varied according to the measurement strategy employed). They also observed positive correlations between performance (satisfactoriness) and intentions to remain on the job (.23) and tenure (.06). In contrast, these investigators failed to find support for satisfactoriness as a moderator of the correspondence-satisfaction relationship—a finding echoed by Bizot and Goldman (1993).

One recent study that explored the theoretical relationship between ability-ability requirement correspondence and satisfactoriness deserves mention. Bizot and Goldman (1993) observed a correlation of .29 between satisfactoriness (as measured by the Minnesota Satisfactoriness Scale) and ability-ability requirement correspondence. It should be noted, however, that these authors used an indirect measure of correspondence limiting the generalizability of their findings. These authors failed to find support for satisfaction as a moderator of the correspondence-satisfactoriness relationship.

Summary

The bulk of research on TWA conducted by vocational psychologists has concentrated on elaborating the relationship between needs-reinforcer correspondence, satisfaction, and

tenure—presumably due to our focus on the individual rather than the organization. To date, the data seem to support relationships between correspondence and satisfaction, and between satisfaction and job tenure. In contrast, there is clearly less evidence supporting satisfaction and satisfactoriness as moderators of the correspondence-satisfactoriness and correspondence-satisfaction relationships, respectively. Despite generally promising findings over the last 35 years, however, research specifically using constructs and measures from this theory has proceeded at a very slow pace.

Super's Life Span, Life Space Theory

Super's "segmental" theoretical system includes recognition of life span aspects (developmental constructs) and life space aspects (multiple contexts of individuals' lives) of career development, and the view of work as embedded within other life roles. The intersection of life span (longitudinal) and life space (latitudinal) dimensions of Super's life career rainbow describes the current status of an individual and predicts that individual's future career trajectory.

A hallmark of Super's theory is the view that vocational development is a process of making several decisions, which culminate in vocational choices that represent an implementation of the self-concept. Vocational choices are viewed as successive approximations of a good match between the vocational self and the world of work. Super proposed a series of stages over the life span, beginning with growth in early childhood, and moving through exploration, establishment, and maintenance of a career, into disengagement in later life. He also proposed that transition between stages or "maxi-cycles" was characterized by a "mini-cycle" or a recycling through the stages of growth, reexploration, and reestablishment.

Within each stage, Super proposed characteristic developmental tasks. Successful mastery of these tasks allows individuals to function effectively in their life roles within that stage, and prepares them for the next task. Successful coping with the requirements of each stage is dependent on the individual's career maturity. Career maturity—or readiness to master the developmental tasks of each stage—involves both attitudinal factors and cognitive factors.

A cadre of active researchers and theorists guarantee the continuation of Super's theoretical constructs despite his recent death (Blustein, 1997; Herr, 1997; Nevill, 1997; Phillips, 1997). For example, Savickas (1996, 1997) has advocated the modification of Super's construct of "career maturity" into "career adaptability," defined as "readiness to cope with changing work and work conditions" (Savickas, 1994, p. 58). Career adaptability may offer greater relevance for adult career development, may provide a bridging construct for integrating the diverse segments of Super's life span, life space theory (Savickas, 1997), and may connect Super's theory to the fields of industrial/organizational psychology (Goodman, 1994).

Empirical Evidence

Super's theory has received a great deal of attention and empirical support over the years, from Super and his colleagues, as well as a number of independent researchers. However, contemporary empirical attention has been scant (Osipow & Fitzgerald, 1996). One area of recent work is documenting the existence of career stages and their associated tasks, generally providing results that are concordant with earlier studies. Dix and Savickas (1995), for example, identified characteristic coping responses associated with each of the six developmental tasks in Super's establishment stage, in an occupationally diverse male sample. Smart and her colleagues have reported support for Super's stage-related propositions in samples of Australian employed adults. Smart and Peterson (1997) tested Super's idea of recycling, finding that adults in the midst of career changes indicated greater concern with exploration than nonchangers. Smart (1998) reported differential attitudes within career stages of Australian professional women; for example, pay satisfaction and job involvement were lowest among women in the exploration stage, and professional commitment and career involvement were highest among women in the maintenance stage.

Research regarding the construct of career maturity has waxed and waned since the 1970s, yet continues to occupy researchers' attention (Watkins & Subich, 1995). The use of the construct of "career adaptability" to supplant "career maturity" may infuse this line of research with some new energy (Goodman, 1994; Savickas, 1997). For example, a recent empirical study reported support for career adaptability by examining the interrelations among career concerns, values, and role salience in a sample of employed adult men (Duarte, 1995).

Super's theory also has spawned a body of research characterizing the process of career exploration (e.g., Blustein, 1997; Phillips & Blustein, 1994). Exploration has been linked to parental attachment (Ketterson & Blustein, 1997; Schultheiss & Blustein, 1994) and to college students' progress in career decision making (Blustein, Pauling, DeMania, & Faye, 1994). Further, adults exhibit varying patterns of exploratory behavior (Niles, Anderson, & Goodnough, 1998). These studies provide broader developmental underpinnings for Super's theoretical propositions, particularly as they relate to concepts from attachment theory (see Blustein, Prezioso, & Schultheiss, 1995, for a review of attachment theory and its relevance to career development).

In addition to recent empirical attention, a number of authors have written about applications or extensions of Super's theory, related to gender (Cook, 1994), sexual orientation (Dunkle, 1996), and self-efficacy research and Gottfredson's theory (Betz, 1994). Moreover, Super's theory has been applied extensively outside of the United States, for example, in South Africa (Stead & Watson, 1998), and Australia (Smart, 1998; Smart & Peterson, 1997).

Super's theory is intuitively appealing, and offers assistance in understanding the richness of an individual's career and life. Research on the theory, however, is plagued by the same difficulties inherent to all developmental models, including the overreliance on cross-sectional designs, insufficient attention to true longitudinal life span development, use of retrospective recall methodology, and circularity in definitions of stages. Although the theory's propositions are logical and have the potential to be clinically quite useful, they lack the operational specificity found in other theories.

Summary

Super's theory directed vocational psychologists' focus to life span career development, yet research has continued to focus primarily on the early adulthood stage of exploration. Even though evidence has accumulated about the antecedents and outcomes of exploration, there clearly is a need to further our knowledge about later stages of career development (Swanson, 1992; Watkins & Subich, 1995). Attention to tasks in Super's establishment and maintenance stages seems to have fallen to researchers interested in work adjustment, from the perspective of the TWA. Further, tasks related to the disengagement stage have received relatively little attention from vocational psychologists. Finally, Super's earliest stage of growth also has been virtually ignored by vocational psychologists (with the exception of Gottfredson, as noted in the next section). We continue to focus on the point of initial career choice, and not nearly enough on what precedes or follows it.

Gottfredson's Theory of Circumscription and Compromise

L.S. Gottfredson's (1981, 1996) theory seeks to explain why individuals' vocational expectations, even when they are children, vary by sex, race, and social class. "Circumscription" refers to the process by which children narrow their "zone of acceptable alternatives" by progressive and irreversible elimination of unacceptable alternatives, in an age-graded sequence.

Gottfredson's four-stage model of circumscription characterizes children as having an increasing capacity to think abstractly, and these cognitive changes are reflected in how children conceptualize the occupational world. In Stage One (ages three to five), children develop an orientation to size and power. They categorize people in simple ways, such as big versus little, and

they recognize observable differences between men and women. This recognition increases i Stage Two (ages six to eight), when children develop an orientation to sex roles. They tend to us dichotomous thinking, and use sex appropriateness to define their vocational aspirations. In thi stage, children construct their tolerable-sex type boundary.

Stage Three (ages 9 to 13) entails orientation to social valuation, or sensitivity to prestige an status. Adolescents establish their tolerable-level boundary to eliminate occupations that are unac ceptably low in prestige, and their tolerable-effort boundary to eliminate occupations that are to difficult to attain. Finally, in Stage Four (ages 14 and older), individuals develop their orientatio to the internal, unique self. Interests, values, and abilities are clarified, and occupational explo ration occurs within the zone of acceptable alternatives as circumscribed in earlier stages. Stage One through Three are focused on rejecting unacceptable alternatives. Stage Four is focused o identifying which of the acceptable alternatives are most preferred (L.S. Gottfredson, 1996), an begins the process of compromise.

"Compromise" in this instance entails the modification of alternatives due to inaccessibility leading to acceptance of less attractive alternatives. Gottfredson posited that sex type, prestige and field of interest are the three dimensions considered in the process of compromise. She furthe specified an order of compromise such that sex type is least likely, and field of interest mos likely, to be compromised. Most individuals will settle for a "good enough" choice rather than the best possible choice.

Gottfredson's theory seemed to address an important missing piece in the understanding of vocational behavior, and is useful in conceptualizing the compromises that individuals make, particularly related to sex-typed learning and experiences. However, the theory is quite difficult to examine empirically because of its focus on internal processes that occur early in childhood. Therefore, scrutiny of the evolving processes of circumscription and compromise is necessarily indirect. Most research has used retrospective methodology to assess circumscription, a procedure that is ultimately not at all satisfactory. Researchers have focused on instrumentation but, as L.S. Gottfredson and Lapan (1997) noted, no one has determined how to quantify the three-dimensional space required to fully depict an individual's occupational preferences.

Moreover, L.S. Gottfredson and Lapan (1997) discussed a conceptual shift inherent in Gottfredson's theory in comparison to other theories, namely, that early vocational development is a process of rejection or elimination, rather than one of selection or expansion. Although this view may be a more accurate picture of what occurs as individuals confront environmental barriers and limits, as a conceptual shift it may be somewhat antithetical to the philosophy underlying traditional vocational psychology theories.

Empirical Evidence

Published research regarding Gottfredson's theory has been sparse in the last few years, and, although it has been the focus of a number of unpublished doctoral dissertations, interest in examination of the theory seems to be in decline. Moreover, in contrast to other theories of career development, in which the theorists also conduct the majority of the relevant research, Gottfredson herself has conducted little empirical evaluation of the tenets of her theory. Two groups of researchers have served as the primary investigators of Gottfredson's theory: Hesketh and colleagues (e.g., Hesketh, Elmslie, & Kaldor, 1990; Hesketh & McLachlan, 1991); and Leung and colleagues (e.g., Leung, 1993; Leung, Conoley, & Scheel, 1994).

As with earlier research, the few recent published studies provide mixed results for Gottfredson's theoretical propositions. Lapan and Jingeleski (1992) provided support for the underlying dimensions of sex type and prestige levels, reporting a common perceptual map among eighth graders. Sex differences emerged along sex-typed lines in expected attainment, self-efficacy, and interest. Circumscription is predicted to be determined early and to remain stable, yet empirical results suggest that changes in occupational sex type and prestige occur through adolescence, and that the number

of considered occupational alternatives increases (Hall, Kelly, & Van Buren, 1995; Leung, 1993). Leung et al. (1994) reported consideration of higher prestige occupations with increasing age, consistent with Gottfredson's theory, but also consideration of a wide range of prestige levels, contrary to the theory.

The process of compromise also has received equivocal support. Perhaps most notable is that the order in which compromise was predicted to occur has not been supported. Contrary to Gottfredson's prediction that interest would be compromised first, prestige compromised second, and sex type compromised last, several studies have reported that sex type is least important in compromise situations (Hesketh et al., 1990; Leung, 1993). In fact, Leung (1993) reported that choices were more likely to be in the center of the sex-type continuum at later ages, a finding that corresponds to Tracey and Ward's (1998) report that sex-typed dimensions in interest structure are apparent in childhood, but not later in adolescence.

The use of retrospective methodology to examine circumscription continues to be problematic. For example, Leung (1993) excluded data from the earliest life period (age eight and under) due to the infrequency of participants' responses, which serves as an indicator of the difficulty of retrospective recall of early occupational aspirations. L.S. Gottfredson and Lapan (1997) argued that the value of previous research regarding compromise is not in the questions that have been answered, but rather in the identified difficulties in conceptualizing and assessing the occurrence of compromise.

Summary

Gottfredson's theory offers an interesting framework to conceptualize the development of aspirations in childhood, and is one of the few attempts to study specifically the period corresponding to Super's growth stage. However, it essentially remains quite difficult to test the theoretical propositions, and, unfortunately, an untestable theory is not particularly useful. Recent discussions of self-efficacy have been more explicitly included with Gottfredson's theory (L.S. Gottfredson & Lapan, 1997; Lapan & Jingeleski, 1992), suggesting that future efforts might focus on the convergence of Gottfredson's concepts with the social cognitive career theory.

Social Cognitive Career Theory

Bandura's (1986) reformulation of social cognitive theory has been accompanied by a steady stream of empirical work on the important roles of self-efficacy beliefs and other social cognitive constructs in career development. Social cognitive theory (Bandura, 1986) hypothesizes that individuals' behaviors are a function of the dynamic interplay between belief systems and environmental conditions. It suggests that self-efficacy beliefs, or individuals' beliefs about their abilities to carry out actions to reach a specific goal, determine whether an action will be pursued, how much effort will be expended in carrying out that action, persistence in the face of obstacles, and ultimate performance level. Also influential in guiding behavior are an individual's perceptions of probable response outcomes (outcome expectations) and the formation of goal intentions. Bandura advocated the concept of triadic reciprocality, a proposition that assumes that personal, environmental, and behavioral factors interact dynamically and bidirectionally.

Hackett and Betz (1981) were the first authors to describe the role of self-efficacy beliefs in the career domain. Their seminal work was followed by over a decade of research that clearly established the importance of self-efficacy beliefs in various stages of career development. To summarize this research, self-efficacy beliefs are related to career entry behaviors such as career interests and range of occupational considerations (Betz, Harmon, & Borgen, 1996; Bores-Rangel, Church, Szendre, & Reeves, 1990; Lapan, Boggs, & Morrill, 1989; Lenox & Subich, 1994; Lent, Larkin, & Brown, 1989; Rotberg, Brown, & Ware, 1987); academic and career performance and persistence (Bores-Rangel et al., 1990; Lent, Brown, & Larkin, 1984, 1986, 1987; Locke, Frederick, Lee, &

Bobko, 1984; Multon, Brown, & Lent, 1991); and other career-relevant behaviors such as the use of computers (Hill, Smith, & Mann, 1987).

Research on the role of social cognitive factors in career development intensified following the introduction of social cognitive career theory (SCCT; Lent, Brown, & Hackett, 1994). These authors proposed three interrelated and dynamic models of academic and career-related interest, choice, and performance. According to this theory, an individual's exposure to academic and career-related experiences is a function of environmental and personal factors (e.g., socioeconomic status, genetics, personality variables). The development of important social cognitive variables such as self-efficacy beliefs and outcome expectations is dependent on an individual's experience, and these factors develop according to mechanisms described by Bandura (1986). An individual's self-efficacy beliefs and outcome expectations, in turn, relate to the development of academic and career-related interests. In short, people will develop interests in activities for which they have strong positive self-efficacy beliefs and for which they perceive desirable and probable outcomes.

In the absence of environmental barriers and in the presence of environmental support, interests translate into academic or career goals and, ultimately, academic- or career-related behaviors (e.g., course enrollment, occupational information seeking activities, job search behaviors). Consistent with the dynamic nature of social cognitive theory, SCCT holds that the outcome of such behaviors will provide valuable feedback for the further development of self-efficacy beliefs and outcome expectations. Thus, interest development and choice behaviors are a function of lifelong exposure to experiences, cognitive appraisal of those experiences, and the presence or absence of environmental obstacles.

Empirical Support

Research on aspects of SCCT has been intense during the last decade. Evidence of this can be seen in the widespread application of this theory (e.g., Bishop & Bieschke, 1998; Brown, Lent, Ryan, & McPartland, 1996; Chartrand & Rose, 1996; Hackett & Byars, 1996; S.L. Morrow, Gore, & Campbell, 1996; O'Brien & Heppner, 1996; O'Brien, Heppner, Flores, & Bikos, 1997); the publication of a special issue of the *Career Development Quarterly* (Volume 44, Number 4) on the application of social cognitive career theory to career counseling; and the rapid growth of measures of theoretical constructs (Betz, Borgen, & Harmon, 1996; Fouad, Smith, & Enochs, 1997; O'Brien et al., 1997; Rooney & Osipow, 1992). SCCT yields a number of very specific and testable hypotheses, many of which have been explored empirically. Although a comprehensive review of the SCCT literature is beyond the scope of this chapter, we attempt to summarize those theoretical propositions that have received the most attention.

SCCT's assertion that interests are positively related to self-efficacy beliefs and outcome expectations has received a great deal of attention from researchers. Lent et al. (1994) reported effect size estimates for the relationship between interests and self-efficacy beliefs (.53) and outcome expectations (.52) in their outline of SCCT. Similar effect sizes have been reported in a number of additional studies (Betz, Harmon, et al., 1996; Bieschke, Bishop, & Garcia, 1996; Fouad & Smith, 1996; Lapan, Shaughnessy, & Boggs, 1996; Lenox & Subich, 1994; Lopez, Lent, Brown, & Gore, 1997). Fouad and Smith (1996), for example, used path analysis to explore the relations among measures of math and science self-efficacy, outcome expectations, interests, and intentions, in a large sample of ethnically diverse middle-school children. Both outcome expectations and self-efficacy beliefs were positively related to interests (path coefficients of .18 and .29, respectively) and intentions (path coefficients of .39 and .13, respectively). Moreover, self-efficacy beliefs and outcome expectations were highly intercorrelated (path coefficient = .55), and model fit statistics provided strong support for the exploratory utility of the SCCT model among different ethnic groups. In a related study, Lopez et al. (1997) found very similar

relationships among interests, self-efficacy beliefs, and outcome expectations in a sample of high school students.

Although empirical evidence supporting the relationships among self-efficacy beliefs, outcome expectations, and interests is substantial, there are a number of hypotheses that derive from this observation that have not yet been fully explored. For example, SCCT hypothesizes that changes in self-efficacy beliefs or outcome expectations will lead to changes in interests, and that self-efficacy beliefs and outcome expectations stabilize in late adolescence or early adulthood—a finding consistently reported in the interest measurement literature (Swanson, 1999). Research on these topics would be invaluable as practitioners begin to implement the concepts outlined in SCCT.

Lent et al. (1994) proposed that (1) self-efficacy beliefs are positively related to academic and career performance, (2) the relationship between abilities and outcomes will be partially mediated by self-efficacy beliefs and goals, and (3) the relationship between abilities and interests will be fully mediated by self-efficacy beliefs. Evidence in support of the first hypothesis continues to accumulate. For example, Multon et al. (1991) reported the results of a meta-analysis of the relationship between self-efficacy beliefs and academic performance and persistence. They found positive relationships between self-efficacy beliefs and academic performance (.38) and persistence (.34). The relationships between self-efficacy beliefs and academic outcomes tended to be larger with increased academic experience and when outcomes were measured following an intervention designed to bolster self-efficacy beliefs. Finally, these authors reported a stronger relationship for low-achieving students. Findings from additional studies (Hackett, Betz, Casas, & Rocha-Singh, 1992; Lent, Brown, & Gore, 1997; Lent, Lopez, & Bieschke, 1993; Lopez et al., 1997; Pajares & Miller, 1995; Schaefers, Epperson, & Nauta, 1997) provide clear evidence in support of the relationship between academic self-efficacy beliefs and academic performance (average $r = .42$ for content-specific performance measures and .28 for nonspecific performance measures).

Studies focusing on the mediating role of self-efficacy in the relationship between abilities and interests, and abilities and performance, are far less common. Lent et al. (1994) reported effect sizes from a small number of studies. They observed a modest relationship between abilities and interests ($r = .20$) that was completely eliminated when the effects of self-efficacy beliefs were controlled. These results suggest that self-efficacy beliefs fully mediate the relationship between abilities and interests but only partially mediate the relationship between past achievement and performance. In addition to the mediating role of self-efficacy beliefs, some studies have observed circumstances in which self-efficacy may moderate the relationship between abilities and performance. Brown, Lent, and Larkin (1989), for example, described an interaction effect between ability level and self-efficacy beliefs for academic requirements. Specifically, academic outcomes of lower aptitude students were facilitated by high self-efficacy beliefs, whereas the academic outcomes of higher aptitude students were unaffected by self-efficacy beliefs.

Consistent with Bandura's (1986) theory, SCCT hypothesizes that self-efficacy beliefs and outcome expectations develop as a result of four mechanisms (personal performance accomplishments, social persuasion, vicarious learning, and physiological reactions or emotional arousal). Using confirmatory factor analysis procedures, Lent, Lopez, Brown, and Gore (1996) found strong support for a theoretically consistent four-factor model of mathematics self-efficacy sources in high school and college students (Comparative Fit Index = .99). Other investigators (Lent, Brown, Gover, & Nijjer, 1996; Lent et al., 1991; Lopez & Lent, 1992; Lopez et al., 1997; Matsui, Matsui, & Ohnishi, 1990) consistently report that personal performance accomplishments are the strongest predictors of mathematics self-efficacy. Four of these studies (Lent et al., 1991; Lopez & Lent, 1992; Lopez et al., 1997; Matsui et al., 1990) provided sufficient information to calculate simple effect sizes. Personal performance accomplishments accounted for, on average,

32% of the variance in self-efficacy belief scores, whereas vicarious learning, verbal persuasion, and emotional arousal accounted for less variance (4%, 9%, and 7%, respectively) across studies. Lent, Brown, et al. (1996) employed a qualitative approach to the study of sources of self-efficacy beliefs and found that most individuals list personal performance accomplishments as the primary factor influencing their self-efficacy beliefs. Respondents also listed vicarious learning and physiological arousal experiences but far less frequently. Interestingly, respondents failed to list any instances of social persuasion in this study.

Most experimental studies of the relationship between sources of self-efficacy and self-efficacy estimates have, not surprisingly, concentrated on the role of personal performance accomplishments (N.K. Campbell & Hackett, 1986; Hackett, Betz, O'Halloran, & Romac, 1990; Hackett & Campbell, 1987). Results from these studies suggest that self-efficacy beliefs can be enhanced through successful performance experiences. Similar support for the role of vicarious learning in the development of self-efficacy beliefs can be found in the educational psychology literature (Schunk & Hanson, 1985; Schunk, Hanson, & Cox, 1987).

In sharp contrast to the growing body of evidence supporting the sources of self-efficacy beliefs, empirical support for the sources of career-related outcome expectations is lacking. The paucity of specific investigations on the sources of outcome expectations and more general research on the role of outcome expectations in career processes may be attributable, in part, to measurement deficiencies. Whereas measures of occupational and task specific self-efficacy continue to surface, fewer measures of outcome expectations have been reported. The most recent measures of outcome expectations (Fouad & Smith, 1996; Lent, Lopez, & Bieschke, 1993) require participants to respond with an indication of agreement to statements of positive outcomes. One may argue that these measures only implicitly incorporate both value (valence) and expectancy elements—relatively independent conceptual components that career researchers and practitioners recognize as important determinants in career decision making (Locke & Henne, 1986; Mitchell & Krumboltz, 1984; Vroom, 1964). However, Brooks and Betz (1990) provide some evidence that suggests that expectancy estimates alone predict choice behavior, as well as the product of expectancy and valence. Most investigators would probably agree that a great deal of fundamental measurement work still remains before the assessment of outcome expectations attains the levels already achieved in measuring other social cognitive constructs such as self-efficacy beliefs and interests.

A number of investigators have focused on the construct validity of measures of self-efficacy beliefs. For example, Betz and Klein (1996) reported that various measures of self-efficacy beliefs (e.g., career decision making self-efficacy, Skills Confidence Inventory [SCI] scores, occupational self-efficacy) correlated more highly with one another than they did with a measure of self-esteem. In a confirmatory factor analytic study, Lent et al. (1997) reported that self-efficacy beliefs at various levels of measurement specificity (broad academic milestones self-efficacy, mathematics course–specific self-efficacy, and math problem solving self-efficacy) were empirically distinguishable from measures of academic self-concept and academic adjustment. Finally, Betz, Harmon, et al. (1996) reported bivariate correlations between Strong Interest Inventory General Occupational Theme (GOT) scores and scores on the recently developed SCI. Although they reported generally strong positive correlations between GOT and SCI scores within the same Holland dimension (average $r = .47$), the observed correlations were not so high as to suggest that the scales were measuring the same underlying dimension.

Given the wealth of empirical findings generated by researchers investigating social cognitive determinants of career development, choice, and performance, it is not surprising that a number of authors are now writing about the clinical utility of SCCT. Several authors have focused on the application of SCCT to the special issues faced by specific client populations (e.g., Chartrand & Rose, 1996; Hackett & Byars, 1996; S.L. Morrow et al., 1996). Brown and Lent (1996) outlined a number of specific strategies for assisting clients who are experiencing career choice difficulties

and for working with clients who may fail to implement career-related interests or goals due to the presence of career barriers. Swanson and Woitke (1997) provided additional recommendations related to addressing perceived barriers. Finally, Brown and Lent encourage counselors to work with their clients to identify and engage in academic- and career-related experiences that will bolster self-efficacy beliefs and provide accurate outcome expectation information.

Summary

Social cognitive career theory has had a significant impact on vocational psychology in the last decade. Although clearly stressing the importance of social cognitive constructs, SCCT also adopts a constructivist perspective, acknowledges the role of personal and contextual variables on the career trajectories of individuals, and embraces the role of personal agency in the formation of cognitions and goals. It was developed in response to a decade of work on the role of self-efficacy beliefs in career and academic decision making and performance, and it has received a great deal of empirical attention—due in part to the precise elaboration of its propositions and hypothesis.

Empirical support for the propositions outlined by SCCT is strong and growing. Investigators continue to study the often complex relationships among important social cognitive constructs, and to explore the relationship between these variables and important career behaviors. Researchers continue to focus on important measurement issues and the developmental etiology of adult career constructs. Given the consistent empirical findings, it is not surprising that some vocational psychologists are now beginning to turn their attention to the application of this theory to career counseling practice.

Despite the literature that has accumulated since the publication of SCCT, a number of specific propositions and measurement issues have not yet received attention. Noticeably missing from the literature are studies that explore the role of early contextual influences. Although Lent et al. (1994) clearly emphasized the central role of self-efficacy beliefs, outcome expectations, interests, and goal behaviors in their model, they also stressed the important role of personal and contextual affordances. Research on the early influence of personal and contextual variables is likely to introduce career researchers to a previously underresearched population (namely, children) and to bodies of literature that speak to the development of self-percepts and the performance of younger children (developmental and educational psychology). Such research could significantly contribute to our understanding of the early development of academic self-efficacy beliefs, the origin of academic and career outcome expectations, and the agonistic or antagonistic effects of personal and environmental factors on children's early learning experiences (see Arbona, this volume).

Of equal importance are studies designed to investigate the moderating role of personal and contextual variables at a point more proximal to important academic and career choice points (e.g., late adolescence and early adulthood). SCCT describes the smooth translation of academic- and career-related interests into goal intentions, and goals into actions, but it also describes the moderating role of personal and contextual variables in this process. A number of authors have speculated on the role of active and passive discrimination at all stages of career development (Chartrand & Rose, 1996; Hackett & Byars, 1996; S.L. Morrow et al., 1996), yet few studies have explored the effects of social-environmental and personal factors on the translation of interests into goals and goals into actions.

A separate line of research has examined perceptions of career barriers (McWhirter, 1997; Swanson & Tokar, 1991a, 1991b). This research recently has been recast within the framework of SCCT (Swanson, Daniels, & Tokar, 1996; Swanson & Woitke, 1997), offering new directions in exploring the role of perceived barriers in the implementation of interests, choice, and performance. For example, Swanson et al. speculated that barriers may be construed as equivalent to self-efficacy beliefs, to outcome expectations, or as mediating the relationship among constructs within SCCT, depending on the type of barrier under consideration.

From a measurement standpoint, we know a great deal about the relationships among social cognitive constructs and career outcomes in the math and science realm. Far less, however, is known about the role of social cognitive variables in other domains. Several recent attempts at extending SCCT beyond the math and science boundary are worthy of the reader's attention (Bieschke et al., 1996; Bores-Rangel et al., 1990; Brown et al., 1996; Church, Teresa, Rosebrook, & Szendre, 1992; O'Brien & Heppner, 1996; O'Brien et al., 1997; Vasil, 1992). The successful application of self-efficacy belief measures to other career-relevant behavioral domains is likely to result in important recommendations for practicing career professionals.

Issues of Diversity in Career Development Theories

All behavior—including vocational behavior—occurs within a cultural context. Individuals are shaped through the differential exposure that occurs according to gender, race/ethnicity, sexual orientation, socioeconomic status, and disability—factors that help to form individuals' environments and their life experiences, as well as their responses to the environment. An understanding of human behavior would not be complete without acknowledgment of cultural context (see Fouad & Brown, this volume). Although a comprehensive review of the literature regarding issues of diversity in vocational psychology is beyond the scope of this chapter, it is crucial to acknowledge the important advances that have occurred in the past decade and to encourage further theoretical development and empirical study.

Research and theory regarding issues of diversity in vocational psychology seem to be undergoing a paradigmatic shift. Early work focused on between-group differences, such as comparing career maturity scores of African American and Caucasian students. The next stage of research focused more on within-group differences, and investigated variables such as racial-identity attitudes or perceptions of opportunity structure among African Americans. These dual foci are logical places to begin when little is known about a group of individuals who "deviate" from established theory or knowledge—that is, whose vocational behavior may be substantially different from the groups who have received the bulk of research attention (middle class, Caucasian, male, heterosexual, able-bodied) for a multitude of reasons.

There are, however, recent signs that issues of diversity are being increasingly integrated into the "mainstream" of vocational psychology (and counseling psychology); put another way, contextual issues surrounding vocational behavior are beginning to be fully considered. This shift is by no means universal or uniform: Some groups have received more consistent attention, and the resultant body of research has thus developed to a point where theoretical integration is possible. For example, years of research into women's career development has paved the way for a more fundamental consideration of the role of gender in career choice (Cook, 1994; Phillips & Imhoff, 1997).

An unresolved issue regarding vocational psychology of diverse populations is whether it is necessary to develop separate theories versus expanding existing theories or developing new theories that encompass diverse experiences of a wider range of individuals (Harmon, 1997; Leong & Brown, 1995; Meara, 1997). Some theories are more adaptable to the diversity of human experience, and some include constructs that provide explanation for differences in experience. A conference sponsored by the Division 17 Section on Women, held at Michigan State University in October 1998, endeavored to place gender, race/ethnicity, and sexual orientation squarely in the center of counseling psychology research and practice. Another landmark conference was held by the Society for Vocational Psychology at the University of Wisconsin-Milwaukee in May 1999 to consider the impact of contextual factors in career development.

Gender Issues

Research regarding women's career development continues to be in the forefront of scholarly inquiry, and has been characterized as "the most active and vibrant area of research in all vocational

psychology (Fitzgerald, Fassinger, & Betz, 1995, p. 67). Newer research is beginning to fully consider the contextual impact of gender in women's and men's lives. For example, several recent studies examining the career development of highly achieving women provide rich descriptions of the complex intersection of work and personal aspects (Richie et al., 1997; Williams et al., 1998). Meara (1997) provided a cogent example of the way in which gender permeates *all* aspects of career development—from daily work decisions, to permeability of work and family boundaries, to issues of workplace justice—and, therefore, needs to be fully incorporated into career development theory.

Race/Ethnicity

Racial discrimination and economic conditions have strongly affected the career behavior of racial/ethnic minorities in the United States, but have not been taken into account in most traditional career development theories or career counseling practice (Fitzgerald & Betz, 1994; Leung, 1995). Such external issues as discrimination and poverty have a disproportionate effect on racial/ethnic groups, limiting the options that individuals may consider and restricting their access to a wide variety of opportunities (Fitzgerald & Betz, 1994). The strong relationships between socioeconomic status and educational attainment and occupational level have led to a continuous cycle of poor and poorly educated minority individuals.

No one theoretical framework has been developed to explain the career behavior of racial/ethnic minorities (Leong & Brown, 1995). Rather, writers have focused on the delivery of culturally appropriate career counseling, and some also have described models for appropriate intervention. Three complementary models have recently been developed to help counselors conceptualize ways to incorporate culture into career counseling. The most comprehensive model is Leong and Hartung's (1997) integrative-sequential conceptual framework for career counseling. Leung's (1995) model focuses on career interventions, and Fouad and Bingham's (1995) model delineates the career counseling process, identifying specific areas in which culture may play a role.

Future research regarding the influence of race/ethnicity in vocational behavior could benefit from the same ideas espoused earlier regarding gender issues. Namely, we need to move beyond studies of racial/ethnic differences in career choice to a fuller understanding of the academic and career experiences of racial/ethnic minorities.

Gay/Lesbian/Bisexual Issues

The past five years have witnessed a substantial growth in literature regarding career development and vocational behavior of gay/lesbian/bisexual (GLB) individuals, in contrast to previous reviews suggesting little attention (Watkins & Subich, 1995). Much of the literature has been conceptual in nature, discussing career development issues for GLB individuals (Chung, 1995; Elliott, 1993; Fassinger, 1996a, 1996b; Prince, 1995). Several authors have addressed issues related to career assessment (Prince, 1997) and career counseling interventions (Chojnacki & Gelberg, 1994; Croteau & Thiel, 1993; Pope, 1995).

A recent special issue of the *Journal of Vocational Behavior* provided much-needed theoretical and methodological framework for future study regarding GLB career issues (Croteau & Bieschke, 1996; Lonborg & Phillips, 1996), including articles describing the utility of existing theories of career development, as noted earlier (Dunkle, 1996; Mobley & Slaney, 1996; S.L. Morrow et al., 1996). In contrast to the conceptual and practice-based articles, there is a dearth of empirical evidence regarding the career behavior of GLB individuals (for exceptions, see Boatwright, Gilbert, Forrest, & Ketzenberger, 1996; Chung & Harmon, 1994). Some of the conceptual articles provided specific hypotheses derived from existing theories (e.g., Mobley & Slaney, 1996). It is important not to assume that career development issues are the same for lesbian women and gay men, given the overlay of gender issues with sexual identity issues.

Because attention to GLB issues is relatively recent, it is not as fully "evolved" as other research, and has not been fully integrated into consideration of cultural context. Betz and Fitzgerald

(1993) cited GLB research as an example of the trend from "pathology to diversity" in how issues are viewed within counseling psychology research.

Theory Convergence

The preceding sections attest to the health of theory-building and theory-testing efforts in the field of career psychology. The trait-factor career counseling theory of Frank Parsons has been joined by additional person-environment fit theories, as well as developmental theories and theories that emphasize learning mechanisms and cognitions. It is clear from conceptual and empirical work that the field can no longer ignore the role of gender, ethnicity, culture, and socioeconomics in the process of career development (e.g., L.S. Gottfredson, 1981; Lent et al., 1994; Richardson, 1993). Most counseling psychologists would probably agree that understanding of career development has benefited greatly from the diverse theoretical work already described and from the theories preceding them.

Some authors, however, have argued that theoretical diversity can outlive its usefulness (Goldfried & Padawer, 1982) and that there comes a time in the evolution of a field when the benefits of theory convergence outweigh those provided by healthy competition among theories. Writers in the areas of psychotherapy process research and those espousing a unificationist position in psychology are addressing these issues. More recently, a number of prominent vocational psychologists recognized the potential benefits of looking at extant career theories through a concave or convergent lens. As a result of several articles celebrating the twentieth anniversary of the *Journal of Vocational Psychology* (Borgen, 1991; Hackett et al., 1991; Osipow, 1990; Super, 1992), a special conference was convened at Michigan State University to address the prospects of career theory convergence. This conference was hosted by the Vocational Behavior and Career Intervention Special Interest Group of Division 17 of the American Psychological Association (now called the Society for Vocational Psychology).

The authors of leading career theories (John Holland, René Dawis, Donald Super, John Krumboltz, and Edward Bordin) were invited to attend and to outline their views on theory convergence, including a discussion of possible bridges among theories. The authors differed considerably in their endorsement of efforts toward theory convergence, but all identified a number of possible points of overlap. For example, Krumboltz (1994) noted similarities between self-observation generalizations and Super's notion of vocational self-concept, and Holland (1994) described how Krumboltz's theory might be used to understand the development of RIASEC work personalities. In short, although these authors were not generally in favor of the development of one unifying theory of career development, they were able to acknowledge substantive overlap among theories. The proceedings from this conference were published in a book (Savickas & Lent, 1994) that includes the papers delivered by the major theorists listed, in addition to thoughtful discussions of specific bridge-building constructs written by prominent vocational researchers.

This theory convergence conference was followed by a second conference, entitled "Toward the Convergence of Career Theory and Practice," hosted by the Society for Vocational Psychology. The second conference was convened to address the perceived lack of practical utility of career theory to practice. The conference proceedings were recently published (Savickas & Walsh, 1996) and address two primary questions: Can career theory adequately inform practice? Can there ever be a theory of career practice?

Despite the energy invested in debating the possibilities, to date there are remarkably few studies that directly compare constructs from competing or even complementary theories (e.g., Lent et al., 1987; Rounds, 1990). As noted in previous sections, there are clear points of overlap among theories, with specific areas in which researchers could forge conceptual and empirical bridges.

There appear to be several potentially beneficial linkages among theories of career development. For example, social cognitive career theory (Lent et al., 1994) describes several very specific

mechanisms that influence the development of interests—mechanisms that were alluded to, but not fully elaborated on, in Holland's theory. These theories already have been merged in the form of inventories such as the SCI (Betz, Borgen, et al., 1996), where social cognitive constructs such as self-efficacy beliefs are organized using Holland RIASEC types. Our understanding of the nature of work personalities would certainly benefit from studies focusing on the acquisition of interests in early childhood and adolescence through the dual lenses of Gottfredson's theory of circumscription and Lent et al.'s SCCT. Social cognitive mechanisms such as vicarious learning, personal performance accomplishments, and persuasion would seem to be logical targets for such investigations, especially as they relate to how children establish tolerable-effort boundaries between the ages of 9 and 13. Social cognitive constructs such as self-efficacy beliefs and outcome expectations might also be investigated for their ability to predict variance in career choice and satisfaction beyond that predicted by occupational congruence. Finally, self-efficacy beliefs for a wide variety of different behaviors (e.g., coping, social anxiety) might help to explain important career outcomes, such as performance, persistence, and satisfaction, in Holland's theory.

Other potential overlaps also exist. For example, the TWA describes the importance of vocational needs and their reinforcement by work environments. The perception of need reinforcement might contribute to vocational satisfaction in a way that is entirely complementary to contributions made by congruence. Preliminary exploration of this idea has yielded promising results (Rounds, 1990). Finally, Gottfredson's developmental theory might be used to explore gender and socioeconomic influences on the development or manifestation of work personalities.

VOCATIONAL INTERESTS

The study of vocational interests has occupied a central role in counseling psychology research for nearly a century, and the past few decades are no exception. One reason for the recent flurry of activity is a major overhaul of the Strong Interest Inventory (Harmon, Hansen, Borgen, & Hammer, 1994), with the introduction of a companion instrument to measure self-efficacy, the SCI. A second reason is the work focused on describing the structural underpinnings of interests, typically vis-à-vis Holland's model. In addition to the empirical literature, in 1997 a conference sponsored by the Society for Vocational Psychology highlighted theoretical and practical issues in interest measurement (Savickas & Spokane, 1999). In this section, we provide an update of theory and research regarding vocational interests occurring since Hansen's (1984) chapter in the first edition of the *Handbook*.

Origin, Development, and Stability

A clear gap in the theoretical understanding regarding vocational interests is their origin and development over the life span. Barak (1981) proposed a model of interest development, in which three cognitive factors (perceived ability, expected success, and anticipated satisfaction) determine an individual's interests. Surprisingly, Barak's model has received relatively little attention, in spite of its convergence with Bandura's (1986) construct of self-efficacy, as well as with social cognitive career theory (Lent et al., 1994). Some empirical support has been reported by Barak and his colleagues. For example, in an experimental manipulation, preschool children expressed greater preference for activities when they were followed by cognitive restructuring, in comparison to behavioral reinforcement or no intervention (Barak, Shiloh, & Hauschner, 1992).

Tracey and Ward (1998) described an inventory to measure children's interests and perceptions of competence, providing the type of instrumentation necessary to begin to examine questions regarding the origin and development of interests and emergence of the circular RIASEC structure. Their results demonstrated differences in structure by age (using elementary, middle school, and

college-aged cross-sectional samples), suggesting the importance of sex typing in the early years as theorized by Roe (1957) and L.S. Gottfredson (1981). In addition, they reported an age-related increase in fit of the circular RIASEC model to the data.

Concern about the long-term stability or "permanence" of interests began as early as the 1930s: "[I]f interests change from year to year, they are not trustworthy guides to the choice of a career" (Strong, 1931, p. 3). The accumulated evidence since that time suggests that interests are quite stable, at least when viewed from a group perspective. People in general have stable interests, as do members of specific occupations (D.P. Campbell, 1966; Strong, 1931). Using test-retest correlations as an indicator of stability reveals coefficients ranging from .54 to .84, over intervals ranging from 1 year to 23 years (Johansson & Campbell, 1971).

Despite the evidence for interest stability, there also are considerable individual differences in interest stability: Some individuals demonstrate remarkably stable interests over time, whereas others have interest profiles that show substantial change, as evidenced by intraindividual correlation coefficients ranging from –.31 to .98 when examined over 3- to 12-year intervals (Hansen & Stocco, 1980; Hansen & Swanson, 1983; Lubinski, Benbow, & Ryan, 1995; Rohe & Krause, 1998; Swanson & Hansen, 1988). We do not know, however, what leads to a change in vocational interests, nor whether interest stability or change can be predicted, although some of social cognitive career theory's hypotheses offer possibilities for future investigation. Further, little is known about individual differences in stability of interests beyond the end of the college years. Previous results have focused primarily on time intervals spanning the period of formal education, with less attention paid to posteducational stability of interests (Swanson, 1999).

Structure

Concern about the dimensionality underlying vocational interests also has been ongoing since the 1930s, when E.K. Strong gave interest data to Thurstone to factor analyze (Betsworth & Fouad, 1997; Hansen, 1996; Tracey & Rounds, 1995). The search for structural dimensions underlying interests has accelerated substantially in the last few years, presumably because of the theoretical and practical significance in understanding how interests are characterized. Two primary themes are evident in recent research: investigation of the degree to which models are universal across diverse groups, and rethinking the manner in which structural models are conceptualized.

Universality of Structural Models

The vast majority of research examining the structural properties of vocational interests has used Holland's model as a basis. Evidence of structural invariance has consequences for theoretical understanding of interests, but also for use of interest inventories with clients. Structural comparisons provide a different perspective than do examinations of mean differences in interests. For example, mean score sex differences in interests are well documented, yet such differences do not necessarily imply structural sex differences; thus, both types of investigation are necessary.

Studies of the adequacy of the fit of Holland's theory to the structure of interests distinguish between tests of the circular order model and tests of the equidistant hexagonal or circumplex model (Fouad, Harmon, & Borgen, 1997; Rounds & Tracey, 1996). The former requires that the six types be arranged in the order specified by Holland, with adjacent types more highly related than opposing types. The latter model is more stringent, adding a requirement that the six types be arranged with equal distances among them. Studies typically employ a comparative approach, with three primary foci of attention regarding structural invariance: sex, U.S. racial-ethnic minority groups, and international populations.

Although earlier research suggested differences in the way interests are structured across groups, evidence is now accumulating for considerable invariance in the structure of interests. In particular, several recent efforts have demonstrated remarkable invariance (Day & Rounds, 1998;

Day, Rounds, & Swaney, 1998), as evidenced by virtually identical multidimensional scaling analysis patterns across sex and racial/ethnic group membership. In contrast to previous results, these analyses suggest that although mean differences continue to be evidenced among groups, the theoretical models underlying interests seem to provide equally adequate representations for a variety of individuals.

Evidence of sex differences in the strength of interests has been among the most incontrovertible findings in vocational psychology (Hansen, 1984). These differences have been found at the level of items and scales, and are apparent within and across occupational groups. Examining evidence regarding structural differences by sex, however, reveals a different picture. Several studies documented differences between men and women in the underlying structure of interests (Fouad et al., 1997; Hansen, Collins, Swanson, & Fouad, 1993), whereas meta-analyses suggest minimal differences (Anderson, Tracey, & Rounds, 1997; Day & Rounds, 1998; Ryan, Tracey, & Rounds, 1996).

Hansen et al. (1993) used the reference samples from the 1985 revision of the Strong to demonstrate support for the hypothesized circular ordering of Holland's model (RIASEC), but not for the circumplex arrangement that entails equidistance between points. This deviation from the hexagonal shape was particularly noticeable for women, for whom the plotted points for realistic and investigative collapsed onto one another.

In contrast, several studies showed little evidence for sex differences in interest structure. Ryan et al. (1996) reported no differences by sex or race, but did find differences in interest structure when socioeconomic status was jointly considered with race and sex. Anderson et al. (1997) examined seven male/female pairs of general occupational theme correlation matrices collected from 1974 to 1994, concluding that there was no evidence to support differential fit. Tracey's (1997) comparison of a hypothesized three-dimensional spherical structure underlying three different types of data—preferences for occupations, preferences for activities, and self-efficacy expectations—revealed sex differences in mean scale scores, but not in the fit of the model to the data. He interpreted these results to suggest that observed sex differences in actual prestige in occupational attainment may be due to lack of opportunity rather than lack of interest.

As with sex differences, persistent and substantial racial/ethnic differences have been documented in mean scores on interest inventories (Carter & Swanson, 1990). However, the structure of interests was not investigated until recently, and, as with sex differences, mean group differences do not necessarily imply the existence of group structural differences. Initial studies that focused on structural invariance found discrepancies from Holland's circumplex model.

Similar to the research on sex differences, recent research using large and representative samples has shown that the structure of interests is also invariant across race and ethnicity. For example, Fouad et al. (1997) examined dimensions underlying four racial/ethnic groups (including over 38,000 individuals) collected as part of the 1994 revision of the Strong Interest Inventory. They reported support for the circular structure for all eight groups (race-ethnicity by sex), but no support for the equidistant hexagonal structure for any of the groups.

Two other recent studies presented strong evidence for the universality of interest structure among U.S. racial/ethnic minority groups (Day & Rounds, 1998; Day et al., 1998). In each case, the researchers examined UNIACT data from large samples (e.g., nearly 50,000 college-bound students) and reported virtually identical mapping of the data/ideas and people/things dimensions for 10 groups (5 ethnic groups by sex). They concluded that sampling may have been a factor in earlier studies that documented racial/ethnic differences in interest structure and that their results may differ from earlier studies because of the use of UNIACT items, which measure only activities (versus, for example, occupational titles, which are common to other inventories).

Structure of interests also has been investigated in international samples, including Bolivian college students (Glidden-Tracey & Parraga, 1996), Japanese college students (Tracey, Watanabe, & Schneider, 1997), and Mexican engineering and law students (Fouad & Dancer, 1992) with

varying degrees of fit, some very poor. These cross-national studies are fraught with confoun problems that limit their generalizability, such as adequacy of translations of inventories and c language issues, potential variation in the content and opportunity in occupations in diffe countries, and sampling issues.

Organization of these studies by topical area (that is, sex, race/ethnicity, country of origin) gests equivocal conclusions about the universality of interest structures. However, examinin literature chronologically suggests an emerging agreement about universality, particularl large, representative samples. Methodological and psychometric advances provided new rigo techniques for examining conformity of models to data. Most research has found support fo circular RIASEC arrangement of Holland types, but less support for the hexagonal or circum structure.

Most recently, researchers are beginning to call for a shift in attention from the relative ut of Holland's model to the antecedents and consequences of observed differences in interest st tures (Anderson et al., 1997). This shift reflects a willingness to accept the universalit Holland's model as an adequate representation of interests (Day & Rounds, 1998; Day et al., 1 Rounds & Day, 1999) and a desire to move beyond structural concerns to other issues. Obse differences in the strength of interests or in structural representations may be viewed as clu differential perceptions and experiences of the world of work, or as a "source for theorizing a cultural influences on interests" (Haverkamp, Collins, & Hansen, 1994).

Thus, there has been substantial convergence on the universality of Holland's model as a re sentation of interests, although there remain some nagging questions about the extent of devia and their meaning. In the context of sex differences, Anderson et al. (1997) suggested that fu research should "focus on understanding the development or implications of those differe rather than on the relative validity of Holland's model" (p. 362).

New Perspectives

The second major theme in the past decade entails new directions regarding the structure of i ests, which may be characterized as efforts to "think outside (and inside) the hexagon" (Su 1992). Several researchers have focused on further modifications of Holland's model. Pre and colleagues (Prediger, 1982, 1996; Prediger, Swaney, & Mau, 1993; Prediger & Vansi 1992) have emphasized a two-dimensional structure underlying Holland's model, suggesting data-ideas and people-things offer a parsimonious, and more complete, description of the tional interest space. Others have suggested alternative two-dimensional arrangements, essent rotations of orthogonal dimensions in the hexagonal space (Hogan, 1983; Rounds & Tracey, 1 Tokar & Fischer, 1998).

By far, the most prolific team of researchers regarding structure of interests is led by Tr and Rounds. They have examined all of the alternative theoretical models of the structure u lying interests, including Holland's hexagonal model, Gati's (1991) hierarchical model (Trac Rounds, 1993), and Roe's circular structure (Tracey & Rounds, 1994). They also have devel methodological advances for evaluating interest structures (Rounds, 1995; Rounds, Trace Hubert, 1992).

Consequences of the efforts by Tracey and Rounds have been twofold. First, they called a tion to the fundamental nature of the dominant model in vocational psychology (Tracey & Ro 1995). They convincingly argued that the number of points in Holland's circular model is trary: The use of six categories may be no more than a convenient representation of the stru of individuals' interests and occupational environments. A six-category system, however, ha come reified through the widespread application of Holland's theory. Use of a greater numb defined points may clarify the relation of interest types to underlying dimensions, such as proposed by Prediger (1982) or Hogan (1983), or to interdomain relationships (see next sec This disarmingly simple idea has raised the possibility of deviating from the six-point circu while still maintaining its circular arrangement.

Second, they proposed the addition of a third dimension to Holland's theory—prestige. Incorporation of the prestige dimension results in an innovative three-dimensional spherical model of vocational interest space, essentially as the intersection of three separate circumplexes resulting from the three dimensions each paired with one another. Although not without its critics (cf. Borgen & Donnay, 1996), the spherical model has served a heuristic purpose and continues to undergo examination by its proponents. For example, Tracey (1997) examined the spherical structure of interests in combination with a measure of self-efficacy expectations, and concluded that the structures paralleled one another. He also reported parallel structures for items measuring preferences for occupations and items measuring preferences for activities. Although mean sex differences were reported, the spherical model fit data from men and women equally well. Tracey also concluded that self-efficacy differed from self-esteem, but may not be a distinct construct from interests.

Overlap of Models of Interests with Other Domains

The interconnections among interests and other domains have received considerable attention recently, most notably, personality attributes, abilities, and self-efficacy. Some of this attention is fueled by the emerging dominance of the five-factor model of personality. Ironically, Holland (1997) has consistently presented his model as one of personality, yet the personality components per se have not received as much attention as other aspects of his theory.

In the domain of personality, the five-factor model represents a widely recognized system for describing the basic dimensions of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Digman, 1990). A large body of research suggests that the five-factor model provides a suitable structure in which other personality systems may be interpreted and organized (Costa & McCrae, 1992, 1995).

The association between Holland's typology and personality variables has generally been supported in empirical studies relating scores on measures of Holland types to a wide range of personality inventories, such as Cattell's 16 PF (Bolton, 1985; Peraino & Willerman, 1983), the Myers-Briggs Type Indicator (Dillon & Weissman, 1987; Martin & Bartol, 1986), and the Eysenck Personality Questionnaire (Goh & Leong, 1993), among others. In an effort to describe these associations in a more parsimonious manner, another approach has been to examine the structural overlap of the basic dimensions underlying personality and interests (Rounds, 1995; Tokar & Fischer, 1998; Tokar & Swanson, 1995).

There are consistent results connecting aspects of the five-factor model of personality to portions of Holland's model: Investigative and artistic interests are related to openness to experience, and social and enterprising interests are strongly related to extraversion, with agreeableness differentiating these two types (Costa, Fozard, & McCrae, 1977; Costa, McCrae, & Holland, 1984; De Fruyt & Mervielde, 1997; G.D. Gottfredson, Jones, & Holland, 1993; Schinka, Dye, & Curtiss, 1997; Tokar, Fischer, & Subich, 1998). Even more compelling evidence suggests that scores on measures of the five-factor model can predict concurrent membership in Holland's vocational interest categories: Openness to experience and extraversion, plus the addition of agreeableness for females, reproduced the Holland hexagon in two-dimensional data-ideas-people-things space (Tokar & Swanson, 1995). Moreover, Holland (1999) argued that the facet scales which accompany the Big Five may clarify differences between adjacent interest types; for example, enterprising and conventional share relations with competence, achievement, striving, and self-discipline, but not with order, dutifulness, and deliberation (De Fruyt & Mervielde, 1997).

In spite of these convergences, there also are demonstrated points of divergence between the two models: Neuroticism and conscientiousness do not appear to be well represented in the interest domain (G.D. Gottfredson et al., 1993), even though these constructs are clearly important to work satisfaction and performance (Tokar et al., 1998). There also is consistent evidence that the correspondence of interest and personality domains appears to be moderated by gender, with

different patterns of relationships existing for men and for women (G.D. Gottfredson et al., 199 Tokar & Swanson, 1995; Tokar, Vaux, & Swanson, 1995).

Models of personality other than the Big Five dimensions also have received attention. Wiggins Interpersonal Circle (Kiesler, 1983; Wiggins, 1979) rests on two underlying dimensions: The pow dimension is defined by two types, dominant versus submissive; the affiliation dimension also is d fined by two types, hostile versus friendly. Some evidence suggests that the affiliation dimensic links the interpersonal circle and Holland's schema, as translated through Prediger's (1982) pe ple/things dimension (Schneider, Ryan, Tracey, & Rounds, 1996). As another example, Donnay ar Borgen (1996) investigated the predictive power of the four personal style scales on the newest rev sion of the Strong Interest Inventory, suggesting that these scales represent "relevant personali constructs beyond Holland's six types" (p. 276). Although these scales were less predictive th other Strong scales, they did reproduce a hexagon when personal style scale scores for six occup tional prototypes were mapped in two-dimensional space.

A recent reanalysis by Tokar and Fischer (1998) moved beyond Holland types to underlying d mensions. Specifically, they derived scores based on Prediger's (1982) and Hogan's (1983) d mensions underlying the Holland hexagon, then predicted these two sets of dimensions from B Five personality scores. Data for males were better predicted than for females, and Hogan's mod produced a more parsimonious explanation than did Prediger's model. Interestingly, many Tokar and Fischer's results conform to a model offered by Ackerman and Heggestad (1997), di cussed in the next section, suggesting the convergence that is beginning to emerge from dispara literatures.

A related body of literature includes behavior genetic studies, which provide estimates of the re ative influence of genetic and environmental factors on interests and personality. There is consiste evidence to suggest that genetic factors strongly influence personality. In contrast, literature r garding heritability of vocational interests suggests that environmental influences, particularly no shared environmental effects, exert more influence than do genetic effects (Betsworth et al., 199 Moloney, Bouchard, & Segal, 1991). Heritability also has been documented for other career-relat variables, such as job satisfaction (Arvey, Bouchard, Segal, & Abraham, 1989), work values (Kell Bouchard, Arvey, Segal, & Dawis, 1992), and propensity to change jobs (McCall, Cavanaugh, Arve & Taubman, 1997), variables which may have stronger links to personality dimensions than interests (Tokar et al., 1998).

The link between interests and abilities has been discussed since the advent of interest me surement, yet there have been relatively few studies examining this relation. Lowman, William and Leeman (1985) reported structural similarity between primary abilities and vocational inte ests in college women, but little common variance between the domains; in other words, althou they shared a common structure, they were relatively independent of one another. Randahl (199 reached a substantially different conclusion in her high-point profile analysis of an adult samp seeking career counseling: "[T]he relations between interests and abilities are strong and are accordance with theoretical predictions" (p. 346).

Ackerman and Heggestad (1997) discussed the theoretical and empirical overlap among d mains of interests, abilities, and personality. Reviewing previous literature, they noted that (1) s ence and engineering interests (investigative and realistic) were positively associated with ma spatial, and mechanical abilities; (2) literary interests were positively associated with verbal ab ity; (3) social service interests were negatively associated with many abilities, particularly ma and spatial; and, (4) depth and breadth of interests were related to intellectual ability (Ackerm Kanfer, & Goff, 1995; Kanfer, Ackerman, & Heggestad, 1996; Rolfhus & Ackerman, 1996). Th final integrative model incorporated abilities, interests, and personality, as reflected in four tr complexes: social, clerical/conventional, science/math, and intellectual/cultural. These four cl ters are arranged so that interest, ability, and personality components fall into the circular or corresponding to Holland's theory, suggesting the utility of Holland's model as a heuristic, in grative model to organize the domains, and supporting his basic typological formulations.

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A related body of literature includes behavior genetic studies, which provide estimates of the relative influence of genetic and environmental factors on interests and personality. There is consistent evidence to suggest that genetic factors strongly influence personality. In contrast, literature regarding heritability of vocational interests suggests that environmental influences, particularly nonshared environmental effects, exert more influence than do genetic effects (Betsworth et al., 1994; Moloney, Bouchard, & Segal, 1991). Heritability also has been documented for other career-related variables, such as job satisfaction (Arvey, Bouchard, Segal, & Abraham, 1989), work values (Keller, Bouchard, Arvey, Segal, & Dawis, 1992), and propensity to change jobs (McCall, Cavanaugh, Arvey, & Taubman, 1997), variables which may have stronger links to personality dimensions than do interests (Tokar et al., 1998).

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Inserting Tokar and Fischer's (1998) findings regarding the common dimensions underlying interests and personality into Ackerman and Heggestad's (1997) model suggests that Hogan's (1983) two orthogonal dimensions of sociability and conformity fit perfectly into the four trait complexes. Prediger's (1982) dimensions, on the other hand, are more difficult to visualize, primarily because they bisect the spaces between the four clusters. Taken together, these empirical observations and theoretical speculations are supportive of Holland's circular arrangement yet also consonant with Tracey and Rounds's (1995) argument regarding the arbitrary nature of the hexagon: The four trait complexes may be a sufficient number of types to adequately represent the intersection of ability, personality, and interest domains.

Ackerman and Heggestad (1997) speculated about the causal sequences of the three domains, suggesting that abilities, interests, and personality develop in tandem. Ability and personality may determine the probability of success in a particular task, whereas interests determine the motivation to attempt the task: Success increases interest and failure decreases interest. These propositions are congruent with social cognitive career theory (Lent et al., 1994).

The literature discussed thus far relates to objectively measured ability. A related area of research and theory focuses on perceptions or self-ratings of ability. Self-rated abilities have shown predicted relations with interests, and may be more directly related to interests than are objectively assessed abilities (Barak, 1981; Swanson, 1993). These self-ratings may be construed as self-efficacy expectations, although Betz (1999) argued for a conceptual distinction between these two constructs. Self-efficacy beliefs, as discussed earlier, emerged from social cognitive theory, and are typically assessed by asking individuals to rate their level of confidence in a task; self-rated abilities originated in trait-and-factor theories, and are assessed in a normative fashion by asking individuals to compare their abilities with those of other people.

Tracey (1997) examined the connections between ratings of self-efficacy and preferences for occupations and activities. He concluded that a spherical model (Tracey & Rounds, 1996) fit all three types of data, but questioned whether self-efficacy added much to data available from the interest items. On the other hand, he suggested that the close associations between interests and self-efficacy may be reflective of their causal relationship. A third interpretation is that shared measurement or method variance inflated the observed link between interests and self-efficacy. Other authors (Bandura, 1986; Betz, 1994; Lent et al., 1989) have also speculated that a threshold of self-efficacy was necessary before interest would develop, a speculation that received preliminary support as reported by Lenox and Subich (1994).

Development of the SCI (Betz, Borgen, et al., 1996) as a complement to the Strong Interest Inventory (Harmon et al., 1994) provided a method of examining interests and self-efficacy in tandem. Betz, Harmon, et al. (1996) reported that mismatches involving high interest and low confidence were more likely to occur for interest areas that were atypical for one's sex, such as realistic for women and social for men, whereas mismatches involving high confidence but low interest were more likely to occur for interest areas that were highly sex-typical, such as realistic for men and social for women. Evidence also suggests that self-efficacy adds incremental validity to predictions of occupational membership made from interest data alone (Donnay & Borgen, 1999).

CONCLUSIONS

Standing on the verge of a new millennium, it is tempting to comment on the past and the future of vocational psychology. Many writers have reflected on what vocational psychologists believed to be important at the beginning of the twentieth century (Super, 1983). Our review of the literature reflects what vocational psychologists believe to be important as we begin the next century. SCCT and Holland's theory clearly dominate the literature, whereas other theories seem to have generated more discussion than empirical inquiry. Vocational interests is one area of research that is receiving as much attention today as it did in the 1920s and 1930s. That we continue to investigate

the nature of interests is testimony to their enduring role both in the theory and practice of vocational psychology. One can view the disproportionate distribution of research as indicative of the current status of career development theories. On the other hand, what researchers choose to investigate is not necessarily related to a theory's scholarly merit. Perhaps more troubling is that our review includes but a fraction of research published in the last decade; that is, the majority of published research is not explicitly tied to career development theory or to a systematic course of sustained research.

It is also tempting to speculate how vocational psychologists at the turn of the next century will evaluate where we are today. Our response to a rapidly evolving society will undoubtedly dictate their assessment. What challenges will we face in the future? The workforce will contend with ever-increasing technology and diversity. We will all be called on to fully recognize the impact of cultural and contextual factors in vocational behavior. Changes are likely to occur in the nature of work itself—increases in the contingent workforce, novel work structures (telecommuting, job sharing), and salience and balance of work versus other life roles. An additional challenge will result from the changing nature of the employment contract and the meaning of "career." Extant theories of career development were formulated at a time when job tenure was commonplace—when it was a desirable outcome. A theory's responsiveness to changes in the outcomes valued by individuals in society may determine its continued survival.

We contend that the historical roots underlying vocational psychology will serve us well in the future, as they have in the past, and will ensure that the field continues to contribute to understanding human behavior and to meeting clients' needs. These roots are what define vocational psychology as an applied science—namely, responsiveness to changes in society, the interdependence of theory and practice, and the commitment to quality measurement.

REFERENCES

Ackerman, P.L., & Heggestad, E.D. (1997). Intelligence, personality, and interests: Evidence for overlapping traits. *Psychological Bulletin, 121,* 219–245.

Ackerman, P.L., Kanfer, R., & Goff, M. (1995). Cognitive and noncognitive determinants and consequences of complex skill acquisition. *Journal of Experimental Psychology Applied, 1,* 270–304.

Anderson, M.Z., Tracey, T.J.G., & Rounds, J.B. (1997). Examining the invariance of Holland's vocational interest model across gender. *Journal of Vocational Behavior, 50,* 349–364.

Arvey, R.D., Bouchard, T.J., Segal, N.L., & Abraham, L.M. (1989). Job satisfaction: Environmental and genetic components. *Journal of Applied Psychology, 74,* 187–192.

Assouline, M., & Meir, E.I. (1987). Meta-analysis of the relationship between congruence and well-being measures. *Journal of Vocational Behavior, 31,* 319–332.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Barak, A. (1981). Vocational interests: A cognitive view. *Journal of Applied Psychology, 75,* 77–86.

Barak, A., Shiloh, S., & Hauschner, O. (1992). Modification of interests through cognitive restructuring Test of a theoretical model in preschool children. *Journal of Counseling Psychology, 39,* 490–497.

Betsworth, D.G., Bouchard, T.J., Jr., Cooper, C.R., Grotevant, H.D., Hansen, J.C., Scarr, S., & Weinberg R.A. (1994). Genetic and environmental influences on vocational interests assessed using adoptive an biological families and twins reared apart and together. *Journal of Vocational Behavior, 44,* 263–278.

Betsworth, D.G., & Fouad, N.A. (1997). Vocational interests: A look at the past 70 years and a glance a the future. *Career Development Quarterly, 46,* 23–47.

Betz, N.E. (1994). Self-concept theory in career development and counseling. *Career Development Quarterly, 43,* 32–42.

Betz, N.E. (1999). Getting clients to act on their interests: Self-efficacy expectations as a mediator of th implementation of vocational interests. In M.L. Savickas & A.R. Spokane (Eds.), *Vocational interests Their meaning, measurement, and use in counseling.* Palo Alto, CA: Davies-Black.

Betz, N.E., Borgen, F.H., & Harmon, L.W. (1996). *Skills Confidence Inventory: Applications and technical guide*. Palo Alto, CA: Consulting Psychologists Press.

Betz, N.E., & Fitzgerald, L.F. (1993). Individuality and diversity: Theory and research in counseling psychology. *Annual Review of Psychology, 44,* 343–381.

Betz, N.E., Harmon, L.W., & Borgen, F.H. (1996). The relationships of self-efficacy for the Holland themes to gender, occupational group membership, and vocational interests. *Journal of Counseling Psychology, 43,* 90–98.

Betz, N.E., & Klein, K.L. (1996). Relationships among measures of career self-efficacy, generalized self-efficacy, and global self-esteem. *Journal of Career Assessment, 4,* 285–298.

Bieschke, K.J., Bishop, R.M., & Garcia, V.L. (1996). The utility of the research self-efficacy scale. *Journal of Career Assessment, 4,* 59–75.

Bishop, R.M., & Bieschke, K.J. (1998). Applying social cognitive career theory to interest in research among counseling psychology doctoral students: A path analysis. *Journal of Counseling Psychology, 45,* 182–188.

Bizot, E.B., & Goldman, S.H. (1993). Prediction of satisfactoriness and satisfaction: An 8-year follow up. *Journal of Vocational Behavior, 43,* 19–29.

Blustein, D.L. (1997). The role of work in adolescent development. *Career Development Quarterly, 45,* 381–389.

Blustein, D.L., Pauling, M.L., DeMania, M.E., & Faye, M. (1994). Relation between exploratory and choice factors and decisional progress. *Journal of Vocational Behavior, 44,* 75–90.

Blustein, D.L., Prezioso, M.S., & Schultheiss, D.P. (1995). Attachment theory and career development: Current status and future directions. *The Counseling Psychologist, 23,* 416–432.

Boatwright, K.J., Gilbert, M.S., Forrest, L., & Ketzenberger, K. (1996). Impact of identity development upon career trajectory: Listening to the voices of lesbian women. *Journal of Vocational Behavior, 48,* 210–228.

Bolton, B. (1985). Discriminant analysis of Holland's occupational types using the Sixteen Personality Factor Questionnaire. *Journal of Vocational Behavior, 27,* 210–217.

Bores-Rangel, E., Church, A.T., Szendre, D., & Reeves, C. (1990). Self-efficacy in relation to occupational consideration and academic performance in high school equivalency students. *Journal of Counseling Psychology, 37,* 407–418.

Borgen, F.H. (1991). Megatrends and milestones in vocational behavior: A 20-year counseling psychology retrospective. *Journal of Vocational Behavior, 39,* 263–290.

Borgen, F.H., & Donnay, D.A.C. (1996). Comment: Slicing the vocational interest pie one more time: Comment on Tracey and Rounds. *Journal of Vocational Behavior, 48,* 42–52.

Boyd, C.J., & Cramer, S.H. (1995). Relationship between Holland high-point code and client preferences for selected vocational counseling strategies. *Journal of Career Development, 21,* 213–221.

Breeden, S.A. (1993). Job and occupational change as a function of occupational correspondence and job satisfaction. *Journal of Vocational Behavior, 43,* 30–45.

Bretz, R.D., & Judge, T.A. (1994). Person-organization fit and the theory of work adjustment: Implications for satisfaction, tenure, and career success. *Journal of Vocational Behavior, 44,* 32–54.

Brooks, L., & Betz, N.E. (1990). Utility of expectancy theory in predicting occupational choice in college students. *Journal of Counseling Psychology, 37,* 57–64.

Brown, S.D. (1993). Contemporary psychological science and the theory of work adjustment: A proposal for integration and a favor returned. *Journal of Vocational Behavior, 43,* 58–66.

Brown, S.D., & Gore, P.A., Jr. (1994). An evaluation of interest congruence indices: Distribution characteristics and measurement properties. *Journal of Vocational Behavior, 45,* 310–327.

Brown, S.D., & Lent, R.W. (1992). *Handbook of counseling psychology* (2nd ed.). New York: Wiley.

Brown, S.D., & Lent, R.W. (1996). A social cognitive framework for career choice counseling. *Career Development Quarterly, 44,* 354–366.

Brown, S.D., Lent, R.W., & Larkin, K.C. (1989). Self-efficacy as a moderator of scholastic aptitude-academic performance relationships. *Journal of Vocational Behavior, 35,* 64–75.

Brown, S.D., Lent, R.W., Ryan, N.E., & McPartland, E.B. (1996). Self-efficacy as an intervening mechanism between research training environments and scholarly productivity: A theoretical and methodological extension. *The Counseling Psychologist, 24,* 535–544.

Camp, C.C., & Chartrand, J.M. (1992). A comparison and evaluation of interest congruence indices. *Journal of Vocational Behavior, 41,* 162–182.

Campbell, D.P. (1966). Stability of interests within an occupation over thirty years. *Journal of Applied Psychology, 50,* 51–56.

Campbell, N.K., & Hackett, G. (1986). The effects of math task performance on math self-efficacy and task interest. *Journal of Vocational Behavior, 28,* 149–162.

Carson, A.D., & Mowsesian, R. (1993). Moderators of the prediction of job satisfaction from congruence: A test of Holland's theory. *Journal of Career Assessment, 1,* 130–144.

Carsten, J.M., & Spector, P.E. (1987). Unemployment, job satisfaction, and employee turnover: A meta-analytic test of the Muchinsky model. *Journal of Applied Psychology, 72,* 374–381.

Carter, R.T., & Swanson, J.L. (1990). The validity of the Strong interest inventory for black Americans: A review of the literature. *Journal of Vocational Behavior, 36,* 195–209.

Chartrand, J.M., & Rose, M.L. (1996). Career interventions for at-risk populations: Incorporating social cognitive influences. *Career Development Quarterly, 44,* 341–353.

Chojnacki, J.T., & Gelberg, S. (1994). Toward a conceptualization of career counseling with gay/lesbian/bisexual persons. *Journal of Career Development, 21,* 3–10.

Chung, Y.B. (1995). Career decision making of lesbian, gay, and bisexual individuals. *Career Development Quarterly, 44,* 178–190.

Chung, Y.B., & Harmon, L.W. (1994). The career interests and aspirations of gay men: How sex-role orientation is related. *Journal of Vocational Behavior, 45,* 223–239.

Church, A.T., Teresa, J.S., Rosebrook, R., & Szendre, D. (1992). Self-efficacy for careers and occupational consideration in minority high school equivalency students. *Journal of Counseling Psychology, 39,* 498–508.

Cook, E.P. (1994). Role salience and multiple roles: A gender perspective. *Career Development Quarterly, 43,* 85–95.

Costa, P.T., Jr., Fozard, J.L., & McCrae, R.R. (1977). Personological interpretation of factors from the Strong Vocational Interest Blank scales. *Journal of Vocational Behavior, 10,* 231–243.

Costa, P.T., Jr., & McCrae, R.R. (1992). Four ways five factors are basic. *Personality and Individual Differences, 13,* 653–665.

Costa, P.T., Jr., & McCrae, R.R. (1995). Solid ground in the wetlands of personality: A reply to Block. *Psychological Bulletin, 117,* 216–220.

Costa, P.T., Jr., McCrae, R.R., & Holland, J.L. (1984). Personality and vocational interests in an adult sample. *Journal of Applied Psychology, 69,* 390–400.

Croteau, J.M., & Bieschke, K.J. (1996). Beyond pioneering: An introduction to the special issue on the vocational issues of lesbian women and gay men. *Journal of Vocational Behavior, 48,* 119–124.

Croteau, J.M., & Thiel, M.J. (1993). Integrating sexual orientation in career counseling: Acting to end a form of the personal-career dichotomy. *Career Development Quarterly, 42,* 174–179.

Dawis, R.V. (1996). The theory of work adjustment and person-environment-correspondence counseling. In D. Brown & L. Brooks (Eds.), *Career choice and development* (3rd ed., pp. 75–120). San Francisco: Jossey-Bass.

Dawis, R.V., England, G.W., & Lofquist, L.H. (1964). A theory of work adjustment. *Minnesota Studies in Vocational Rehabilitation,* 15.

Dawis, R.V., & Lofquist, L.H. (1984). *A psychological theory of work adjustment.* Minneapolis: University of Minnesota Press.

Day, S.X., & Rounds, J.B. (1998). Universality of vocational interest structure among racial and ethnic minorities. *American Psychologist, 53,* 728–736.

Day, S.X., Rounds, J.B., & Swaney, K. (1998). The structure of vocational interests for diverse racial-ethnic groups. *Psychological Science, 9,* 40–44.

De Fruyt, F., & Mervielde, I. (1997). The five-factor model of personality and Holland's RIASEC interest types. *Personality and Individual Differences, 23,* 87–103.

Digman, J.M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology, 41,* 417–440.

Dillon, M., & Weissman, S. (1987). Relationship between personality types on the Strong-Campbell and Myers-Briggs instruments. *Measurement and Evaluation in Counseling and Development, 20,* 68–79.

Dix, J.E., & Savickas, M.L. (1995). Establishing a career: Developmental tasks and coping responses. *Journal of Vocational Behavior, 47,* 93–107.

Donnay, D.A.C., & Borgen, F.H. (1996). Validity, structure, and content of the 1994 Strong Interest Inventory. *Journal of Counseling Psychology, 43,* 275–291.

Donnay, D.A.C., & Borgen, F.H. (1999). The incremental validity of vocational self-efficacy: An examination of interest, self-efficacy, and occupation. *Journal of Counseling Psychology, 46,* 1–16.

Downes, M., & Kroeck, K.G. (1996). Discrepancies between existing jobs and individual interests: An empirical application of Holland's model. *Journal of Vocational Behavior, 48,* 107–117.

Duarte, M.E. (1995). Career concerns, values, and role salience in employed men. *Career Development Quarterly, 43,* 338–349.

Dunkle, J.H. (1996). Toward an integration of gay and lesbian identity development and Super's life-span approach. *Journal of Vocational Behavior, 48,* 149–159.

Elliott, J.E. (1993). Career development with lesbian and gay clients. *Career Development Quarterly, 41,* 210–226.

Fassinger, R.E. (1996a). From invisibility to integration: Lesbian identity in the workplace. *Career Development Quarterly, 44,* 148–167.

Fassinger, R.E. (1996b). Notes from the margins: Integrating lesbian experience into the vocational psychology of women. *Journal of Vocational Behavior, 48,* 160–175.

Fitzgerald, L.F., & Betz, N.E. (1994). Career development in cultural context: The role of gender, race, class, and sexual orientation. In M.L. Savickas & R.W. Lent (Eds.), *Convergence in career development theories* (pp. 103–118). Palo Alto, CA: Consulting Psychologists Press.

Fitzgerald, L.F., Fassinger, R.E., & Betz, N.E. (1995). Theoretical advances in the study of women's career development. In W.B. Walsh & S.H. Osipow (Eds.), *Handbook of vocational psychology* (2nd ed., pp. 67–109). Mahwah, NJ: Erlbaum.

Fouad, N.A., & Bingham, R.P. (1995). Career counseling with racial and ethnic minorities. In W.B. Walsh & S.H. Osipow (Eds.), *Handbook of vocational psychology* (2nd ed., pp. 331–365). Mahwah, NJ: Erlbaum.

Fouad, N.A., & Dancer, L.S. (1992). Cross-cultural structure of interests: Mexico and the United States. *Journal of Vocational Behavior, 40,* 129–143.

Fouad, N.A., Harmon, L.W., & Borgen, F.H. (1997). Structure of interests in employed male and female members of U.S. racial-ethnic minority and nonminority groups. *Journal of Counseling Psychology, 44,* 339–345.

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

Fouad, N.A., Smith, P.L., & Enochs, L. (1997). Reliability and validity evidence for the middle school self-efficacy scale. *Measurement and Evaluation in Counseling and Development, 30,* 17–31.

Gati, I. (1991). The structure of vocational interests. *Psychological Bulletin, 109,* 309–324.

Glidden-Tracey, C.E., & Parraga, M.I. (1996). Assessing the structure of vocational interests among Bolivian university students. *Journal of Vocational Behavior, 48,* 96–106.

Goh, D.S., & Leong, F.T.L. (1993). The relationship between Holland's theory of vocational interests and Eysenck's model of personality. *Personality and Individual Differences, 15,* 555–562.

Goldfried, M.R., & Padawer, W. (1982). Current status and future directions in psychotherapy. In M.R. Goldfried (Ed.), *Converging themes in psychotherapy* (pp. 3–49). New York: Springer.

Goodman, J. (1994). Career adaptability in adults: A construct whose time has come. *Career Development Quarterly, 43,* 74–84.

Gottfredson, G.D., & Jones, E.M. (1993). Psychological meaning of profile elevation in the Vocational Preference Inventory. *Journal of Career Assessment, 1,* 35–49.

Gottfredson, G.D., Jones, E.M., & Holland, J.L. (1993). Personality and vocational interests: The relation of Holland's six interest dimensions to five robust dimensions of personality. *Journal of Counseling Psychology, 40,* 518–524.

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

Gottfredson, L.S. (1996). Gottfredson's theory of circumscription and compromise. In D. Brown & L. Brooks (Eds.), *Career choice and development* (3rd ed., pp. 179–232). San Francisco: Jossey-Bass.

Gottfredson, L.S., & Lapan, R.T. (1997). Assessing gender-based circumscription of occupational aspira tions. *Journal of Career Assessment, 5,* 419–441.

Hackett, G., & Betz, N.E. (1981). A self-efficacy approach to the career development of women. *Journal o Vocational Behavior, 18,* 326–339.

Hackett, G., Betz, N.E., Casas, J.M., & Rocha-Singh, I.A. (1992). Gender, ethnicity, and social cognitiv factors in predicting the academic achievement of students in engineering. *Journal of Counseling Psy chology, 39,* 527–538.

Hackett, G., Betz, N.E., O'Halloran, M.S., & Romac, D.S. (1990). Effects of verbal and mathematics tas performance on task and career self-efficacy and interest. *Journal of Counseling Psychology, 37* 169–177.

Hackett, G., & Byars, A.M. (1996). Social cognitive theory and the career development of African Ameri can women. *Career Development Quarterly, 44,* 322–340.

Hackett, G., & Campbell, N.K. (1987). Task self-efficacy and task interest as a function of performance o a gender-neutral task. *Journal of Vocational Behavior, 30,* 203–215.

Hackett, G., & Lent, R.W. (1992). Theoretical advances and current inquiry in career psychology. I S.D. Brown & R.W. Lent (Eds.), *Handbook of counseling psychology* (2nd ed., pp. 419–451). New York Wiley.

Hackett, G., Lent, R.W., & Greenhaus, J.H. (1991). Advances in vocational theory and research: A 20-yea retrospective. *Journal of Vocational Behavior, 38,* 3–38.

Hall, A.S., Kelly, K.R., & Van Buren, J.B. (1995). Effects of grade level, community of residence, and se on adolescent career interests in the zone of acceptable alternatives. *Journal of Career Development, 2* 223–232.

Hansen, J.C. (1984). The measurement of vocational interests: Issues and future directions. In S.D. Brow & R.W. Lent (Eds.), *Handbook of counseling psychology* (pp. 99–136). New York: Wiley.

Hansen, J.C. (1996). Comment: What goes around, comes around. *Journal of Vocational Behavior, 4* 73–76.

Hansen, J.C., Collins, R.C., Swanson, J.L., & Fouad, N.A. (1993). Gender differences in the structure interests. *Journal of Vocational Behavior, 42,* 200–211.

Hansen, J.C., & Sackett, S.A. (1993). Agreement between college major and vocational interests for femal athlete and non-athlete college students. *Journal of Vocational Behavior, 43,* 298–309.

Hansen, J.C., & Stocco, J.L. (1980). Stability of vocational interests of adolescents and young adults. *Me surement and Evaluation in Guidance, 13,* 173–178.

Hansen, J.C., & Swanson, J.L. (1983). Stability of interests and the predictive and concurrent validity the 1981 Strong-Campbell Interest Inventory for college majors. *Journal of Counseling Psycholog 30*(2), 194–201.

Harmon, L.W. (1997). Do gender differences necessitate separate career development theories and me sures? *Journal of Career Assessment, 5,* 463–470.

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

Haverkamp, B.E., Collins, R.C., & Hansen, J.C. (1994). Structure of interests of Asian-American colleg students. *Journal of Counseling Psychology, 41,* 256–264.

Herr, E.L. (1997). Super's life-span, life-space approach and its outlook for refinement. *Career Develo ment Quarterly, 45,* 238–246.

Hesketh, B. (1993). Toward a better adjusted theory of work adjustment. *Journal of Vocational Behavior, 4* 75–83.

Hesketh, B., Elmslie, S., & Kaldor, W. (1990). Career compromise: An alternative account to Gottfredson theory. *Journal of Counseling Psychology, 37,* 49–56.

Hesketh, B., & McLachlan, K. (1991). Career compromise and adjustment among graduates in the bankı industry. *British Journal of Guidance & Counselling, 19*(2), 191–208.

Hesketh, B., McLachlan, K., & Gardner, D. (1992). Work adjustment theory: An empirical test using fuzzy rating scale. *Journal of Vocational Behavior, 40,* 318–337.

Hill, T., Smith, N.D., & Mann, M.F. (1987). Role of efficacy expectations in predicting the decision to u advanced technologies: The case of computers. *Journal of Applied Psychology, 72,* 307–313.

Hogan, R. (1983). A socioanalytic theory of personality. In M.M. Page (Ed.), *Nebraska symposium on motivation 1982. Personality: Current theory and research* (pp. 55–89). Lincoln: University of Nebraska Press.

Holland, J.L. (1959). A theory of vocational choice. *Journal of Counseling Psychology, 6,* 35–45.

Holland, J.L. (1963). Explorations of a theory of vocational choice and achievement. II. A four-year prediction study. *Psychological Reports, 12,* 547–594.

Holland, J.L. (1994). Separate but unequal is better. In M.L. Savickas & R.W. Lent (Eds.), *Convergence in career development theories* (pp. 45–52). Palo Alto, CA: Consulting Psychologists Press.

Holland, J.L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources.

Holland, J.L. (1999). Why interest inventories are also personality inventories. In M.L. Savickas & A.R. Spokane (Eds.), *Vocational interests: Their meaning, measurement, and use in counseling.* Palo Alto, CA: Davies-Black.

Holland, J.L., Johnston, J.A., & Asama, N.F. (1994). More evidence for the relationship between Holland's personality types and personality variables. *Journal of Career Assessment, 2,* 331–340.

Johansson, C.B., & Campbell, D.P. (1971). Stability of the SVIB for men. *Journal of Applied Psychology, 55,* 34–36.

Kanfer, R., Ackerman, P.L., & Heggestad, E.D. (1996). Motivational skills and self-regulation for learning: A trait perspective. *Learning and Individual Differences, 8,* 185–209.

Keller, L.M., Bouchard, T.J., Jr., Arvey, R.D., Segal, N.L., & Dawis, R.V. (1992). Work values: Genetic and environmental influences. *Journal of Applied Psychology, 77,* 79–88.

Ketterson, T.U., & Blustein, D.L. (1997). Attachment relationships and the career exploration process. *Career Development Quarterly, 46,* 167–178.

Kiesler, D.J. (1983). The 1982 Interpersonal Circle: A taxonomy for complementarity in human transactions. *Psychological Review, 90,* 185–214.

Krumboltz, J.D. (1994). Improving career development theory from a social learning perspective. In M.L. Savickas & R.W. Lent (Eds.), *Convergence in career development theories* (pp. 9–31). Palo Alto, CA: Consulting Psychologists Press.

Kwak, J.C., & Pulvino, C.J. (1982). A mathematical model for comparing Holland's personality and environmental codes. *Journal of Vocational Behavior, 21,* 231–241.

Lapan, R.T., Boggs, K.R., & Morrill, W.H. (1989). Self-efficacy as a mediator of investigative and realistic general occupational themes on the Strong Interest Inventory. *Journal of Counseling Psychology, 36,* 176–182.

Lapan, R.T., & Jingeleski, J. (1992). Circumscribing vocational aspirations in junior high school. *Journal of Counseling Psychology, 39,* 81–90.

Lapan, R.T., Shaughnessy, P., & Boggs, K. (1996). Efficacy expectations and vocational interests as mediators between sex and choice of math/science college majors: A longitudinal study. *Journal of Vocational Behavior, 49,* 277–291.

Lenox, R.A., & Subich, L.M. (1994). The relationship between self-efficacy beliefs and inventoried vocational interests. *Career Development Quarterly, 42,* 302–313.

Lent, R.W., Brown, S.D., & Gore, P.A., Jr. (1997). Discriminant and predictive validity of academic self-concept, academic self-efficacy, and mathematics-specific self-efficacy. *Journal of Counseling Psychology, 44,* 307–315.

Lent, R.W., Brown, S.D., Gover, M.R., & Nijjer, S.K. (1996). Cognitive assessment of the sources of mathematics self-efficacy: A thought listing analysis. *Journal of Career Assessment, 4,* 33–46.

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

Lent, R.W., Brown, S.D., & Larkin, K.C. (1984). Relation of self-efficacy expectations to academic achievement and persistence. *Journal of Counseling Psychology, 31,* 356–362.

Lent, R.W., Brown, S.D., & Larkin, K.C. (1986). Self-efficacy in the prediction of academic performance and perceived career options. *Journal of Counseling Psychology, 33,* 265–269.

Lent, R.W., Brown, S.D., & Larkin, K.C. (1987). Comparison of three theoretically derived variables in predicting career and academic behavior: Self-efficacy, interest congruence, and consequence thinking. *Journal of Counseling Psychology, 34,* 293–298.

Lent, R.W., Larkin, K.C., & Brown, S.D. (1989). Relation of self-efficacy to inventoried vocational interests. *Journal of Vocational Behavior, 34,* 279–288.

Lent, R.W., Lopez, F.G., & Bieschke, K.J. (1991). Mathematics self-efficacy: Sources and relation to science-based career choice. *Journal of Counseling Psychology, 38,* 424–430.

Lent, R.W., Lopez, F.G., & Bieschke, K.J. (1993). Predicting mathematics-related choice and success behaviors: Test of an expanded social cognitive model. *Journal of Vocational Behavior, 42,* 223–236.

Lent, R.W., Lopez, F.G., Brown, S.D., & Gore, P.A., Jr. (1996). Latent structure of the sources of mathematics self-efficacy. *Journal of Vocational Behavior, 49,* 292–308.

Lenz, J.G., Reardon, R.C., & Sampson, J.P. (1993). Holland's theory and effective use of computer-assisted career guidance systems. *Journal of Career Development, 19,* 245–253.

Leong, F.T.L., Austin, J.T., Sekaran, U., & Komarraju, M. (1998). An evaluation of the cross-cultural validity of Holland's theory: Career choices by workers in India [Special issue]. *Journal of Vocational Behavior, 52,* 441–455.

Leong, F.T.L., & Brown, M.T. (1995). Theoretical issues in cross-cultural career development: Cultural validity and cultural specificity. In W.B. Walsh & S.H. Osipow (Eds.), *Handbook of vocational psychology* (2nd ed., pp. 143–180). Mahwah, NJ: Erlbaum.

Leong, F.T.L., & Hartung, P. (1997). Career assessment with culturally different clients: Proposing an integrative-sequential conceptual framework for cross-cultural career counseling research and practice. *Journal of Career Assessment, 5,* 183–202.

Leung, S.A. (1993). Circumscription and compromise: A replication study with Asian Americans. *Journal of Counseling Psychology. 40,* 188–193.

Leung, S.A. (1995). Career development and counseling: A multicultural perspective. In J.G. Ponterotto, J.M. Casas, L.A. Suzuki, & C.M. Alexander (Eds.), *Handbook of multicultural counseling* (pp. 549–560). Thousand Oaks, CA: Sage.

Leung, S.A., Conoley, C.W., & Scheel, M.J. (1994). The career and educational aspirations of gifted high school students: A retrospective study. *Journal of Counseling and Development, 72,* 298–303.

Leung, S.A., Conoley, C.W., Scheel, M.J., & Sonnenberg, R.T. (1992). An examination of the relation between vocational identity, consistency, and differentiation. *Journal of Vocational Behavior, 40,* 95–107.

Locke, E.A., Frederick, E., Lee, C., & Bobko, P. (1984). Effect of self-efficacy, goals, and task strategies on task performance. *Journal of Applied Psychology, 69,* 241–251.

Locke, E.A., & Henne, D. (1986). Work motivation theories. In C.L. Cooper & I.T. Robertson (Eds.), *International review of industrial and organizational psychology 1986* (pp. 1–35). Chichester, England: Wiley.

Lofquist, L.H., & Dawis, R.V. (1991). *Essentials of person-environment correspondence counseling.* Minneapolis: University of Minnesota Press.

Lonborg, S.D., & Phillips, J.M. (1996). Investigating the career development of gay, lesbian, and bisexual people: Methodological considerations and recommendations. *Journal of Vocational Behavior, 48,* 176–194.

Lopez, F.G., & Lent, R.W. (1992). Sources of mathematics self-efficacy in high school students. *Career Development Quarterly, 41,* 3–12.

Lopez, F.G., Lent, R.W., Brown, S.D., & Gore, P.A., Jr. (1997). Role of social-cognitive expectations in high school students' mathematics-related interests and performance. *Journal of Counseling Psychology, 44,* 44–52.

Lowman, R.L., Williams, R.E., & Leeman, G.E. (1985). The structure and relationship of college women's primary abilities and vocational interests. *Journal of Vocational Behavior, 27,* 298–315.

Lubinski, D., Benbow, C.P., & Ryan, J. (1995). Stability of vocational interests among the intellectually gifted from adolescence to adulthood: A 15-year longitudinal study. *Journal of Applied Psychology, 80,* 196–200.

Mahalik, J.R. (1996). Client vocational interests as predictors of client reactions to counselor intentions. *Journal of Counseling and Development, 74,* 416–421.

Martin, D.C., & Bartol, K.M. (1986). Holland's Vocational Preference Inventory and the Myers-Briggs Type Indicator as predictors of vocational choice among master's of business administration. *Journal of Vocational Behavior, 29,* 51–65.

Matsui, T., Matsui, K., & Ohnishi, R. (1990). Mechanisms underlying math self-efficacy learning of college students. *Journal of Vocational Behavior, 37,* 225–238.

McCall, B.P., Cavanaugh, M.A., Arvey, R.D., & Taubman, P. (1997). Genetic influences on job and occupational switching. *Journal of Vocational Behavior, 50,* 60–77.

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

Meara, N.M. (1997). Changing the structure of work. *Journal of Career Assessment, 5,* 471–474.

Melchiori, L.G., & Church, A.T. (1997). Vocational needs and satisfaction of supported employees: The applicability of the theory of work adjustment. *Journal of Vocational Behavior, 50,* 401–417.

Miller, M.J. (1991). Accuracy of the leisure activities finder: Expanding Holland's typology. *Journal of Vocational Behavior, 39,* 362–368.

Mitchell, L.K., & Krumboltz, J.D. (1984). Research on human decision making: Implications for career decision making and counseling. In S.D. Brown, & R.W. Lent (Eds.), *Handbook of counseling psychology* (pp. 238–280). New York: Wiley.

Mobley, M., & Slaney, R.B. (1996). Holland's theory: Its relevance for lesbian women and gay men. *Journal of Vocational Behavior, 48,* 125–135.

Moloney, D.P., Bouchard, T.J., Jr., & Segal, N.L. (1991). A genetic and environmental analysis of the vocational interests of monozygotic and dizygotic twins reared apart. *Journal of Vocational Behavior, 39,* 76–109.

Morrow, P.C. (1993). Work adjustment theory: From a distance. *Journal of Vocational Behavior, 43,* 90–97.

Morrow, S.L., Gore, P.A., Jr., & Campbell, B.W. (1996). The application of a sociocognitive framework to the career development of lesbian women and gay men. *Journal of Vocational Behavior, 48,* 136–148.

Multon, K.D., Brown, S.D., & Lent, R.W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology, 38,* 30–36.

Murphy, K.R. (1993). Integrating research on work adjustment with research on job performance and behavior in organizations: Perspectives from industrial/organizational psychology. *Journal of Vocational Behavior, 43,* 98–104.

Nevill, D.D. (1997). The development of career development theory. *Career Development Quarterly, 45,* 288–292.

Niles, S.G. (1993). The relationship between Holland types preferences for career counseling. *Journal of Career Development, 19,* 209–220.

Niles, S.G., Anderson, W.P., Jr., & Goodnough, G. (1998). Exploration to foster career development. *Career Development Quarterly, 46,* 262–275.

O'Brien, K.M., & Heppner, M.J. (1996). Applying social cognitive career theory to training career counselors. *Career Development Quarterly, 44,* 367–377.

O'Brien, K.M., Heppner, M.J., Flores, L.Y., & Bikos, L.H. (1997). The career counseling self-efficacy scale: Instrument development and training applications. *Journal of Counseling Psychology, 44,* 20–31.

Oleski, D., & Subich, L.M. (1996). Congruence and career change in employed adults. *Journal of Vocational Behavior, 49,* 221–229.

Osipow, S.H. (1990). Convergence in theories of career choice and development. *Journal of Vocational Behavior, 36,* 122–131.

Osipow, S.H., & Fitzgerald, L.F. (1996). *Theories of career development* (4th ed.). Boston: Allyn & Bacon.

Pajares, F., & Miller, M.D. (1995). Mathematics self-efficacy and mathematics performance: The need for specificity of assessment. *Journal of Counseling Psychology, 42,* 190–198.

Parsons, F. (1989). *Choosing a vocation.* Garrett Park, MD: Garrett Park Press. (Original work published 1909)

Peraino, J.M., & Willerman, L. (1983). Personality correlates of occupational status according to Holland types. *Journal of Vocational Behavior, 22,* 268–277.

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

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

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

Pope, M. (1995). Career interventions for gay and lesbian clients: A synopsis of practice knowledge and research needs. *Career Development Quarterly, 44,* 191–203.

Prediger, D.J. (1982). Dimensions underlying Holland's hexagon: Missing link between interests and occupations? *Journal of Vocational Behavior, 21,* 259–287.

Prediger, D.J. (1996). Alternative dimensions for the Tracey-Rounds interest sphere: Comment. *Journal of Vocational Behavior, 48,* 59–67.

Prediger, D.J. (1998). Is interest profile level relevant to career counseling? *Journal of Counseling Psychology, 45,* 204–211.

Prediger, D.J., Swaney, K., & Mau, W.C. (1993). Extending Holland's hexagon: Procedures, counseling applications, and research. *Journal of Counseling and Development, 71,* 422–428.

Prediger, D.J., & Vansickle, T.R. (1992). Locating occupations on Holland's hexagon: Beyond RIASEC [Special issue]. *Journal of Vocational Behavior, 40,* 111–128.

Prince, J.P. (1995). Influences on the career development of gay men. *Career Development Quarterly, 44,* 168–177.

Prince, J.P. (1997). Career assessment with lesbian, gay, and bisexual individuals. *Journal of Career Assessment, 5,* 225–238.

Randahl, G.J. (1991). A typological analysis of the relations between measured vocational interests and abilities. *Journal of Vocational Behavior, 38,* 333–350.

Richards, J.M. (1993). Career development: A ten year longitudinal study in a population of scientists. *Journal of Career Assessment, 1,* 181–192.

Richardson, M.S. (1993). Work in people's lives: A location for counseling psychologists. *Journal of Counseling Psychology, 40,* 425–433.

Richie, B.S., Fassinger, R.E., Linn, S.G., Johnson, J., Prosser, J., & Robinson, S. (1997). Persistence, connection, and passion: A qualitative study of the career development of highly achieving African American-black and white women. *Journal of Counseling Psychology, 44,* 133–148.

Roe, A. (1957). Early determinants of vocational choice. *Journal of Counseling Psychology, 4,* 212–217.

Rohe, D.E., & Krause, J.S. (1998). Stability of interests after severe physical disability: An 11-year longitudinal study. *Journal of Vocational Behavior, 52,* 45–48.

Rolfhus, E.L., & Ackerman, P.L. (1996). Self-report knowledge: At the crossroads of ability, interest, and personality. *Journal of Educational Psychology, 88,* 174–188.

Rooney, R.A., & Osipow, S.H. (1992). Task-specific occupational self-efficacy scale: The development and validation of a prototype. *Journal of Vocational Behavior, 40,* 14–32.

Rosenthal, R. (1990). How are we doing in soft psychology? *American Psychologist, 45,* 775–777.

Rosenthal, R., & Rubin, D.B. (1982). A simple general purpose display of magnitude of experimental effect. *Journal of Educational Psychology, 74,* 166–169.

Rotberg, H.L., Brown, D., & Ware, W.B. (1987). Career self-efficacy expectations and perceived range of career options in community college students. *Journal of Counseling Psychology, 34,* 164–170.

Rounds, J.B. (1990). The comparative and combined utility of work value and interest data in career counseling with adults. *Journal of Vocational Behavior, 37,* 32–45.

Rounds, J.B. (1995). Vocational interests: Evaluating structural hypotheses. In R.V. Dawis & D. Lubinski (Eds.), *Assessing individual differences in human behavior: New concepts, methods, and findings* (pp. 177–232). Palo Alto, CA: Consulting Psychologists Press.

Rounds, J.B., & Day, S.X. (1999). Describing, evaluating, and creating vocational interest structures. In M.L. Savickas & A.R. Spokane (Eds.), *Vocational interests: Their meaning, measurement, and use in counseling.* Palo Alto, CA: Davies-Black.

Rounds, J.B., Henly, G.A., Dawis, R.V., Lofquist, L.H., & Weiss, D.J. (1981). *Manual for the Minnesota Importance Questionnaire.* Minneapolis: University of Minnesota, Department of Psychology.

Rounds, J.B., & Tracey, T.J. (1993). Prediger's dimensional representation of Holland's RIASEC circumplex. *Journal of Applied Psychology, 78,* 875–890.

Rounds, J.B., & Tracey, T.J. (1996). Cross-cultural equivalence of RIASEC models and measures. *Journal of Counseling Psychology, 43,* 210–239.

Rounds, J.B., Tracey, T.J., & Hubert, L. (1992). Methods for evaluating vocational interest structural hypotheses. *Journal of Vocational Behavior, 40,* 239–259.

Ryan, J.M., Tracey, T.J.G., & Rounds, J.B. (1996). Generalizability of Holland's structure of vocational interests across ethnicity, gender, and socioeconomic status. *Journal of Counseling Psychology, 43,* 330–337.

Sackett, S.A., & Hansen, J.C. (1995). Vocational outcomes of college freshmen with flat profiles on the Strong Interest Inventory. *Measurement and Evaluation in Counseling and Development, 28,* 9–24.

Savickas, M.L. (1994). Measuring career development: Current status and future directions. *Career Development Quarterly, 43,* 54–62.

Savickas, M.L. (1996). A framework for linking career theory and practice. In M.L. Savickas & W.B. Walsh (Eds.), *Handbook of career counseling theory and practice* (pp. 191–208). Palo Alto, CA: Davies-Black.

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

Savickas, M.L., & Lent, R.W. (Eds.). (1994). *Convergence in career development theories.* Palo Alto, CA: Consulting Psychologists Press.

Savickas, M.L., & Spokane, A.R. (Eds.). (1999). *Vocational interests: Their meaning, measurement, and use in counseling.* Palo Alto, CA: Davies-Black.

Savickas, M.L., & Walsh, W.B. (Eds.). (1996). *Handbook of career counseling theory and practice.* Palo Alto, CA: Davies-Black.

Schaefers, K.G., Epperson, D.L., & Nauta, M.M. (1997). Women's career development: Can theoretically derived variables predict persistence in engineering majors? *Journal of Counseling Psychology, 44,* 173–183.

Schinka, J.A., Dye, D.A., & Curtiss, G. (1997). Correspondence between 5-factor and RIASEC models of personality. *Journal of Personality Assessment, 68,* 355–368.

Schneider, P.L., Ryan, J., Tracey, T.J., & Rounds, J.B. (1996). Examining the relation between Holland's RIASEC types and the interpersonal circle. *Measurement and Evaluation in Counseling and Development, 29,* 123–133.

Schultheiss, D.P., & Blustein, D.L. (1994). Role of adolescent-parent relationships in college student development and adjustment. *Journal of Counseling Psychology, 41,* 248–255.

Schunk, D.H., & Hanson, A.R. (1985). Peer models: Influence on children's self-efficacy and achievement. *Journal of Educational Psychology, 77,* 313–322.

Schunk, D.H., Hanson, A.R., & Cox, P.D. (1987). Peer-model attributes and children's achievement behaviors. *Journal of Educational Psychology, 79,* 54–61.

Smart, R.M. (1998). Career stages in Australian professional women: A test of Super's model [Special issue]. *Journal of Vocational Behavior, 52,* 379–395.

Smart, R.M., & Peterson, C. (1997). Super's career stages and the decision to change careers. *Journal of Vocational Behavior, 51,* 358–374.

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

Spokane, A. (1985). A review of research on person-environment congruence in Holland's theory of careers. *Journal of Vocational Behavior, 26,* 306–343.

Stead, G.B., & Watson, M.B. (1998). Career research in South Africa: Challenges for the future [Special issue]. *Journal of Vocational Behavior, 52,* 289–299.

Strahan, R.F., & Severinghaus, J.B. (1992). Dealing with ties in Holland-type consistency measures. *Journal of Vocational Behavior, 40,* 260–267.

Strong, E.K., Jr. (1931). *Change of interests with age.* Palo Alto, CA: Stanford University Press.

Subich, L.M. (1992). Comment: Holland's theory: "Pushing the envelope" [Special issue]. *Journal of Vocational Behavior, 40,* 201–206.

Super, D.E. (1983). The history and development of vocational psychology: A personal perspective. In W.B. Walsh & S.H. Osipow (Eds.), *Handbook of vocational psychology* (pp. 5–37). Mahwah, NJ: Erlbaum.

Super, D.E. (1992). Toward a comprehensive theory of career development. In D. Montross & C. Shinkman (Eds.), *Career development: Theory and practice* (pp. 35–64). Springfield, IL: Thomas.

Super, D.E., Savickas, M.L., & Super, C.M. (1996). The life-span, life-space approach to careers. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development* (3rd ed., pp. 121–178). San Francisco: Jossey-Bass.

Sutherland, L.F., Fogarty, G.J., & Pithers, R.T. (1995). Congruence as a predictor of occupational stress. *Journal of Vocational Behavior, 46,* 292–309.

Swanson, J.L. (1992). Vocational behavior, 1989–1991: Life-span career development and reciprocal int action of work and nonwork. *Journal of Vocational Behavior, 41,* 101–161.

Swanson, J.L. (1993). Integrated assessment of vocational interests and self-rated skills and abilities. *Jo nal of Career Assessment, 1,* 50–65.

Swanson, J.L. (1999). Stability and change in vocational interests. In M.L. Savickas & A.R. Spok (Eds.), *Vocational interests: Their meaning, measurement, and use in counseling.* Palo Alto, CA: Davi Black.

Swanson, J.L., Daniels, K.K., & Tokar, D.M. (1996). Assessing perceptions of career-related barriers: ' career barriers inventory. *Journal of Career Assessment, 4,* 219–244.

Swanson, J.L., & Hansen, J.C. (1986). A clarification of Holland's construct of differentiation: The imp tance of score elevation. *Journal of Vocational Behavior, 28,* 163–173.

Swanson, J.L., & Hansen, J.C. (1988). Stability of vocational interests over 4-year, 8-year, and 12-y intervals. *Journal of Vocational Behavior, 33,* 185–202.

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

Swanson, J.L., & Tokar, D.M. (1991b). Development and initial validation of the Career Barriers Invent *Journal of Vocational Behavior, 39,* 344–362.

Swanson, J.L., & Woitke, M.B. (1997). Theory into practice in career assessment for women: Assessm and interventions regarding perceived career barriers. *Journal of Career Assessment, 5,* 443–462.

Tenopyr, M.L. (1993). Construct validation needs in vocational behavior theories. *Journal of Vocational havior, 43,* 84–89.

Tinsley, H.E.A. (1993). Special issue on the theory of work adjustment. *Journal of Vocational Behavior,* 1–4.

Tokar, D.M., & Fischer, A.R. (1998). More on RIASEC and the five-factor model of personality: Di assessment of Prediger's (1982) and Hogan's (1983) dimensions. *Journal of Vocational Behavior,* 246–259.

Tokar, D.M., Fischer, A.R., & Subich, L.M. (1998). Personality and vocational behavior: A selective rev of the literature, 1993–1997. *Journal of Vocational Behavior, 53,* 115–153.

Tokar, D.M., & Subich, L.M. (1997). Relative contributions of congruence and personality dimension job satisfaction. *Journal of Vocational Behavior, 50,* 482–491.

Tokar, D.M., & Swanson, J.L. (1995). Evaluation of the correspondence between Holland's vocational sonality typology and the five-factor model. *Journal of Vocational Behavior, 46,* 89–108.

Tokar, D.M., Vaux, A., & Swanson, J.L. (1995). Dimensions relating Holland's vocational personality pology and the five-factor model. *Journal of Career Assessment, 3,* 57–74.

Tracey, T.J.G. (1997). The structure of interests and self-efficiency expectations: An expanded exam tion of the spherical model of interests. *Journal of Counseling Psychology, 44,* 32–43.

Tracey, T.J., & Rounds, J.B. (1993). Evaluating Holland's and Gati's vocational-interest models: A st tural meta-analysis. *Psychological Bulletin, 113,* 229–246.

Tracey, T.J., & Rounds, J.B. (1994). An examination of the structure of Roe's eight interest fields. *Jou of Vocational Behavior, 44,* 279–296.

Tracey, T.J., & Rounds, J.B. (1995). The arbitrary nature of Holland's RIASEC types: A concentric-cir structure. *Journal of Counseling Psychology, 42,* 431–439.

Tracey, T.J., & Rounds, J.B. (1996). The spherical representation of vocational interests. *Journal of V tional Behavior, 48,* 3–41.

Tracey, T.J., & Ward, C.C. (1998). The structure of children's interests and competence perceptions. *J nal of Counseling Psychology, 45,* 290–303.

Tracey, T.J., Watanabe, N., & Schneider, P.L. (1997). Structural invariance of vocational interests ac Japanese and American cultures. *Journal of Counseling Psychology, 44,* 346–354.

Tranberg, M., Slane, S., & Ekeberg, S.E. (1993). The relation between interest congruence and satisfact A metaanlysis. *Journal of Vocational Behavior, 42,* 253–264.

Upperman, P.J., & Church, A.T. (1995). Investigating Holland's typological theory with army occupati specialties. *Journal of Vocational Behavior, 47,* 61–75.

Vasil, L. (1992). Self-efficacy expectations and causal attributions for achievement among male and fe university faculty. *Journal of Vocational Behavior, 41,* 259–269.

Vondracek, F.W. (1992). The construct of identity and its use in career theory and research. *Career Development Quarterly, 41,* 130–144.

Vroom, V.H. (1964). *Work and motivation.* New York: Wiley.

Watkins, C.E., & Subich, L.M. (1995). Annual review, 1992–1994: Career development, reciprocal work/nonwork interaction, and women's workforce participation. *Journal of Vocational Behavior, 47,* 109–163.

Weiss, D.J., Dawis, R.V., England, G.W., & Lofquist, L.H. (1967). Manual for the Minnesota Satisfaction Questionnaire. *Minnesota Studies in Vocational Rehabilitation,* 22.

Wiggins, J.S. (1979). A psychological taxonomy of trait-descriptive terms: The interpersonal domain. *Journal of Personality and Social Psychology, 37,* 395–412.

Williams, E.N., Soeprapto, E., Like, K., Touradji, P., Hess, S., & Hill, C.E. (1998). Perceptions of serendipity: Career paths of prominent academic women in counseling psychology. *Journal of Counseling Psychology, 45,* 379–389.

Young, G., Tokar, D.M., & Subich, L.M. (1998). Congruence revisited: Do 11 indices differentially predict job satisfaction and is the relation moderated by person and situation variables? *Journal of Vocational Behavior, 52,* 208–233.