

The Development, Evolution, and Status of Holland's Theory of Vocational Personalities: Reflections and Future Directions for Counseling Psychology

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This article celebrates the 50th anniversary of the introduction of John L. Holland's (1959) theory of vocational personalities and work environments by describing the theory's development and evolution, its instrumentation, and its current status. Hallmarks of Holland's theory are its empirical testability and its user-friendliness. By constructing measures for operationalizing the theory's constructs, Holland and his colleagues helped ensure that the theory could be implemented in practice on a widespread basis. Empirical data offer considerable support for the existence of Holland's RIASEC types and their ordering among persons and environments. Although Holland's congruence hypotheses have received empirical support, congruence appears to have modest predictive power. Mixed support exists for Holland's hypotheses involving the secondary constructs of differentiation, consistency, and vocational identity. Evidence of the continued impact of Holland's theory on the field of counseling psychology, particularly in the area of interest assessment, can be seen from its frequent implementation in practice and its use by scholars. Ideas for future research and practice using Holland's theory are suggested.

Keywords: Holland's Theory of Vocational Personalities, RIASEC personality and environment types, occupational interests, occupational interest measures, person–environment fit

When an article written by John L. Holland (1959) entitled, "A Theory of Vocational Choice," was published in the *Journal of Counseling Psychology* 50 years ago, it is unlikely that many readers would have anticipated the theory's eventual impact. In an editorial immediately following Holland's theoretical statement, Bordin (1959) commented, "It remains to be seen whether or not it [Holland's theory] will provide the basis for a big breakthrough" (p. 45). Half a century later it is clear that a breakthrough did occur; this theory's contributions to counseling psychology are undeniable, as Holland's typology now pervades career counseling research and practice. The golden anniversary of the introduction of his theory provides a fitting occasion for appraising the magnitude of Holland's contributions to counseling psychology while also noting the field's loss as a result of his passing in November, 2008. This article summarizes Holland's theory, reviews historical information that provides the context for his theory and its impact, discusses the evolution and refinement of his theory and instruments over the years, and summarizes the theory's current status.

Overview of Holland's Theory, Instruments, and Classification Materials

Helping people make career decisions has been fundamental to counseling psychology since its emergence as a profession, and it continues to be central to its identity today (Gelso & Fretz, 2001).

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By helping to generate core knowledge related to career development, assessment, and practice, Holland's theory and research have contributed in innumerable and significant ways to the field of counseling psychology.

Holland's greatest contribution and his most well-renowned work pertains to his theory (Holland, 1959, 1966b, 1973, 1985, 1997c) of vocational personalities and work environments. The theory's core idea is that most people resemble a combination of six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (commonly abbreviated with the acronym RIASEC). Each type is characterized by a constellation of interests, preferred activities, beliefs, abilities, values, and characteristics. A Holland code (typically the first letters of the three RIASEC types the person most resembles) can be generated on the basis of assessments, although Holland (1997c) recommended using the rank ordering of all six types to describe individuals. Likewise, work environments can be categorized by their resemblance to a combination of the RIASEC types, and Holland codes are often used to describe them as well.

The RIASEC personality and environment types and their relationships to each other provide the basis for several testable hypotheses. Most importantly, Holland (1997c) asserted that individuals search for and enter work environments that permit them to "exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles" (p. 4). Accordingly, *congruence*—the degree of fit between an individual's personality type and the work environment type—is theorized to be a determinant of several important outcomes, including job satisfaction, stability, and performance.

The underlying structure, or *calculus*, of the RIASEC types is represented by Holland's (1973, 1985, 1997c) iconic hexagon. *Con-*

sistency, a measure of the overlap or internal coherence of an individual's or environment's type scores, is represented by greater proximity on the hexagon. *Differentiation*, or the degree to which a person or environment clearly resembles some RIASEC types and not others, reflects greater clarity with respect to making vocational choices. The final construct, *identity*, refers to the degree to which an individual has a clear "picture of one's goals, interests, and talents" (Holland, 1997c, p. 5) or, among environments, reflects the degree to which a work setting has clear goals, tasks, and rewards that remain stable over time. Consistent and well-differentiated individuals should have more crystallized vocational identities and, as a result, are expected to make career choices with less difficulty and to "do competent work, be satisfied and personally effective, and engage in appropriate social and educational behavior" (Holland, 1997c, p. 40). Likewise, environments characterized by a high degree of consistency and differentiation and that possess a clear identity are expected to have employees with higher levels of satisfaction, stability, and productivity.

Second only to his theory in terms of impact on the field of counseling psychology are Holland's instruments for assessing persons and environments with respect to the RIASEC types. These include the Vocational Preference Inventory (VPI; Holland, 1994a) and the Self-Directed Search (SDS; Holland, Fritzsche, & Powell, 1994), both of which assess RIASEC personality types. The Position Classification Inventory (PCI; G. D. Gottfredson & Holland, 1991) classifies work environments using the RIASEC types, and the Environmental Assessment Technique (EAT; Astin & Holland, 1961) classifies educational environments. The Vocational Decision Making Difficulty scale (Holland & Holland, 1977) and its successor, My Vocational Situation (MVS; Holland, Daiger, & Power, 1980), as well as the Vocational Identity Scale (Holland, Johnston, & Asama, 1993), permit researchers and practitioners to assess the clarity of a client's vocational identity. Finally, the Career Attitudes and Strategies Inventory (Holland & Gottfredson, 1994) assesses clients' beliefs and factors that influence their career choices.

Assessing clients' RIASEC personality types would be of limited value without a corresponding way to link them to congruent environments (Holland, 1997c). A third major contribution of Holland's, therefore, was the development of Holland-code classifications for environments. Along with colleagues, Holland helped to develop materials for classifying occupations using the RIASEC types, first by characterizing the people who work in them (Campbell & Holland, 1972; Holland, 1966a, 1975) and later on the basis of job-analysis data (Holland, 1978; G. D. Gottfredson & Holland, 1996). The most well known of the publications resulting from this work is the *Dictionary of Holland Occupational Codes (DHOC)* (G. D. Gottfredson & Holland, 1996). Materials that accompany the SDS, such as the *Occupations Finder* (Holland, 1996b), the *Educational Opportunities Finder* (Holland, 1997a; formerly called the *College Majors Finder*), and the *Leisure Activities Finder* (Holland, 1997b), also permit clients to explore occupations, majors, and hobbies that are congruent with their personalities.

Historical Context

To appreciate the ways in which Holland's theory contributed to counseling psychology, it is useful to consider the historical context in which it emerged. In addition, to the extent that theories are the products of their creators, knowledge about the theorist has value (Weinrach, 1996). When viewed in the context of history,

Holland's theory and instruments are remarkable for having extended others' ideas and translated them into forms that are easily accessible to clients and counselors. Influences of Holland's academic training and work experiences can be seen in his theory and instruments and help account for their user-friendliness and impact.

Many ideas that are central to Holland's theory resulted from his graduate training and from frustrations he experienced when providing career counseling services. The idea that people tend to exemplify one of a few vocational personality types first occurred to Holland when he was serving in the Army as a classification interviewer (American Psychological Association, 1995; Holland, 1999; Weinrach, 1980). Holland kept this notion in mind when he later enrolled in the University of Minnesota's graduate program to study counseling psychology. While there, his research (Holland, 1952) focused on the ability of artists' scores on the Minnesota Multiphasic Personality Inventory to predict others' ratings of their artistic works. Holland (1999) described this research as having prompted his belief that personality is expressed in varied ways. While at the University of Minnesota, Holland studied under John Darley, who exposed him to research on interests (Holland, 1999), and he spent 4 years in vocational counseling practice. Once Holland concluded that personality is linked with important individual difference constructs, and once he had been exposed to vocational assessment, it was then not a stretch for the idea to emerge that personality and vocational interests are closely intertwined. This belief eventually manifested itself in Holland's (1959, 1966b, 1973, 1985, 1997c) assertion that vocational interests are expressions of people's personalities. Given its tradition of "dust bowl empiricism" that eschewed theory in favor of data, the University of Minnesota might have been an unlikely place for the seeds of a theory of vocational types to have been sown, but Holland credited a philosophy of science course taught by Herbert Feigl as having stimulated his appreciation for theory (American Psychological Association, 1995).

After graduate school, Holland provided vocational counseling at Western Reserve University and at the Perry Point, MD, Veteran's Administration Hospital (Holland, 1999). These experiences led to some frustrations (American Psychological Association, 1995). Although existing inventories, such as Strong's (1927) Vocational Interest Blank (SVIB) and the Kuder Preference Record (KPR; Kuder, 1939) compared individuals' likes and dislikes with known occupational groups, Holland noted that there were limits to their practical utility. First, they were reliant on occupational scales that were difficult to interpret and extrapolate beyond those occupations assessed directly (Campbell & Borgen, 1999; G. D. Gottfredson, 1999). Second, they involved complicated scoring and had to be sent away, necessitating a delay between administration and interpretation (Weinrach, 1980). Finally, there was no easy way to link clients' scores to environments.

Collectively, these work experiences and frustrations prompted Holland's eagerness to find a way to make interest assessment more user-friendly. Beginning in 1953, therefore, he commenced work on the VPI, which he considered to be a personality inventory (Weinrach, 1980). He reported that an undated *Occupational Interest Blank*, by LeSuer (n.d.), served as a model for having clients rate their liking or disliking of occupations (Holland, 1999). He was also inspired by an article by Forer (1948) that provided

interpretation guidelines for counselors based on clients' responses to an interest inventory (American Psychological Association, 1995; Holland, 1999; Weinrach, 1980). Thus, using intuition, scoring keys for the SVIB, and factor analyses of responses to occupational scales from existing instruments (Guilford, Christensen, Bond, & Sutton, 1954; Strong, 1943) as a starting point, Holland created scales by grouping occupations together to represent types. The scales underwent a number of revisions, and when the VPI first appeared in print (Holland, 1958) it had several advantages over existing instruments. Namely, its organization around broad occupational groups rather than single occupations allowed clients and counselors to generalize more easily to occupations that were not listed on the inventory itself. In addition, it contained scales of equal lengths that could be scored by clients, thereby providing immediate feedback. This was in marked contrast to the norm of professional interpretations of tests that existed at the time (Campbell & Borgen, 1999; G. D. Gottfredson, 1999).

Holland reported that the VPI scales' correlations with SVIB and KPR scores gave him confidence to proceed with the development of his (1959) theory of vocational types (Weinrach, 1980). It should be noted that although this theory was pioneering in many ways, it built upon important works of other scholars. First, it is an exemplar of the Parsons (1909) trait-and-factor approach in that it matches people to environments. The trait-and-factor approach had been used in practice prior to the emergence of Holland's theory, for example in placing soldiers in positions on the basis of ability with the Army classification tests (Gelso & Fretz, 2001). What was missing, however, was an easy way of matching persons to environments using self-perceptions rather than objectively measured abilities, and Holland's work eventually provided the means for this to occur (Gelso & Fretz, 2001). Holland's theory was also unique in that it provided a completely parallel way for describing people and environments (L. S. Gottfredson & Richards, 1999), thus lending itself well to counseling interventions. Holland's was also not the first career-type theory. Antecedents of Holland's RIASEC types included Roe's (1956) division of occupations into eight fields and Darley and Hagenah's (1955) identification of a hierarchy of job titles and conceptualization of interests as indirect reflections of personality. Holland's theory extended these ideas and made them user-friendly through the use of a parsimonious set of types that counselors and clients could easily understand (Campbell & Borgen, 1999).

Although Holland's theory provided a mechanism for linking client characteristics with environments in a parallel fashion, doing so still represented a challenge because information about environments was scattered and disorganized. Arguments by Murray (1938) and Linton (1945) for the need to assess individuals and environments in the same ways provided the groundwork for the development of materials for characterizing work environments according to the RIASEC types. After presenting his theoretical statement, Holland and colleagues (e.g., G. D. Gottfredson & Holland, 1991, 1996; L. S. Gottfredson, 1980; Richards, Seligman, & Jones, 1970) took an extensive collection of books and files that comprised the *Dictionary of Occupational Titles (DOT)* (Employment and Training Administration, 1991) and many other sources and derived Holland-type classifications for each occupation. This was no small undertaking, as the sources of information were vast and disparate.

Given his training's emphasis on empiricism, it is not surprising that Holland created a theory with testable postulates, and much of his later career—at the National Merit Scholarship Corporation, American College Testing Program, and Johns Hopkins University—and his ensuing retirement was devoted to testing his theory's hypotheses and developing instruments to operationalize its constructs. Thus, the push for evidence that Holland learned to appreciate at the University of Minnesota contributed to his career-long effort to evaluate the tenets of his theory and the psychometric properties of his instruments (Holland, 1999).

Evolution and Refinement of Holland's Theory, Instruments, and Materials

Evolution of the Theory

Few theories emerge as fully developed from their inception, and Holland's is no exception. The theory's core assertion of the existence of six personality and environment types remained constant, but new concepts and reformulations of the relationships among constructs developed over time. Consistent with his training's emphasis on empiricism, and in response to having been challenged by Bill Alston, a philosopher, to refine the theory so that it would be more defensible (American Psychological Association, 1995), Holland's revisions were driven primarily by evidence. Throughout the revisions of his work, however, Holland remained motivated to articulate a theory that was simple and practical (Holland, 1999).

The direct precursor to Holland's theory was his VPI, the first six scales of which formed the basis for the RIASEC types. Foreshadowing of Holland's eventual idea of vocational identity can be seen in his interpretation for frequently omitted VPI items: "the inability to make discriminations among occupations is indicative of conflict and disorganized self-understanding" (Holland, 1958, p. 337).

When the theoretical statement itself was first published in 1959, Holland asserted that people develop over time a "hierarchy of habitual or preferred methods for dealing with environmental tasks" (Holland, 1959, p. 35) and advanced the theory's central tenet that "the person making a vocational choice in a sense 'searches' for situations which satisfy his [sic] hierarchy of adjustive orientations" (Holland, 1959, p. 35). He specified six environments, which in terms of content are easily mapped onto the RIASEC types but were at the time labeled *motoric*, *intellectual*, *esthetic*, *supportive*, *persuasive*, and *conforming*. The types' core descriptions are similar to those in the final (Holland, 1997c) version of his theory, albeit much less comprehensive. In the original statement, Holland conceptualized each type as having a distinctive lifestyle, preferred methods of dealing with problems, interpersonal skills, and other personal factors, and he clearly stated that interest inventories are personality inventories. One can see precursors to hypotheses about differentiation in the original theoretical statement, as Holland (1959) suggested that a well-defined hierarchy results in "directional choice with minimal conflict or vacillation" (p. 39). Finally, his original statement emphasized the importance of self-knowledge, accurate self-evaluations of ability, the importance of environmental knowledge, and the role of environmental influences, such as barriers or limited opportunities. All of these ideas were retained in later versions.

The theory's first major revision (Holland, 1966b) more clearly specified the role of the environment and ways to measure it using the EAT. This revision also provided more explicit definitions of the main concepts, and it included more comprehensive descriptions of the types. At this point, Holland began using the RIASEC labels for the types, with the exception that the Investigative type was labeled Intellectual. This 1966b version identified specific outcomes associated with congruence, including work choices, stability of vocational choices, higher educational and work achievement, and greater job satisfaction. The foundation for the idea of consistency was introduced, in that Holland discussed degrees of overlap among types and speculated that consistency is associated with stable vocational choices. Finally, in this version of the theory, Holland introduced the idea of *homogeneity*, a predecessor to the idea of *environmental differentiation*. A homogeneous environment was described as one that has "only one or two dominant environmental presses and four or five very weak environmental presses" (Holland, 1966b, p. 67). Homogeneity was posited as leading to stability and achievement among employees.

Around 1969, while they were examining the pattern of correlations among the VPI scales, Holland and his colleagues identified the RIASEC circular ordering of types and came up with the idea of the hexagon to represent the relations among the types (Weinrach, 1980). The hexagon was then introduced into the literature (Cole, Whitney, & Holland, 1971; Holland, Whitney, Cole, & Richards, 1969) and served as the impetus for the second major revision of Holland's theoretical statement in 1973.

In the 1973 version of the theory, the RIASEC labels, including *Investigative*, were used for the types. The most notable revision was the explicit incorporation of the hexagon for assessing degrees of congruence and determining consistency among personality and environment types. It also contained expanded typologies of persons and environments that had been revised in response to evidence, offered speculations about how types develop, provided more specific methods for measuring the constructs, and offered ideas for practical applications for clients across the lifespan. One such idea was that the RIASEC types might be useful predictors of leisure activities that people would enjoy. Finally, Holland (1973) explicated ordering with respect to the importance of constructs in the theory: "Congruence of the person-environment is most influential; differentiation of the person or environment is next, and consistency of person or environment is least influential" (p. 40).

The most substantial change in the 1985 revision of Holland's theory was the formal introduction of the idea of vocational identity. In this version the construct of consistency was "demoted" (Holland, 1985, p. x) because of weak empirical support for hypotheses related to it. Holland also added an "other things being equal" (Holland, 1985, p. 12) qualifier at this point, indicating that interest inventories and his theory are useful for understanding individuals' career choices after controlling for age, gender, social class, and other influences that circumscribe (L. S. Gottfredson, 1981) the range of careers a person considers.

Based on a factor analysis of job analysis ratings of occupations in the *DOT* (Employment and Training Administration, 1991), the idea of cognitive complexity was added in a minor revision (G. D. Gottfredson & Holland, 1996). In this statement, the authors articulated the need to assess persons and environments not only with respect to the RIASEC types but also with respect to the level

of cognitive complexity of the individual and the level of demand for complexity required by the environment.

In the theory's final version Holland (1997c) emphasized the idea that different RIASEC types have different belief systems, stating that each personality type has unique beliefs about the self and the consequences of actions, and each RIASEC environment promotes different belief systems. The 1997 version also gave greater emphasis to the construct of vocational identity, reflecting research (e.g., Holland et al., 1993) that had supported the usefulness of this construct and additional evidence for the validity of measures to assess it.

Evolution of Instruments and Classification Materials

As with his theory, Holland's instruments and environment-classification materials underwent multiple revisions. Two themes mark the changes to these over time: refinement based on research and data, and attempts to be more practical and user-friendly.

After the VPI first appeared in print (Holland, 1958), Holland continued to work toward improving it. By 1969, scores were organized according to the hexagonal model, which helped counselors and clients understand the relationships among the RIASEC types. This was followed by refinements that incorporated findings from item analyses and research on the occupational titles that best depicted the types and distinguished among occupational groups, as well as revision to reduce gender-biased language.

Although the VPI represented a step toward user-friendliness, Holland remained convinced that interest inventories could be made even more helpful to clients. Acting upon this conviction, he commenced work on the SDS, which he described as a "practical, self-help device" (Weinrach, 1980, p. 408). He used item analyses from the VPI, data on the relationships between VPI scores and personality scales, and fields of study to form the basis for the SDS items and scales (Holland, 1999). The SDS reflected Holland's (1959, 1997c) assertion that the RIASEC types are personality types, as it included not only preferences for occupational titles but also items assessing wider beliefs about the self, including preferences for various activities and self-rated competencies. The first version of the SDS appeared in print in 1971, and in subsequent versions the scoring was simplified even more to enhance user-friendliness. As with the VPI, later versions also reduced gender-biased language.

Finally, Holland's environmental classifications became more sophisticated over time. He and others began by classifying environments in terms of the mean profiles of people comprising them (Campbell & Holland, 1972; Holland, 1966a, 1975). This approach was limited, however, because it was impractical to assess large numbers of employees in every occupation. Holland and colleagues (e.g., G. D. Gottfredson & Holland, 1991, 1996; Richards et al., 1970) therefore advanced to classifying environments in terms of work activities and institutional structures. For example, the EAT (Astin & Holland, 1961) assessed college environments on the basis of institutional size, student test scores, and relative emphasis on the Holland types (L. S. Gottfredson & Richards, 1999). Eventually, using intuition and knowledge accumulated from the other categorization methods, Holland et al. (1972) began using job-analysis data to categorize occupations into RIASEC types. Research with data from the *DOT* (Employment and Training Administration, 1991) resulted in the development and success

sive revisions of the *DHOC* (G. D. Gottfredson & Holland, 1996), the *Occupations Finder* (Holland, 1996b), and other ancillary materials for the SDS. Finally, the PCI (G. D. Gottfredson & Holland, 1991) was developed to provide a direct measure of environments by having employees or supervisors rate the frequency with which a job involves various activities, abilities, values, and perspectives that are grouped by RIASEC type. This allows for the generation of an occupation's Holland code, along with its degree of differentiation and consistency.

Current Status of Holland's Theory

Partly because Holland developed a theory that lends itself well to empirical tests and partly because of its popularity, it has been the most extensively examined career theory (Brown & Lent, 2005; Spokane & Cruza-Guet, 2005). As a result, it is a credit to the theory that we now know a great deal about its relative merits and shortcomings.

Empirical Status

Empirical status of the theory's tenets. Research has supported the existence of the RIASEC types among a wide variety of individuals, including high school students (e.g., Holland, 1962), college students (e.g., Edwards & Whitney, 1972), and working adults (e.g., Rachman, Amernic, & Aranya, 1981). Holland (1973, 1985, 1997c) conceptualized the types as being broadly applicable but acknowledged the impact of gender, race or ethnicity, age, and social class variables on career development. Consistent with this idea, research has revealed some differences in RIASEC score levels across demographic groups, with the strongest being related to gender (Betz & Gwilliam, 2002; Fouad, 2002). Men tend to score higher than do women on measures of the Realistic type, and women tend to score higher than do men on measures of the Social type (e.g., Fouad, 2002; Tracey & Robbins, 2005). Effect sizes for differences by age and race/ethnicity tend to be fairly small, with the exception that Asian Americans tend to score higher on measures of the Investigative type than do members of other groups (Fouad, 2002).

Holland's RIASEC calculus has been the subject of a great deal of research. Findings have generally supported the RIASEC ordering of types among individuals. Types that are contiguous on the hexagon have consistently been found to be more strongly related than are noncontiguous types (e.g., Armstrong, Hubert, & Rounds, 2003; Armstrong & Rounds, 2008; Darcy & Tracey, 2007), although there is less support for a stricter model that specifies equal distances between the six sides of the hexagon (e.g., Armstrong et al., 2003). Accordingly, many scholars (e.g., Armstrong & Rounds, 2008; Darcy & Tracey, 2007) now refer to the Holland "circumplex" rather than the Holland hexagon. It is interesting that, if Holland had followed his initial instincts, the theoretical statement would have depicted a circle rather than a hexagon. Referring to Roe's (1956) eight vocational fields, Holland explained, "If Anne Roe had not preceded me, we would have called it [the hexagon] a circle" (Weinrach, 1980, p. 408). As it was, Holland (1997c, p. 138) acknowledged that data tend to be more consistent with a "misshapen polygon."

The vast majority of recent research on Holland's theory (e.g., Armstrong, Rounds, & Hubert, 2008; Elosua, 2007; Gupta,

Tracey, & Gore, 2008; Hedrih, 2008; Tracey & Robbins, 2005) has been devoted to examining the fit of the RIASEC model for different groups. Much (but not all) research has shown that the RIASEC circumplex structure holds across gender (Armstrong et al., 2003; Darcy & Tracey, 2007; Rounds & Tracey, 1993; Ryan, Tracey, & Rounds, 1996; Swanson & Gore, 2000), race or ethnicity (e.g., Armstrong et al., 2003; Darcy & Tracey, 2007; Gupta et al., 2008; Rounds & Tracey, 1993; Swanson & Gore, 2000), and socioeconomic status (Ryan et al., 1996). There is debate, however, about its fit among those of different nationalities (e.g., Armstrong & Rounds, 2008; Rounds & Tracey, 1993; Yang, Stokes, & Hui, 2005). In addition, the fit with younger (i.e., middle school) populations is unclear (Lent, Tracey, Brown, Soresi, & Nota, 2006; Tracey & Ward, 1998), as is the fit with data in noncareer realms, such as leisure activities (Hansen, Dik, & Zhou, 2008; Hansen & Scullard, 2002).

Holland's assertion that the RIASEC types exist among environments has been the focus of less empirical study than has that regarding the types among individuals. Nevertheless, there is support for the existence of the types among environments stemming from studies that have operationalized work environments in terms of the interest profiles of successful workers in various occupations (Donnay & Borgen, 1996), job analyses of work tasks and requirements (McCormick, Jeanneret, & Mecham, 1972), and expert ratings (Rounds, Smith, Hubert, Lewis, & Rivkin, 1999). The RIASEC environment types have also been shown to have correlations with characteristics of work environments that are consistent with Holland's theory, although this was less true of the Realistic type than of the other types (Maurer & Tarulli, 1997). Finally, there is support for the RIASEC circumplex structure for environments (G. D. Gottfredson & Holland, 1996; Holland, 1997c), although again this literature is much sparser than is that regarding the structure among individuals.

Of course research documenting the presence of the RIASEC types and their ordering does not mean this is the only structure for characterizing people and environments. Support for the RIASEC model may partially be a function of the use of scales developed specifically to assess the RIASEC dimensions (Rounds, 1995). Empirical support has also been found for Prediger's (1982) model of Data-Ideas and People-Things dimensions, Hogan's (1983) conceptualization of sociability and conformity dimensions, Gati's (1991) hierarchical model, and Tracey and Rounds's (1995) circular model. Moreover, comprehensive factor analytic studies of interest structure tend to identify more than six factors (Rounds, 1995). Holland (1997c) acknowledged the likelihood of more than six factors among person and environment data but stood by the decision to have six types on the grounds that a theory with more types and greater complexity would be less useful in practice.

Holland's congruence hypotheses have also been well tested. There is strong evidence that congruence predicts individuals' choices of (see Betz, 2008; Holland, 1997c; Spokane & Cruza-Guet, 2005) and persistence or stability in (e.g., Donohue, 2006) college majors and occupations. In addition, people who change jobs frequently switch to ones that are more congruent with their personalities (Oleski & Subich, 1996). Meta-analyses have confirmed that greater person-environment congruence with respect to the RIASEC types is associated with favorable outcomes, including job satisfaction (Assouline & Meir, 1987; Spokane, Meir, & Catalano, 2000; Tsabari, Tziner, & Meir, 2005) and, to a lesser

extent, performance (Spokane et al., 2000; Tsabari et al., 2005). However, the effect sizes of these relationships tend to be small. For example, Tsabari et al.'s (2005) meta-analysis revealed a mean congruence–satisfaction correlation of .17. Holland (1996a) acknowledged the need to understand more about the modest explanatory power of the congruence construct. Holland (1997c) and others (e.g., Gore & Brown, 2006) have noted methodological limitations of many congruence studies, such as restrictions in range of key variables, that may attenuate the magnitude of correlations. Moreover, there are many indices that represent congruence (see De Fruyt, 2002), and congruence–satisfaction relationships tend to differ depending on the index used (Camp & Chartrand, 1992). Finally, other variables, such as age and vocational identity, may moderate the relationships between congruence and important outcomes (Assouline & Meir, 1987; Holland, 1985, 1997c, 1999; Spokane, 1985). There is some empirical support for age (Carson & Mowesian, 1993), overall interest levels (Tracey & Robbins, 2006), and Holland personality type (Young, Tokar, & Subich, 1998) as moderators of congruence–outcome relationships, but differentiation, consistency, and vocational identity have not received strong support as moderators of such relationships (Carson & Mowesian, 1993).

Holland's differentiation and consistency hypotheses have received mixed empirical support (see Carson & Mowesian, 1993). Holland (1985) characterized this body of findings as "checkered" because there have been both positive and negative findings. For example, Barak and Rabbi (1982) found that consistency was associated with college-major persistence and achievement, but Frantz and Walsh (1972) did not find support for the idea that consistency was associated with achievement, and Hughes (1972) found no support for the relationship between consistency and stability and satisfaction among employed adults. In one of the few studies operationalizing consistency with respect to both personality and environment types, Latona (1989) found that consistency was unrelated to persistence in a college major. Differentiation has been shown to be related to stability of vocational choices (Holland, 1968; Villwock, Schnitzen, & Carbonari, 1976) but unrelated to psychological adjustment (Loughead & Reardon, 1989) and career indecision (Lowe, 1981). Differences in the ways consistency and differentiation are calculated may account for some of the inconsistent findings (Alvi, Khan, & Kirkwood, 1990), but overall, these constructs have proved to have less explanatory power than would be ideal. The lack of empirical support for the consistency construct's predictive power led Holland to deemphasize it in later versions (Holland, 1985, 1997c) of the theory, and the concepts of consistency and differentiation have not been extensively studied in recent years (Betz, 2008).

Vocational identity, the most recently added construct to Holland's theory (Holland, 1985, 1997c), has received only minimal empirical attention. Vocational identity among persons has been shown to be associated with occupational commitment (Grotevant & Thorbecke, 1982), life satisfaction (Olson, Johnston, & Kuncze, 1985), well-being and adjustment (Savickas, 1985; Strauser, Lustig, & Ciftci, 2008), career decision-making self-efficacy (Gushue, Scanlan, Pantzer, & Clarke, 2006), and career-choice readiness (Hirschi, 2007), but other studies (e.g., Blinne & Johnston, 1998; Leung, 1998) have yielded mixed or null results regarding vocational identity's association with predicted outcomes. Environmental identity was linked to job satisfaction in one

study (Perdue, Reardon, & Peterson, 2007) but otherwise has received little empirical attention. A puzzling finding is that although vocational identity was conceptualized by Holland (1985, 1997c) as leading to similar outcomes as consistency and differentiation, some research (Leung, Conoley, Scheel, & Sonnenberg, 1992) has found no association between vocational identity and the consistency and differentiation of RIASEC profiles.

Expressions of personality? Stability and overlap with other domains. Beginning with his original (Holland, 1959) theoretical statement and continuing throughout the theory's revisions, Holland (1966b, 1973, 1985, 1997c, 1999) strongly asserted that the RIASEC types are personality types. Accordingly, they should have trait-like qualities, such as stability over time. This idea has been supported empirically. For example, 12-week test–retest stability of SDS RIASEC scores ranges from .73 to .88. Meta-analytic research (Low, Yoon, Roberts, & Rounds, 2005) revealed a population estimate for the mean stability of the RIASEC types to be .61. Thus, the RIASEC types exhibit one important quality of traits. Research has shown that some individuals' interests change substantially over time, however (see Swanson, 1999). Holland (1997c) explained such fluctuations in terms of inconsistent, undifferentiated profiles or a less crystallized vocational identity, but again, these hypotheses have received only mixed support.

Holland conceptualized the RIASEC types as broad expressions of personality, each with associated abilities, self-views, preferences, and characteristics. Therefore, the types should correspond to other individual difference variables. Early studies confirmed that the RIASEC types are linked in ways that are consistent with Holland's type descriptions to values (Laudeman & Griffith, 1978; Williams, 1972) and life goals (Astin & Nichols, 1964). More recently, scholars have examined how other domains of individuality overlap with the RIASEC types.

Several points of convergence between models of interests and personality are consistent with Holland's (1997c) RIASEC type descriptions. A frequently studied topic has been the relationships of the Big Five personality dimensions with the Holland RIASEC types. Holland (1999) reported that an early study (Costa, McCrae, & Holland, 1984) in this line of research reinvigorated his interest in research during his retirement because it provided support for his long-held conviction that interests were manifestations of personality. Subsequently, meta-analyses (Barrick, Mount, & Gupta, 2003; Larson, Rottinghaus, & Borgen, 2002) have confirmed several areas of overlap between RIASEC scores and personality dimensions. Among the most consistently found relationships are those between Extraversion and both Social and Enterprising interests, Openness and both Artistic and Investigative interests, and Agreeableness and Social interests, findings that are largely consistent with the Holland type descriptions.

Other research has examined associations between the RIASEC types and indices of actual or perceived ability (see Ackerman & Heggestad, 1997). For example, Randahl (1991) found that RIASEC personality type scores were related to corresponding ability scores from the General Aptitude Test Battery. Swanson (1993) also found support for predictable relations between interests, skills, and abilities within the same Holland type, although these relationships tended to be fairly small. Relations between RIASEC interest and corresponding self-efficacy types are more substantial, with correlations ranging from .20 to .70 (e.g., Betz, Harmon, & Borgen, 1996).

Recently, scholars (e.g., Armstrong, Day, McVay, & Rounds, 2008; Armstrong & Rounds, 2008) have been integrating other individual difference variables and environmental demands into the RIASEC structure. For example, Armstrong, Day, et al., (2008) created the *Atlas of Individual Differences*, using the RIASEC types as a framework. They revealed associations between RIASEC types and several personality dimensions and environmental demands, many (although certainly not all) of which were consistent with Holland's (1997c) type descriptions. Their data also provided support for G. D. Gottfredson's and Holland's (1996) cognitive complexity dimension.

Outstanding research questions. Although much is known about the key assertions of Holland's theory, several remaining research questions have been identified. First, and perhaps most important given that it provides the basis for countless interventions, it would be useful to understand more about the modest predictive power of the congruence construct. Inconsistent findings regarding consistency, differentiation, and identity as moderators of congruence–outcome relationships have raised questions about their ability to account for congruence's modest predictive power. However, examining congruence–outcome relations and moderators using methodological best practices would help provide more definitive answers about these aspects of Holland's theory. Attention to issues of skew and restricted range among the predictor and outcome variables is essential (Holland, 1997c), as is the selection of appropriate constructs. For example, Prediger (2000) argued persuasively that congruence should theoretically be associated with intrinsic job satisfaction but should not be expected to relate to other forms of satisfaction that may be more a function of organizational reinforcers. Finally, longitudinal research would assess the congruence–satisfaction hypothesis in a manner that is most consistent with Holland's theory (Walsh, 2001).

Second, the vocational identity construct remains understudied, and there are questions about whether Holland's vocational identity measures may represent (a lack of) career indecision more so than vocational identity (Fuqua & Newman, 1989; Graef et al., 1985; Slaney, 1988). Holland (1997c) called attention to the need to understand more about vocational identity's ability to predict career stability over time and its value as a predictor of career outcomes when combined with the consistency and differentiation constructs. These questions remain virtually untested.

Third, in contrast to hypotheses dealing with the RIASEC personality types and their relationships with one another, much less is known about the relationships among environment types (L. S. Gottfredson & Richards, 1999). Thus, Holland's (1997c) claim that environments characterized by high levels of consistency, differentiation, and identity should have employees with greater stability of career choices, higher levels of achievement and productivity, and greater work satisfaction needs empirical verification. Latona's (1989) finding that environmental consistency was unrelated to persistence in a college major suggests the possibility that, as among personality types, these secondary constructs among environment types may have limited predictive power, but further study is needed to confirm this.

Fourth, investigations of the RIASEC structure in noncareer domains are scarce. Research (e.g., Gaudron & Vautier, 2007) has suggested that the structure of family and leisure activity interests may differ from that of career interests. Understanding more about

the structure of RIASEC leisure interests and the RIASEC types' predictive validity for the enjoyment of leisure activities would help extend the utility of the theory to retirees (Hansen et al., 2008).

Finally, in evaluating the Holland type descriptions, it appears there is more support for links between personality (and other individual difference variables) and the A, S, E, and C types. Fewer individual difference variables integrate into the R and I types (Armstrong, Day, et al., 2008; Barrick et al., 2003; Larson et al., 2002). Learning more about characteristics that correspond to these types would help to verify Holland's (1997c) descriptions or may suggest needed modifications.

Implications for counseling practice. Given what we now know about Holland's theory and about career development and the work force in general, some implications for using Holland's theory in practice might be offered. First, because we now have considerable data suggesting that Holland's congruence construct has only modest power to predict important outcomes such as job satisfaction, it is imperative that clients be encouraged to view RIASEC interest scores as only one of a complex array of individual difference variables that might be used to identify potentially good-fitting work environments. It is also important to clarify with clients that although RIASEC scores may help them anticipate satisfaction with respect to the nature of work activities, such scores would be less useful in helping them anticipate extrinsic work satisfaction (Prediger, 2000).

Second, Holland's (1985, 1997c) "other things being equal" qualifier is particularly important to emphasize in current practice. Economic changes and shifts in the labor force mean that substantial proportions of individuals have limited career options from which to choose (Blustein, 2006; Fouad, 2007), making it crucial not to assume that all individuals are free to use interests as the primary basis for educational and career choices. Limited choices need not render Holland's theory irrelevant but simply require counselors to be mindful of the constraints of reality. Holland's theory and clients' RIASEC scores may be used to help clients explore career options from within the range of those that are feasible.

Finally, economic constraints have resulted in an increase in forced career transitions, and globalization and technological developments have led to rapid shifts in the nature of the world of work (Blustein, 2006; Fouad, 2007). Holland's theory and type scores may be particularly useful in such a context, because they help provide clients with families of occupations, rather than single occupational titles, to explore. To the degree that counselors can help clients view RIASEC scores not only as information upon which to base current career decisions but also future career decisions, the better equipped clients will be to face transitions.

Impact of Holland's Theory

The contributions of Holland's theory to counseling psychology may be evaluated not just on the basis of the theory's empirical support but also on the basis of impact. When evaluated according to this criterion, the theory is unsurpassed in vocational psychology and has also been resoundingly successful in terms of the broader realm of counseling psychology.

Incorporation into counseling psychology practice. Among the clearest evidence of the impact of Holland's work is its

widespread use in practice. Holland's theory, instruments, and classification materials have been used to guide counseling interventions around the world.

First, Holland's (1997c) RIASEC structure is the most widely used model for organizing career interest assessment instruments (G. D. Gottfredson & Holland, 1996). The SDS has been taken by millions of people in more than 25 countries (Ciechalski, 2009). What is especially noteworthy is that the use of the RIASEC types to organize assessment instruments extends beyond Holland's own VPI and SDS. Rayman (1976) used Holland's RIASEC types as the organizing framework for the Unisex Interest Inventory, the precursor to the current ACT Interest Inventory (Swaney, 1995), and Holland's collaboration with Campbell (Campbell & Holland, 1972) resulted in the addition of RIASEC content scales to the SVIB. Together, the integration of the RIASEC framework into these instruments helped ensure that thousands of people annually have received information about their interests in the form of RIASEC-type scores and undoubtedly contributed to the theory's popularity. Now the majority of all career-interest inventories use some version of Holland scales. These include the Strong Interest Inventory (Donnay, Morris, Schaubhut, & Thompson, 2005), the Unisex Edition of the ACT Interest Inventory (Rayman, 1976; Swaney, 1995), the Career Assessment Inventory (Johansson, 1986), the Harrington and O'Shea (2000) Career Decision Making System, and the Armed Services Vocational Aptitude Battery (U.S. Department of Defense, 1994). Public domain RIASEC marker scales have also recently been developed (Armstrong, Allison, & Rounds, 2008). In addition, the RIASEC types have been used as the organizing framework for instruments designed to assess other constructs related to career development, including the Skills Confidence Inventory (Betz, Borgen, & Harmon, 2004).

Second, Holland's RIASEC model has been used to organize occupational information from many sources. The *DHOC* (G. D. Gottfredson & Holland, 1996) provides Holland codes for occupations listed in the *DOT* (Employment and Training Administration, 1991), the *Occupational Outlook Handbook* (U.S. Department of Labor, 2002), and many other occupational classification systems. Occupational interest profiles based on the RIASEC typology have also been created (Rounds et al., 1999) for each occupation in the government-sponsored O*Net database (Eggerth, Bowles, Tunick, & Andrew, 2005). Finally, Holland's hexagon is used to help clients understand occupational information in the ACT's widely used World-of-Work map (Swaney, 1995).

Holland's theory and instruments are also used as interventions. The RIASEC typology has been incorporated into computer-assisted career guidance programs such as DISCOVER (ACT, 1995) and into such self-help programs as *What Color is Your Parachute?* (Bolles, 1986). The SDS has even been shown to serve effectively as a stand-alone intervention (Holland & Rayman, 1986) in that it is associated with a greater number of career options being considered by clients (Barker, 1980), greater career-choice certainty (Atanasoff & Slaney, 1980), and greater career exploration (O'Neil, Muchow, & Barke, 1980).

Impact on counseling psychology scholarship. As Bordin's (1959) statement reflecting uncertainty regarding the impact of Holland's theory indicates, Holland's theory did not materialize with a big bang. Even by 1982, the theory was still listed only as an "emerging" classic in counseling psychology on the basis of citation counts (Heesacker, Heppner, & Rogers, 1982). The theory's

popularity greatly increased over the ensuing decade, however, and Holland eventually became regarded, along with Donald Super, as one of vocational psychology's two most preeminent figures (Borgen, 1991).

Now, evidence documenting the impact of Holland's theory is voluminous. An examination of recent textbooks on career counseling (e.g., Brown & Lent, 2005; Capuzzi & Stauffer, 2006; Swanson & Fouad, 2010) and counseling psychology in general (e.g., Brown & Lent, 2008; Gelso & Fretz, 2001) shows that Holland's (1997c) theory is featured prominently. Borgen (1991) documented that cited references to Holland's works were far greater than those of any other vocational theory during the prior 20-year period and continued to be abundant over the following decade as well (Campbell & Borgen, 1999). The impact of Holland's theory, instruments, and materials was celebrated by many eloquent scholars (Astin, 1999; Campbell & Borgen, 1999; Chartrand & Walsh, 1999; G. D. Gottfredson, 1999; L. S. Gottfredson & Richards, 1999; Hogan & Blake, 1999; McDaniel & Snell, 1999; Muchinsky, 1999; Osipow, 1999; Rayman & Atanasoff, 1999; Reardon & Lenz, 1999; Savickas, 1999) in a 1999 special issue of the *Journal of Vocational Behavior*.

Although Holland's own published writing was minimal after 1999, its continued impact is apparent. A PsycInfo search revealed 2,209 citations of Holland's works in the past 10 years (1999 through August 2009). To reveal areas in which Holland's recent impact may be particularly strong, I calculated the percent of articles in various counseling- and career-related journals that had at least one citation of Holland's work between 1999 and August 2009. Perhaps not surprising given its ubiquity as an organizing framework for interest inventories, Holland's work has been cited in nearly half (47%) of all articles published in the *Journal of Career Assessment* over the last decade. His work was also cited in substantial proportions of articles published in other career-related journals, including 32% of those published in the *Career Development Quarterly*, 18% of those in the *Journal of Vocational Behavior*, and 18% of those in the *Journal of Career Development*. In journals devoted to the broader realm of counseling psychology the percentage of articles citing Holland's work is smaller but still represents an impressive proportion given the diversity of topics spanned in these publications. Holland's work was cited in 9% of articles published in *Measurement and Evaluation in Counseling and Development*, 7% of those in the *Journal of Counseling Psychology*, 5% of those in *The Counseling Psychologist*, and 2% of those in the *Journal of Counseling and Development*.

Although many herald the impact of Holland's theory and instruments as a point of pride for counseling psychology, others (e.g., Armstrong, Rounds, & Hubert, 2008) have noted the potential for the pervasiveness of the RIASEC model to restrain innovation, especially in the area of interest assessment. The dominance of the RIASEC model could, to the degree that it is viewed as "the" way to conceptualize interests, serve to inhibit the development of new models and interventions. Thus, while giving Holland's theory, instruments, and classification materials the well-deserved credit they are due, it is also important for counseling psychologists to remain open to alternatives that may improve the ability to account for variability in work satisfaction, persistence, and performance and enhance the practice of career counseling.

Conclusion

In summary, Holland's contributions to counseling psychology are remarkable not so much because his theory advanced completely novel ideas but because it built upon the work of others to organize and make interest assessment and career materials user-friendly. Holland's academic training and work experiences contributed to the development of a theory that is empirically grounded and widely applicable. In his American Psychological Association presidential address, George Miller (1969) called on psychologists to give the profession's knowledge away. By basing his theory on a limited number of types, operationalizing them with self-scorable instruments, and providing a parallel mechanism for linking person types with environment types, Holland helped to "give away" an important part of counseling psychology's knowledge. Sadly, we no longer have Holland himself to serve as a leader of the field, but the continued widespread use of his theory, instruments, and classification systems suggests that his legacy will be enduring. If Bordin (1959) could have written his editorial with the benefit of hindsight that we have today, perhaps his comment would have read, "It remains to be seen whether or not any other theory will provide the basis for as big a break-through as Holland's."

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