

Does Professionalism Matter in the IT Workforce? An Empirical Examination of IT Professionals

Michael Dinger
University of South Carolina Upstate
mdinger@uscupstate.edu

Lee Stepina
Florida State University
lstepina@cob.fsu.edu

Jason B Thatcher
Clemson University
jthatch@clemson.edu

Jacob Breland
University of Southern Mississippi
jacob.breland@usm.edu

Darren Treadway
SUNY-Buffalo
darrent@buffalo.edu

Abstract

This paper investigates the role of professionalism in the information technology (IT) workforce. We develop a model that describes how professionalism relates to attitudes, perceptions, and behaviors among IT professionals. Specifically, we hypothesize that dimensions of professionalism influence attitudes (including intrinsic motivation, job satisfaction, and organizational commitment), perceived job alternatives, job performance, and turnover. We test the research model with data, which includes supervisor evaluations and actual turnover data drawn from 214 IT professionals. Results show that some dimensions of professionalism demonstrate a positive relationship with intrinsic motivation, job satisfaction, and job performance. Other dimensions have no effect or positively influence awareness of job alternatives, driving turnover intention. As the IT workforce grows increasingly professional, managers may benefit from more satisfied, harder-working IT personnel at the cost of having a workforce more connected to the labor market.

Keywords: IT Professionals, IT Workers, IT Workforce, Professionalism, Performance, Turnover, Intrinsic Motivation.

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1. Introduction

Despite constrained labor markets, opportunities for skilled IT workers remain robust: the unemployment rate among IT workers has consistently stayed at roughly one-half the rate of the general U.S. workforce (BLS, 2011). Consequently, retaining and motivating top IT talent remains an enduring concern of IT managers (Agarwal & Ferratt, 2002; Luftman & Ben-Zvi, 2010). The loss of key IT personnel inflates the time and cost required to complete software development projects (Abdel-Hamid, 1989) and decreases the morale of employees left behind (Allen, Freeman, Russell, Reizenstein, & Rentz, 2001). Such an increase in retention and turnover costs siphon money from lean IT budgets (Agarwal & Ferratt, 1999; Ammirati, 2003), time from IT managers' schedules (Ives & Olson, 1981), and tacit knowledge from IT support functions (Moore & Burke, 2002).

Managing IT professionals requires an understanding of the occupational culture in the broader IT field. While the many different jobs in the IT field result in distinct work experiences, such as specific jargon and shifting work demands (Guzman, Stam, & Stanton, 2008; Guzman & Stanton, 2009), the broader IT workforce possesses shared norms around what constitutes professional behavior, who is best positioned to assess their work, and the importance of their work for enabling the activities of the broader organization (Bartol, 1983). As individuals are socialized into a professional field (Lui, Ngo, & Tsang, 2003), they form mindsets regarding standards of behavior and professional expectations about how they will be compensated for work. To understand this broader culture of IT professionals and how individuals view their work, we leverage the concept of professionalism.

Professionalism refers to the mindset with which individuals view their occupation (Hall, 1968; Smith & McKeen, 2003). Occupational professionalism is associated with membership in a specific group defined by shared knowledge and experience, such as the legal, medical, or IT fields. This conceptualization of professionalism does not refer to a generic sense of workplace professionalism such as working hard and being a "good" colleague but instead confers a sense of higher standards and beliefs towards work in the occupation and how it should be structured and conducted. Professionalism results from various sources, including the professional education or certification process, experience in the workplace, or socialization with other professionals (Lui et al., 2003).

Professionalism among IT personnel may be a particularly desirable outcome for IT managers (Smith & McKeen, 2003). Professionalism positively impacts job satisfaction (Bartol, 1983), organizational commitment (Bartol, 1979b), and job performance (Kalbers & Fogarty, 1995). In other occupations, such as auditing (Kalbers & Fogarty, 1995; Shafer, Park, & Liao, 2001), nursing (Price & Mueller, 1981), engineering (Tremblay, Wils, & Proulx, 2002), and human resources (Lui et al., 2003), professionalism influences desirable workplace behaviors and attitudes, including lower turnover rates and higher job performance. As a result, professionalism has long been considered a potential substitute for close managerial leadership because professionalism emphasizes the value of peers as a source of regulation and reinforces standards of behavior that motivate performance (Kerr & Jermier, 1978). Professionalism's potential as a substitute for close managerial oversight may be particularly important for IT workers since IT work is notably difficult to monitor and control (Kirsch, 1997; Kirsch, Sambamurthy, Ko, & Purvis, 2002).

Importantly, professionalism is a factor that IT managers may encourage or use to develop and motivate their subordinates. IT managers could encourage professionalism indirectly by serving as role models for professional behaviors and mindsets for their subordinates (Lui et al., 2003). Alternatively, they might motivate professionalism through direct methods, such as financially supporting memberships in IT organizations, enabling participation at conferences, or even individually mentoring new IT personnel. Because professionalism is amenable to change, it might serve as a useful means to generate desirable outcomes such as intrinsic motivation and performance. However, participating in a professional community might also result in undesirable outcomes, such as awareness of job alternatives and turnover behavior. Hence, in this paper, we address the following research question: how does professionalism influence IT professionals' relationship with their job and organization?

To address this question, we develop an integrative model that connects professionalism to IT workers' performance (Joseph, Boh, Ang, & Slaughter, 2012; Joseph, Kok-Yee, Koh, & Soon, 2007). Our work contributes to practice and research by extending understanding of IT professionals' behavior through the lens of professionalism (Bartol, 1983; Dinger, Thatcher, & Stepina, 2010; Dinger, Thatcher, Stepina, & Craig, 2012). Also, we tie together prior research by theoretically and empirically examining professionalism's place in a well-established nomological network used to predict IT worker behavior. We empirically test the model using a longitudinal, matched-pairs sample of 214 IT professionals that used self-reported perceptual measures to predict supervisor-rated performance and actual employee turnover. Through our theoretical integration and empirical test, we work to lay a foundation for future research that examines professionalism's role in the IT workforce.

2. Theoretical Development

Turnover research has long recognized the tension between factors contributing to satisfaction with current employment and factors facilitating movement to other jobs (March & Simon, 1958; Mobley, Griffeth, Hand, & Meglino, 1979; Mobley, Horner, & Hollingsworth, 1978). As a result, it is unsurprising that the IT workforce turnover literature converged on a core set of factors that predict IT professionals' behavior: satisfaction with the job, affective commitment to the organization, and perceived availability of alternative work (Joseph et al., 2007). This simple model broadly captures the essence of IS research that seeks to connect an IT professional's thoughts regarding their job, their organization, and the labor market with their behavior at work.

In the domain of IT research, the repeated validation of the relationships among satisfaction, affective commitment, and turnover intention (Joseph et al., 2007) has contributed to an implicit theory of IT turnover¹ (see Figure 1). The central relationships of this implicit theory suggest that job satisfaction positively influences affective organizational commitment and that both decrease the turnover intention of IT professionals. In addition, this theory has been extended to incorporate perceived job alternatives as direct positive influence on turnover intention. IS research has evaluated a in a wide variety antecedents to satisfaction, commitment, and turnover intention (Joseph et al., 2007).

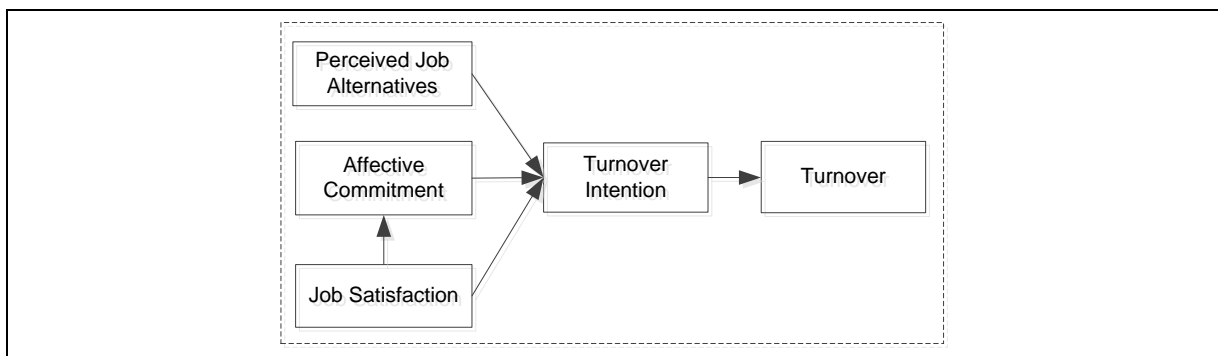


Figure 1. Implicit Theory of IT Turnover

We draw on this implicit theory of IT turnover to extend understanding of IT professionals' behavior in the workplace. First, we extend this core model of IT turnover to include actual job performance. It is crucial to understand performance in conjunction with turnover. Managers might be able to combat turnover by reducing workloads or changing incentive structures, but such changes might not positively affect the organization if they reduce IT professionals' productivity (Joseph et al., 2007). Therefore, it is important to simultaneously evaluate perspectives that have the potential to increase performance levels and mitigate turnover.

Second, we introduce professionalism as a precursor to IT professionals' workplace attitudes and behaviors. Research suggests professionalism may be useful in understanding both turnover and job

¹ We thank the senior editor for observing that our work drew on an implicit theory of the IT workforce found in the work of literature.

performance (Bartol, 1983; Dinger et al., 2010; Dinger et al., 2012; Kalbers & Fogarty, 1995). This sense of occupational professionalism broadly captures how an individual views work in their field (Hall, 1968). Research suggests that professionalism is amenable to change through levers such as socialization via training programs or mentoring in the workplace (Lui et al., 2003). Therefore, if we can establish the potentially beneficial ways in which IT professionalism impacts attitudes and behavior, IT managers may be in a position to design processes to encourage professionalism among new hires.

Third, we introduce intrinsic motivation as an intermediate linkage between professionalism and workplace outcomes. Intrinsic motivation refers to the innate sense of satisfaction IT professionals derive from the work itself (Couger, 1986; Couger & McIntyre, 1987; Couger, Zawacki, & Oppermann, 1979; Thatcher, Liu, Stepina, Goodman, & Treadway, 2006). We argue that elements of occupational professionalism may influence the level of satisfaction an IT professional receives from doing IT work and completing technical tasks. In this way, professionalism may increase feelings of intrinsic motivation, which, in turn, drives feelings of satisfaction and performance levels.

Finally, consistent with early work on professionalism (Bartol, 1979a), we include professional reward system as a mediator of professionalism's influence on attitudes, perceptions, and behaviors. Professional reward system represents the professional's perception that the organization values and rewards professional standards and behaviors (Bartol, 1979a). This construct captures the IT professional's belief that they are evaluated and valued for holding themselves to a high standard of quality, keeping current with the IT field, and being able to work without close management. Consequently, professional reward system should mediate the impact of professionalism on outcome variables. On one hand, if the employing organization does not value professional standards, the impact of professionalism on outcome attitudes and behaviors should be minimal as IT personnel perceive little value in holding to a high, professional standard. On the other hand, if the organization values professional behavior, the full effect of professionalism should be felt on the outcome variables.

Figure 2 presents our research model. In Section 2.1, we define our core constructs and their interrelationships.

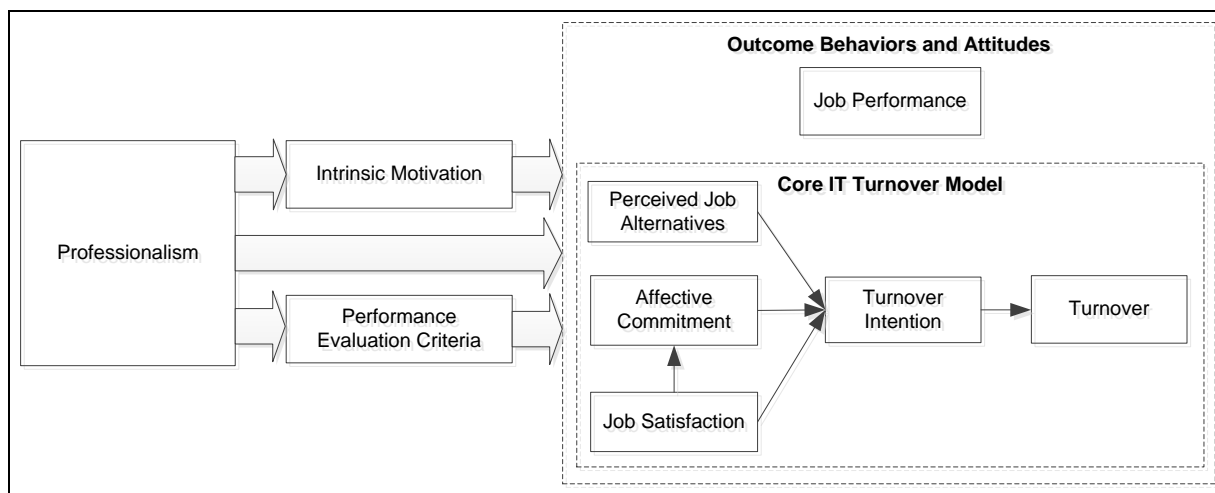


Figure 2. Extending the Implicit Theory of IT Workforce Behavior

2.1. Professionalism

Professionalism refers to how an individual views their chosen profession and field of work. It is a perceptual mindset that individuals develop and maintain that is based on their understanding of collective norms in a profession (Hall, 1968). Professionalism is manifest as a dimension set of five conceptually related elements that shape individuals' behavior in the workplace (Polites, Roberts, & Thatcher, 2012; Swales, 2003). These dimensions are belief in public service, belief in self-regulation, sense of calling to the field, professional autonomy, and professional identification.

Collectively, the dimensions of professionalism represent a mindset present in professionals. Individually, these dimensions exert independent influences on a variety of attitudes and behaviors, including job performance, job satisfaction, and their attachment to the employing organization (Bartol, 1979b; Bartol, 1983; Dinger et al., 2010; Dinger et al., 2012; Hall, 1968; Kalbers & Fogarty, 1995; Shafer, et al., 2001). In order to develop a more granular understanding of professionalism, we individually examine the dimensions to articulate the logic explaining their impact on outcome behaviors and attitudes.

Belief in public service captures the perception that the profession is necessary and beneficial to society and organizations (Hall, 1968). Professionals believe that their work fulfills an important function for organizations and society. In the information systems context, it suggests that IT workers believe that their work, such as supporting networking or enabling information sharing systems, is necessary for their employing organization to succeed (Pawłowski & Robey, 2004). Evidence from prior professionalism research suggests that belief in public service has a distinct impact on individual attitudes and experience: reducing continuance commitment among accounting professionals (Kalbers & Fogarty, 1995) and increasing perceptions of work-family conflict among IT professionals (Dinger et al., 2010). Furthermore, other studies find evidence implying that IT professionals do appreciate the importance of their work. For instance, Pawłowski and Robey (2004) detail how IT professionals are aware of the key role they play in facilitating knowledge transfer throughout their firm. Belief that their work provides an important public service should impact IT professionals' affective feelings towards the job. A rich stream of research on job design, motivation, and satisfaction theorizes that, when work is perceived to be important, it results in higher motivation, satisfaction, and better performance (Hackman & Oldham, 1976). Therefore, we argue that those who believe in the social value of their work are likely to report greater levels of satisfaction with their jobs because they are making vital contributions to their organization and society.

Organizations may also further reap benefits from the ideological beliefs of IT professionals because those who believe in the critical value of their work are likely to be invested in performing high-quality work (Elliott, 1973). Research suggests that, when workers perceive their task to be important and impact others, they perform at a higher level than those who do not (Grant, 2008). In terms of professionalism, if individuals believe that the work is important to society and their organization, then they are likely to feel motivational effects from perceiving that their work matters to others, thus driving performance. Hence, these feelings of value may give rise to intrinsic motivation, which refers to internal motivators such as satisfaction or fulfillment derived from interaction between the individual and the work context (Ambrose & Kulik, 1999).

In the IT workforce, we anticipate that a belief in public service will positively affect motivation, job satisfaction, and job performance. As such, we hypothesize:

H1a: *Belief in public service positively relates to job satisfaction.*

H1b: *Belief in public service positively relates to job performance.*

H1c: *Belief in public service positively relates to intrinsic motivation.*

Belief in self-regulation refers to the extent to which professionals believe peers are the most-qualified personnel to monitor the quality of their professional work (Hall, 1968). Because professionals believe that task performance requires specialized knowledge, only peers with similar training or skills would be best suited for evaluating the quality of their work (Snizek, 1972). Note that self-regulation in the sense of professionalism refers to an ability to understand the competence and productivity of colleagues even if the IT professional is not conducting formal performance evaluations on their colleagues. Simply, IT professionals may know and appreciate the quality work of competent, hardworking colleagues.

IT work requires a complicated set of constantly changing skills (Goles, Hawk, & Kaiser, 2008; Lee & Wingreen, 2010) and is frequently difficult for managers to understand, monitor, and control (Kirsch,

1996; Kirsch, 1997). Consequently, IT professionals may believe their peers are the best judge of their work's quality (Mason, 1990). Furthermore, IT work often involves long cycles between completed deliverables for judgment by management (e.g., software development) or engages in process or maintenance work where management tends to be alerted only by failures (e.g., networking, IT security). Additionally, some indicators of productivity easily understood by managers (e.g., lines of code, creating a running system) may be poor indicators of work quality (e.g., lack of bugs, presence of features). Therefore, the IT setting may be particularly appropriate for peer monitoring, where highly skilled IT professionals are the best equipped individuals to have the expertise and awareness to know which of their colleagues are performing well.

Belief in self-regulation suggests the IT professional perceives a work environment where IT professionals are aware, and monitor the quality, of each other's work. In such a work environment, IT professionals likely feel social pressure to live up to group standards and expectations. We argue that this feeling of social pressure engenders a form of motivation known as introjected regulation, which represents a midpoint between purely extrinsic and purely intrinsic motivation (Ryan & Deci 2000). Introjected regulation suggests that an individual feels internal pressure to meet the expectations of others either for the sake of avoiding shame or for achieving approval. In order to avoid the embarrassment of being seen as a poor performer or from a desire to gain the approval of peers, we expect belief in self-regulation to motivate IT professionals to perform at a higher level.

Research has found that belief in peer regulation positively influenced supervisor-rated job performance among accounting professionals (Kalbers & Fogarty, 1995). In the IT setting, we expect to find a similar effect and argue that belief in peer regulation may influence performance as the result of motivation to meet social expectations. As such, we hypothesize:

H2: Belief in self-regulation positively relates to job performance.

Sense of calling to the profession refers to the extent to which the professional feels dedicated to the profession and would work in the profession even if there were fewer extrinsic rewards (Hall, 1968)². Feeling called to work in a profession provides a sense of confidence and certainty to individuals (Duffy & Sedlacek, 2007). Furthermore, individuals who feel called to a profession tend to exhibit indicators of satisfaction and well-being (Duffy, Dik, & Steger, 2011). This research indicates that there is value in feeling a sense of calling but, in order to adapt this concept to the IT workforce, we explore why IT professionals feel called to the field.

Evidence suggests that some IT professionals do feel a strong dedication to their field because, across organizations, anecdotes abound of IT professionals in niches such as programming or information security who find pride in performing important IT work and value being labeled a "technology geek" (Moore & Love, 2011). Furthermore, research on students might imply that individuals feel a "calling" to the IT field before entering the workforce. Papastergiou (2008) shows that high school students formed opinions about IT careers based on their perceptions of the type of work being done in the IT field. Thatcher, Dinger, and George (2012) found that indicators of an attraction to the field, such as meaningfulness, personal growth, and challenge, differed among undergraduate students with an interest in more technical IT jobs and an interest in IT consulting jobs. Together, these studies suggest that high school and college students form impressions of the IT field and may feel "called to the field" based on the type of work they expect to perform. As a result, we argue that IT professionals feel an IT-specific calling because they believe that IT work is meaningful and interesting.

Although IT professionals may feel called to the IT field for different reasons, we expect the sense of calling to have a similar effect on IT professionals as it does in other fields. Research in related fields

² In recent years, definitions of sense of calling have appeared to highlight a higher order calling and an emphasis on pro-social behavior. For example, Dik and Duffy (2009) state that a sense of calling includes a transcendental summons to the field, a pursuit of purpose and meaningfulness, and an emphasis on service to others. However, given the nature of IT work, we believe that defining a sense of calling to the IT field through a transcendental and pro-socially oriented lens is a poor fit with the context. To stay consistent with prior professionalism research and fit with the IT context, we focus on the conceptualization that Hall (1968) initially offered.

suggests that a sense of calling influences motivation, satisfaction, and performance. Duffy and Sedlacek (2007) suggest that, when professionals feel little calling to a job, they tend to be confused and uncomfortable in their career and tend to be unsatisfied and uncommitted to their work (Duffy et al., 2011). By contrast, when employees feel a calling, they are more likely to demonstrate a willingness to “exert the effort needed to succeed and carry out the calling” (Hall & Chandler, 2005, p. 165). As a result, we suspect that IT professionals will be more likely to express greater motivation, demonstrate mastery over professional skills, and exert more effort to actualize their sense of calling and perform at higher levels in the workplace (Hall & Chandler, 2005; King, 2004; Quigly & Tymon, 2006). As such, we hypothesize:

H3a: *Sense of calling to the profession positively relates to intrinsic motivation.*

H3b: *Sense of calling to the profession positively relates to job satisfaction.*

H3c: *Sense of calling to the profession positively relates to job performance.*

Professional autonomy refers to whether workers feel that they define and control the manner in which tasks are executed (Hall, 1968). Because professional work requires specialized knowledge, professionals believe that they are the only ones qualified to decide how their work should proceed. Recent research has underscored the importance of autonomy and related constructs such as professional efficacy for predicting the satisfaction and performance of IT professionals in different contexts (Ply, Moore, Williams, & Thatcher, 2012).

Autonomy is commonly studied as an element of job design (Hackman & Oldham, 1976). Job design autonomy refers to decision making freedom that is inherent in the structure of a specific job (Hackman & Oldham, 1976). In this way, any employee placed in a high autonomy job would experience autonomy regardless of qualifications or experience. In such a situation, the autonomy experienced by the IT worker would result from the job design, not from their credentials. Professional autonomy similarly addresses autonomy as decision making freedom, but this concept implies that the autonomy is derived from a different source: the professional's qualifications and standing as a member of the profession. In this situation, a trained professional receives more autonomy because they are qualified to make decisions on their own.

Although professional autonomy and job design autonomy have distinct sources, we believe professional autonomy will result in similar attitudinal and behavioral outcomes. Research on IT workers consistently links autonomy with positive work attitudes, such as intrinsic motivation (Thatcher et al., 2006) and job satisfaction (Bartol, 1983; Thatcher, Stepina, & Boyle, 2002). Furthermore, because workers can structure their work in a manner that fits their preferences, we anticipate that autonomy will enable IT professionals to perform at higher levels. Prior research suggests that autonomy is a key factor contributing to job performance (Dodd & Ganster, 1996; Morgeson, Delaney-Klinger, & Hemingway, 2005). As such, we hypothesize:

H4a: *Professional autonomy positively relates to intrinsic motivation.*

H4b: *Professional autonomy positively relates to job satisfaction.*

H4c: *Professional autonomy positively relates to job performance.*

Theory and research on human behavior suggests that individuals perceive themselves as part of different social groups (Tajfel & Turner, 1985). Professionals may identify with different groups, including their work group, organization, and profession. **Identification with professional organizations** (IPO) refers to the extent to which an individual identifies with the profession and uses peers and professional groups as a source of beliefs and opinions (Hall, 1968). IT professionals with strong identification with organizations actively think of themselves as an IT professional and think of the IT field and their IT colleagues as “we” in a collective sense. Professionals demonstrate such identification by participating in the field, through reading professional journals, attending meetings,

and engaging with profession associations. Where once IT professionals may have labored in isolation, now, in practice, conferences draw tens of thousands of skilled workers. When attending conferences such as Dreamforce, IT professionals exchange technical and social knowledge of how to build stronger IT-enabled organizations (Taber, 2012).

Although participating in professional associations may also enable professionals to become better prepared to perform work-related functions, we hypothesize that it will not relate to intrinsic motivation, job satisfaction, or performance. Because IPO directs attention to the broader context of the profession and means to realize competence in it, we propose that it will not directly relate to drivers of satisfaction or commitment to the present job. However, because IPO should result in felt social pressure on the part of the professional to maintain and advance skills, we do not believe it should diminish IT professionals' motivation, job satisfaction, or task performance either. As such, we hypothesize:

H5a: *Identification with professional organizations does not relate to intrinsic motivation.*

H5b: *Identification with professional organizations does not relate to job satisfaction.*

H5c: *Identification with professional organizations does not relate to affective commitment.*

H5d: *Identification with professional organizations does not relate to job performance.*

However, because IPO is outward looking, it may result in IT professionals having superior awareness and understanding of the labor market. First, IT professionals with strong connections to professional organizations may be aware of more job alternatives. As professionals participate in professional organizations to a greater extent, they form weak ties with a greater number of employed IT professionals with similar skill sets and interests in other organizations. By forming professional ties with peers who are likely of similar status, an IT professional is likely to acquire information about desirable external job opportunities (Wegender, 1991). Additionally, experienced and connected IT professionals are also likely to have a more accurate understanding of the types of jobs available and their suitability for various roles. Through interaction with colleagues across different firms and through professional organizations, these IT professionals should gain a stronger understanding of the various roles IT personnel play in organizations and their ability to move between various jobs through different organizations. As such, we hypothesize:

H5e: *Identification with professional organizations positively influences perceptions of job alternatives.*

2.2. Professional Reward System

Professional reward system refers to the professional's perception that the organization emphasizes professional behavior, such as maintaining high-quality work and staying current in the field, when conducting performance evaluations (Bartol, 1983). The professional reward system addresses the extent to which IT professionals are evaluated for acting in an independent, qualified manner. As professionals believe that they are valued for keeping to professional standards, they are more likely to be satisfied with their work and are more likely to be committed to the organization (Bartol, 1983). Consistent with Bartol (1983), we suggest that professional reward system fully mediates the connection between professionalism and affective outcomes. When IT professionals perceive that managers do not value professional standards and behaviors, the impact of professionalism on attitudes and outcomes should be mitigated. Finally, we suggest that IT professionals will be less inclined to quit when they believe that their professional behaviors are understood and appreciated by their managers.

Furthermore, this level of fit between the personal values of the professional and the organizations performance evaluation system may also lead to a higher level of performance. Because the evaluations emphasize the value of professional behavior, they may lead to extrinsic rewards.

Therefore, as professionals perceive that the organization evaluates their behavior accurately, they may demonstrate higher levels of job performance. As such, we hypothesize:

H6a: *Professional reward system mediates the impact of professionalism on job satisfaction.*

H6b: *Professional reward system mediates the impact of professionalism on affective commitment.*

H6c: *Professional reward system mediates the impact of professionalism on turnover.*

H6d: *Professional reward system mediates the impact of professionalism on performance.*

2.3. Perceived Job Alternatives

Perceived job alternatives represent the IT professional's belief that there are other positions readily available in the external job market (Thatcher et al., 2002). As the professional perceives a poor labor market, they become more committed to keeping their existing position, which is exhibited in greater levels of organizational commitment, but a strong market may loosen ties to their current firm (Thatcher et al., 2002). Also, perceptions of a strong labor market regularly drive propensity to turnover (Joseph et al., 2007). As such, we hypothesize:

H7a: *Perceived job alternatives negatively relates to affective commitment.*

H7b: *Perceived job alternatives positively relates to turnover intention.*

2.3.1. Intrinsic Motivation

Intrinsic motivation concerns the satisfaction or fulfillment that the professional receives from performing work well (Ambrose & Kulik, 1999; Hackman & Oldham, 1976). Researchers have investigated intrinsic motivation in IS professionals from various perspectives, including the impact of job design (Thatcher et al., 2006), culture (Couger, 1986), managerial level (Couger et al., 1979), and job type (Couger & McIntyre, 1987). We expect that employees who are intrinsically satisfied by their work will be more apt to exert extra effort on behalf of their employing organization and perform at a higher level (Mowday, Porter, & Steers, 1982). Similarly, we expect that individuals who are intrinsically motivated will experience a greater sense of satisfaction with their work.

H8a: *Intrinsic motivation positively influences job satisfaction.*

H8b: *Intrinsic motivation positively influences affective commitment.*

H8c: *Intrinsic motivation positively influences job performance.*

2.3.2. Job Satisfaction

Job satisfaction refers to "the emotional reactions of individuals to their jobs and their job experiences" (Igbaria & Cidambaram, 1997). A substantial body of literature examines the relationships between job satisfaction, organizational commitment, and turnover intention. Although theory suggests that job satisfaction may have direct effects on organizational commitment and turnover intention (Mobley et al., 1979), substantial disagreement exists over the pattern of relationships between job satisfaction, organizational commitment, and turnover intention (Thatcher et al., 2002; Williams & Hazer, 1986). While we acknowledge this disagreement, IS research most frequently models job satisfaction as an antecedent to affective organizational commitment and turnover intention (Igbaria & Greenhaus, 1992; Joseph et al., 2007). As a result, we propose that, as IT workers express greater job satisfaction, they will report more affective organizational commitment and less turnover intention. As such, we hypothesize:

H9a: *Job satisfaction positively relates to affective commitment.*

H9b: *Job satisfaction negatively relates to turnover intention.*

2.3.3. Affective Commitment

Affective commitment measures the strength of an individual's identification or involvement with an organization (Mowday et al., 1982). IS research has consistently found that affective commitment leads to lower levels of turnover intention (e.g., Igbaria & Greenhaus, 1992; Thatcher et al., 2002). Although multiple concepts of organizational commitment exist, including normative commitment and continuance commitment, affective commitment is the only one clearly established in the nomological network regarding IT professional behavior (Joseph et al., 2007). Furthermore, independent of the IS field, researchers have consistently identified affective commitment as the strongest and most useful predictor of individual outcomes as compared to normative and continuance commitment (Meyer, Paunonen, Gellatly, Goffin, & Jackson, 1989; Meyer, Stanley, Herscovitch, & Topolnysky, 2002). Therefore, in the interest of parsimony and in order to focus on the unique contribution of professionalism to the nomological network, we only include affective commitment in the research model. As such, we hypothesize:

H10: *Affective commitment negatively relates to turnover intention.*

2.3.4. Turnover and Turnover Intention

Although actual turnover is often a strong positive correlate of turnover intention (Thatcher et al., 2006), relatively few studies are able to test the link between IT worker turnover intention and actual turnover (Joseph et al., 2007). As a result, we include turnover intention as a direct behavioral antecedent predicting actual IT worker turnover. As such, we hypothesize:

H11: *Turnover intention positively relates to turnover.*

We summarize all hypotheses in Table 1.

Table 1. Summary of Hypotheses

H1a: Belief in public service positively relates to job satisfaction.
H1b: Belief in public service positively relates to job performance.
H1c: Belief in public service positively relates to intrinsic motivation.
H2: Belief in self-regulation positively relates to job performance.
H3a: Sense of calling to the field positively relates to intrinsic motivation.
H3b: Sense of calling to the field positively relates to job satisfaction.
H3c: Sense of calling to the field positively relates to job performance.
H4a: Professional autonomy positively relates to intrinsic motivation.
H4b: Professional autonomy positively relates to job satisfaction.
H4c: Professional autonomy positively relates to job performance.
H5a: Identification with professional organizations does not relate to intrinsic motivation.
H5b: Identification with professional organizations does not relate to job satisfaction.
H5c: Identification with professional organizations does not relate to affective commitment.
H5d: Identification with professional organizations does not relate to job performance.
H5e: Identification with professional organizations positively influences perceptions of job alternatives.
H6a: Professional reward system mediates the impact of professionalism on job satisfaction.
H6b: Professional reward system mediates the impact of professionalism on affective commitment.
H6c: Professional reward system mediates the impact of professionalism on turnover.
H6d: Professional reward system mediates the impact of professionalism on performance.

Table 1. Summary of Hypotheses (cont.)

H7a: Perceived job alternatives negatively relates to affective commitment.
H7b: Perceived job alternatives positively relates to turnover intention.
H8a: Intrinsic motivation positively influences job satisfaction.
H8b: Intrinsic motivation positively influences affective commitment.
H8c: Intrinsic motivation positively influences job performance.
H9: Job satisfaction positively relates to affective commitment.
H9b: Job satisfaction negatively relates to turnover intention.
H10: Affective commitment negatively relates to turnover intention.
H11: Turnover intention positively relates to turnover.

3. Research Method

To evaluate our research model, we completed a longitudinal study of IT professionals working for public agencies in the Southeast United States.

3.1. Survey Data

We gathered data from IT professionals working in the Southern United States in twenty-three different government agencies. From these agencies, human resource departments provided lists of IT professionals to the research team to select a sample. We engaged in a theoretical sampling approach and selected highly skilled IT workers who were working in positions that were classified as professional or managerial. We tried to select IT professionals who were experienced and had specialized IT expertise because these IT professionals could reasonably be expected to indicate feelings of professionalism as opposed to, for example, an entry-level data entry clerk. We contacted potential respondents by phone to invite their participation. Agencies provided respondents with time to complete the surveys during regular work hours. Of 300 possible participants, 214 provided usable responses. Since there was agency support for this project, respondents were given paid time off of work to complete the survey. Participants were released from work obligations to participate in the project in a structured manner, and so it was not meaningful to analyze for non-response bias via traditional methods, such as wave analysis (Armstrong & Overton, 1977), because the respondents did not voluntarily participate early or late in the process. However, analysis of available archival data (e.g., tenure), suggest no meaningful differences between respondents and non-respondents.

3.2. Supervisor Evaluations

Job performance refers to the extent to which a professional fulfills job expectations. Performance can be assessed in many different ways. In some IS research, performance is assessed through self-reported measures. Often, dyadic data is unavailable and self-report measures are leveraged (Kalbers & Fogarty, 1995; Wade & Parent, 2001). For example, a study of webmaster performance partly measured job performance through self-assessment (Wade & Parent, 2001). However, a stronger research design is to match individuals with objective evaluations from peers or supervisors (Ang & Slaughter, 2001). By disentangling IT professionals' self-reported beliefs about the job from assessments of their job performance, researchers may more effectively evaluate the implications of belief about their jobs and their relationship with their employing organization for their behavior in the workplace. Consequently, we relied on supervisor evaluations to evaluate IT professionals' performance.

Due to agency support, we were able to match respondents' annual supervisor evaluations of work performance with their completed surveys. Evaluations occurred six months after the surveys gathering perceptual data were completed. The human resource departments provided summary supervisor evaluations of each respondent along four dimensions used to assess performance: job knowledge, attendance/reliability, quantity of work completed, and an overall performance rating. Supervisors rated IT professionals on scales from 100 (low) to 500 (high) on each of these dimensions.

There were advantages of collecting performance data temporally removed from the survey data. The time lapse should contribute to diminishing any potential biases on the part of the performance evaluator or the respondent. If performance evaluations were timed to coincide with the individual surveys, the evaluator may have felt an external bias unduly pressuring their evaluations to be either too lenient or too harsh. Any such bias would undermine the validity of the performance evaluations. Furthermore, if the respondents were aware that performance evaluations were being conducted in association with the surveys, they may have felt suspicion regarding the true nature of these surveys (i.e., that the surveys were part of the evaluation process). Any such bias would undermine the validity of the survey responses. We avoided any such threats to validity by simply collecting supervisor evaluations during their regularly scheduled time.

3.3. Turnover

Prior research suggests a wide variety in terms of time intervals for collecting turnover data that ranges from a few months to over 8 years, but that the average time interval for studies of civilian workers was 13.1 months (Carsten & Spector, 1987, p. 377,). We set a slightly more conservative target of 12 months in which to account for voluntary turnover. Therefore, one year after initial survey completion, we collected archival data from state agencies regarding participants who voluntarily quit (e.g., left the organization). Out of 214 study participants, 34 voluntarily quit.

While the specific job titles are too numerous to comprehensively list, respondents were in managerial positions, such as database manager and project manager. Furthermore, as evidenced by the average age (37) and average years in position (7.5), the respondents were generally experienced and had time to forge valid opinions about their profession. Sample characteristics appear in the following table:

Table 2. Sample Characteristics	
Gender³	
Male	146
Female	68
Total	214
Education	
High school or less	7%
Some technical school	14%
Technical school	11%
Some college	17%
College	29%
Graduate degree	20%
Not reported	2%
Average age	37
Average years in position	7.5

3.4. Measures

We measured performance with the assessment tools already established by the agencies. We measured all other constructs with well-established scales used in organizational behavior and MIS literature. Construct means and standard deviations can be found in Table 3. Item measures appear in Appendix A.

Notably, we leverage the motivating potential score (MPS) as a control on outcome variables. Hackman

³ These numbers for gender were originally incorrectly published. This version of the paper has these numbers corrected.

and Oldham (1976) state that the MPS is intended to capture the influence of three experienced psychological states (meaningfulness to the work, responsibility for the work, and knowledge of the results) as a result of job design. The motivating potential score is calculated as follows:

$$\text{MPS} = ((\text{Skill Variety} + \text{Task Identity} + \text{Task Significance})/3) * \text{Autonomy} * \text{Feedback}$$

Note that skill variety, task identity, and task significance are averaged to represent the experienced meaningfulness of the work. The multiplicative effect in the index suggests that, if there is little meaningfulness to the work, little responsibility for the work, or little knowledge of the results, that the motivating potential score will be particularly low. All three elements must be present in order for a job to be motivating. Hackman and Oldham (1976) note that the MPS is a significant correlate of outcomes such as internal motivation and general satisfaction.

Several reasons exist to leverage the MPS index as opposed to an implementation of the five individual dimensions. Some meta-analysis results suggest that the MPS is a better predictor of work outcomes, such as job satisfaction, growth satisfaction, internal motivation, and performance, than are the individual job dimensions (Fried & Ferris, 1987). Due to this finding, the MPS has been used in research specifically for its power as a predictor of outcome variables (Tepper, Shafer, Meredith, & Marsh, 1996). As an index for measuring motivational potential, the MPS has been used to compare individual motivations in a variety of IS contexts: across levels of management (Couger et al., 1979), across cultures (Couger, 1986), and across specific IT fields (Couger et al., 1987). The MPS offers a clean approach for controlling the impact of job characteristics on individual outcomes. Thus, we implement the motivating potential score as an index of job characteristics to control their effect on job satisfaction and organizational commitment.

Our measures captured demonstrated reasonable variance in the sample. On average, construct means and standard deviations captured the midpoint of the Likert type scales (e.g., 2.5 for measures with a range from 1 to 5 and 3.5 for measures with a range from 1 to 7). With that said, note that our respondents were evaluated as being higher than average performers in the workplace. Given our theoretical sampling approach, with a focus on inviting highly skilled IT workers who held positions that were classified as professional or managerial, this relatively high performance rating was not surprising. Given the relatively large standard deviation, we were comfortable that the evaluations captured reasonable variance in IT professionals' performance (e.g., our dataset included high- and low-performing IT professionals).

Table 3. Measure Means and Standard Deviations

Construct	Mean	St. dev.	Range
Professionalism			
Public service	2.71	.70	1 to 5
Self-regulation	2.19	.57	1 to 5
Sense of calling	2.95	.63	1 to 5
Professional autonomy	2.98	.62	1 to 5
Identification with professional organizations	2.87	.62	1 to 5
Professional reward system	2.09	.61	1 to 5
Perceived job alternatives	3.77	.66	1 to 7
Intrinsic motivation	5.87	.77	1 to 10
Motivating potential score	3.42	.81	N/A
Job satisfaction	5.37	1.05	1 to 10
Affective commitment	4.38	.98	1 to 7
Turnover intention	2.24	1.11	1 to 5
Performance	413	73.26	100 to 500

3.5. Preliminary Analysis

We examined histograms and scatter-plots for non-normal distributions and outliers. The histograms and scatter-plots indicated non-normal distributions in the data (Tabachnick & Fidell, 1996). As a result, we used techniques robust to non-normal distributions to test the model.

3.6. Data Analysis

To analyze the measurement model, we used partial least squares (PLS). We selected PLS due to the evidence of non-normality in the data, our desire to establish predictive validity, and our interest in precise estimates of the path coefficients (Ringle, Sarstedt, & Straub, 2012). Because PLS is robust to sample size and offers precise estimates (Cassel, Hackl, & Westlund, 1999; Chin, 1998), it was well suited for this application. The model was estimated using SmartPLS 2.0 using bootstrapping with 200 resamples of the data (Ringle, Wende, & Alexander, 2005). First, we analyzed the measurement model to validate the measures used in this study. Second, we analyzed the structural model to test hypothesized relationships.

3.7. Measurement Model

To assess reliability and validity in PLS, we used internal composite reliability (ICR) and average variance extracted (AVE) (Chin, 1998). Internal composite reliability is interpreted like Cronbach's alpha, and .70 is considered sufficiently reliable for research. The AVE is used to indicate convergent validity, and it measures the variance captured by the indicators relative to measurement error. To support validity, the AVE should be greater than .50 (Chin, 1998). Values reported in Table 4 demonstrate adequate ICRs and AVEs for the latent constructs.

To evaluate discriminant validity, the square root of the AVE is compared with correlations among the latent variables (Chin, 1998). There is discriminant validity when the square root of a construct's AVE is greater than its correlation with any other construct. The correlation matrix demonstrates discriminant validity (see Table 4).

Table 4. Correlation of Constructs, Average Variance Extracted, and Internal Composite Reliability

	1. PS	2. SR	3. SC	4. PA	5. IPO	6. PRS	7. PJA	8. IM	9. MPS	10. JS	11. AC	12. TI	13. P	14. T
1. Public service (PS)	—													
2. Self-regulation (SR)	-0.03	—												
3. Sense of calling (SC)	0.28	0.19	—											
4. Professional autonomy (PA)	0.03	0.23	0.30	—										
5. Identification with professional organizations (IPO)	0.28	0.05	0.31	0.04	—									
6. Professional reward system (PRS)	0.04	0.30	0.11	-0.31	-0.08	—								
7. Perceived job alternatives (PJA)	0.04	0.11	0.34	0.02	0.27	0.02	0.74							
8. Intrinsic motivation (IM)	0.11	0.27	0.19	0.31	0.08	0.30	0.04	0.78						
9. Mot. potential score (MPS)	0.06	0.25	0.28	0.48	0.05	0.31	0.07	0.32	—					
10. Job satisfaction (JS)	0.14	0.18	0.39	0.41	0.10	0.28	-0.06	0.46	0.38	0.76				
11. Affective commitment (AC)	0.17	0.24	0.13	0.33	0.17	0.32	-0.10	0.40	0.27	0.61	0.84			
12. Turnover intention (TI)	-0.04	0.10	-0.03	-0.25	0.03	0.18	0.35	-0.19	-0.30	-0.59	-0.45	0.86		
13. Performance (P)	-0.01	0.08	-0.01	0.27	-0.02	0.15	0.04	0.25	0.24	0.14	0.18	-0.09	—	
14. Turnover (T)	-0.01	0.05	0.00	0.00	-0.03	-0.04	-0.03	-0.12	0.03	-0.13	-0.16	0.07	-0.07	—
ICR	—	—	—	—	—	—	0.78	0.82	—	0.80	0.87	0.92	—	—

^aDiagonal elements of the correlation of constructs matrix are the square root of the average variance extracted.

The measures of professionalism's dimensions, professional reward system, and performance are formative. As a result, it is inappropriate to report or interpret AVE or reliability. To evaluate convergent validity for these factors, we evaluate the significance of the outer model weights (see Table 5). The majority of indicators load significantly onto their specified construct, supporting convergent validity. While some researchers suggest that non-significant formative indicators should be dropped (Diamantopoulos & Winklhofer, 2001), we contend that these indicators still contribute to defining the constructs and that dropping indicators would change the content validity of each construct (Petter, Straub, & Rai, 2007; Roberts & Thatcher, 2009).

Additionally, because of our interest in realizing a more granular understanding of professionalism's implications, we examined the direct effects of each dimension. While this approach is not consistent with prior research that has modeled professionalism as single, multidimensional factor (Bartol, 1983; Dinger et al., 2012), our focus is consistent with recent prescriptions found in developing IS literature on multi-dimensional constructs. Specifically, Polites et al. (2012) suggest that, when interested in realizing a deeper understanding of a higher-order constructs implications, researchers may choose to examine the direct effects of theoretically related, yet distinct, dimensions. Hence, given our interest in expanding on prior work and focusing specifically on the unique outcomes of professionalism, we chose to hypothesize and analyze the effect of each individual dimension of professionalism. We believe this approach will offer greater granularity in understanding the impact of professionalism on the attitudes and behaviors of IT professionals and, thus, offer more significant contributions to research and practice.

Table 5. Formative Factor Outer Model Weights

Construct	Item	t-statistic
Public service	PS1	2.20*
	PS2	2.09*
	PS3	2.53*
	PS4	1.81
Self-regulation	SR1	5.30*
	SR2	3.74*
	SR3	3.75*
	SR4	1.99*
Sense of calling	SC1	3.46*
	SC2	11.2*
	SC3	4.28*
	SC4	0.64
Professional autonomy	PA1	4.18*
	PA2	26.3*
	PA3	2.19*
	PA4	2.66*
Identification with professional organizations	PI1	2.99*
	PI2	0.97
	PI3	2.09*
	PI4	1.36
Professional reward system	PRS1	3.15*
	PRS2	4.99*
	PRS3	5.44*
	PRS4	1.52
	PRS5	6.04*
Performance	P1	3.99*
	P2	3.20*
	P3	2.85*
	P4	1.97*

* = significant at $p < .05$

Motivating potential score is an index calculated from long-established job characteristics measures, and turnover is a binary measure indicating whether or not voluntary quitting occurred. As a result, we did not calculate ICR or AVE for either of these measures.

To further evaluate validity, we analyzed indicator loadings and cross loadings (Chin, 1998). Items should load much higher on their specified factor than on any other factor. High factor loadings support convergent validity, and low cross loadings support discriminant validity (see Table 6). The confirmatory factor analysis results (CFA) support discriminant and convergent validity.

Note that several of our items loaded at relatively low levels on constructs of interest. When we dropped the items from the analysis, our results were substantially unchanged. Consequently, to preserve the content validity of the measures and be consistent with prior work, we retained the items with low loadings in our measurement and structural models. Also, note that affective commitment,

job satisfaction, and turnover intention cross-loaded at relatively high levels. While our loadings are indicative of convergent and discriminant validity, their high cross-loadings are consistent with prior research (see Joseph et al., 2007; Thatcher et al., 2002). These cross-loadings may be explained by the close conceptual and theoretical similarity between affective commitment and job satisfaction (Mathieu & Zajac, 1990).

Table 6. Item Loadings and Cross-Loadings

	1.PS	2.SR	3.SC	4.PA	5.PI	6.PRS	7.PJA	8.IM	9.MPS	10.JS	11.AC	12.TI	13.P	14.T
PS1	0.65													
PS2	0.62													
PS3	0.85													
PS4	0.66													
SR1		0.90												
SR2		0.67												
SR3		0.66												
SR4		0.49												
SC1			0.64											
SC2			0.98											
SC3			0.75											
SC4			0.13											
PA1				0.64										
PA2				0.99					0.46	0.40				
PA3				0.38										
PA4				0.33										
IPO1					0.85									
IPO2					0.41									
IPO3					0.72									
IPO4					0.42									
PRS1						0.59								
PRS2						0.77								
PRS3						0.78								
PRS4						0.42								
PRS5						0.81								
PJA1							0.78							
PJA2							0.69							
PJA3							0.75							
IM1								0.86						
IM2								0.90		0.52	0.43			
IM3								0.54						
MPS				0.48					1.00					
JS1				0.40				0.49		0.95	0.62	-0.47		
JS2										0.75		-0.65		
AC1										0.48	0.83	-0.47		

Table 6. Item Loadings and Cross-Loadings (cont.)

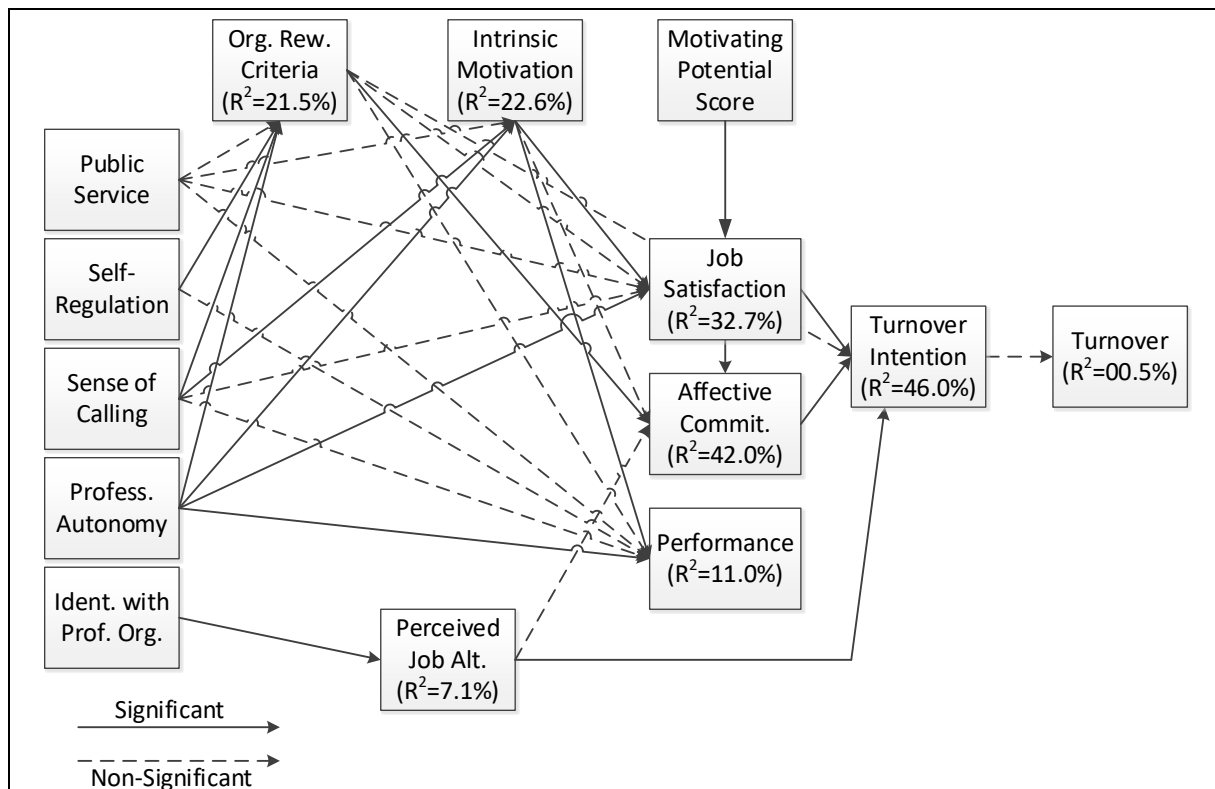
AC2								0.42		0.47	0.82			
AC3										0.57	0.86			
TI1										-0.54	-0.44	0.88		
TI2										-0.46		0.85		
P1													0.89	
P2													0.76	
P3													0.75	
P4													0.58	
T														1.00

All item loadings < |.40| have been suppressed.

Key: PS (public service), SR (self-regulation), SC (sense of calling), PA (professional autonomy), IPO (identification with professional organizations), PRS (professional reward system), PJA (perceived job alternatives), IM (intrinsic motivation), MPS (motivating potential score), JS (job satisfaction), AC (affective commitment), TI (turnover intention), P (performance), T (turnover)

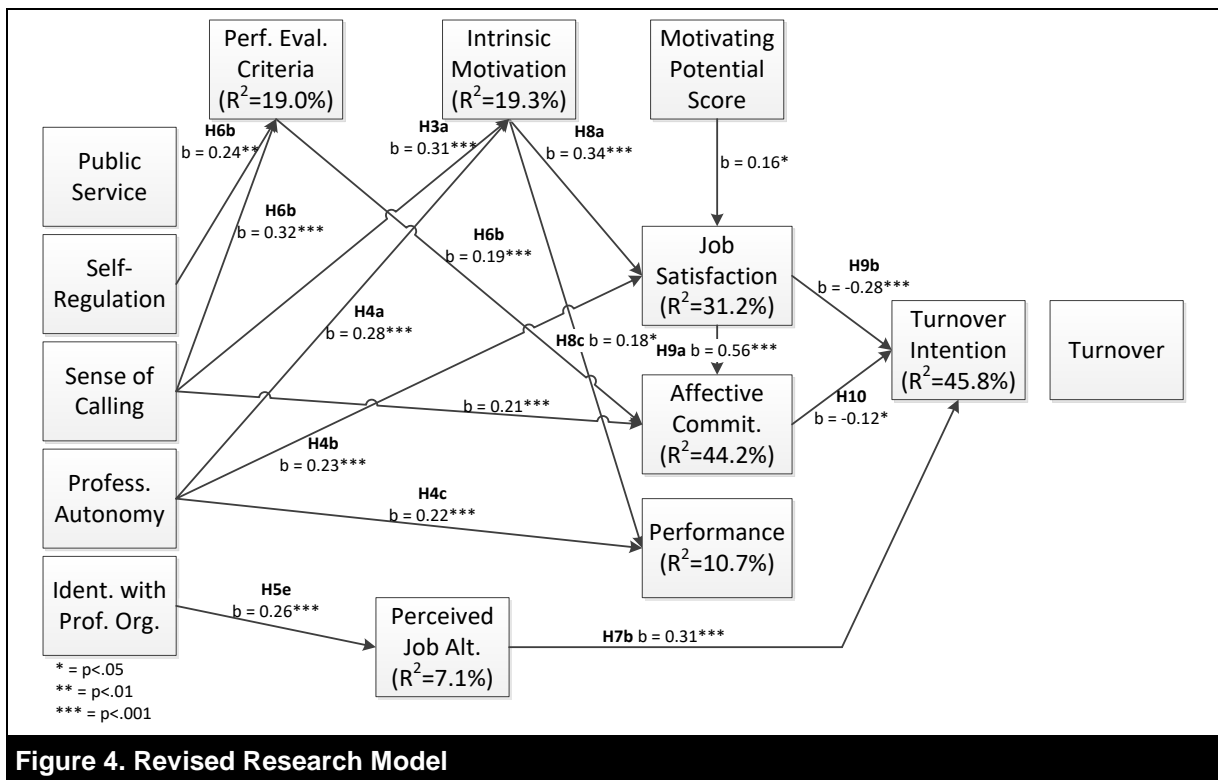
3.8. Structural Model

Results provided support for only a portion of the hypotheses (see Figure 2). The model explains a large amount of variance in job satisfaction ($R^2 = 32.7\%$), affective commitment ($R^2 = 42.0\%$), and turnover intention ($R^2 = 46.0\%$). The model also explains a moderate percent of variance in professional reward system ($R^2 = 21.5\%$) and intrinsic motivation ($R^2 = 22.6\%$). There was a smaller percentage of variance explained in perceived job alternatives ($R^2 = 7.1\%$) and job performance ($R^2 = 11.0\%$). Surprisingly, there was very little explained variance in actual turnover ($R^2 = 00.5\%$).

**Figure 3. Research Model Results**

After identifying significant main effects, we conducted tests for mediation using Baron and Kenny's (1986) approach. Consistent with Bartol's original model, we examined whether perceived professional reward system would mediate the influence of professionalism on job satisfaction, affective commitment, performance, and turnover (H6). Tests show that self-regulation exhibited a significant, positive relationship with affective commitment ($b = 0.15$, $p < .001$), and that this effect was fully mediated by professional reward system. Sense of calling also exhibited a significant, positive relationship with affective commitment ($b = 0.28$, $p < .001$). Furthermore, this effect was only partially mediated by professional reward system. As a result, we included this additional path in our revised model.

Following analysis of the full research model and tests for mediation, we eliminated non-significant paths, added the path identified during tests for mediation, and re-analyzed the model. Even though we dropped many paths, the amount of variance explained was not substantially reduced (see Figure 3). The revised model still explained a large portion of variance for job satisfaction ($R^2 = 31.2\%$), affective commitment ($R^2 = 44.2\%$), and turnover intention ($R^2 = 46.0\%$). Also, variance explained stayed about the same for professional reward system ($R^2 = 20.3\%$), intrinsic motivation ($R^2 = 21.3\%$) and job performance ($R^2 = 10.7\%$). For perceived job alternatives, explained variance was unchanged ($R^2 = 7.1\%$).



We summarize our results in Table 7.

Table 7. Summary of Significant Results

Professionalism findings	
Factor	Results
Public service	Belief in public service appears to have had little influence on relevant work attitudes and outcomes among IT professionals.
Self-regulation	Professional reward system fully mediated (H6b) the positive impact of self-regulation on affective commitment.
Sense of calling	Sense of calling exhibited a positive relationship with intrinsic motivation (H3a) and affective commitment. Professional reward system also partially mediated (H6b) the positive relationship between sense of calling and affective commitment.
Professional autonomy	Professional autonomy positively impacted intrinsic motivation (H4a), job satisfaction (H4b), and job performance (H4c).
Identification with professional organizations	Identification with professional organizations did not impact intrinsic motivation (H5a), job satisfaction (H5b), affective commitment (H5c), or job performance (H5d), but did positively influence perceptions of available job alternatives (H5e).
Nomological network findings	
Factor	Results
Perceived job alternatives	Perceptions of job alternatives increased turnover intention (H7b).
Intrinsic motivation	Intrinsic motivation positively impacted job satisfaction (H8a) and job performance (H8c).
Job satisfaction	Job satisfaction positively impacted affective commitment (H9a) and negatively impacted turnover intention (H9b).
Affective commitment	Affective commitment negatively impacted turnover intention (H10).
Turnover intention	Turnover intention did not significantly impact turnover.

4. Discussion

Our research yields insight into how professionalism influences IT professionals' relationships with their jobs and employers. We first discuss findings concerning the extensions regarding professionalism and then discuss results from the core nomological network composing the implicit theory of IT behavior.

4.1. Professionalism Results

IT professionals' belief in the IT profession's public service did not significantly relate to our outcomes including satisfaction, motivation, or performance. While one explanation for this lack of significant findings might be insufficient power, a plausible alternative explanation lies in how belief in public service is positioned in the nomological network. Research on IT professionals has found that belief in public service relates to aspects of IT professionals' personal lives. For example, Dinger et al. (2010) found that the belief in public service increased perceptions of work-family conflict. This finding may indicate that belief in public service influences the interplay IT workers experience in balancing their professional and personal lives. When examined in light of prior work, our finding may suggest that, while belief in public service may not affect job or organizational outcomes (e.g., job attitudes and organizational behaviors), it may be a reason that IT professionals sacrifice their personal lives to perform work that they perceive as crucially important to the greater good of their organization or society. In order to probe the validity of this insight, we believe future research needs to conduct omnibus tests of the relationship from belief in public service relates to work and non-work related outcomes.

Belief in self-regulation among the IT professionals exhibited a positive relationship with affective commitment as fully mediated by professional reward system. This is consistent with prior research on professionalism (Bartol, 1983) that suggests that the manner in which IT professionals are evaluated directly impacts their commitment to the firm. This finding suggests that a network of IT personnel who are competent and aware of the quality of each other's work could strengthen all of their affective commitment to the organization—depending on how the organization evaluates their performance. This belief in peer-level monitoring reflects contemporary research on how to structure IT work, such as prescriptions for the use of governance mechanisms such as clan control (Kirsch, 1997). Our work offers a unique contribution to the literature because the concept of self-regulation indicates not only potential support for the governance arrangement (e.g., clan control), but also the value of a workplace culture where peers are aware of each other's quality of work.

We found that IT workers with a strong sense of calling to the IT profession responded more positively to their work and their employer: they reported greater intrinsic motivation and affective commitment. Positioning sense of calling as an antecedent to intrinsic motivation is an important contribution because intrinsic motivation has been connected to many positive workplace outcomes, including greater willingness to use new technologies (Gerow, Ayyargi, Thatcher, & Roth, 2009) and organizational citizenship behaviors (Finkelstein, 2011). Furthermore, IT workers who feel called to the profession indicate a greater affective commitment to their employing organization as partially mediated by professional reward system. Taken together, these results suggest that sense of calling to the IT profession is a particularly useful construct in understanding IT professionals because it gives rise to more positive feelings concerning their work and employment. In future IT recruitment work, it would be interesting to probe whether IT workers who report a strong sense of calling to the profession also demonstrate more pro-active work behaviors vis a vis their recently hired peers.

We found that, when IT workers believe that they have professional autonomy (e.g., significant control over the design and timing of their work), they report greater motivation and satisfaction and earn higher performance ratings. The performance result is particularly encouraging given that there is strong support for a valid, causal relationship between autonomy and performance since job performance was rated by supervisors six months after the self-reported professional autonomy data was collected. These findings may be explained in different ways. First, professional autonomy may be a motivational factor, with the IT professional working harder because they can control how and when they do things. In this way, the work may be more enjoyable because they are able to optimize the way in which the work is done to decrease stress or frustration. Alternatively, professional autonomy may increase performance because it removes work constraints, such as micro-management by a less-skilled supervisor who might make work demands that increase stress, create conflict, or reduce the opportunity for productivity. In total, the value of autonomy for IT professionals is clear: autonomy increases motivation, satisfaction, and performance.

While our work highlights the aspects of professionalism that strengthen IT workers' ties to their job and organization, our findings also show that identification with the IT professional organizations increases awareness of alternative jobs, indirectly driving intentions to quit. According to Hall (1968), identification with the profession involves engaging with it through participating in professional associations, attending meetings, and reading professional journals. Not only might such involvement drive greater awareness of the number of jobs available, but also such experiences may enable the IT professional to better understand the various types of jobs in the market that would fit with their qualifications and experience. For IT managers, this finding presents something of a dilemma. On the one hand, participating in professional organizations is necessary for IT workers to update skill sets, identify new technologies, and to stay abreast of new practices in their field. On the other hand, participating in professional organizations may lure IT workers away from their current employer.

We would be remiss if we failed to note that our findings underscore the importance of the manner in which organizations evaluate IT workers. Consistent with Bartol (1983), our findings suggest that professional reward systems mediate the influence of a sense of calling and self-regulation on affective commitment. This finding directs IT managers' attention to a set of non-financial incentives that they can leverage to retain IT workers. By validly evaluating IT workers for engaging in

professional behaviors or developing professional values, managers can encourage affective commitment to their firm.

Finally, our findings underscore the need for a vessel to infuse professionalism into culture of the IT field. While scholars have often made a case for IT training to include soft skills, less attention has been paid to developing programs that foster a professional value system in the IT workforce (Smith & McKeen, 2003). In order to do so, it may be necessary for IT professional organizations to serve as advocates for professionalism. Not unlike the role that American Medical Association and the American Bar Association play as centers for training and professional development, professional organizations such as the AIS, ACM, and IEEE need to engage in a broader discourse about how to further professionalize the field.

4.2. Core Nomological Network Results

Results concerning the core nomological network composing the implicit theory of IT behavior are largely unsurprising and confirm prior research (Joseph et al., 2007). As expected, job satisfaction positively impacted affective commitment, and both reduced turnover intention. Perceptions of job alternatives increased turnover intention but, contrary to prior work (Thatcher et al., 2002), did not impact affective commitment. These findings reinforce the core relationships predicting turnover intention. Expanding the network to include motivation and performance, we find that intrinsic motivation positively impacted job satisfaction and supervisor-rated job performance.

Our analysis did not support turnover intention predicting actual turnover, data for which we collected 12 months later. Where prior IS research has successfully employed the same method to predict turnover (Dinger et al., 2012; Thatcher et al., 2002), our perceptual measures did not predict the actual turnover behavior. While this is not uncommon in behavioral research (Sheppard, Hartwick, & Warshaw, 1988), we suspect that this non-finding was due to broader economic conditions. Our data were collected during a period of economic decline in the Southeastern United States, likely reducing the number of desirable employment opportunities in the region. It very well could be that our respondents planned to leave their jobs but were unable to actually follow through on their desire to leave because they could not secure alternative employment or, in uncertain economic times, did not want to forego the job security associated with public sector employment. However, this non-significant finding may be beneficial because this outcome suggests that, even though IT professionals form intentions to quit, they do not always follow through on this intention in a timely manner. This result may indicate that, if IT managers can identify those with the desire to quit, there is a window of time during which IT managers could intervene to prevent turnover.

5. Limitations

This study is not without limitations. The primary limitation relates to external validity. We sampled from IT workers employed public sector organizations in the Southeastern United States. In doing so, we deliberately sampled from a pool of professionals with supervisory or professional classifications in their organizations (e.g., not entry-level employees). While it is important to note that employees in public and private organizations might not differ in terms of important beliefs or attitudes, our sample of more-established workers might differ from entry-level IT professionals. For example, while our public sector professionals are no more likely to be risk averse than their private sector peers (Bozeman & Kingsley, 1998), there very well might be differences between early and late-career IT professionals. Nonetheless, further research is needed to assess professionalism's influence among IT workers in diverse sectors (e.g., private and non-profit), subcultures (e.g., professional and technical), and career stages.

Also, we gathered many of our perceptual measures through self-reports at a single point in time. We mitigated this concern through designing our instrument in a manner consistent with prescriptions in contemporary research (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For example, we employed a range of different anchors across constructs and randomized item placement in the survey. Also, James, Gent, Hater, and Corey (1979) suggest that common method variance is a concern when there appears to be a systematic inflation in the correlation of constructs matrix. Examination of the

matrixes demonstrates that correlations varied across constructs. While we would have liked to employ a more rigorous technique to detect common method bias, to the best of our knowledge, there is not a reliable approach for detecting its influence in structural equation modeling (see Chin, Thatcher, & Wright, 2012; Richardson, Simmering, & Sturman, 2009).

Finally, note that we had limited success predicting our objective measures of turnover and performance. As discussed previously, we were unable to significantly predict actual turnover behavior. However, we were able to directly connect professional autonomy to performance and also indirectly connect sense of calling to performance via intrinsic motivation. While an explained variance of 10.7 percent is considered large in organizational behavior research, particularly when using matched pairs, it is considered relatively modest in information systems research. Nonetheless, we believe the use of supervisor-rated performance should be considered a strength of this paper.

6. Future Research

First, future research should consider how professionalism is developed and maintained over time among IT professionals. One approach would be to examine the sources, and implications, of professionalism in the distinct subgroups of the IT workforce (Joseph et al., 2012). For example, do IT professionals following different career trajectories hold distinct mindsets regarding professionalism and, therefore, engage in different behaviors? Another approach would be to probe for differences in professionalism between early career versus late-entry IT professionals. It could be that IT professionals who are socialized at early stages in their career hold distinct beliefs about professionalism from their peers. We believe that there is a need for research that examines beliefs that stem from socialization (Lui et al., 2003), such as beliefs about peers' ability to assess their work (e.g., self-regulation) and the implications of such beliefs holds the potential to yield insight into drivers of individual behavior in the IT workforce. Given that the IT field contains a unique occupational culture (Guzman et al., 2008; Guzman & Stanton, 2009), IT professionals may be socialized into holding professional mindsets that are idiosyncratic and unique from any other profession. As a result, future research should address the manner in which professionalism manifests among IT workers.

Professionalism may also impact the dynamic between organizational and professional outcomes. In this study, we only examined outcomes that occur in organizations, such as job attitudes, performance, and turnover behavior. Given that professionalism is composed of broad feelings towards the occupation, professionalism should exhibit a strong influence on occupationally oriented outcomes. Future research should examine how professionalism relates to professionally salient, yet non-organizationally focused, outcomes, such as career success, professional embeddedness, and turnaway. In this way, professionalism may contribute to understanding how IT professionals progress through their careers, become more attached to the IT profession, and make decisions to stay in, or exit, the IT profession.

Finally, future research should seek to gain a deeper understanding of the interaction between various focal units present in extended models of IT professional behavior⁴. Specifically, our research model includes constructs addressing multiple levels of an IT worker's professional experiences, including constructs at the job level (e.g., performance evaluations, intrinsic motivation, job satisfaction), at the organizational level (e.g., affective commitment, turnover intention), and at the professional level (e.g., professionalism). Therefore, future research should investigate the manner in which experiences and attitudes manifesting at one level (e.g., the job) culminate in impacts on another level (e.g., the profession). More specifically, future research should investigate how professionalism impacts the interplay between IT personnel's professional and personal lives. We demonstrated that elements of professionalism impact diverse areas of organizational attitudes and behaviors. While professionalism may be a positive force in the workplace, this may come at the cost of work occupying a more central in the lives of IT workers. If professionalism impacts the balance of an IT professional's work and personal life (Dinger et al.,

⁴ We thank an anonymous reviewer for this suggestion.

2010), the resulting conflict may drive feelings of anxiety, stress, and, ultimately, burnout. We contribute to theory and research by recognizing that professionalism's components may exert a disparate influence on personal and work-related attitudinal (satisfaction, commitment, motivation) and behavioral (performance, turnover) outcomes.

7. Conclusion and Implications for Research

This paper was motivated by a desire to establish professionalism as an integrative frame for understanding IT personnel behavior. In this regard, we make multiple contributions to the field. For research, we establish professionalism as a useful perspective on attitudes and behaviors of IT professionals. We found that professionalism impacts satisfaction, commitment, and performance. As a result, through deeply probing the sources and implications of professionalism, IS research might inform how managers craft HR practices that encourage valuable behavior, such as organizational citizenship (Yen, Li, & Niehoff, 2008), in the IT workforce.

Also, our model provides an updated view of professionalism's relationship with core pillars of IT workforce research (e.g., job satisfaction, affective commitment, intrinsic motivation, and job performance). Our study suggests that not all dimensions of professionalism tie to each construct. Because we conceptualize professionalism as a dimension set, this suggests that future research need not include all of professionalism's dimensions in research models. Rather, our work suggests that researchers direct attention to specific dimensions that relate to a specific outcome of interest. Through integrating elements of professionalism in future studies, IT research will provide a more holistic view of what drives IT professionals' behavior in the workplace.

We hope that this work inspires future research that dives deeper into understanding the relationship between IT professionals, their profession, and their organizational behavior. As the domain of information technology continues to mature, we believe it is important for IT scholars to reflect more deeply on the role of professional value systems in organizations. In addition, we hope that this research will lead to a rich discussion of professionalism and how it relates to the manner in which we, as educators, can inculcate professional value systems in our students. Through such research, our findings could identify paths for future IT professionals to find their work more fulfilling and their employers could benefit from more satisfied, more motivated, and higher-performing personnel.

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Appendix: Constructs and Items

Table A1. Constructs and Items

Professionalism (Snizek, 1972)

Stem: The referent in these questions is your own profession. Each item then, should be answered in light of the way you yourself both feel and behave as a member of your particular profession

anchors: 1 = strongly agree; 3 = neither agree nor disagree; 5 = strongly disagree

Belief in public service

1. Other professions in society are actually more vital to society than mine.
2. The importance of being in my profession is sometimes overstressed.
3. If ever an occupation is indispensable, it is this one.
4. I think my profession more than any other is essential for society.

Belief in self-regulation

1. My fellow XXXXXXXX* have a pretty good idea about each other's competence.
2. A problem in this profession is that no one really knows what his/her fellow XXXXXXXX* are doing. ®
3. My fellow XXXXXXXX* pretty well know how we all do in our work.
4. There is not much opportunity to judge how other XXXXXXXX* worker does his-her work. ®

Sense of calling to the profession

1. People in this profession have a real "calling" for their work.
2. The dedication of people in this profession is really gratifying.
3. It is encouraging to see the high level of idealism which is maintained by XXXXXXXX*.
4. There are few XXXXXXXX* workers who don't really believe in their work.

Professional autonomy

1. I make my own decisions in regard to what is to be done in my work.
2. My own decisions are subject to review. ®
3. Most of my decisions are reviewed by other people in the organization. ®
4. I am my own boss in almost every work-related situation.

Identification with professional organizations

1. I systematically read the professional journals.
2. I believe that professional associations should be supported.
3. The professional associations really don't do too much for the average person. ®
4. I regularly attend the professional meetings at the local level.

** Terminology was adjusted in each survey to appropriately refer to the subject's department or function.*

Table A1. Constructs and Items (cont.)**Professional reward system (Bartol, 1979a)**

Stem: Please read each statement carefully and indicate how important each of the following factors are to your manager in evaluating your job performance.

Anchor: 1 = Very important; 3 = neither important nor unimportant; 5 = Very unimportant

1. Ability to work without much guidance
2. Having concern for users' interests
3. High quality work in your field
4. Participation in professional organizations
5. Keeping up with the latest developments in the field

Perceived job alternatives (Thatcher et al., 2002)

Anchor: 1 = strongly agree; 3 = neutral; 5 = strongly disagree

1. I have many alternative job opportunities including some that are different from what I do now.
2. There are many jobs available similar to mine.
3. I can find another job doing exactly what I am doing now.

Intrinsic motivation (Hackman & Oldham, 1980)

Anchor: 1 = strongly agree; 4 = Neutral; 7 = strongly disagree

1. My opinion of myself goes up when I do this job well.
2. I feel bad and unhappy when I discover that I have performed poorly on this job.
3. I feel a great sense of personal satisfaction when I do this job well.

Motivating potential score: job characteristics (Hackman & Oldham, 1980)

Item 1 of job characteristics scales used unique anchors. Items 2 and 3 of the job characteristics scales used the following anchors 1 = *very accurate*, 4 = *uncertain*, 7 = *very inaccurate*.

Task identity

Item 1. To what extent does your job involve doing a "whole and identifiable piece of work"? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people or by automatic machines?

Anchor: 1 = *My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final product or service;*
 4 = *My job is a moderate-sized chunk of the overall piece of work; my own contribution can be seen in the final outcome;*
 7 = *My job involves doing the whole piece of work, from start to finish; the results of my activities are easily seen in the final product or service.*

Item 2. The job is arranged so I do not have the chance to do an entire piece of work from beginning to end. ®

Item 3. The job provides me the chance to completely finish the pieces of work I begin.

Table A1. Constructs and Items (cont.)**Task significance**

Item 1. In general, how **significant or important** is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

Anchor: 1 = Not very significant; the outcomes of my work are not likely to have important effects on other people;

4 = Moderately significant;

7 = Highly significant; the outcomes of my work can affect other people in very important ways

Item 2. The job itself is not very significant or important in the broader scheme of things. ®

Item 3. This job is one where a lot of other people can be affected by how well the work gets done.

Skill variety

Item 1. How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of skills and talents?

Anchor: 1 = Very little; the job requires me to do the same routine things over and over again; 4 = Moderate variety; 7 = Very much; the job requires me to do many different things, using a number of different skills and talents.

Item 2. The job requires me to use a number of complex or high-level skills.

Item 3. The job is quite simple and repetitive. ®

Job feedback

Item 1. To what extent does the job itself provide you with information about your work performance? That is, does the actual work itself provide clues about how well you are doing--aside from any "feedback" co-workers and supervisors may provide?

Anchor: 1 = Very little; the job itself is set up so I could work forever without finding out how well I am doing;

4 = Moderately; sometimes doing the job provides "feedback" to me; sometimes it does not; 7 = Very much; the job is set up so that I get almost constant "feedback" about how well I am doing.

Item 2. Just doing the work required by the job provides many chances for me to figure out how well I am doing.

Item 3. The job itself provides very few clues about whether or not I am performing well. ®

Table A1. Constructs and Items (cont.)**Autonomy**

Item 1. How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

Anchor: 1 = Very little; the job gives me almost no personal "say" about how and when the work is done;
 4 = Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work;
 7 Very much; the job gives me almost complete responsibility for deciding how and when the work is done.

Item 2. The job denies me any chance to use my personal initiative or judgment in carrying out the work. ®

Item 3. The job gives me considerable opportunity for independence and freedom in how I do the work.

Job satisfaction (Hackman & Oldham, 1980)

Anchors: 1 = strongly agree; 4 = neutral; 7 = strongly disagree

1. Generally speaking, I am very satisfied with this job.

2. I am generally satisfied with the kind of work I do on this job.

Affective commitment (Mowday et al., 1982)

Anchors: 1 = strongly agree; 4 = neither agree nor disagree; 7 = strongly disagree

1. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.

2. I am proud to tell others that I am part of this organization.

3. I really care about the fate of this organization.

Turnover intention (Thatcher et al., 2002)

Anchors: 1 = strongly agree; 4 = neutral; 7 = strongly disagree

1. I intend to quit.

2. I am thinking about quitting.

About the Authors

Michael DINGER is an Assistant Professor of Management at the University of South Carolina Upstate. He received his PhD from Clemson University. His research interests include IT workforce management and absorptive capacity. His work appears in *MIS Quarterly*, *Information Systems Research*, *IEEE Transactions on Engineering Management*, and in other journals. On Saturday afternoons, Michael can be found reenacting Star Wars with his daughters.

Jason Bennett THATCHER is a Professor of Information Systems at Clemson University. He also directs the Social Analytics Institute, an interdisciplinary center focused on understanding the implications of analytics for individual, organizational, and social issues. His research examines the influence of individual beliefs and characteristics on information technology use. He also studies strategic and human resource management issues related to the application of information technologies in organizations. His work appears in *MIS Quarterly*, *Journal of Applied Psychology*, and other outlets. His work has been supported by the National Science Foundation, National Parks Service, Salesforce.com, IBM, and other organizations. Jason lives in Greenville, SC, where he enjoys hot summer nights, the occasional low country boil, and Clemson Tiger football!

Lee P. STEPINA is a Professor in the Department of Management in the College of Business at Florida State University. He earned his PhD in Labor and Industrial Relations, University of Illinois, Urbana-Champaign. His research interests include international/cross cultural management issues, equity theory, high-tech workers, compensation, motivation and job design. He has published papers in journals such as *Academy of Management Journal*, *Organizational Behavior and Human Decision Processes*, *Journal of Organizational Behavior*, and *Industrial Relations*.

Darren C. TREADWAY is an Associate Professor of Organizational Behavior and Human Resources at the University at Buffalo. He received a PhD Florida State University and an MBA from Virginia Tech. Dr. Treadway's research interests include social influence processes in organizations, with particular reference to organizational leadership, politics, political skill, leadership, bullying, and abusive supervision. His research has been published in leading journals such as *Journal of Applied Psychology*, *Journal of Management*, *Leadership Quarterly*, *Journal of Organizational Behavior*, and *Human Relations*. Cumulatively, he has co-authored 40 papers, 20 book chapters, and 50 conference papers. He co-edited the forthcoming Society for Industrial and Organizational Psychology Frontier Series book *Politics in Organizations: Theory and Research Considerations*.

Jacob BRELAND is an Assistant Professor of Management and International Business at the University of Southern Mississippi where he specializes in human resource (HR) and organizational behavior (OB) management. He earned his PhD at the University of Mississippi where he specialized in HR/OB. His MBA and BS (psychology) were earned at Southern Miss. His teaching assignments include both undergraduate and graduate courses in the area of talent management. His research interests include organizational politics and power, organizational fit, and social networks, and his work has been published in such peer-reviewed outlets as *Journal of Management*, *Journal of Managerial Psychology*, *Journal of Leadership and Organizational Studies*, and *Career Development International*, and he has presented at Academy of Management and Southern Management Association conferences.