Distinctive Personality Traits of Information Technology Professionals

John W. Lounsbury[1], Eric Sundstrom[1], Jacob J. Levy[1] & Lucy W. Gibson[2]

[1] University of Tennessee, Knoxville, United States

[2] Resource Associates, Inc., Knoxville, United States

Correspondence: John W. Lounsbury, Department of Psychology, 1404 Circle Drive, University of Tennessee, Knoxville, TN 37996-0900, United States. Tel: 1-865-577-6089. E-mail: jlounsbu@utk.edu

Abstract

Drawing on Holland's (1985) vocational theory, Schneider's (1987) ASA model, and the Big Five / narrow traits model of personality, the present study examined key Big Five and narrow traits that distinguish 12,695 IT professionals from 73,140 individuals in other occupations. IT professionals had significantly higher levels of agreeableness and tough-mindedness, and lower conscientiousness, emotional stability, extraversion, assertiveness, customer service orientation, optimism, and work drive. These findings reinforce the functional value and person-occupation fit of this distinctive trait profile for the work of IT professionals in an era of technological and organizational change. Implications are described for future research as well as the recruitment, selection, management and promotion of IT professionals, as well as their training, development, coaching, and mentoring.

Keywords: information technology, personality traits, Big Five, narrow-traits, person-occupation fit

1. Introduction

The present study examined personality traits which differentiate information technology (IT) professionals from other occupations. Despite persistent problems in staffing IT positions and retaining IT employees (Gaylard, Sutherland & Viedge, 2005; Jiang & Klein, 2002), and notwithstanding earlier studies indicating the importance of the job motivation and attitudes of IT workers (Bartol, 1983; Bartol & Martin, 1982), there is a dearth of empirical literature on key personological attributes of IT personnel which distinguish them from other occupations. This research lacuna was noted over three decades ago by Bartol and Martin (1982) and largely continues today. In one of the early studies in this area, Woodruff (1980) compared employees in various IT occupations (including systems analysts, programmers, and operations technicians) with engineers and accountants on twenty facets of satisfaction, including ability utilization, achievement, advancement, compensation, independence, recognition, security, and variety. While differences in satisfaction varied by facet, compared with engineers or accountants IT employees reported consistently lower satisfaction. Ferratt and Short (1988) surveyed 1008 employees in 100 insurance companies, comparing perceived job characteristics of IT employees with clerical, technical/professional, and managerial employees. They reported no significant differences between IT and the other three occupational groups, and concluded that IT personnel should be managed no differently. The U.S. Department of Labor maintains a comprehensive occupational network database (O*NET), which uses subject-matter experts to classify jobs and provide summary data for a wide, yet inclusive, range of occupations. For IT project managers, for example, O*NET (2014) lists several important personal attributes, including adaptability, autonomy, customer service, dependability, detail-mindedness, effort and achievement, persistence, stress tolerance, and teamwork. However, O*NET does not provide any empirical information which could be used to compare IT with other occupations on such attributes.

In summary, extant empirical research on key attributes of IT personnel is sparse, fragmentary, and limited. It lacks empirical information usable to examine differences between IT and other occupations.

Accordingly, the purpose of the present study was to identify key personality traits of IT professionals which differentiate them from those in other occupations. The results could be used for a variety of purposes, such as the assessment of IT job candidates and incumbents for recruitment, selection, placement, training needs identification, career planning, counseling, and ongoing management. From the organization's standpoint, pre-employment assessments can focus on these traits to optimize person-job fit and, in turn, help prevent

subsequent job dissatisfaction, absenteeism, and turnover, as well as increase the likelihood of success on the job.

We focused on personality traits because of the common construct meaning of individual traits across a broad range of situations, as well as their rich theoretical background and extensive validity base. To assess personality traits, we drew on the most widely accepted and currently used approach to assessing personality from a non-clinical perspective, the Big Five model (de Raad, 2000; McCrae, & Costa, 1997). Comprised of the personality traits of Agreeableness, Conscientiousness, Extraversion, Neuroticism (or its opposite, Emotional Stability), and Openness, the Big Five model has been replicated across a wide range of settings (McCrae & Costa, 2003), and the individual traits have been found correlated with important workplace outcomes, including job performance (Barrick & Mount, 1991; Salgado, 1997), job satisfaction (Judge, Heller, & Mount, 2002), and career satisfaction and financial success (Judge, Higgins, Thoresen & Barrick, 1999). More recently, researchers have contended that the Big Five taxonomy is too broad, and that more narrow-scope personality constructs can enhance their validity in both work and academic domains (Paunonen & Ashton, 2001). For example, Lounsbury, Loveland, Sundstrom, Gibson, Drost, and Hamrick (2003) found several narrow traits (including assertiveness, customer service orientation, optimism, and work drive) positively related to career satisfaction for individuals in a wide range of occupational fields, above and beyond the variance accounted for by the big five personality traits. In the present study we investigated the Big Five personality traits and five traits which are narrower in conceptualization than the Big Five, and have been found important in diverse work domains (Lounsbury et al., 2003): Assertiveness, Customer Service Orientation, Optimism, Tough-mindedness, and Work Drive. In view of the lack of a compelling rationale for directional hypotheses, we instead proposed and addressed a simple research question: to what extent, if any, do IT professionals differ from individuals in other occupations on these five broad and five narrow traits?

2. Method

2.1 Overview

The data for the present investigation originated in an archival, Internet source developed by a company specializing in career planning and transition services. The 12,695 individuals who described their current or most recent position as being in the profession of Information Technology were selected for inclusion. Because of confidentiality restrictions, the identities of the companies with which these individuals were affiliated were un-available. Data were originally obtained between the dates of March, 2004, and March, 2012.

2.2 Participants

Of the 85,835 participants, 77% were male. Relative frequencies by age group were: under 30, 34%; 30-39, 40%; 40-49, 24%; and 50 or older, 2%. Data on ethnicity were un-available. Participants hailed from a variety of industries, including IT services (35%); banking/financial services (12%); communications/telecommunications (11%); manufacturing (10%); consumer products (6%); retail (4%); health care (2%); petroleum (2%); printing (2%); professional services (2%); and automotive (1%).

2.3 Measures

The personality assessment used in generating the original data archive for this study is the Resource Associates' Personal Style Inventory (PSI), a work-contextualized personality measure that has been utilized in a wide range of settings in the U.S. and other nations, typically for career planning and employee selection programs (see, e.g., Lounsbury, Gibson, & Hamrick, 2004; Lounsbury, Gibson, Sundstrom et al., 2003; Lounsbury, Loveland et al., 2003; Lounsbury, Park et al., 2004; Williamson, Pemberton, & Lounsbury, 2005). Information about reliability and validity for the PSI is summarized in Lounsbury and Gibson (2014).

A brief description of each personality constructs examined in the present study is given below with the number of items in the scale and the value of Cronbach's coefficient alpha for the scale observed in the present study.

2.3.1 Agreeableness

Preference for and comfort with cooperation; propensity for working in a team; willingness to contribute to group efforts; satisfaction with teamwork (7 items; coefficient alpha=.83).

2.3.2 Assertiveness

Tendency to speak out about important matters, express views with confidence, stand by personal beliefs, seize the initiative, and bring influence to bear on others in a direct, non-aggressive, manner (8 items; coefficient alpha=.79).

2.3.3 Conscientiousness

Disposition to be dependable, reliable, and responsible while adhering to company rules and policies in a manner others can count on. (8 items; coefficient alpha=.77).

2.3.4 Customer Service Orientation

Striving to provide highly responsive, personalized, quality service to internal and external customers; putting the customer first; and trying to make the customer satisfied, even if it means going above and beyond the normal job description or policy (6 items; coefficient alpha = .70).

2.3.5 Emotional Stability

Disposition to handle stress, challenges, and pressures with composure; resilience and overall high level of adjustment. (6 items; coefficient alpha=.81).

2.3.6 Extraversion

Habit of acting sociable, expressive, outgoing, talkative, affiliative, gregarious, and warmhearted. (7 items; coefficient alpha=.82).

2.3.7 Openness

Disposition to be receptive to new ideas, change, innovation, and new learning and new learning. (8 items; coefficient alpha = .81).

2.3.8 Optimism

Having an upbeat, hopeful outlook concerning situations, people, prospects, and the future, even when confronting difficulties; tendency to minimize problems and persist in the face of setbacks (6 items; coefficient alpha=.83).

2.3.9 Tough-Mindedness

Making appraisals, ,drawing conclusions, and deciding based on logic, facts, and data rather than feelings, values and intuition; disposition to be analytical, realistic, objective, and unsentimental (7 items; coefficient alpha=.79).

2.3.10 Work Drive

Disposition to work extended hours (including overtime) in irregular schedules; investing high levels of time and energy into job and career, and being motivated to extend oneself, if necessary, to finish projects, meet deadlines, be productive, and achieve job success (7 items; coefficient alpha = .81).

Table 1. Mean Personality Trait Scores and t tests for IT Versus Other Occupations

Variable	Group	Mean	SD	t test
Openness	IT	3.73	.73	-.33
	Other Occupations	3.74	.72	
Conscientiousness	IT	3.29	.71	-9.42**
	Other Occupations	3.36	.77	
Emotional Stability	IT	3.37	.73	-7.40**
	Other Occupations	3.43	.73	
Agreeableness	IT	3.53	.76	-4.33**
	Other Occupations	3.49	.79	
Extraversion	IT	3.59	.78	-25.87**
	Other Occupations	3.80	.81	
Assertiveness	IT	3.40	.84	-17.90**
	Other Occupations	3.55	.84	
Optimism	IT	3.70	.78	-15.84**
	Other Occupations	3.82	.80	

Tough-Mindedness	IT	2.98	93	44.43**
	Other Occupations	2.63	.80	
Work Drive	IT	3.21	.79	-17.58**
	Other Occupations	3.34	.79	
Customer Service Orientation	IT	4.21	.64	2.44*
	Other Occupations	4.19	.69	

Note: For IT n =12,695; for other occupations n = 73,140.   * $p < .05$ ** $p < .01$.

3. Results

3.1 Comparison of IT Professionals with Other Occupations

Table 1 presents the means and standard deviations for IT personnel and all other occupations.

To examine the research question, we used univariate t tests and profile analysis (Tabachnick & Fidell, 2007). As can be seen in Table 1, IT personnel had significantly higher mean scores than other occupations on only two of the personality traits: Agreeableness (t (85833) = 4.33, p<.01) and Tough-Mindedness (t (85833) = 44.43, p<.01). In contrast, IT professionals had significantly lower mean scores than other occupations on seven traits, as follows: Assertiveness (t (85833) = -44.43, p<.01), Customer Service Orientation (t (85833) = -2.33, p<.05), Conscientiousness (t (85833) = -9.42, p<.01), Emotional Stability (t (85833) = -7.40, p<.01), Extraversion (t (85833) = -25.87, p<.01), Optimism (t (85833) = -15.84, p<.01), and Work Drive (t (85833) = -17.57, p<.01). The mean score of IT personnel was not significantly different from the mean for non-IT personnel on the Big Five trait, Openness (t (85833) = .32, p>.05).

3.2 Profile Analysis

To examine overall differences between IT and all other occupations on the ten traits studied here, profile analysis (PA) with MANOVA was used. PA requires that all measures use a common metric; therefore, all scores were first converted to normal curve equivalent scores with Mean=50 and SD=21.06. For the PA, we performed three tests: 1) between-groups – whether the groups' profiles differed significantly overall, across traits; 2) parallelism – whether the between-group profile differences varied significantly from trait to trait; and 3) flatness – whether the profiles had significant, within-group, trait-to-trait differences. The corresponding multivariate analysis of variance (MANOVA) using Wilk's criterion indicated a significant between-group difference across traits between IT and other occupations (F(1,85833)=826038.82, p<.01). Also, the profiles for IT and other occupations significantly different; they were not parallel (F(8,85833) = 413.30, p<.01). In addition, the profiles across traits were not flat (F(8,85833)=413.30, p<.01), reflecting mainly the trait-to-trait variability in the IT profile. These profile differences are portrayed in Fig. 1 with graphs of group means for the ten traits using normal curve equivalent scores.

4. Discussion

4.1 Overview

Overall, results of the present study indicated that the personality profile for IT professionals differed significantly from other occupations, particularly on Tough-Mindedness. Below we discuss the results on each of 9 distinguishing traits in terms of related literature on attributes of IT workers, from the perspectives of vocational fit theory (Holland, 1985), and the ASA framework (Schneider, 1987).

4.2 Tough-Mindedness

By far the largest difference between the two groups was for the narrow trait Tough-Mindedness, with IT employees scoring much higher than other occupations. This result is readily interpretable given the objectivity, logic, rational analysis, and problem-solving required by most of the job duties and tasks of their jobs, for example: purchase, implementation, and life-cycle maintenance of PCs, software, servers and LAN network connectivity equipment; installing work stations; documentation of operations and procedures; maintaining system security and guarding against breaches; providing strategic, budgeting, disaster recovery, and operational continuity planning to all offices and multiple business units; and troubleshooting complex software/hardware problems, among others. These job functions call for IT employees whose personalities enable them to remain detached, analytical, and tough-minded.

4.3 Agreeableness

One finding of the present study might come as a surprise to those unfamiliar with the range of tasks involved in the work of IT professionals – that they displayed significantly higher levels of the Big Five trait, Agreeableness than individuals in other occupations. Higher Agreeableness among IT professionals may seem surprising in view of the prevalence of IT tasks carried out by employees functioning autonomously as individual contributors. Indeed, O*NET (2014) describes Independence as being an important value for IT work. On the other hand, IT work occurs in an organizational setting in which IT staff must work closely with members of other areas to analyze, develop, implement, and monitor computer and information system technologies and applications. In that vein, O*NET (2014) also lists coordinating the work of others and developing and building teams as key IT work activities. This facet of IT work is consistent with widespread reliance on work teams by private-sector and public organizations in the last two decades (Landy & Conte, 2013), and the rising prevalence of team training (Salas, Tannenbaum, Kraiger & Smith-Jentsch, 2012). Today's IT work includes not only the solitary work of programming, but a mix of interactive tasks calling for teamwork with peers, performed in an inter-group and inter-departmental context (Schneider, 2002). As noted by ITTraining (2001, p. 42): "Training for IT professionals is not just about teaching staff how to work with the latest hardware and software. Other skills like communication and teamwork are becoming increasingly important as IT departments work across the business rolling out technology-based projects." Rather than viewing IT work as primarily independent or interdependent, a more nuanced perspective seems warranted: IT work requires dispositions suited both to independent tasks and interdependent work that requires   teamwork, with the primacy of one over the other depending upon the nature of the task and situational contingencies.

From the perspective of the ASA framework (Schneider, 1987), the higher average Agreeableness found in IT occupations could reflect selective attrition among those unable to manage the required balance between independence and interdependence in today's IT occupations. While Agreeableness has been associated with team effectiveness in many kinds of work (Stewart, 2006), it may be particularly helpful in IT organizations with peers whose personalities are significantly higher on Tough-Mindedness than in other occupational groups. Indeed relatively high Agreeableness may be critical to maintaining satisfying relationships with IT peers, where those who demonstrate person-occupation fit may demonstrate what could be called tough-minded teamwork.

4.4 Extraversion

IT personnel also had significantly lower levels of Extraversion, which is consistent with both the independent tasks required in IT work the frequent observation that IT occupations are populated predominantly by introverts, (e.g., Myers & McCaulley, 1985), and with the fact that most IT jobs involve extended solitary tasks, such as writing and editing code, performed by individuals with little interaction with other people. In their study of IT professionals the Institute for Management Excellence (2003) reported that only 25% of the general population can be considered introverted while 67% of computer professionals are introverted. They also noted that IT work is suited to introverts because of the long, quiet hours spent working alone. Most of the technical aspects of IT work require quiet concentration and attention focused on the tasks at hand with little social interaction.

4.5 Assertiveness

IT employees were also distinguished by lower levels of Assertiveness. This is understandable for two reasons. First, IT work may not often require assertiveness. Most of the typical IT tasks can be performed without the IT employee having to display assertiveness by, for example, imposing his or her will on other people, taking the lead in groups, or standing one's ground in arguments or debates. Second, as noted above, introversion – which some studies have found more strongly characteristic of IT personnel, as reflected by lower scores on Extraversion – has tended to correlate with shyness, reticence, and timidity (de Raad, 2000), the opposite of assertiveness. This is not to say that assertiveness should be discouraged among IT personnel. Some situations may call for an IT employee to demonstrate assertiveness to be most effective. For example, when complaints arise about IT system failures, hardware crashes, and service interruptions. Appropriate expression of assertiveness could also prove helpful for the IT professional requesting a raise, asking for more variety and challenge in work assignments, or discussing problems raised by argumentative users, customers, or vendors. As IT jobs increasingly involve interacting with external customers, their jobs could call for more assertiveness. Such examples may help explain the appearance of commercial assertiveness training programs which are designed specifically as "an excellent resource for those who belong to the fields of Information Technology" (Exforsys, 2014).

4.6 Optimism

One result with no immediate, obvious explanation is the lower level of Optimism for IT personnel, which raises

the question of why IT professionals might describe themselves as more pessimistic than individuals in other occupations. A possible explanation may pertain to the importance of critical thinking inherent in IT work. Indeed, the first essential skill for IT work listed by O*NET (2014) is critical thinking, which involves "Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems." Pessimism may be seen as a tendency to emphasize critical thinking and focus on potential risks and disadvantages, so it is understandable that IT personnel register as more pessimistic than other occupations. Indeed, some facets of IT work, such as developing and testing software, require vigilance for errors and sensitivity to risk, so pessimism could represent a trait not only congruent with IT work, but perhaps required for effective performance. Further, since the available, empirical evidence suggests that personality traits tend to remain relatively stable for adults (Costa & McCrae, 1997), we surmise that that IT work attracts individuals who are dispositionally less optimistic, or more pessimistic, than individuals in other occupations, at least partly because the trait is congruent with the work. This presents a dilemma for IT management in that having an over-abundance of pessimistic employees in IT departments could possibly be associated with low morale which could, in turn, lead to the "job-churning" and high turnover that pose endemic problems in the IT field (Jiang & Klein, 2002; Moore & Burke, 2002). Hoonakker, Carayon, Marian, and Schoepke (2004) noted turnover rates as high as 25% to 33% among IT personnel in *Fortune* 500 companies and the field as a whole.

From the perspective of the ASA framework (Schneider, 1987; Schneider, Goldstein, & Smith, 1995), high turnover reflects a mis-match between expectations of individuals entering IT positions and expectations of their new co-workers about how they carry out their roles in the organization. For example, a new IT employee might under-estimate the priority of cooperation and consensus expected in IT development tasks, and/or over-estimate his or her discretion and autonomy. Disagreement or even conflict could ensue, possibly prompting dissatisfaction for both a new IT employee and his or her peers, perhaps soon followed by the attrition as envisioned in the ASA framework.

4.7 Work Drive

IT personnel are differentiated from all other occupations by having lower levels of Work Drive. It is safe to say that most IT employees, who are usually on salary with few opportunities for promotion (O*NET, 2014) prefer to not have to work long hours or make personal sacrifices for their jobs. This may reflect the IT employee perceiving relatively few advancement opportunities or other incentives for hard work. It may also reflect a time-honored credo and what has become an esteemed work value of many IT employees that one should work smarter, not harder (Morton, 2014). In this vein, McKenzie (2014) notes that working harder no longer offers a competitive advantage in today's marketplace and is "a poor strategy which your competitors can trivially replicate." Rather, he advises, IT employees should work smarter, "then go home." This strategy has become so entrenched in IT culture that there are compendia of tactics for working smarter which include such maxims as: "get organized immediately and cleanup often"; "read the manual first, even if it is boring"; "refactor first, before coding"; and "think very hard about the consequences before diving in" (Morton, 2012).

4.8 Conscientiousness

A result that, at first, seems somewhat puzzling is the lower level of Conscientiousness for IT personnel compared to other occupations. A conscientious employee can be expected to be organized, orderly, methodical, detail-minded, dependable, and rule-following way – all of which are required to some degree for IT work. On the other hand, many IT functions, including programming, systems design, troubleshooting, and developing innovative applications, call for flexibility, creativity, and non-routine problem-solving, which are characteristic of low-conscientiousness individuals (LePine, Colquitt, & Erez, 2000; Lounsbury. Foster, Patel, Carmody, Gibson, & Stairs, 2012). It is often the non-routine, novel, and infrequently occurring problems which challenge IT employees and from which they derive considerable satisfaction when solved. This may help explain why so many IT job descriptions and position openings emphasize such required attributes as "demonstrated ability to be flexible and creative when presented with challenges" (https://utdirect.utexas.edu/apps/hr/jobs/ nlogon/140407019303) and "practice creative thinking and ideation to advance our business performance" (https://careers-gd-ais.icims.com/jobs/10797/nformation-system-security-officer-%28isso%29/job?mode=job&ii s=Indeed&iisn=Indeed.com). In view of the progressive and seemingly never-ending advancement of new technology, we expect to see increased demands for flexible, creative IT professionals who can think creatively, work on problems which call for divergent thinking and non-traditional problem-solving, and contribute to the innovation required for competitiveness in today's global marketplace. Thus, it is easy to imagine that IT personnel will continue to be distinguished from other occupations by their lower levels of Conscientiousness.

4.9 Emotional Stability

One of the more alarming findings of the present study is the lower level of Emotional Stability. This result is troubling for the field of IT and IT management because, based on meta-analyses and results from many studies, Emotional Stability has been found be to one of the strongest personality predictors of job, career, and life satisfaction (see, for example, Lounsbury, Loveland, Sundstrom et al., 2003; DeNeve & Cooper, 1998) as well as job turnover, withdrawal, and performance (Tett, Jackson, & Rothstein, 1991; Tett & Meyer, 1993). One explanation for this finding may relate pertain to the high level of stress associated with most IT jobs (Jepson, 2004). Savvas (2004) found that 90% of IT managers reported that their health suffers because of their work, particularly as a result of an impossible workload, though they depicted other sources of job strain, including continual demands from their managers, unrealistic expectations, and perceived job insecurity. Regardless of the basis for lower levels of emotional stability among IT personnel, it is a problem which should be addressed by IT employers and HR management. Companies may need to try and recruit more emotionally resilient, hardy employees for IT jobs and/or try to help provide more mental health resources for IT professionals; for example, via employee assistance programs, on-the job counseling, and specific training in dealing with stressors, such as time management programs, work-nonwork interventions, parental leave benefits, and vacation policies.

4.10 Customer Service Orientation

Finally, IT workers displayed significantly lower levels of Customer Service Orientation than employees in other occupations. One reason for this finding is that IT employees traditionally have had little, direct contact with external customers, even though they may have a fair amount of interaction with internal customers. In fact, IT is somewhat unique compared to most organizational units in that meeting the needs and demands of internal customers can be seen as a raison d'etre for IT departments. In the future, IT personnel may need to possess higher levels of customer service orientation given increasing demands from internal customers, such as marketing and sales departments, and pressure for more integration of IT with other organizational units (Huarng, 1998; Lee, Trauth, & Farwell, 1995). Moreover, IT is becoming increasingly utilized in new customer service activities such as personalized marketing, direct self-service sales, instant product presentation, and real-time customer intelligence (Gogan, 1998). As observed by Ray, Muhanna, and Barney (2005), for most companies, "quality customer service has emerged as a strategic imperative, one that is increasingly tied to a firm's information technology resources and capabilities" (p. 625).

4.11 Implications for Theory, Practice, and Research

Most of the present results support both Holland's (1985) vocational theory and Schneider's (1987) Attraction-Selection-Attrition (ASA) framework. Holland's theory asserts that individuals seek out and are satisfied and remain in work environments where there is a good fit with their personality (Holland, 1996; Holland, Gottfredson, & Baker, 1990). Under the ASA model, individuals gravitate toward and are selected by organizations in which both the individual and the organization see is a good fit between their personality and the work performed (Schneider, Goldstein, & Smith, 1995). For most of the trait differences found in the present study – higher levels of tough-mindedness and agreeableness among IT professionals, and lower levels of conscientiousness, assertiveness, extraversion, work drive, customer service orientation, and optimism – there is a logical correspondence, or fit, between the meaning of the construct and the nature of IT work. As noted above, each of these trait differences may have adaptive value for IT work.

The one trait finding which does not appear to be a factor leading to job attraction or initial fit among IT workers is the lower level of emotional stability. Instead, the lower level of emotional stability--which as a construct includes anxiety, worry, stress, and negative ideation—may be the consequence of IT work, rather than an antecedent of it. Future research of a longitudinal nature might be able to unravel the casual direction of the relationship between Emotional Stability and IT work –and its relatively low levels among IT workers.

The main research implications which can be drawn from our study concern our finding that IT personnel can be differentiated from other occupations by key personality traits. Future research could replicate as well as extend these findings to whether they are moderated as a function of age, gender, number of years of experience in the field, IT sub-specialty and so forth. Since personality traits are rather stable for adults (Costa & McCrae, 1994), it is more likely that IT work attracts individuals with the personality differences observed here than it is that IT work changes their personalities, with the possible exception of emotional stability, which as it is typically measured, can reflect an individual's current level of anxiety, tension, strain, worries, etc.

From a practical standpoint, the present findings could be used in career planning and development, job enrichment, and both career and personal counseling activities for IT employees. Most of these traits can be useful for both job-seekers and employers in IT recruitment, selection, and placement as well as, coaching,

mentoring, training, and ongoing management of employees. By way of example, prior to filling an IT opening, staffing personnel could target tough-minded, relatively agreeable introverts in their recruitment efforts. Measures of these traits could be included in a pre-employment test battery, and an applicant's trait levels could be confirmed via reference checking and follow-up interviews. Then, too, the profile of IT personnel which emerged in the present study could be useful for recruiters, pre-employment assessors, and those engaged in career planning who want to compare the traits of a single person against the characteristic traits identified here. In addition, a company could incorporate personality measures into the pre-employment selection process for IT positions. Also, to minimize later problems due to unrealistic expectations among applicants for IT jobs, it may be helpful to include a realistic preview of the IT work environment, expected interpersonal competencies, and the applicant's prospects for person-occupation fit in view of his or her relevant personality traits.

4.12 Limitations

Our study has several limitations. First, tenure for working in the field of IT was not assessed. Second, we did not compare potential differences and similarities between IT managers and individual contributors. Third, it is not known how well the population in the present study represents the larger population of IT professionals, though we expect that our large and diverse IT population is likely generalizable to a wide range of IT jobs with different job titles in different types of companies and business/industry sectors. Fourth, we did not assess changes over time in the personality measures, nor we did look at the predictive validity of personality traits in relation to important outcomes such as tenure, turnover, performance, and job and career satisfaction.

4.13 Conclusions

The present study found results indicative of multiple personality traits that differentiate IT from other occupations and which are readily interpretable from the perspective of person-occupation fit theory. In brief, IT professionals scored significantly higher on tough-mindedness and agreeableness, and lower on seven other personality traits, including assertiveness and optimism, consistent with IT job requirements calling for a mix of independent and interdependent tasks. The present findings warrant replication efforts as well as further explanation of how and why these results occur. Further research and explanation seem particularly needed where the current results contravene traditional assumptions about IT employees, such as them having lower, not higher (as might be expected), levels of conscientiousness.
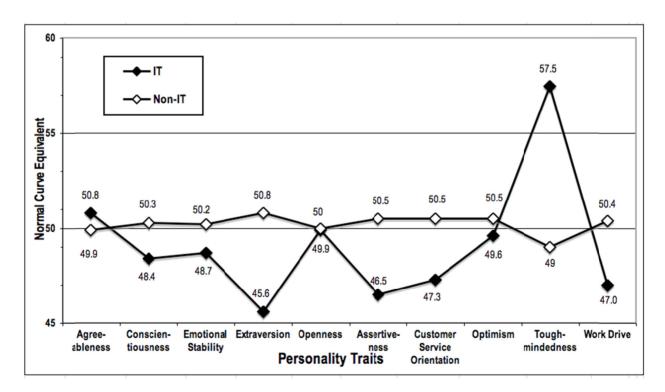

Figure 1. Normal Curve Equivalent Profile for IT Professionals versus Non-IT Occupations for 10 Traits

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