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IT Career Counseling: Are Occupational Congruence and the Job Characteristics Model Effective at Predicting IT Job Satisfaction?

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ABSTRACT

The IT industry struggles to attract qualified talent despite an exceptional outlook in terms of both job availability and compensation. Similarly, post-secondary academic institutions report difficulties recruiting students for IT majors. One potential reason for this is that current career counseling practices do not adequately convey relevant job characteristic data to prospective job applicants and academic majors. Accordingly, we report the results of a survey of 72 IT professionals regarding their job interests and perceptions of important characteristics of their current job. We use the data to test the efficacy of Holland's classic occupation congruence model, the basis of current career counseling practices. In addition, we assess an alternate congruence model based on professionals' job perceptions and the Job Characteristics Model of Work Motivation (JCM) to determine which is more effective at predicting desired job outcomes. Results show that a sub-set of JCM constructs including task variety, task identity, and task autonomy is superior to both congruence models in predicting positive job outcomes. This suggests that IT career counseling outcomes might be improved by emphasizing the JCM characteristics.

Keywords: Job skills, IS major, Careers, STEM, Factors of major selection

1. INTRODUCTION

The outlook for individuals undergoing job retraining, as well as college graduates entering the workforce, in the information technology (IT) field is exceptionally positive. The United States Bureau of Labor Statistics (BLS) projects that demand for computer and mathematical occupations will increase 13.1% between 2014 and 2024, while average salaries will continue to outpace other highly regarded occupational areas such as healthcare, legal, and business disciplines (United States Bureau of Labor Statistics, 2015).

Despite strong projected demand and handsome salaries, interest in IT occupations among high school students and collegiate underclassmen remains weak (Ali and Shubra, 2010; Tabatabaei and Tehrani, 2010). Several researchers have studied this phenomenon and identified decision factors that

hinder students from choosing the IT field including: general lack of interest in IT occupations (Burns et al., 2014), curricula difficulty (Kuechler, McLeod, and Simkin, 2009; Zhang, 2007), social stigma for females (McLeod, Croasdell, and Simkin, 2011; Zhang, 2007), and lack of understanding regarding typical work tasks (Carter, 2006). In addition, some studies have found that students are aware of the IT field's high job availability and substantial compensation yet have little interest in pursuing occupations in the field (Burns et al., 2014; Kori et al., 2015).

One question regarding this phenomenon that has received little research attention is whether current career counseling practices are effective at matching counselees with IT occupations. High school, collegiate, and vocational career counselling practices are predominantly based on the Theory of Vocational Choice (TVC) (Holland, 1959) which uses a six dimension typology (RAISEC codes) to characterize individuals and occupations. The theory asserts that when an individual's RAISEC code characterization is congruent with the RAISEC code characterization of a given occupation, the individual will be satisfied and committed to that occupation (Holland, 1959).

Accordingly, current career counselling practices almost always begin with an individual completing a TVC interest inventory, such as the United States Department of Labor's (DOL) Occupational Information Network (O*NET) Interest Profiler. The results of the interest inventory provide the career counselor with a RAISEC code that represents the counselee's primary occupational interests. The counselor then uses that code to search resources such as the BLS Occupational Outlook Handbook (United States Bureau of Labor Statistics, 2015) to identify and recommend occupations with congruent RAISEC code assignments.

A recent study found that students were admitted to IT majors at a higher rate when they perceived an IT career to be well suited with their interests (Kori et al., 2015). The researchers performed qualitative content analysis on answers provided by 1,464 students applying for college admission to educational institutions in Estonia. Results of the study indicated that individuals were more likely to be admitted to an IT major if their answers to the questions included phrases indicating a general interest in IT. Conversely, other research found a near-zero correlation between the O*NET interest profiles of students who self-selected an IT major and the RAISEC code of the specific IT occupation those students were most interested in pursuing after graduation (Young, Carpenter, and Maasberg, 2016). This empirical study consisted of a survey of 210 students, and findings suggested that occupational congruence was a poor predictor of academic major satisfaction and performance. Additionally, a meta-analysis of 27 TVC studies conducted in numerous occupational domains found that congruence was not a significant predictor of job satisfaction (Tranberg, Slane, and Ekeberg, 1993). Finally, our search of the literature found no study that specifically examined the correlation between congruence and satisfaction for IT professionals nor did we find any study that had examined how well the RAISEC code characterizations assigned by the BLS to IT occupations matched the perceptions of individuals actually working in the occupations.

We believe these prior findings and the existing gaps in the literature raise several questions regarding the efficacy of current career counseling practices to guide good candidates toward IT occupations and believe that other theories may be better suited for predicting IT occupational satisfaction. The Job Characteristics Model of Work Motivation (JCM) is one candidate model which assesses the impact of occupational characteristics such as skill variety, task identity, task significance, autonomy, and feedback on job satisfaction. Accordingly, the goal of the current study is to answer the following three research questions:

- **RQ1**: Is TVC congruence a valid predictor of IT occupational satisfaction?
- **RQ2**: Is the JCM more informative than TVC congruence in predicting IT occupational satisfaction?
- **RQ3:** Are RAISEC codes derived from IT professionals' perceptions of their current occupational position superior to BLS assigned codes in predicting job satisfaction?

To answer these questions, we surveyed IT professionals regarding their current occupation, their RAISEC interests, their perceptions regarding the RAISEC and JCM characteristics of their current occupation, their occupational satisfaction, and their commitment to that occupation. We then used structural equation modeling to test hypotheses related to our research questions. In the following section, we present the results of that investigation. We begin with an overview of the extant TVC, JCM, and occupational commitment literature. We follow with the development of our research model and hypotheses. Next, we outline our research method and present our statistical results. We close with a discussion of those results and recommendations for further research.

2. LITERATURE REVIEW

2.1 Theory of Vocational Choice

The TVC (Holland, 1959) is considered to be the most prominent model of career choice and career development decisions (Leung, 2008). It is one of a group of theories referred to as trait and factor theories focusing on the characteristics of the individual in relation to occupational outcomes (Patton, 2008). TVC primarily focuses on the role of individual interests in career preferences (Leong and Gupta, 2008). Holland's theory has historically been considered a practical tool for guiding students in academic environments by identifying occupations consistent with individual patterns of interest and ability (Smart, Feldman, and Ethington, 2000).

Holland's theory postulates that an individual's vocational interest can be classified using six dimensions based on personality and work environment characteristics (Holland, 1996; Leung, 2008). These dimensions include Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C), resulting in the acronym RAISEC (Holland, 1996). Table 1 delineates the scales and preferences associated with each dimension of TVC.

Scale	Preference
(R)ealistic	Technical and skilled trades
(A)rtistic	Artistic, musical, and literary occupations
(I)ntellectual	Scientific occupations
(S)ocial	Teaching and helping occupations
(E)nterprising	Supervisory and sales occupations
(C)onventional	Clerical occupations

Table 1. Vocational Interest Scales from Holland's Theory (Holland, 1966)

Holland's theory includes three central components which are individuals, environments, and congruence between individuals and environments (Smart, Feldman, and Ethington, 2000). Job description data is used to assess work environments along the same six dimensions resulting in a three-letter code identifying the most important characteristics of a given occupation. To gauge suitability for a given occupation, individuals complete an interest inventory that determines their relative preference for work types associated with the six dimensions. The theory suggests that when there is high congruence between an occupation's code and an individual's code, the individual will be more successful and satisfied (Holland, 1996). Traditional vocational counseling has principally relied on Holland-type interest inventories to establish individual preferences and subsequently identify congruent occupations (Dik, Strife, and Hansen, 2010).

The TVC forms the basis for a number of surveys. The Vocational Preference Inventory (VPI) was the first survey to implement the six-factor TVC model. It was administered to 12,432 college freshman in 1964 (Holland, 1966). Several additional personality assessments were developed subsequent to the VPI including the Self-Directed Search (Holland, 1994), the Strong Interest Inventory (Harmon et al., 1994), the Vocational Identity Scale (Holland, Johnston, and Asama, 1993), and, most recently, the Occupational Information Network (O*NET) Interest Profiler developed by the BLS.

Holland's theory has formed the basis for extensive compilations of job characteristics data. For example, the *Dictionary of Holland Occupational Codes* (DHOC) lists more than 1,200 occupations and their associated TVC classifications. These occupational codes were derived via an algorithm based on Department of Labor job description data (Gottfredson and Holland, 1996). In addition, the BLS incorporated Holland code classifications into the O*NET occupational database, its free online resource. O*NET was most recently updated in 2010 and provides code classifications for nearly 1,000 occupations (United States Bureau of Labor Statistics, 2016a).

The six dimensions from Holland's theory have been refined over many years of empirical investigation (Holland, 1959, 1966, 1996) and validated in several domains (Betz, Harmon, and Borgen, 1996; Dik, Strike, and Hansen, 2010; Eggerth, Bowles, and Andrew, 2005; Tziner, Oren, and Caduri, 2014). Despite broad practical application, our review of the extant literature only produced a single study using TVC to analyze IT occupational decisions. Based on a study of 152 IT professionals and 415 non-IT professionals, results showed that individuals who measure high on the realistic dimension were significantly more likely to pursue an IT related occupation, whereas individuals who measured high on the enterprising dimension were significantly less likely to pursue an IT related occupation (Rosenbloom et al., 2008). However, the study neither assessed the level of congruence between the IT professionals' interest inventories and their current occupations nor the relationship between congruence and occupational satisfaction.

2.2 Job Characteristics Model of Work Motivation

Hackman and Oldham (1975) proposed the JCM of work motivation in which core job dimensions affect critical psychological states which impact personal and work outcomes. Core job dimensions included skill variety, task identity, task significance, autonomy, and feedback. Critical psychological states were developed based on several factors including experiencing meaningfulness of the work, experiencing responsibility for outcomes of work, and knowledge of the actual results of the work activities. Personal and work outcomes were determined by assessing qualitative factors such as high internal work motivation, high quality work performance, high satisfaction with the work, and low absenteeism and turnover.

Subsequently, Hackman and Oldham (1976) tested their theory, and, in general, results provided support for the model suggesting the relationships between job dimensions and outcomes were significant. Although significant, the impact of absenteeism and work performance results on outcome measures was less than that of other predictors. A decade later, Fried and Ferris (1987) performed a meta-analysis on nearly 200 studies including the model with results indicating support for the multidimensionality of job dimensions, support for the mediating role of psychological states, and the association of job characteristics and performance outcomes.

Many disciplines consider the job characteristics model when examining specific work situations. For example, information systems researchers have extended the job characteristics model when considering the unique attributes of programmers. Goldstein and Rockart (1984) point out that the original JCM model assumes that workers operate independently and that this assumption conflicts with much of the IT work completed in organizations. To explore this aspect, they study the relationship between job satisfaction and role conflict, role ambiguity, and quality of leadership. Goldstein and Rockart (1984) state these variables can be added to Hackman and Oldham's model when needed.

Within the domain of information systems implementations, Morris and Venkatesh (2010) incorporated the job characteristics model when considering the effects of an ERP system rollout on employee's jobs. They examined how job characteristics (skill variety, autonomy, and feedback) impacted job satisfaction and found the ERP implementation moderated these relationships. Prior to this work, little consideration was given to how such large-scale technological changes affected employees and their jobs.

Recently, Oldham and Fried (2016) reviewed 50 years of job design research and theory summarizing the progression of work in this area beginning with early work on job design and how job characteristics were measured. Next, they discussed how researchers searched for new moderating variables such as personality, career stage, and uncertainty, as well as the effects of organizational context and interdisciplinary perspectives of job design. Following this historical perspective, Oldham and Fried examined recent research that

included alternative 1) job characteristics, 2) outcomes such as creativity, organizational citizenship behaviors, and employee health and well-being, and 3) mediators of job characteristics and design of jobs for teams. Concluding, new research directions were discussed such as job crafting, generational differences, transformational leadership, and job design for temporary employees across cultures. Clearly, job characteristics play an important role in understanding the workplace and employee outcomes.

2.3 Occupational Commitment

Allen and Meyer (1990) proposed a three factor model comprised of affective, continuance, and normative commitment that integrated notions from an array of previous theories on occupational commitment. Affective commitment refers to an employee's positive emotional attachment to an occupation. Continuance commitment refers to an employee's recognition of the costs associated with leaving their current occupation. Accordingly, high continuance commitment indicates high-perceived cost associated with leaving the occupation, whereas, low continuance commitment reflects low-perceived cost associated with leaving. Finally, normative commitment refers to an employee's sense of loyalty to the occupation.

Subsequent empirical studies have found that affective commitment is the strongest predictor of positive organizational outcomes such as low turnover rates, performance, and organizational citizenship (Cho and Huang, 2012; Meyer et al., 2002). Continuance commitment is also a significant predictor of organizational outcomes in some professions (Duffy, Dik, and Steger, 2011; Meyer et al., 2002) but appears to be less stable in the IT profession (Dockel, Basson, and Coetzee, 2006; Lumley et al., 2011). Several scholars suggest that Becker's (1960) side-bet theory comes into play as IT professionals tend to be young, single, and childless, which reduces their ancillary reasons for continuing in a particular job or profession (Cho and Huang, 2012; Powell and Meyer, 2004). Ease of moving to a new job and job availability further reduce the impact of continuance commitment in IT professions (Dockel, Basson, and Coetzee, 2006; Joseph et al., 2007). Normative commitment tends to share antecedents with affective and continuance commitment (Meyer et al., 2002), and its effect is moderated by continuance commitment (Dockel, Basson, and Coetzee, 2006; Joseph et al., 2007; Powell and Meyer, 2004). Thus, normative commitment has less relevance in the IT domain where continuance commitment is largely driven by side-bet factors.

3. MODEL AND HYPOTHESES DEVELOPMENT

TVC postulates that high congruence between occupational characteristics and individual interests will result in positive outcomes such as occupational satisfaction (Holland, 1996). Similarly, we suggest that high congruence between professionals' job characteristics perceptions and individual interests may lead to high occupational satisfaction. We positioned these as competing hypotheses as expressed in RQ3. In both cases, we modeled the impact of occupational congruence as a direct antecedent of occupational satisfaction. Our PLS analysis methodology will allow us to identify each path's contribution to occupational satisfaction within a single analysis and address both RQ1 and RQ3. Thus, our first two hypotheses are:

- **H1a**: Congruence between an individual's TVC personality theme classification and the TVC theme classification assigned by O*NET to their current occupation heightens the individual's occupational satisfaction.
- **H1b:** Congruence between an individual's TVC personality theme classification and their perceptions regarding the TVC classification of their current position heightens their occupational satisfaction.

JCM contends that five core job characteristics including task significance, task variety, task identity, task autonomy, and task feedback influence personal and work outcomes including job satisfaction (Hackman and Oldham, 1976) forming the basis for our next five hypotheses:

- **H2a:** Task significance is positively associated with occupational satisfaction.
- **H2b:** Task variety is positively associated with occupational satisfaction.
- **H2c:** Task identity is positively associated with occupational satisfaction.
- **H2d:** Task autonomy is positively associated with occupational satisfaction.
- **H2e:** Task feedback is positively associated with occupational satisfaction.

Consistent with Allen and Meyer's (1990) three-factor organizational commitment model, we propose that occupational satisfaction will lead to high affective commitment and high continuance commitment. Based on previous findings specifically related to the IT field (Dockel, Basson, and Coetzee, 2006; Joseph et al., 2007; Powell and Meyer, 2004), we do not expect normative commitment to be a significant outcome of occupational satisfaction. Thus, our final two hypotheses become:

- **H3:** Occupational satisfaction is positively associated with occupational affective commitment.
- **H4:** Occupational satisfaction is positively associated with occupational continuance commitment.

The research model presented in Figure 1 summarizes these hypotheses.

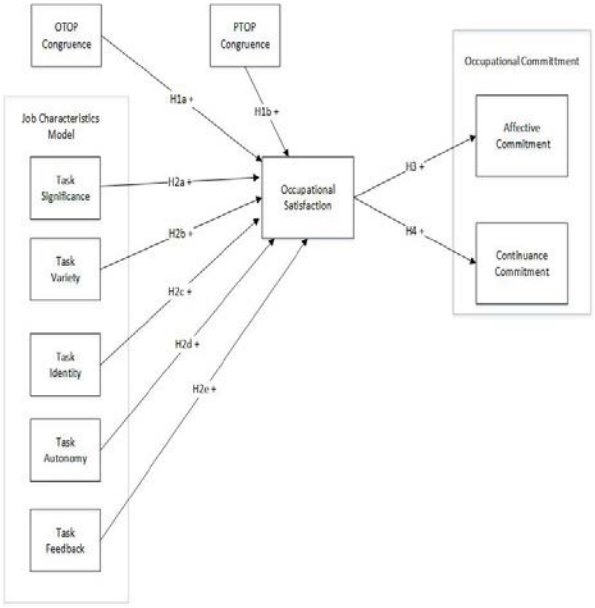

Figure 1. Research Model

4. METHODOLOGY

We employed a survey research method and Partial Least Squares (PLS) modeling to address our research questions. Surveys have been widely used in vocation-based research, as they allow for straight-forward data collection regarding a variety of constructs (Dik, Strife, and Hansen, 2010; Morris and Venkatesh, 2010; Powell and Meyer, 2004; Tziner, Oren, and Caduri, 2014). While we considered a few qualitative approaches for data collection, we felt that use of a survey would allow for a larger sample of responses from a more heterogeneous set of individuals.

Prior vocation-based studies have used ANOVA (Betz, Harmon, and Borgen, 1996), multiple regression (Cho and Huang, 2012; Dik, Strike, and Hansen, 2010; Hackman and Oldham, 1976), generalized estimation methods (Morris and Venkatesh, 2010), and partial least squares (PLS) for analysis purposes (Young, Carpenter, and Maasberg, 2016). We chose PLS for this study because the method has been noted as a superior approach when studying complex relationships between sets of latent variables (Chin, 1998). Moreover, PLS has been shown to work effectively with: 1) both small and large samples, 2) interval scales, and 3) skewed data (Vilares, Almeida, and Coelho, 2010). As we were dealing with a relatively small sample that included Likert-scale measures, we felt PLS was the most appropriate analysis method for this study. Below we outline our instrument development and data collection processes.

4.1 Measurement

We drew all measures from the existing literature. IT occupations were drawn from the BLS Occupational Handbook (United States Bureau of Labor Statistics, 2016b). Forty two items to assess individuals' RAISEC scores were drawn from My Next Move Interest Profiler (United States Bureau of Labor Statistics, 2016a). Items to assess the JCM dimensions of task significance, task identity, skill variety, autonomy, feedback, and occupational satisfaction were drawn from Morris and Venkatesh (2010) where they exhibited Cronbach alpha reliability coefficients of 0.79, 0.76, 0.75, 0.71, 0.75, and 0.75, respectively. Finally, items to assess affective and continuance occupational commitment were drawn from Meyer, Allen, and Smith (1993) where they exhibited Cronbach alpha reliability coefficients of 0.87 and 0.79. All survey items are included in Appendix A.

Respondents' TVC theme classifications were determined by first identifying each respondent's first, second, and third highest RAISEC scores and then assigning the appropriate TVC theme classification. Next, we used the O*NET database to identify the TVC theme classification assigned to the respondents' professed occupation, which was then used to calculate O*NET to personality (OTOP) congruence using Brown and Gore's (1994) congruence index formula. Finally, we used six items to determine each respondent's perceptions regarding the first, second, and third highest RAISEC characteristics for their current occupational position. We then used that information to assign the appropriate TVC theme classification to the position and calculate perceived position to personality (PTOP) congruence.

4.2 Data Collection

We collected the study data using an electronic survey instrument that contained six blocks of questions. The first block identified the respondent's current IT occupation. The second block contained the 42 items to assess the respondent's preferences for realistic, artistic, investigative, social, entrepreneurial, and convention tasks (i.e., RAISEC scores). The third block contained the six slider-bar items to assess the respondent's perceptions regarding the relative frequency with which they performed tasks in each of the RAISEC categories in their current position. These scalar items allowed the respondent to select any point from 0 to 10 with end points anchored with "very rarely" and "very often." The fourth block contained ten items to assess perceptions regarding the task significance, task identity, skill variety, autonomy, and feedback of the respondent's current position. The fifth block contained three items to assess the respondent's occupational satisfaction and eight items to assess their affective and continuance commitment for that occupation. The final block contained demographic questions.

The pilot sample was drawn from the researchers' professional networks. A total of 179 personalized email messages seeking study participation were sent to known IT professionals with each message containing a link to the survey instrument. One week later, 72 responses had been collected, a 41% response rate.

5. RESULTS

We analyzed the proposed model using PLS, a predictive modeling technique that performs bootstrap re-sampling as a non-parametric means of drawing statistical inferences based on the provided sample. PLS is robust to small sample sizes and does not rely on the assumptions of normality required for parametric inferential analysis (Pratyush and Kim, 2013). We utilized the PLSPM package of the R programming language to perform both item validation and predictive analysis.

Following the recommended two stage approach, we first assessed the measurement model and then analyzed the structural model (Anderson and Gerbing, 1988).

5.1 Measurement Model

Tests of convergent validity, discriminant validity, and reliability assessed the suitability of the instrument measures. To assess the convergent validity of the multi-item measures, we examined the "on-factor" loadings provided by the PLSPM output (Gefen, Rigdon, and Straub, 2011). One satisfaction item did not load well on its hypothesized construct and was dropped. Subsequently, each item loaded most strongly on its hypothesized construct and all "on-factor" loadings either exceeded or were very close to 0.70 (see Appendix B). Accordingly, we concluded that the multi-item measures exhibited an acceptable level of convergent validity.

Next, we examined item cross-loadings to assess discriminant validity. We note that all items loaded most strongly on its theorized construct. Although some items had moderately high cross-loadings, such as Satisfaction (SAT) on Affective Commitment (AC), these must be assessed with the theorized relationships in mind. Satisfaction is theorized as an antecedent of Affective Commitment. Accordingly, high cross-loadings were expected. To further substantiate the discriminate validity of the scales, the square root of the average variance extracted (AVE) was checked for each multi-item construct to ensure that it was higher than the construct's correlations with all other constructs. The results in Table 2 show that each construct's square root of the AVE exceeded its correlations with other constructs supporting discriminant validity. Reliability was assessed using composite reliability scores. All were above 0.70, indicating that for this particular population of participants, the scales exhibited an acceptable level of reliability (Wilkinson, 1999).

Finally, we employed Harman's (1976) single factor technique and Lindell and Witney's (2001) marker variable technique to ensure that common method bias did not unduly impact our measurement model. Neither technique indicated that biases due common method variance were of significant concern for the collected sample.

5.2 Structural Model

The structural model results provided tests of the hypotheses. We began by calculating path coefficients and R^2 values. We then utilized bootstrap resampling to determine *t* statistics and significance values. Figure 2 shows the results of the predictive model analysis including path β coefficients, associated ρ values, and R^2 value for each dependent variable. Overall, the model accounted for significant portions of the variance in occupational satisfaction (R^2 = 0.65) and occupational affective commitment (R^2 = 0.57). However, the model explained very little of the variance in occupational continuance commitment (R^2 = 0.06).

Our hypothesis tests showed that neither OTOP Congruence (β = 0.02, ρ = 0.811) nor PTOP Congruence (β = 0.02, ρ = 0.811) had a significant influence on occupational satisfaction. Thus, neither H1a nor H1b were supported. However, three of the five JCM dimensions were found to be significantly related to occupational satisfaction. Task variety (β = 0.33, ρ < 0.001), task identity (β = 0.25, ρ = 0.008), and task autonomy (β = 0.25, ρ = 0.021) were all associated with increases in occupational satisfaction, providing support for H2b, H2c, and H2d. The influence of task significance (β = 0.16, ρ = 0.077) on occupational satisfaction was approaching significance. Given our small sample size for this pilot study, this relationship warrants additional scrutiny. Task feedback (β = 0.07, ρ = 0.508) was not found to be significantly related to occupational satisfaction, thus H2e is rejected. Finally, occupational satisfaction was significantly and positively associated with occupational affective commitment (β = 0.75, ρ < 0.001) providing support for H3. However, there was no significant association between occupational satisfaction and occupational continuance commitment (β = 0.10, ρ = 0.370), thus H4 is rejected. We conducted post-hoc power analyses using G*Power (Faul et al., 2007) and found that our sample provided an observed statistical power of 0.60 for occupational satisfaction and 0.90 for both of the occupational commitment constructs.

	Mean	SD	AVE	α	OtoP	PtoP	TS	TI	TV	TA	TF	SAT	AC	CC
OtoP	9.01	3.1												
PtoP	8.92	3.7			0.30 *									
TS	12.5	1.6	0.8	0.73	0.10	0.15	**0.89**							
TI	11.6	2.0	0.9	0.86	0.04	-0.05	0.70 ***	**0.94**						
TV	10.5	3.0	0.8	0.77	0.12	-0.03	0.35 **	0.83 ***	**0.90**					
TA	11.0	2.5	0.8	0.82	0.19	0.02	0.40 **	0.67 ***	0.84 ***	**0.92**				
TF	13.2	2.3	0.9	0.84	0.04	0.04	0.40 ***	0.46 ***	0.41 ***	0.53 **	**0.93**			
SAT	15.1	3.6	0.9	0.85	0.06	0.08	0.36 **	0.52 ***	0.47 ***	0.58 **	0.38 **	**0.93**		
AC	23.1	5.2	0.7	0.87	-0.02	0.04	0.39 **	0.47 ***	0.40 ***	0.50 **	0.34 **	0.74 ***	**0.84**	
CC	14.1	6.6	0.7	0.88	0.09	0.16	-0.05	-0.04	0.03	0.07	-0.04	0.22	0.09	**0.81**

Note: OtoP = O*NET to Person Congruence, PtoP = Position to Person Congruence, TS = Task Significance, TI = Task Identity, TV = Task Variety, TA = Task Autonomy, TF = Task Feedback, SAT = Satisfaction, AC = Affective Commitment, CC = Continuance Commitment * ρ < 0.05, ** ρ < 0.01, *** ρ < 0.001

Table 2. Reliability and Descriptive Statistics

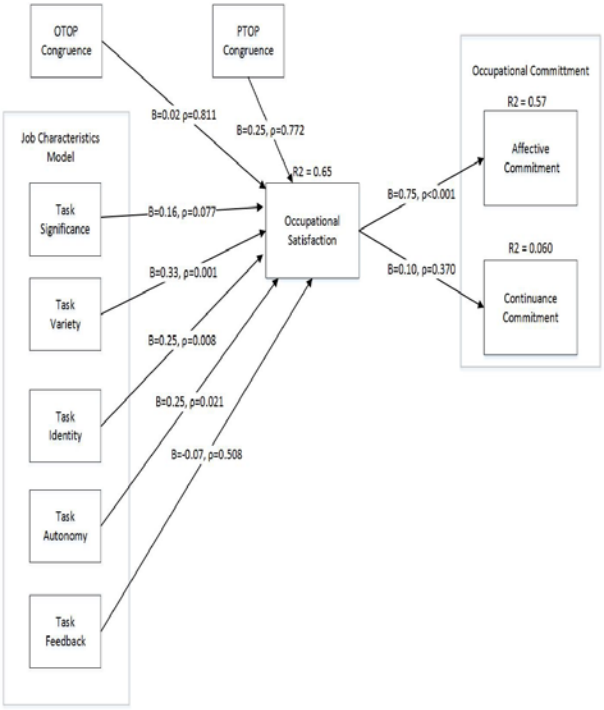

Figure 2. PLS Structural Model

6. DISCUSSION

Our study results indicate that TVC congruence has little influence on the occupational satisfaction of IT professionals. This is consistent with prior research that found a near-zero correlation between congruence, academic major satisfaction, and performance of students who planned to pursue an IT career (Young, Carpenter, and Maasberg, 2016). Several reasons could account for these findings. First, the items contained in most career interest profiles have changed little since TVC was first introduced (Holland, 1959). Accordingly, it is entirely possible that the items do not adequately represent the types of tasks that IT-oriented individuals like to do. A second possibility is that the TVC theme classifications assigned to IT occupations do not adequately represent the real work done in those occupations. However, we tested for this possibility in our results and found that even when a TVC theme classification was assigned based on professionals' perceptions of their occupation, congruence between that classification and the individual's personality had low correlation with their occupational satisfaction. A third possibility is that IT professionals are more satisfied working in secure and lucrative occupations even if the field is not a perfect match with their personality. However, we did not find any prior research that empirically or qualitatively suggests financial motives or job security concerns as primary drivers of long-term occupational satisfaction. While monetary and job security factors may play a role in decisions to initially pursue a given career path, they are consistently portrayed in the literature as hygiene aspects of one's occupation. In other words, an IT professional may leave the field if he or she perceives the financial remuneration or job security to be low but is not likely to achieve high occupational satisfaction simply because the pay is good and job positions are relatively secure.

Based on the empirical evidence, we believe that current generation occupational inventory instruments do not adequately assess the types of tasks of interest to technology-centric individuals. We believe this is a fundamental issue with the dated instruments used for interest inventories, but not the root cause of poor occupational satisfaction prediction capability when using TVC-based themes. While inadequate task inventory lists would intuitively lead to TVC themes that are inconsistent with the work performed in IT jobs, we discount the overall impact of inconsistent TVC themes on poor occupational satisfaction prediction result in our research. We base this argument on our finding that TVC themes constructed from current IT professionals' perceptions of their occupations also produced low correlations with occupational satisfaction. While additional empirical inquiry may be necessary to validate this contention, our research raises serious concerns about the ability of TVC-based themes to predict occupational satisfaction even with the use of a modernized task list to derive the overall themes for IT professions. Thus, regardless of the reason, our results call into question the applicability of TVC when providing IT-related career counseling, particularly for students considering an IT-related major for post-secondary education. Therefore, we believe that there is a possibility that more students would be interested in pursuing IT academic majors and occupations if improved career-counseling methods were employed.

In contrast with TVC, several factors from the JCM had significant impacts on occupational satisfaction. Task variety was the strongest predictor, with task identity and task autonomy also having significant impacts on occupational satisfaction. Additionally, the impact of task significance warrants additional study given our relatively small pilot sample size and a result approaching statistical significance. Our findings related to the JCM should be of keen interest to both researchers and practitioners as the JCM seeks to achieve positive outcomes for both individuals and organizations. Identifying people well suited for IT jobs based on a match between the JCM's job characteristics and individual preferences may lead to improved outcomes for the employee and the organization. While our results support the JCM as a better predictor of occupational satisfaction, it is perhaps a less than idyllic solution to the overall issues with career counseling effectiveness. It may be possible to match individuals with their desired job characteristics, but other factors in the JCM, such as critical psychological states, are more suitable to measurement in current professionals within a specific career as opposed to job seekers. This means career counseling efforts based on JCM would likely only partially employ the theory's main tenants. However, we believe that even a limited JCM-based approach to career counseling would yield a superior outcome to that achieved with TVC-based methods. The implications of this suggestion are further discussed under the directions for future research below, as new instruments suitable for use in career counseling settings would likely need to be developed. Additionally, long-term studies would be necessary to determine whether JCM-based career counseling is ultimately successful in relation to the theory's expected personal and work outcomes such as

internal work motivation, work performance, work satisfaction, absenteeism, and turnover.

Finally, the statistically non-significant relationship between occupational satisfaction and continuance commitment is particularly noteworthy in the IT domain. The IT field is currently characterized as having the highest employee turnover rate among all jobs at Fortune 500 companies, and the lowest average employee tenure (Clapon, 2014; Tech Republic, 2017). In a field with near-zero unemployment and aggressive recruiting practices, the lack of continuance commitment may be more a result of exceptional opportunity than high costs associated with leaving the field. The ability to move laterally from one IT occupation to another (i.e., application developer to web developer) in a vibrant labor market may further confound the relationship between these variables.

7. LIMITATIONS

As with all research, our results must be interpreted with regard to several limitations. First, while we found relatively robust results for the occupational commitment constructs (statistical power = 0.92), only a modest observed statistical power (statistical power = 0.645) was achieved for occupational satisfaction given our small sample size and the high number of predictor variables. Accordingly, replication with a large sample size would help substantiate the results. Second, all of the measures used in the study were self-reported values. Accordingly, it is possible that employing other types of measures would produce different results. As noted previously, we included an unrelated construct in our instrument and conducted tests for common method bias to assess the impact of reliance on a single measurement method. We noted no significant methodological bias. Finally, a convenience sample of IT professionals known to the researchers served as the subjects for this research. More robust sampling methods might have resulted in different results; however, as the survey participants were all legitimate members of the population of interest and showed satisfactory dispersion among job titles, experience levels, and salary, our concerns regarding sampling bias were low.

8. DIRECTIONS FOR FUTURE RESEARCH

Our research identifies several areas ripe for further exploration. Our findings on congruence models suggest that much work could be done to modernize the basic Holland (Holland, 1959) framework to accommodate newer employment domains such as IT. A complimentary task would be to re-conceptualize the job codes for specific IT professions in light of the industry's rapid evolvement in recent years. This likely involves large-scale studies to determine the classic Holland characteristics or newly defined characteristics that best describe IT occupations.

Another area where additional research is warranted is the study of alternative job and academic major counseling techniques. Experiments comparing the effectiveness of traditional counseling methods versus alternative methods based on JCM principles would shed substantial insight into the effectiveness of various approaches.

Finally, work/life balance has been suggested as a factor that drives occupational continuance in high-technology fields (Clapon, 2014; Tech Republic, 2017). Limited empirical data supports this contention (Dockel, Basson, and Coetzee, 2006). Future research should more thoroughly explore the relative impact of work/life balance in IT job satisfaction and occupational commitment outcomes.

9. CONCLUSION

Our study adds to the theoretical literature base for both IT career counseling and job satisfaction by empirically evaluating the relative strength of occupational congruence methods versus the JCM as predictors of occupational satisfaction. Given the dearth of experimental data assessing career-counseling models in the IT field, our study provides important insights into the applicability of popular theoretical frameworks in the IT domain. While a subset of JCM constructs including task variety, task identity, and task autonomy were strong predictors of occupational satisfaction, we found no support for occupational congruence as a predictor of positive job outcomes. Our results remained consistent despite testing congruence models based on DOL job codes as well as job codes derived from current IT professionals. We found that the impact of task significance on occupational satisfaction was approaching significance and warrants further study with a more robust sample. From the JCM, only task feedback was a poor predictor of occupational satisfaction in the IT domain. Lastly, occupational satisfaction was strongly predictive of affective commitment, but not indicative of continuance commitment.

Our findings have important practical implications for employers, career counselors, students, and potential employees. They suggest that current interest-based job congruence metrics are poor proxies for job fit and occupational counseling techniques may not be effective for identifying individuals well suited to IT occupations. They further suggest that stressing certain factors from the JCM as critical characteristics of employment opportunities in both job postings and academic advising may resonate better than interest compatibility with prospective employees or students.

10. REFERENCES

Ali, A. & Shubra, C. (2010). Efforts to Reverse the Trend of Enrollment Decline in Computer Science Programs. *Issues in Informing Science and Information Technology*, 7, 209-224.

Allen, N. J. & Meyer, J. P. (1990). The Measurement and Antecedents of Affective, Continuance and Normative Commitment to the Organization. *Journal of Occupational and Organizational Psychology*, 63(1), 1–18.

Anderson, J. C. & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103(3), 411–423.

Becker, H. S. (1960). Notes on the Concept of Commitment. *American Journal of Sociology*, 66(1), 32–40.

Betz, N. E., Harmon, L. W., & Borgen, F. H. (1996). The Relationships of Self-Efficacy for the Holland Themes to Gender, Occupational Group Membership, and Vocational Interests. *Journal of Counseling Psychology*, 43(1), 90–98.

Brown, S. D. & Gore, P. A. (1994). An Evaluation of Interest Congruence Indices: Distribution Characteristics and Measurement Properties. *Journal of Vocational Behavior*, 45(3), 310–337.

Burns, T. J., Gao, Y., Sherman, C., Vengerov, A., & Klein, S. (2014). Investigating a 21st Century Paradox: As the Demand for Technology Jobs Increases Why are Fewer Students Majoring in Information Systems? *Information Systems Education Journal*, 12(4), 4-16.

Carter, L. (2006). Why Students with an Apparent Aptitude for Computer Science Don't Choose to Major in Computer Science. In *Proceedings of the 37th SIGCSE Technical Symposium on Computer Science Education* (pp. 27–31). Houston, TX.

Chin, W. W. (1998). The Partial Least Squares Approach to Structural Equation Modeling. *Modern Methods for Business Research*, 295(2), 295–336.

Cho, V. & Huang, X. (2012). Professional Commitment, Organizational Commitment, and the Intention to Leave for Professional Advancement: An Empirical Study on IT Professionals. *Information Technology & People*, 25(1), 31–54.

Clapon, P. (2014). Can the Tech Industry Solve the Employee Tenure Problem? Retrieved February 27, 2017, from http://www.gethppy.com/employee-engagement/can-tech-industry-solve-employee-tenure-problem.

Dik, B. J., Strife, S. R., & Hansen, J. C. (2010). The Flip Side of Holland Type Congruence: Incongruence and Job Satisfaction. *The Career Development Quarterly*, 58(4), 352–358.

Dockel, A., Basson, J. S., & Coetzee, M. (2006). The Effect of Retention Factors on Organisational Commitment: An Investigation of High Technology Employees. *SA Journal of Human Resource Management*, 4(2), 20–28.

Duffy, R. D., Dik, B. J., & Steger, M. F. (2011). Calling and Work-Related Outcomes: Career Commitment as a Mediator. *Journal of Vocational Behavior*, 78(2), 210–218.

Eggerth, D. E., Bowles, S. M., & Andrew, M. E. (2005). Convergent Validity of O*NET Holland Code Classifications. *Journal of Career Assessment*, 13(2), 150–168.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G* Power 3: A Flexible Statistical Power Analysis Program for the Social, Behavioral, and Biomedical Sciences. *Behavior Research Methods*, 39(2), 175–191.

Fried, Y. & Ferris, G. R. (1987). The Validity of the Job Characteristics Model: A Review and Meta-Analysis. *Personnel Psychology*, 40(2), 287–322.

Gefen, D., Rigdon, E. E., & Straub, D. (2011). An Update and Extension to SEM Guidelines for Administrative and Social Sciences Research. *MIS Quarterly*, 35(2), iii–xiv.

Goldstein, D. K. & Rockart, J. F. (1984). An Examination of Work-Related Correlates of Job Satisfaction in Programmer/Analysts. *MIS Quarterly*, 8(2), 103–115.

Gottfredson, G. D. & Holland. (1996). *Dictionary of Holland Occupational Codes, 3rd ed*. Odessa, FL: Psychological Assessment Resources.

Hackman, J. R. & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, 60(2), 159-170.

Hackman, J. R. & Oldham, G. R. (1976). Motivation through the Design of Work: Test of a Theory. *Organizational Behavior and Human Performance*, 16, 250–279.

Harman, D. (1976). A Single Factor Test of Common Method Variance. *Journal of Psychology*, 35, 359–379.

Harmon, L. W., Hansen, J.-I. C., Borgen, F. H., & Hammer, A. (1994). *Strong Interest Inventory Applications and Technical Guide*. Palo Alto, CA: Stanford University Press.

Holland, J. (1959). A Theory of Vocational Choice. *Journal of Counseling Psychology*, 6(1), 35–45.

Holland, J. (1966). A Psychological Classification Scheme for Vocations and Major Fields. *Journal of Counseling Psychology*, 13(3), 278–288.

Holland, J. (1994). *The Self-Directed Search, 4th ed*. Odessa, FL: Psychological Assessment Resources.

Holland, J. (1996). Exploring Careers with a Typology: What we have Learned and Some New Directions. *American Psychologist*, 51(4), 397–406.

Holland, J., Johnston, J., & Asama, N. (1993). The Vocational Identity Scale: A Diagnostic and Treatment Tool. *Journal of Career Assessment*, 1, 1–12.

Joseph, D., Ng, K.-Y., Koh, C., & Ang, S. (2007). Turnover of Information Technology Professionals: A Narrative Review, Meta-Analytic Structural Equation Modeling, and Model Development. *MIS Quarterly*, 31(3), 547–577.

Kori, K., Pedaste, M., Niitsoo, M., Kuusik, R., Altin, H., Tõnisson, E., Vau, I., Leijen, A., Maeots, M., Siiman, L., Murtazin, K., & Paluoja, R. (2015). Why do Students Choose to Study Information and Communications Technology? *Procedia – Social and Behavioral Sciences*, 191, 2867–2872.

Kuechler, W., McLeod, A., & Simkin, M. (2009). Why Don't More Students Major in IS? *Decision Sciences Journal of Innovative Education*, 7(2), 463–488.

Leong, T. L. & Gupta, A. (2008). Theories in Cross-Cultural Contexts. In *International Handbook of Career Guidance* (pp. 227–245). New York, NY: Springer.

Leung, S. A. (2008). The Big Five Career Theories. In *International Handbook of Career Guidance* (pp. 115–132). New York, NY: Springer.

Lindell, M. K. & Whitney, D. J. (2001). Accounting for Common Method Variance in Cross-Selectional Research Designs. *Journal of Applied Psychology*, 86(1), 114–121.

Lumley, E. J., Coetzee, M., Tladinyane, R., & Ferreira, N. (2011). Exploring the Job Satisfaction and Organisational Commitment of Employees in the Information Technology Environment. *South African Business Review*, 15(1), 100–118.

McLeod, A., Croasdell, D., & Simkin, M. (2011). Why Don't More Women Major in Information Systems? *Information Technology & People*, 24(2), 158-183.

Meyer, J. P., Allen, N. J., & Smith, C. A. (1993). Commitment to Organizations and Occupations: Extension and Test of a Three-Component Conceptualization. *Journal of Applied Psychology*, 78(4), 538-551.

Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, Continuance, and Normative Commitment to the Organization: A Meta-Analysis of Antecedents, Correlates, and Consequences. *Journal of Vocational Behavior*, 61(1), 20–52.

Morris, M. G. & Venkatesh, V. (2010). Job Characteristics and Job Satisfaction: Understanding the Role of Enterprise Resource Planning System Implementation. *MIS Quarterly*, 143–161.

Oldham, G. R. & Fried, Y. (2016). Job Design Research and Theory: Past, Present and Future. *Organizational Behavior and Human Decision Processes*, 136, 20–35.

Patton, W. (2008). Recent Developments in Career Theories: The Influences of Constructivism and Convergence. In *International Handbook of Career Guidance* (pp. 133–156). New York, NY: Springer.

Powell, D. M. & Meyer, J. P. (2004). Side-Bet Theory and the Three-Component Model of Organizational Commitment. *Journal of Vocational Behavior*, 65(1), 157–177.

Pratyush N. S. & Kim, K. H. (2013). A Comparison of PLS and ML Bootstrapping Techniques in SEM: A Monte Carlo Study. In *New Perspectives in Partial Least Squares and Related Methods* (pp. 201–208). New York, NY: Springer.

Rosenbloom, J. L., Ash, R. A., Dupont, B., & Coder, L. (2008). Why are there so Few Women in Information Technology? Assessing the Role of Personality in Career Choices. *Journal of Economic Psychology*, 29(4), 543–554.

Smart, J. C., Feldman, K. A., & Ethington, C. A. (2000). *Holland's Theory and the Study of College Students and Faculty*. Nashville, TN: Vanderbilt University Press.

Tabatabaei, M. & Tehrani, M. (2010). Factors Impacting Enrollment in Information Systems Programs. *Issues in Information Systems*, 17(1), 319–321.

Tech Republic. (2017). Tech Companies have Highest Turnover Rate. Retrieved February 27, 2017, from http://www.techrepublic.com/blog/career-management/tech-companies-have-highest-turnover-rate/.

Tranberg, M., Slane, S., & Ekeberg, S. E. (1993). The Relation between Interest Congruence and Satisfaction: A Meta-Analysis. *Journal of Vocational Behavior*, 42, 253–264.

Tziner, A., Oren, L., & Caduri, A. (2014). Predicting Occupational Congruence: Self-Regulation, Self-Efficacy, and Parental Support. *Journal of Career Assessment*, 22(2), 371–385.

United States Bureau of Labor Statistics. (2015). *Employment Projections - 2014-24*. U.S. Department of Labor. Retrieved from https://www.bls.gov/news.release/pdf/ecopro.pdf.

United States Bureau of Labor Statistics. (2016a). *About O*NET*. Retrieved from http://www.onetcenter.org/overview.html.

United States Bureau of Labor Statistics. (2016b). *Occupational Outlook Handbook*. Retrieved from http://www.bls.gov/ooh/.

Vilares, M., Almeida, M., & Coelho, P. (2010). Comparison of Likelihood and PLS Estimators for Structural Equation Modeling: A Simulation with Customer Satisfaction Data. In V. E. Vinzi, W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares: Concepts, Methods and Applications*. Springer.

Wilkinson, L. (1999). Statistical Methods in Psychology Journals: Guidelines and Explanations. *American Psychologist*, 54(8), 594–604.

Young, D. K., Carpenter, D., & Maasberg, M. (2016). An Examination of Factors that Influence Students' IT Career Decisions. *Journal of Computer Information Systems*, 58(3), 253-263.

Zhang, W. (2007). Why IS: Understanding Undergraduate Students' Intentions to Choose an Information Systems Major. *Journal of Information Systems Education*, 18(4), 447–458.

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APPENDIX A. Survey Items

1. Which of the following titles is most similar to your current position?
    - Business Intelligence Analyst
    - Computer and Information Systems Manager
    - Data Warehouse Specialist
    - Database Administrator
    - Hardware Engineer
    - Information Technology Project Manager
    - Network Architect
    - Network Support Specialist
    - Security Analyst
    - Application Software Developer
    - Systems Software Developer
    - Software Quality Assurance Engineer
    - Systems Administrator
    - Systems Analyst
    - Systems Engineer/Architect
    - User Support Specialist
    - Web Administrator
    - Web Developer
    - None of the above
2. Please indicate your thoughts on the following types of work? Don't think about education/training/pay. Just think about whether you would like or dislike doing the task?
   (5 point Likert Scale)
    - Build kitchen cabinets
    - Lay brick or tile
    - Develop a new medicine
    - Study ways to reduce water pollution
    - Write books or plays
    - Play a musical instrument
    - Teach someone an exercise routing
    - Help people with personal or emotional problems
    - Buy and sell stocks and bonds
    - Operate a beauty salon or barbershop
    - Develop a spreadsheet using computer software
    - Install software across computers on a large network
    - Repair household appliances
    - Conduct chemical experiments
    - Assemble electronic parts
    - Test the quality of parts before shipment
    - Investigate the cause of a fire
    - Develop a way to better predict the weather
    - Compose or arrange music
    - Create special effects for movies
    - Give career guidance to people
    - Perform rehabilitation therapy
    - Manage a department within a large company
    - Start your own business
    - Calculate the wages of employees
    - Keep shipping and receiving records
    - Inventory supplies Using a hand-held computer
    - Negotiate business contracts.
    - Repair and install locks
    - Set up and operate machines to make products
    - Invent a replacement for sugar
    - Do laboratory tests to identify new diseases
    - Write scripts for movies or television shows
    - Perform jazz or tap dance
    - Edit movies

- Do volunteer work at a non-profit organization
- Teach sign language to people with hearing disabilities
- Help conduct a group therapy session
- Represent a client in a lawsuit
- Market a new line of clothing
- Record rent payments
- Keep inventory records

3. Please indicate how frequently you engage in the listed activities in your current occupation. (slider bars scaled from 0 to 10 anchored at end points with very rarely and very often)
   - Manipulate machines, tools, and things
   - Explore, understand, predict, and/or control problems
   - Engage in artistic activities
   - Help, teach, counsel, or serve others through personal interaction
   - Persuade or direct others
   - Establish or maintain orderly routines or standards

4. Are the results of your occupational work likely to significantly affect others? (7 point Likert scale)
   - This job is one where a lot of people can be affected by how well the work gets done.
   - The job itself is very significant and important to the broader scheme of things.

5. Consider only the tasks assigned to you rather than your group or team's overall project when answering the following questions. Does your occupational position involve doing a "whole" piece of work or do you contribute "part" and the rest is finished by others or by machines? (7 point Likert scale)
   - The role provides me the chance to completely finish the work I begin.
   - The position is arranged so that I can do an entire piece of work from beginning to end.

6. How much variety is there in your occupational position? Does the job require you to do many different things, using a variety of skills and talents? (7 point Likert scale)
   - The position requires me to use a number of complex or high-level skills
   - The position is complex and non-repetitive.

7. How much autonomy is there in your occupational position? Are you permitted to decide how to go about doing the work? (7 point Likert scale)
   - The role gives me considerable opportunity for independence and freedom in how I do the work.
   - The position gives me a chance to use my personal initiative and judgement in carrying out the work.

8. Does your work provide you with information about your performance aside from any "feedback" coworkers or supervisors may provide? (7 point Likert scale)
   - After completing work tasks, I can examine the results and assess how well I am doing.
   - After I finish a task, I generally know whether I performed well.

9. How satisfied are you with your occupation? (7 point Likert scale)
   - Overall, I am satisfied with my occupational position.
   - I would prefer another, more ideal occupation.
   - I am satisfied with the important aspects of my occupation.

10. How committed are you to the occupation? (7 point Likert scale)
    - I regret having entered the profession.
    - I am proud to be in the occupation.
    - Changing occupations now would be difficult for me to do.
    - Too much of my life would be disrupted if I were to change occupations.
    - I dislike being in the occupation.
    - I do not identify with the occupation.
    - It would be costly for me to change my profession now.
    - Changing professions now would require considerable personal sacrifice.
    - I am enthusiastic about the profession.

APPENDIX B. Multi-Item Measures Factor Loadings

	Constructs							
Items	TS	TI	TV	TA	TF	SAT	AC	CC
TS1	0.922	0.335	0.339	0.224	0.405	0.447	0.384	-0.013
TS2	0.849	0.294	0.155	0.197	0.329	0.328	0.305	-0.067
TI1	0.338	0.941	0.315	0.418	0.415	0.522	0.404	-0.017
TI2	0.330	0.932	0.305	0.263	0.367	0.487	0.319	0.056
TV1	0.326	0.295	0.942	0.506	0.485	0.659	0.452	0.049
TV2	0.173	0.310	0.857	0.391	0.456	0.429	0.307	0.138
TA1	0.137	0.413	0.499	0.925	0.499	0.559	0.353	0.151
TA2	0.309	0.254	0.431	0.912	0.561	0.518	0.402	-0.018
TF1	0.366	0.355	0.517	0.505	0.919	0.495	0.272	-0.031
TF2	0.408	0.418	0.452	0.559	0.934	0.543	0.358	-0.095
SAT1	0.393	0.494	0.666	0.615	0.578	0.937	0.701	0.055
SAT3	0.440	0.515	0.499	0.477	0.468	0.931	0.709	0.146
AC1	0.136	0.081	0.163	0.190	0.179	0.374	0.710	0.203
AC3	0.499	0.481	0.529	0.467	0.391	0.827	0.885	0.068
AC4	0.313	0.364	0.351	0.324	0.274	0.614	0.892	0.109
AC5	0.267	0.251	0.313	0.321	0.249	0.603	0.878	0.188
CC2	-0.091	0.065	0.051	-0.032	-0.106	0.063	0.059	0.892
CC3	0.010	0.036	0.079	0.162	-0.040	0.110	0.133	0.953
CC4	-0.008	0.009	0.099	0.135	0.000	0.022	-0.055	0.725
CC6	-0.070	0.114	0.179	-0.009	-0.013	0.032	0.168	0.649

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