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Abstract

An understanding of vocational interests and Holland's RIASEC theory are helpful ideas for most persons involved in career decision making. Yet, sometimes dysfunctional thinking interferes with this matching process, and persons are unable to make career choices effectively. The relationship between RIASEC typology structure as measured by the Self-Directed Search and dysfunctional thoughts as measured by the Career Thoughts Inventory was investigated in this study. A canonical correlation analysis showed that dysfunctional thinking may effect some RIASEC types more than others. Implications for career counseling are discussed.

Keywords: Career counseling, interests, career decision making, career thoughts, Holland types, vocational identity

The Relationship Among Constructs in the Career Thoughts Inventory and the Self-Directed Search

The practice of helping persons choose occupations and fields of study that will lead to productive and fulfilling lives is a complex one. RIASEC theory (Holland, 1997) and Cognitive Information Processing theory (CIP; Peterson, Sampson, & Reardon, 1991; Peterson, Sampson, Reardon, & Lenz, 1996) are theories that have demonstrated relevance to increasing our understanding of this process and providing tools that can assist counselors in helping clients become more effective career problem solvers and decision makers. One assessment tool that has been widely used and studied to facilitate this process is the Self-Directed Search (Holland, Powell, & Fritzsche, 1994). The Self-Directed Search (SDS) is an instrument which links a person's interests and skills to psychological type, and in turn, to work environments.

However, Holland's RIASEC theory and the SDS may not be completely effective in helping persons solve career problems or make career decisions when they have an uncommon or undifferentiated code, an unstable interest structure (low vocational identity), low consistency, or low coherence among aspirations (Reardon & Lenz, 1998). Other persons may have trouble making career decisions because of negative or dysfunctional thoughts. These thoughts can impair information processing and learning, and potentially make the SDS results difficult to interpret or to use.

Holland (1997) has recently discussed matching models as a basic component of a person's Personal Career Theory (PCT). Most persons use their PCT to guide their career decision making. However, when a person's PCT no longer provides useful cognitive structures for processing information (e.g., the process of matching a person and an environment fails to produce a useful match) the person may require career assistance to develop a more useful, valid PCT. This may involve reducing negative thinking about career problem solving or decision

making, or strengthening vocational identity.

The Career Thoughts Inventory (CTI; Sampson, Peterson, Lenz, Reardon, & Saunders, 1996a, 1998) is based on CIP theory and assesses negative thinking in career problem solving and decision making. No studies of which the authors are aware have explored how dysfunctional career thoughts, as measured by the CTI, are related to an individual's RIASEC codes and the secondary constructs in Holland's SDS (e.g., congruence, consistency, differentiation, coherence, commonness). The results of this study will hopefully provide guidance to counselors and clients regarding the use of interest inventories in career counseling by examining the SDS in conjunction with the CTI to gain further insight into the relationships among these variables.

Holland's RIASEC theory (Holland et al., 1994) organizes personality and work environments into six typological models: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C). RIASEC theory postulates that if a person and a work environment have the same or similar codes (e.g., R person in an R environment) then the person will likely be satisfied and persist in such an environment (Holland, 1997). This satisfaction will result from individuals being able to express their personality in an environment which is accepting and which includes other persons who have the same or similar interests. The RIASEC theory or typological system helps explain how personality and interests function in the career decision-making process.

Variables of Interest

In addition to the basic RIASEC typology, Holland (1997) has theorized about a set of secondary constructs that provide additional explanatory and predictive power to the typology. The secondary constructs included in Holland's RIASEC theory and reported in the Professional

Summary Report of the SDS: Computer Version Form R (SDS: CV; Reardon, 1987) are Congruence, Code, Coherence, Consistency, Differentiation, Vocational Identity, and Commonness. The latter two secondary constructs, Vocational Identity and Commonness, were not examined in the present study.

Holland et al. (1994, p. 24) defined Congruence as “the degree of agreement...or compatibility between any occupation and a person’s SDS code.” For the SDS:CV, Congruence specifically refers to how closely one’s SDS Summary Code matches his or her Aspirations Summary Code (Reardon & Lenz, 1998). Code refers to the first letter of the SDS Summary Code identifying the RIASEC Holland type that is most characteristic of the person. High levels of congruence are indicative of a person who will maintain the code of the first aspiration in the future.

Coherence, or Coherence of Aspirations, is the extent to which one’s listed aspirations or occupational daydreams on the SDS belong to the same or similar RIASEC type. High coherence is indicative of future persistence in the first letter of the code of the first aspiration (Holland, Gottfredson, & Baker, 1990).

Consistency is measured in three levels; High, Average, and Low. A high score is assigned to a code if the first two letters are adjacent to one another on the Holland hexagon (e.g., E and C). If the first two code categories alternate (e.g., S and I) an average score is assigned. If the letters are opposite from each other on the hexagon, a low score is assigned. High consistency is positively correlated with more stability in work history and the direction of career preferences or work histories (Holland, 1997).

Differentiation refers to “the level of definition or distinctness of a personality or occupational profile” (Reardon & Lenz, 1998, p. 131). A person with a highly differentiated SDS

summary score will have a relatively large discrepancy between the highest and lowest code scores, whereas a person with low differentiation earns more similar scores among all six RIASEC types. High differentiation is positively related to a person's exhibition of characteristics attributed to the types.

The CTI (Sampson et al., 1996a, 1998) was derived from cognitive information processing (CIP) theory. This theory divides information vital to career problem solving and decision making into four domains: self-knowledge, occupational knowledge, decision-making skills, and executive processing. Dysfunctional thoughts in any of these domains could cause significant difficulty in career problem solving and decision making (Sampson et al., 1998). Each of these four areas is further defined in CIP theory and the whole schema represented by a pyramid of information processing domains.

The CTI seeks to assess the level of dysfunctional thinking related to career problem solving and decision making. The CTI contains three construct scales: Decision Making Confusion, Commitment Anxiety, and External Conflict. Decision Making Confusion (DMC) is defined as the inability to make decisions based on negative thoughts or impeding emotions, or not comprehending the process of decision making itself (Sampson et al., 1996a). Items which were found to load highly on DMC through factor analysis include & “I can't think of any fields of study or occupations that would suit me” and “I don't know why I can't find a field of study or occupation that seems interesting” (Sampson et al., 1996a, p. 56). A high score on DMC would indicate that an individual reported more difficulty making career decisions than would a low score.

Commitment Anxiety (CA) refers to “the inability to make a commitment to a specific career choice, accompanied by generalized anxiety about the outcome of the decision-making

process” (Sampson et al., 1996a, p. 28). Items loading heavily on this scale include “There are several fields of study or occupations that fit me, but I can’t decide on the best one” and “I worry a great deal about choosing the right field of study or occupation” (Sampson et al., 1996a, pp. 56-57). As with Decision-Making Confusion, a high score on this factor indicates a greater degree of Commitment Anxiety than a low score.

The third construct scale, External Conflict (EC), measures an inability to balance one’s own perceptions concerning self with the perceptions of others. The presence of external conflict can impair one from taking responsibility for one’s own decisions. External Conflict items include “know what job I want, but someone’s always putting obstacles in my way” and “Whenever I’ve become interested in something, important people in my life disapprove” (Sampson et al., 1996a, p. 57). As with the other scales, high scores on the External Conflict factor are indicative of those experiencing high external conflict. Sampson et al. (1996a) reported that the three CTI scales accurately discriminated between college students in general and those seeking career services, with clients always scoring higher than non-clients on CTI items.

Related Studies

This study is the first of which the authors are aware to explore the relationship of the constructs measured by the CTI to those found within RIASEC theory as measured by the SDS. Earlier research has analyzed relationships among RIASEC types and the secondary constructs measured by the SDS. For example, Reardon, Lenz, and Strausberger (1996) found that Realistic (R) and Investigative (I) types measured by the SDS:CV were negatively correlated with scores on congruence and differentiation. Investigative type was also negatively correlated with consistency. The Artistic type was positively correlated with consistency, and the Social type with differentiation, commonness, and vocational identity. Conventional type was positively

correlated with age and commonness, while the Enterprising type scores did not show any significant correlations with the secondary constructs examined in this study.

Two studies have examined the relationship between vocational identity as measured by the My Vocational Situation (MVS; Holland, Daiger, & Power, 1980) and dysfunctional career thoughts. Sampson et al. (1996a) found the total CTI score and the three CTI scales inversely correlated with vocational identity as measured by the My Vocational Situation for high school students, college students, and adults. For college students, the correlations ranged from -.62 for DMC, -.69 for CA, and -.38 for EC. Saunders, Peterson, Sampson, and Reardon (1999) reported a correlation of -.76 between CTI total scores and the MVS Vocational Identity scores. Because of this prior work, the relationship between dysfunctional career thoughts and vocational identity was not examined in this study.

Other studies have shown relationships between Holland codes and personality dimensions (Gottfredson, Jones, & Holland, 1993), cognitive styles and Holland codes (Alvi, Khan, Hussain, & Baig, 1988; York & Tinsley, 1986), and the validity, congruence and consistency of various Holland measures (Erwin, 1987; Holland et al., 1990; Khan, Alvi, & Kirkwood, 1990; Miller, 1992; Strahan, 1987). A study by Conneran and Hartman (1993) is especially noteworthy in this regard. They found that vocational high school students experiencing chronic career indecision had lower vocational identity scores and less congruence (i.e., less agreement between SDS summary codes and aspirations codes on the SDS). Male students in this group also had lower differentiation scores, although the relationship was not found for females.

More recently, Gottfredson, Jones, and Holland (1993) and Tokar, Vaux, and Swanson (1995) found Enterprising and Social types to be positively correlated with Extroversion on the

NEO Personality Inventory (Costa & McCrae, 1992). In a study correlating adjectives which describe the RIASEC types to the Five Factor model of the NEO, Extroversion was found to relate to adjectives describing Enterprising types, Agreeableness was related to Social, Openness to Artistic, and Conscientiousness to Conventional types (Blake & Sackett, 1993). These studies point to the emerging body of knowledge relating RIASEC types to personality dimensions.

The purpose of the present study was to investigate the relationship between RIASEC typology structure, including selected secondary constructs, and the presence of dysfunctional career thoughts among students coming to a university career center for career planning assistance. It was hypothesized that each of the secondary constructs would correlate negatively with Decision Making Confusion and Commitment Anxiety. Also, Congruence and Coherence were hypothesized to correlate negatively while Differentiation and Consistency would correlate positively with External Conflict.

Method

Participants

Participants were 81 volunteer clients, 48 female and 33 male, seeking assistance in a career center of a large southeastern university. Ages ranged from 18 to 40 years, $M = 21$ years, $SD = 4.3$ years. The sample identified itself as 2.5% Asian-American, 5% African-American, 5% Hispanic, 86.5% Caucasian, and 1% did not respond. Regarding academic class, 25% of the sample were freshman, 26% sophomores, 31% juniors, 6% seniors, 5% graduate students, and 7% other. With respect to the first letters of their SDS Summary Scores, 4% were R types, 11% I types, 14% A types, 38% S types, 28% E types, and 5% C types.

Procedures

Trained career advisors determined if a career center client could be assisted through use

of the SDS: Computer Version. These clients were invited to participate in the study.

Volunteering participants were told that research was being conducted on the role of a person's career thoughts and personality characteristics in their career problem solving and decision making. Upon agreeing to participate, individuals were asked to complete a research consent form, a participant information form, the CTI, and the SDS in that order. The administration of the CTI and the SDS are frequently used as assessments in the career center. Thus, for most volunteers, participation was integrated with normal career counseling processes. The order of the CTI and SDS was not counterbalanced to ensure a typical career center experience, as the CTI is standardly used first as an initial screening tool to assess the level of service most advantageous for the client. All participants were encouraged to make use of the career center to obtain additional assistance with career planning and decision-making concerns or to receive follow-up information on this research. Participants were able to review the contents of their subject folder at any time with the assistance of a career advisor.

Instruments

The SDS:CV Form R (Reardon & PAR staff, 1996) provides an on-screen administration of the SDS Assessment Booklet, including the Daydreams Section and the My Vocational Situation (Holland, Daiger, & Power, 1980). The latter measure was not used in this study. Internal consistency (KR-20) of the SDS summary scales for male and female college students range from .90 to .94 (Holland, Powell, & Fritzsche, 1994). The test-retest reliability for 4- to 12-week time intervals for the summary scales ranged from .76 to .89, indicating that the scales have substantial stability. Concurrent validity of the SDS, as measured by the correct hit percentage of high point codes versus first letter of aspiration code, was reported to be 59.0 for men and 61.0 for women. Holland et al. (1994, p. 31) stated "...the concurrent and predictive validity of

the SDS scales equals that of most other inventories and exceeds that of some.” In addition, Reardon and Loughead (1988) reported very high correlations, $r = .91$ to $.93$, between summary scores on the paper-and-pencil and computer versions of the SDS after a 2-week interval.

The Career Thoughts Inventory (Sampson et al., 1998) consists of 48 items with a 4-point Likert-type scale from strongly disagree to strongly agree. The CTI consists of 3 orthogonal construct scales. Alpha coefficients of the Decision Making Confusion (DMC) Scale were reported at $.94$, the Commitment Anxiety (CA) scale as $.88$, and the External Conflict (EC) scale as being $.77$ (Sampson et al., 1996a). The 4-week test-retest stability scores for college students were $r = .82$, $.79$, and $.74$ for the DMC, CA, and EC construct scales, respectively. Sampson et al. (1996a, 1998) reported validity for the CTI content, construct, convergent, and criterion-related areas. Regarding convergent validity, CTI scales were consistently inversely correlated with positive constructs (e.g., vocational identity, certainty, knowledge about occupations and training) and directly correlated with indecision (Sampson et al., 1996a). With respect to criterion-related validity, the CTI accurately discriminated between those seeking and those not seeking career services within that same study (Sampson et al., 1996a, 1998).

Results

A case analysis was performed to detect any problematic observations. A total of 15 cases with missing data were removed from the data set; the participants had not completed both instruments. The data analyses were performed on the remaining 81 complete cases. The means and standard deviations from the RIASEC scores, congruence, consistency, coherence, differentiation, and the three construct scores from the CTI are presented in Table 1. As expected from previous research using participants from this college population, the S (Social) and E

(Enterprising) scores had higher means relative to the norm than did the other code types (Reardon et al., 1996). Social (38%) and Enterprising (28%) types were also the most frequent first letter codes. The means for the construct scales of the CTI for this client sample were very similar to the client group reported by Sampson et al. (1996), which are shown in parenthesis: DMC, $M = 16.40$ (15.11); CA, $M = 18.15$ (16.20); EC, $M = 5.30$ (4.69). Pearson Product Moment Correlations among variables of interest are presented in **Table 1**.

In this study, Social and Enterprising types were significantly ($p < .05$) related to dysfunctional career thoughts. Zero order correlations were $r = -.25$ between Social and DMC, and $r = -.26$ between Enterprising and DMC. Contrary to expectations, there were no significant zero order correlates between Holland's secondary constructs of congruence, consistency, coherence, and differentiation and dysfunctional career thoughts. Therefore it was concluded there is no significant relationship between indices of interest structure and dysfunctional career thoughts.

A canonical correlation analysis was used to ascertain a multivariate relationship between two sets of variables, RIASEC types and dysfunctional career thoughts (Tabachnick & Fidell, 1996). One significant canonical variate, or root, was derived with a correlation of 0.49 ($X^2 = 33.27$, $df = 18$, $p = .015$), accounting for 24.2% of common variance between the respective sets. Results of the canonical correlation analysis are presented in Table 2.

An examination of the standardized canonical coefficients suggests that Realistic and Enterprising types and Decision Making Confusion and Commitment Anxiety scores were highly associated with the canonical root. The Realistic type and the Decision Making Confusion scale scores both loaded in a negative direction, whereas the Enterprising type and the Commitment Anxiety scale scores loaded in a positive direction. Thus, the Realistic type co-

varied directly with Decision Making Confusion and inversely with Commitment Anxiety, while the Enterprising type was inversely related to Decision Making Confusion but directly related to Commitment Anxiety. In conducting a canonical redundancy analysis to explore the extent to which variates from the SDS items explained variability on the CTI domain and vice versa, the SDS variables of root 1 explained 3.5% of the variance in the CTI variables. Conversely, CTI variables in root 1 accounted for 4.7% of the explained variance of the SDS.

Discussion

Several observations can be made from the findings of this study. First, it appears that RIASEC types and dysfunctional career thoughts are related to one another, but not in the manner that was originally hypothesized. It was speculated that the CTI scales would be significantly ($p < .05$) correlated with the indices measuring the SDS secondary constructs, because dysfunctional career thoughts could effect the degree of congruence, consistency, coherence, and differentiation of a person's SDS code and aspirations. No significant ($p < .05$) correlates were obtained between SDS secondary construct scores and CTI scale scores.

The canonical root portrays interesting relationships between interests and dysfunctional thoughts for this client population. While the canonical root takes into account the interactions among all variables, we are offering the disclaimer that interpreting the root is speculative because of the number of variables and participants. Nevertheless, clients with high Realistic scores had high Decision Making Confusion scores and low Commitment Anxiety scores, whereas clients with high Enterprising scores had low Decision Making Confusion but high Commitment Anxiety scores. In this particular university, which has a predominant liberal arts orientation, there are few majors that provide outlets for Realistic interest proclivities. Thus, individuals with Realistic interest types may struggle to find an appropriate and interesting

course of study and may experience difficulty in making career decisions. This finding is also consistent with Holland's (1997) notion that Realistic and Conventional types may experience particular difficulty in choosing a field of study in colleges and universities in contrast to Social and Enterprising types. Higher levels of decision-making confusion might also suggest the need for early career interventions for Realistic types.

On the other hand, clients with high Enterprising scores had low Decision Making Confusion, but had high Commitment Anxiety. We speculate that individuals with Enterprising proclivities are typically career oriented and have a general idea about what they want, but they may be tentative and hesitant in committing to a choice. In this particular university there are many majors which provide outlets for Enterprising interests, which might reduce the likelihood of Enterprising types experiencing decision-making confusion. They are aware that good choices are available to them. Their difficulty may come later in specifying a particular specialization in which to declare a major field or targeting a particular industry or organization to pursue in advancing their career at the time of seeking employment upon graduation.

Several weaknesses in this study limit the implications of these results. The sample consisted of 81 clients and there were more women than men included in this study. The sample was dominated by Social and Enterprising types, 66%, with a small number of Realistic and Conventional types included among the clients. A client group composed of a higher percentage of R, I, and/or C types might produce different results. Also, low zero order correlations among the variables make interpreting the canonical root highly tentative.

Yet, these results have possible implications for career counseling or advising in a university setting. It may be important for counselors to recognize that some students may be more anxious or confused over the process of making career decisions than others. Because this

research found that some RIASEC types may have more anxiety than others, instruments like the Self-Directed Search and the Career Thoughts Inventory could be helpful tools in determining what level of service would best facilitate a client's career problem-solving and decision-making process. For example, a client coming to the career center with a combination of high Enterprising scores on the SDS and low Decision Making Confusion yet high Commitment Anxiety on the Career Thoughts Inventory may be indicative of an individual who has chosen a business major in general, but is experiencing difficulty committing to a particular study area within business. A client such as this may be facilitated through discussion and challenging of individual CTI items which were strongly endorsed. This process is illustrated in Reardon and Wright (1999) in the case of Mandy. In this case, the client had high CTI scale scores in Decision Making Confusion, Commitment Anxiety, and External Conflict. The self-directed CTI workbook (Sampson, Peterson, Lenz, Reardon, & Saunders, 1996b) was used to enable this student to challenge her dysfunctional career thinking and, therefore, make further progress in her career decision making. Students experiencing high levels of anxiety in general may best be served through individual career counseling, think aloud procedures while completing the SDS and CTI, and exploration and challenging of other career dysfunctional thoughts.

The timing of interventions might also be considered, with some types receiving services during the freshman year and other types being served primarily when they reach the upper division level and when seeking employment upon graduation. For the less confused, career information resources with self-directed guidance may be appropriate. For students who come to a facility for career service and are experiencing a high degree of anxiety and confusion, the process may need to be slowed and more attention given to reducing feelings of anxiety before the career decision can be made.

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Table 1
Intercorrelations Among the Self-Directed Search and Career Thoughts Inventory Scale Scores and Constructs

	1	2	3	4	5	6	7	8	9	10	11	12	13	M	SD
1. R	—	—	—	—	—	—	—	—	—	—	—	—	—	16.57	9.30
2. I	.296*	—	—	—	—	—	—	—	—	—	—	—	—	21.19	9.21
3. A	.005	.236*	—	—	—	—	—	—	—	—	—	—	—	21.60	10.40
4. S	.041	.089	.148	—	—	—	—	—	—	—	—	—	—	30.20	8.61
5. E	.215	.062	.010	.259*	—	—	—	—	—	—	—	—	—	27.72	9.69
6. C	.167	.268*	-.008	.161	.404**	—	—	—	—	—	—	—	—	21.35	9.60
7. Congruence	-.260*	-.144	-.043	.064	-.100	-.227*	—	—	—	—	—	—	—	18.29	7.70
8. Consistency	-.196	-.147	.072	.112	.081	-.030	.142	—	—	—	—	—	—	2.53	0.65
9. Coherence	-.168	-.017	.036	-.118	-.114	-.256*	.164	-.052	—	—	—	—	—	1.60	0.74
10. Differentiation	-.172	-.259*	-.161	.135	.119	-.022	.283*	.158	.011	—	—	—	—	5.54	2.43
11. DMC	.145	-.059	-.096	-.247*	-.261*	-.110	-.109	-.072	-.109	-.127	—	—	—	16.40	5.83
12. CA	-.155	.171	.132	.004	-.031	-.106	.155	-.027	.103	-.142	.468**	—	—	18.15	3.75
13. EC	.052	.040	-.093	.045	.138	.075	.041	.027	-.042	-.019	.276*	.324*	—	5.30	3.03

Note. R = Realistic, I = Investigative, A = Artistic, S = Social, E = Enterprising, C = Conventional, DMC = Decision Making Confusion, CA = Commitment Anxiety, EC = External Conflict.

* $p < .05$. ** $p < .001$.

Table 2
Canonical Correlation of Holland Codes
Versus Career Thoughts Inventory

Variable	Standardized canonical coefficients Root 1
R	-0.747
I	0.340
A	0.323
S	0.208
E	0.661
C	-0.311
DMC	-1.095
CA	0.767
EC	0.098
Canonical R^2	0.242*

Note. R = Realistic, I = Investigative, A = Artistic, S = Social, E = Enterprising, C = Conventional, DMC = Decision Making Confusion, CA = Commitment Anxiety, EC = External Conflict.

* $p < .01$.