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Technical Report 38¹**

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Holland's Theory and Implications for Academic Advising and Career Counseling

John Holland's typological theory of persons and environments is regarded as the most influential in the field of career counseling (Brown, 2002), but this has not carried over to the field of higher education and academic advising (Smart, Feldman, & Ethington, 2000). This conundrum led us to explore whether or not Holland's theory and research were relevant and could shed light on the behavior and organization of college faculty and students, which could ultimately improve the effectiveness of academic advising and career counseling. This article summarizes the results of our exploration.

Holland's person-environment interaction theory is especially important to scholars and practitioners in education and psychology. "John Holland pioneered in assessing the environments of colleges and universities and their influence on students. His research has been central in the development of knowledge about nonacademic accomplishments. His theory of vocational personalities and work environments revolutionized the delivery of vocational assistance worldwide. He made contributions to research on originality and interpersonal competence" (G. Gottfredson, 1999, p. 15). Another reviewer noted, "Research on his theory is voluminous and unabating. His theoretical insights are now at the center of any comprehensive review . . . The widespread use of his inventories is huge. . . ." (Borgen, 1991, pp. 275-276).

As colleges and universities have grown in size, scope, and organizational complexity, some students have found it difficult to find a "home" (Astin, 1984). While students may identify with a student organization, residence hall, or activity program, we believe that the academic department is the entity where students are likely to find important mentors, peers, involvement, direction, and inspiration. Academic departments have an inherent, varied mixture of characteristics that are created by the interests and behaviors of the faculty. If students can recognize, differentiate, and understand these

diverse academic environments and the faculty who dominate them with respect to Holland's theoretical model, we believe they are more likely to find a place within the university that will increase their satisfaction, involvement, and persistence.

In this article, we begin by examining several aspects of academic advising and career counseling services for students. These include definitions, the need for theory-based approaches in advising research and practice, and Holland's current and potential contributions to this field. We then examine Holland's theory and the findings from more than 20 studies by Smart and others (Smart et al., 2000) of college faculty and students in academic departments. We conclude with the presentation of a practical approach for integrating a Holland-based system of academic advising and career counseling. We believe this service-delivery model provides some novel ideas and procedures for enhancing this important area of student services.

Definitions

Although the terms academic advising and career counseling are familiar, it is important to define them as they are used in this article. Ender, Winston, and Miller (1984) defined developmental academic advising as "a systematic process based on a close student-advisor relationship intended to aid students in achieving educational, career, and personal goals through the utilization of the full range of institutional and community resources" (p. 19). Later, Creamer (2000) defined it as "an educational activity that depends on valid explanations of complex student behaviors and institutional conditions to assist college students in making and executing educational and life plans" (p. 18).

Sears (1982) defined career counseling as "a one-to-one or small group relationship between a client and a counselor with the goal of helping the client(s) integrate and apply an understanding of self and the environment to make the most appropriate career decisions and adjustments" (p. 139). She further defined career as

“the totality of work one does in his/her lifetime” (p. 139) and work as “conscious effort, other than that having as its primary purpose either coping or relaxation, aimed at producing benefits for oneself and/or for oneself and others” (p. 142).

The distinctions between academic advising and career counseling are primarily a matter of scope and emphasis. Academic advising is more narrowly focused on college and university students and life/career decision making related to curricular and co-curricular activities. Career counseling is a broader, more comprehensive term not limited to educational settings. However, both functions involve a process of individual or small group interventions to help persons use information to make educational and occupational decisions that are consistent with their personal goals, values, interests, and skills. We believe that a theory that informs career counseling, such as John Holland’s RIASEC theory, can also inform academic advising.

Holland’s Theoretical Contributions

Holland’s typological theory (Holland, 1997) specifies a theoretical connection between personality and environment that makes it possible to use the same RIASEC classification system for both persons and fields of study or occupations. Many inventories and career assessment tools use the typology to enable individuals to categorize their interests and personal characteristics in terms of combinations of the six types: Realistic, Investigative, Artistic, Social, Enterprising, or Conventional. These six types are briefly defined in Table 1.

 Insert Table 1 Descriptions of Holland Types about here

According to RIASEC theory, if a person and an environment have the same or similar codes, e.g., Investigative person in an Investigative environment, then the person will likely be satisfied and persist in that environment (Holland, 1997). This satisfaction

will result from individuals being able to express their personality in an environment that is supportive and includes other persons who have the same or similar personality traits. It should be noted that neither people nor environments are exclusively one type but rather combinations of all six types. Their dominant type is an approximation of an ideal, modal type. The profile of the six types can be described in terms of the degree of differentiation (flat or uneven profile), consistency (level of similarity of interests or characteristics on the RIASEC hexagon for the first two letters of a three-letter Holland code), or identity (stability characteristics of the type). Each of these factors moderates predictions about the behavior related to the congruence level between a person and an environment. Persons and environments are typically described proportionally in terms of the most highly weighted three of the six Holland types, e.g., Lawyer, ESI; Accounting, CEI.

The environments of college campuses, fields of study, work positions, and occupations can also be classified using the RIASEC system (G. Gottfredson & Holland, 1996). Holland's early efforts with the National Merit Scholarship Corporation (NMSC) and the American College Testing Program enabled him to look at colleges and academic disciplines as environments. It is important to note that RIASEC theory had its roots in higher education and later focused on occupations. However, almost any social setting, e.g., a family-owned business, a classroom, or a work group, might be characterized in terms of a RIASEC environment. Every aspect of the theory can be applied to different kinds of environments.

L. S. Gottfredson and Richards (1999) traced the history of Holland's efforts to classify educational and occupational environments. Holland initially studied the numbers of incumbents in a particular environment to classify occupations or colleges, but he later moved to study the characteristics of the environment independent of the persons in it. College catalogs and descriptions of academic disciplines were among the

public records used to study institutional environments. Astin and Holland (1961) developed the Environmental Assessment Technique (EAT) while at the NMSC as a method for measuring college environments.

Success in measuring faculty and the curriculum led Richards to explore differences in environments in Japanese (Richards, 1973) and British Commonwealth universities (Richards, 1974), U. S. law schools (Richards, 1987b), and Historically Black colleges (Richards, 1987a). For example, Richards found that Japanese universities placed less emphasis on the Artistic area and more on the Realistic area than U.S. universities. The most recent instruments for measuring environments are the Position Classification Inventory (PCI; G. Gottfredson & Holland, 1991), a direct theory-based measure of occupational environments, and the Environmental Identity Scale (EIS; Holland, 1997). These instruments make it possible to study college faculty directly and thus advance the study of academic disciplines and their effects on college students.

Those who study or provide services to college students need to understand the importance of Holland's RIASEC theory. For example, Day and Rounds (1998) reported that the RIASEC typology was used similarly by ethnically diverse groups of U.S. students to organize information about their interests and options. This means that varied cultural subgroups in the United States have a sufficiently common social and educational experience that RIASEC theory and related practical applications can be applied to almost everyone. More recently, Tracey and Darcy (2002) found that college students whose schema for organizing information about interests and occupations differed from Holland's RIASEC structure had less career certainty and more career indecision. This finding suggests that the RIASEC hexagon may have a normative benefit regarding the classification of occupations and fields of study.

Scholars have used Holland's theory to study vocational behavior (G. Gottfredson, 1999) and industrial and organizational behavior (Muchinsky, 1999), but

this is not as true for higher education scholars. We searched the *Journal of College Student Development (JCSD)*, the *NACADA Journal*, and the *NASPA Journal* from 1994-2002 for articles on academic advising or educational planning that were based on Holland's theory. We found no relevant publications in the *NACADA* or *NASPA Journals* and one in *JCSD* that examined Holland's RIASEC typology in relation to college students. Another example of inattention is Creamer's (2000) chapter, "Use of Theory in Academic Advising," which extolled the benefits of theory-based advising while providing a cursory reference to Holland's 1973 book rather than the 1997 edition. Smart et al. (2000) found only a handful of Holland citations in a search of the *Journal of Higher Education*, *Research in Higher Education*, *Higher Education*, and *The Review of Higher Education*. Smart et al. further noted that the lack of a theory base is a major impediment to attaining accurate knowledge concerning academic disciplines, which led Smart et al. to conduct a major national study of college faculty and students based on Holland's theory. We discuss this research and other related studies in the following section.

Holland-Based Research on College Students and Faculty

When Holland's theory is used to classify occupations, the distribution across the six RIASEC categories varies in relation to the level of cognitive skill and ability required by the occupation. In other words, occupations differ according to level. G. Gottfredson and Holland (1996) created a Complexity Rating (Cx) to estimate the cognitive skill and ability associated with an occupation. A Cx rating of 65 or higher is associated with an occupation requiring a college degree and possibly post-graduate work and on-the-job training of 4-10 years, while a Cx level of 50 might characterize an occupation requiring a high school degree and a year or more of on the job training. For example, the Cx rating for Nuclear-Fuels Research Engineer (IRC) is 80 while Shoe Shiner (CRE) is 37 and Counselor (SAE) is 68.

College level occupations are least frequently associated with the Conventional and Realistic categories, while Investigative and Artistic work are most likely associated with college level employment or the highest level of cognitive ability. Reardon, Vernick, and Reed (in press) reported the estimated mean Cx ratings across the six kinds of work were Realistic = 52; Investigative = 72; Artistic = 69; Social = 63; Enterprising = 60; and Conventional = 55, revealing a profile rating for the six kinds of work in order of highest to lowest as IASECR. Similarly, Smart et al. (2000) found few college majors, faculty, or students in their samples categorized as Realistic or Conventional, which led them to exclude these two areas from their research. The fact that most college disciplines are concentrated in Holland's Investigative, Artistic, Social, and Enterprising areas has important implications for students exploring educational options.

The incorporation of the concept of cognitive level, along with interests and personality characteristics, into academic advising and career counseling in relation to Holland's theory will require considerable attention by professionals in these areas. Occupations and fields of study differ not only according to interests but also the degree of cognitive ability and skill required. Advisors and counselors are sometimes reluctant to broach this matter with students (L. S. Gottfredson, 2003). However, Holland's theory provides some tools to help in this undertaking, and these can be useful in improving advising and counseling services.

Smart et al. (2000) classified academic disciplines in terms of Holland's RIASEC Theory using the *Educational Opportunities Finder* (Rosen, Holmberg, & Holland, 1994), and the results are shown in Table 2.

 Insert Table 2 Academic Disciplines by Holland Codes about here

Smart et al. (2000) did not classify agriculture, forestry, or education (including administration and counseling) in terms of RIASEC Theory because of a lack of relevant data, and they excluded Realistic and Conventional disciplines from their study because of the small numbers of college faculty and students in these disciplines. Realistic disciplines included industrial arts, military science, electrical engineering, mechanical engineering, marine science, drafting/design, and Conventional disciplines included accounting, secretarial studies, data processing.

Smart, Feldman, and Ethington (2000) examined longitudinal data over a four-year period of study (1986-1990) on approximately 2,309 college students participating in the Cooperative Institutional Research Program (CIRP; Higher Education Research Institute, 1986). They found that the number of students in the Enterprising environment over four years remained relatively stable (21% to 22%), and smaller changes occurred in the Investigative and Artistic environments, 25% to 29% and 8% to 15%, respectively. However, students in the Social environment increased from 22% to 34%, the largest area of change. Smart et al. noted that about 22% of the students had freshman majors that were undecided, not classified, or associated with Realistic or Conventional academic environments.

Socialization Effects of Disciplines

The research of Smart et al. (2000) was based on two ideas. First, “faculty create academic environments inclined to require, reinforce, and reward the distinctive patterns of abilities and interests of students in a manner consistent with Holland’s theory” (p. 96). Second, “students are not passive participants in the search for academic majors and careers; rather, they actively search for and select academic environments that encourage them to develop further their characteristic interests and abilities and to enter (and be successful in) their chosen career fields” (p. 52). In the following paragraphs, we summarize findings relevant to these two ideas.

Smart et al. (2000) sought to discover whether or not changes in students over four years were the result of their experiences in their major fields of study (academic discipline). They reasoned that faculty chose to be in academic environments, e.g., academic departments, because of their preferences and values regarding the goals of undergraduate education and their preferred ways of socializing students. Smart et al. held that faculty are the primary representatives of academic environments and the primary contributors to behavior patterns of students who choose those environments as majors.

Smart et al. (2000) presented evidence from the literature and their own research concerning the way academic departments socialize students. They reported that “faculty members in different clusters of academic disciplines create distinctly different academic environments as a consequence of their preference for alternative goals for undergraduate education, their emphasis on alternative teaching goals and student competencies in their respective classes, and their reliance on different approaches to classroom instruction and ways of interacting with students inside and outside their classes” (p. 238). Furthermore, these environments “have a strong socializing influence on change and the stability of students’ abilities and interests—that is, what students do and do not learn or acquire as a consequence of their collegiate experiences (p. 238).”

Faculty in Investigative, Artistic, Social, and Enterprising disciplines create academic environments in a manner consistent with Holland’s theory (Smart et al., 2000). Moreover, these environments were the primary contributors to differential patterns of change and stability in students, irrespective of students’ personality types, e.g., Artistic student in a Social environment. Smart et al. (2000) noted that “the degree to which academic environments are ‘successful’ in their efforts to socialize students to their respective patterns of abilities and interests thus appears to be differ considerably, with Artistic and Investigative environments being the most ‘successful’ and the Social and

Enterprising environments being less 'successful' (p. 146)." Overall, Smart et al. concluded that the socialization assumption of Holland's theory was supported. These findings have important implications for academic advising that are explored later in this paper.

Students and Major Change

Thus far, we have concentrated our analysis on the impact of four disciplines in socializing students toward the development of interests and skills predicted by Holland's (1997) typological theory. But what about the personal choices made by students in selecting a discipline? In order to study this phenomenon, Smart et al. (2000) classified students as primary or secondary recruits. Primary recruits were defined as students initially selecting a discipline and staying in that field over four years. Secondary recruits were those in a different major in the fourth year.

Regarding primary recruits, 2/3s of freshmen initially selecting majors in the Social area remained in that area over four years, while conversely slightly more than half of the students in the Enterprising area persisted over four years. Students in the Artistic and Investigative areas both persisted over four years at 64%. Overall, about 2/3s of freshmen persisted in one of the four disciplines initially selected, and 1/3 changed to another area. Regarding the secondary recruits (those in a different major after four years), the question might be asked, "Where did they go?" Given that students initially entering the Social area were most likely to persist in that area, the students in the Investigative, Artistic, an Enterprising areas were most frequently secondary recruits to the Social area (about 19% for each of them).

When environments (percentage of seniors in each of the four areas) rather than entering students were examined, Smart et al. (2000) found that from 1/3 to 1/2 of the four environments were composed of primary recruits, and about half of the sample were secondary recruits, e.g., the seniors who had changed their majors. This means that

almost half the seniors ended up in a discipline that was different from their initial choice. This was most notable in the Artistic environment where 2/3 of the students were secondary recruits from one of the other areas and did not intend to major in the Artistic area in their freshman year. About 1/3 of the students migrating into the Social area came from Investigative, Enterprising, or undecided areas. Students moving into the Investigative area were most likely to come from the Enterprising area, and vice versa. These data reveal the fluid nature of students' major selections and the heterogeneous nature of the four environments with respect to the students' initial major preferences.

Socialization in Relation to Student Characteristics

The specific findings of Smart et al. (2000) regarding the impact of socialization for the four discipline environments with respect to student personality characteristics are summarized below. The variability in the socialization styles and the effects of the environments, as well as how socialization effected the student's congruence with the environments are described. It will be recalled that a high level match between the person and the environment, e.g., Investigative person in Investigative major, indicates high congruence.

Faculty in Investigative environments place primary attention on developing analytical, mathematical, and scientific competencies, with little attention given to character and career development. They rely more than other faculty on formal and structured teaching-learning, they are subject-matter centered, and they have specific course requirements. They focus on examinations and grades. This environment has the highest percentage of primary recruits. All students in Investigative environments increased their abilities and interests in this area, and this was even stronger if they were Investigative students at entry (primary recruits). Investigative students in disciplines outside of the Investigative environment did not increase their abilities and skills in the Investigative area.

Artistic environments focus on aesthetics and an emphasis on emotions, sensations, and the mind. The curriculum stresses learning about literature and the arts, as well as becoming a creative thinker. Faculty also emphasize character development, along with student freedom and independence in learning. Varied instructional strategies are used. About two-thirds of students in the Artistic environment did not anticipate majoring in the Artistic environment when they entered college. Artistic type students were not more likely to initially select a major in this environment. On the other hand, Artistic students majoring in Artistic environments did have stronger interests and abilities in this area. Students majoring in Artistic environments did show large increases in Artistic abilities and interests, and this was true for both primary and secondary recruits. Artistic personalities not majoring in Artistic environments did not increase their self-rated interests and abilities over four years.

Social environments have a strong community orientation characterized by friendliness and warmth. Like the Artistic environment, faculty place value on developing a historical perspective of the field and an emphasis on student values and character development. Unlike the Artistic environment, faculty also place value on humanitarian, teaching, and interpersonal competencies. Collegueship and student independence and freedom are supported, and informal small group teaching is employed. The socialization effect of the environment was the smallest of the four areas studied and the effects were muddled by gender. Small increases were recorded for Social students in Social environments, but these were not much different from those for Social students in other environments. Social disciplines seem to have the least impact and Social students reported the least gains in related interests and abilities. Stated another way, the Social environments appear to be the most accepting and least demanding of the four environments studied by Smart et al. (2000).

The Enterprising environment has a strong orientation to career preparation and status acquisition. Faculty focus on leadership development, the acquisition and use of power to attain career goals, and striving for common indicators of organizational and career success. Teaching strategies in this environment are very balanced, but faculty like most to work with career-oriented students regarding specialized matters.

Enterprising students tended to select Enterprising environments, and in this environment they increased their Enterprising abilities and interests. This was also true for non-Enterprising students in the Enterprising environment. Enterprising students not majoring in Enterprising environments did not increase their self-rated Enterprising abilities and interests.

In summary, it is apparent that congruent students in Investigative, Artistic, and Enterprising environments increased their pattern of self-reported interests and abilities over four years by further developing what was already present in their personality. These three environments also increased these related traits for incongruent students, but the gap between the congruent and incongruent students did not decrease over time. In other words, students in both congruent and incongruent environments made equivalent or parallel changes in self-reported abilities and interests over four years, but students in congruent environments had higher levels of interests and abilities at the end of four years. Investigative and Enterprising environments had the most impact on student characteristics. These findings, if communicated to students in academic advising, could potentially change the nature of discussions about students' educational goals in college.

Implications for Advising and Counseling

Sampson, Reardon, Peterson and Lenz (2004) categorized human services interventions into three levels, (1) self-help, (2) brief staff-assisted, and (3) individual case-managed services. Holland's RIASEC theory and related materials are sufficiently

complex and varied to complement this service delivery model. Peterson, Sampson, and Lenz (2003) explained how the concept of student readiness for learning in college could be implemented in academic advising and career counseling programs. We use Holland's theory and materials to illustrate the implementation of this idea.

Self-help services involve the self-guided use of assessment, information, and instructional resources in a library-like or Internet-based remote setting, where resources have been designed for independent use by individuals with a high readiness for educational and career decision making. The Self-Directed Search: Internet Version (Holland, Reardon, Latshaw, Rarick, Schneider, Shortridge, & St. James, 2001) is an example of a self-help educational and career assessment designed to link students and majors or occupations suitable for further exploration. It includes an interpretive report incorporating concepts from Holland's theory. Other self-help resources include the *Dictionary of Holland Occupational Codes* (G. Gottfredson & Holland, 1996), the *Educational Opportunities Finder* (Rosen et al., 1994), an educational and/or career library index arranged by RIASEC codes, and computer-based educational and career guidance systems such as *Choices* (Bridges.com, 2003) and *DISCOVER* (American College Testing, 2003) that use Holland's RIASEC classification to link persons and career information. Holland's typology is ubiquitous—it is even included in the comprehensive, free, federal O*NET on-line system that links citizens with employment and training options (<http://www.onetcenter.org/>).

By combining the concept of the self-help service delivery and the findings of Smart et al. (2000), we can envision the creation of self-help resources such as the following. A college could group its majors in terms of RIASEC codes, produce a printed flier, and distribute this widely to students on posters or websites. This classification of majors according to Holland RIASEC codes would enable students to develop an understanding of the academic culture of the college. Large universities may have over

150 undergraduate majors and this can be overwhelming to students needing to pick one field of study. Holland's RIASEC schema helps to make this process of exploring options less daunting.

In addition, a census of the majors with the largest and smallest numbers of students and faculty at the college would provide information about the relative social power of various disciplines on the campus. In effect, such a census would provide a measured sketch of the campus culture. For example, Reardon, Lenz, and Strausberger (1996) used the *Educational Opportunities Finder* (Rosen et al., 1994) to classify all of the majors at a large university, and then identified the numbers of students majoring in each RIASEC category (R = 5%, I = 19%, A = 13%, S = 34%, E = 19%, C = 10%). They used these data to assess the types of students seeking services in the career center and to design appropriate interventions. In addition, descriptive material associated with majors could include the kinds of information summarized by Smart et al. (2000) about course structures, learning style expectations, faculty interests and activities, and program objectives. Other student information materials could list volunteer experiences related to the discipline (if any), introductory classes, sample employment opportunities, and profiles of graduates. U-Maps (Jacoby, Rue, & Allen, 1984), posters incorporating Holland's RIASEC typology and developed at the University of Maryland, are an earlier example of just such an intervention.

Brief staff-assisted services, a level of services found in some career centers, involves practitioner-guided use of assessment, information, and instructional resources in a library, classroom, or group setting for clients with moderate readiness for career decision making. Many interest inventories, e.g., Strong Interest Inventory, and other tests provide results and interpretive reports based on Holland's theory. Workshops could be conducted using the RIASEC Game (Reardon & Lenz, 1998). This activity provides students with an opportunity to read brief descriptions of the RIASEC types,

rank their top three preferences, and then go to six stations in a room marked with the six letters and engage in a social interaction with other students there, e.g., “why did you select this letter?,” “what are your hobbies?.” Such theory-based interventions provide an alternative to the unsystematic, eclectic counseling and advising interventions used in some settings. Reardon and Lenz (1999) noted that constructs important in Holland’s theory (1997), e.g., code, congruence, differentiation, coherence, consistency, identity, profile elevation, are readily translated into practice for use in designing interventions for individual students with educational and career decision-making problems.

Many of the aforementioned activities are most often practiced in a traditional career counseling setting. Yet, they could easily be adapted to the current resources and structure of many academic advising offices. The Internet or paper-and-pencil format of the Self-Directed Search and increased advisor knowledge of career-related resources would do little to change the structure and typical operations of an academic advising office but could greatly add to its effectiveness. Activities such as the RIASEC Game (Reardon & Lenz, 1998) could be used as an aspect of fairs, workshops, panel discussions, or expositions the academic advising office typically sponsors to further implement the use of theory by advisors.

Individual case-managed services involve practitioner-guided use of assessment, information, and instructional resources in an individual office, classroom, or group setting for clients with low readiness for career decision making. This type of intervention provides the most substantial amount of assistance possible for persons with the greatest need for help. Categories of individual case-managed services include individual counseling or advising by appointment, career courses with small group interaction, and longer term group counseling or advising (e.g., an ongoing group for undecided majors). The academic advising office is often the first stop of a student undecided about his or her major. Serving some of the students in a group format that

have more complex issues related to choosing a major could save financial and human resources. An irony of Holland's (1997) theory is that many scholars and practitioners (e.g., Creamer, 2000) view it as a simple matching model rather than a rich, complex person-environment interaction theory, grounded in more than 500 studies that can inform individual case-managed services. As demonstrated by the implementation of Holland's theory in the three-levels of service, it can meet simple to complex needs.

Reardon and Lenz (1998) and Holland, Gottfredson, and Nafziger (1975) indicated that persons with poor diagnostic signs on the Self-Directed Search, e.g., lack of congruence between expressed and assessed summary codes, low differentiation, low consistency, low coherence among aspirations, low profile elevation, and a high point code in the Realistic or Conventional area, were likely candidates for more intensive interventions provided by more highly trained personnel. High Artistic codes may also be problematic because of the student's preference for a non-rational approach to decision making (Holland et al., 1975). Persons with such diagnostic indicators will likely need more time and professional, individualized assistance in career problem solving and decision making.

Students who are unsure about what discipline or field to pursue might benefit from a thoughtful examination of the institutional context of their educational and career decisions. Given the differences in academic departments and their differential socialization effects (Smart et al., 2000), a student's understanding of the personally desired outcomes of a baccalaureate degree, along with a review of his or her personality characteristics, could be addressed in an individual counseling or advising situation. For example, a student with a Social type personality might decide to develop skills and interests emphasized in the Investigative environment. Such a choice would involve various personal adjustments, costs, and compromises. Holland's theory could provide a conceptual basis for such a decision.

Smart et al.'s research reveals some of the variations in academic departments and suggests implications for college and university organizational systems. It is important for counselors and advisors to inform students about the impact of majors and academic disciplines on the development of student interests and skills. At present, advisors make students aware of many aspects of a major, e.g., required courses, prerequisites, entrance requirements, and the occupations most closely aligned with the major. Providing additional information based on the research findings by Smart et al. (2000) regarding the way academic environments socialize or affect students pursuing that major will make students better "consumers" of majors or "shoppers" of academic programs (Reardon, Sampson, & Lenz, 2000).

Caveats and Additional Ideas

This section addresses some of the limitations of this analysis, as well as some of the further implications for higher education beyond the areas of academic advising and career counseling. In this paper we have emphasized the differences in the ways faculty socialize students into disciplines, but there are also universal qualities among faculty that should not be overlooked. For example, faculty across all disciplines generally prize and value students' intellectual development, academic and personal integrity, and high achievement.

Although the Enterprising environment typically emphasizes career preparation, this does not mean that it is the only discipline that prepares college students for employment. Nevertheless, some students (and/or their parents) believe that a major in business is the only way to prepare for a job after graduation. This kind of thinking needs to be addressed jointly by academic advising and career counseling offices. Students need to understand that career preparation is relevant to and appropriate for majors in all RIASEC disciplines, not just the Enterprising area, and that advising and counseling services can help all students prepare for employment after graduation.

In this analysis we have only used one letter of a RIASEC code, but Holland's matching model is built around three-letter codes. Two- and three-letter codes would provide more precision in matching persons and environments, but such precision might be misplaced, especially given the current state of knowledge regarding higher education environments. The measurement of environments is problematic because the codes for majors, occupations, and jobs have not been assessed by direct measurement. Direct measures of educational environments using the Position Classification Inventory (Gottfredson & Holland, 1991) would be preferable to the classifications based on indirect measures currently available, e.g., *Educational Opportunities Finder* (Rosen et al., 1994).

Counselors and advisors operating from Holland's theoretical system would need to be fully informed about the theory, the research that supports it, the instruments that are based upon it, and the counseling and advising techniques that could be derived from it. Such theory-driven practice might represent a new paradigm, especially in academic advising. Holland's (1997) theory, like other typological theories, has the most power when the extremes of wealth, social class, genetic traits, and health are not in effect. In other words, Holland's theory works best for people in general rather than at the extremes of any personal trait or environmental characteristic. The professional judgment of counselors and advisors needs to take these matters into account in work with students.

Beyond the implications for advising and counseling services, Smart et al. (2000) noted that students typically take a variety of liberal studies or general education courses in their first two years. Some of these courses are new and unfamiliar to students' interests and abilities. Given student attrition in the freshman year and the likelihood of them flourishing in congruent environments, it is possible that the typical pattern should be reversed and beginning students should take most courses in environments that

provide opportunities, activities, tasks, and roles that correspond to their competencies, interests, and self-perceptions. The Self-Directed Search and the *Educational Opportunities Finder* could be used to facilitate this academic advising process. In subsequent years, students would take courses that are increasingly dissimilar to their dominant personality type. For example, Social students could take Social and Enterprising courses in their freshman year, Artistic, Enterprising, and Investigative courses in the sophomore year, Realistic and Conventional courses in the junior year, and back to a Social capstone course in the senior year.

Smart et al. (2000) suggested an alternative college organizational structure in relation to Holland codes for specific academic departments. For example, instead of a traditional college or departmental organization grouping all professional or liberal arts faculty together, departments could be organized by RIASEC type. Or, alternatively, faculty within the traditionally organized unit could be informally connected with other faculty in fields with the same Holland code. Given that different colleges typically have varied numbers of Holland code majors represented, this arrangement would help faculty connect with others in similar areas of work who are not in their specific college. Use of two-letter Holland codes would provide for more precision in the identification of congruent work environments.

Finally, research examining the degree of congruence between the Holland code for the students' major field of study and their personality should be undertaken to examine the implications for poor academic performance or persistence in the major. Do students in incongruent majors have lower GPAs and dropout at a higher rate than students who are congruent with respect to personality and major codes?

Summary

This article examined Holland's RIASEC person-environment interaction theory as a practical basis for academic advising and career counseling services in colleges

and universities. After a brief review of Holland's theory, including its early application in higher education research, the book by Smart et al. (2000) was reviewed. This examination focused on information that could be used to further support and update resources based on Holland's theory as it is used with university students. Smart and his colleagues studied college faculty and students to determine if constructs related to the socialization of students and their adjustment in college were supported by data. The major assumptions of Holland's theory were supported and new information related to the development of students' interests and abilities and academic departmental socialization in relation to Holland's RIASEC types was provided. The article concluded with a description of possible academic advising and career counseling interventions along with other applications that are based on Holland's theory. A theory-based model for academic advising and counseling was presented.

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Table 1

Summary of Holland Types

Type	Examples of Occupations/Fields	Typical Traits
Realistic	computer engineering, forestry, surveyor, poultry science, and farmer	mechanical and athletic abilities, likes to work outdoors and with tools and machines, and might be described as conforming, frank, hardheaded, honest, humble, materialistic, natural, normal, persistent, practical, shy, and thrifty
Investigative	biology, chemist, physicist, geologist, anthropologist, laboratory assistant, and medical technician	math and science abilities, and likes to work alone and to solve problems; might be described as analytical, complex, critical, curious, independent, intellectual, introverted, pessimistic, precise, and rational
Artistic	composer, musician, stage director, dancer, interior decorator, actor, and writer	artistic skills, enjoys creating original work, and has a good imagination; may be described as complicated, disorderly, emotional, idealistic, imaginative, impulsive, independent, introspective, nonconforming, and original
Social	teacher, speech therapist, religious worker, counselor, clinical psychologist, and nurse	likes to help, teach, and counsel people, and may be described as cooperative, friendly, generous, helpful, idealistic, kind, responsible, sympathetic, tactful, understanding, and warm
Enterprising	buyer, sports promoter, television producer, business executive, salesperson, travel agent, supervisor, and manager	leadership and public speaking abilities, is interested in money and politics, and likes to influence people; described as acquisitive, agreeable, ambitious, attention getting, domineering, energetic, extroverted, impulsive, optimistic, self-confident, and sociable
Conventional	bookkeeper, financial analyst, banker, tax expert, and medical laboratory assistant	clerical and math abilities, likes to work indoors and to organize things; described as conforming, careful, efficient, obedient, orderly, persistent, practical, thrifty, and unimaginative

Table 2

Academic Disciplines by Holland Types as Classified by Smart et al. (2000)

Type	Academic Disciplines
Investigative	Allied health/medical technologies, biology and life sciences, economics, geography, math/statistics, physical sciences, finance, aeronautical engineering, civil engineering, chemical engineering, astronomy, earth science, pharmacy, premedicine, predentistry, preveteranian, anthropology, ethnic studies, geography, and sociology
Artistic	Architecture, fine arts (art, drama, music), foreign languages, English, music, speech, theater, and environmental design
Social	Ethnic studies, home economics, humanities (history, philosophy, religion, rhetoric), library science, physical and health education, psychology, social sciences (anthropology, political science, social work), elementary education, special education, nursing, and law enforcement
Enterprising	Business, communications, computer/information science, law, public affairs, journalism, marketing, industrial engineering, and business education

Smart, J. C., Feldman, K. A., & Ethington, C. A. (2000). Academic disciplines: Holland's theory and the study of college students and faculty. Nashville, TN: Vanderbilt University Press.