MAXIMIZING THE PERFORMANCE AND JOB-RELATED BEHAVIORS OF CONTRACT AND PERMANENT IT WORKERS

by

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ABSTRACT

TANUSREE PAI. Maximizing the performance and job-related behaviors of contract and permanent IT workers. (Under the direction of DR. WILLIAM J. TOLONE and DR. SUSAN J. WINTER.)

As the use of contracting for Information Technology (IT) services steadily increases, IT managers are challenged with reconciling the need for flexibility achieved through the use of contract workers, with the need to understand the factors that maximize the performance and behaviors of contract and permanent IT workers. While several research studies have focused on motivation factors, they have focused either on environment factors such as jobs, or individual factors such as the need for challenge, versus focusing on both environment and individual factors as joint determinants. Also, studies that have examined motivation factors of contract workers, lack a comparison to permanent workers. To bridge these gaps, this dissertation develops a model that compares not only the job characteristics experienced (environment factor) by contract and permanent IT workers, but also the job characteristics expected and preferred (individual factors) by contract and permanent IT workers. Further, it applies a complementary needs-supplies perspective of Person-Job Fit Theory to predict the effect of the expected-experienced job characteristics fit and the preferred-experienced job characteristics fit on the performance and behaviors of contract and permanent IT workers. A partial least squares structural equation modeling (PLSSEM) approach is utilized to test the effect of fit. The study sheds new light on Person-Job Fit and its ability to affect the performance and behaviors of contract and permanent IT workers, while avoiding the methodological limitations of prior studies in this area. Key words: *Person-Job Fit, psychological contracts, job characteristics, IT contracting, work motivation, performance, organizational citizenship behavior, PLS structural equation modeling.*

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The doctoral program, a good friend once told me, is not about a degree, it is a journey. In hindsight, not only was it a journey, it was one that was made possible by the generosity and support of several people. Here I attempt to express my gratitude to at least some of those people, if not all, and acknowledge the fact that the degree may be mine; but the success of this journey was as much theirs as mine. First, I would like to thank my committee chair, Dr. Bill Tolone, who has been a patient advisor, a steadfast mentor, and the most humble teacher. Thank you for the encouragement to pursue my own interests, the enthusiasm for every idea, and all the help I needed to successfully complete the program. Second, I would like to thank my co-advisor, Dr. Susan Winter. Susan, if I had not taken your research methods classes, I would not have found my topic, or the inspiration to research the topic. Without your insights, your humor, your availability to meet me anywhere in the country, and call me from anywhere in the world, I would have lost my motivation a long time ago. Third, I would like to acknowledge the guidance and contributions of my committee members, Dr. Ram Kumar, Dr. Tony Stylianou, and Dr. Maisto. Thank you for your support and advice. To Olin Broadway, thank you for all your efforts with helping me recruit participants for my study. To all of the staff at the College of IT, especially Kathy Edwards, Pearl Brown, and Dora Bradley, thank you for all the favors, big and small. It was thanks to you that I could be anywhere in the country and still not miss any important deadline.

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CHAPTER 1: INTRODUCTION

There has been a steady increase in the use of contracting for Information Technology (IT) services over the past decade. Organizations continue to hire contract workers[1] to reduce fixed administrative cost and increase strategic flexibility, adjusting the number of workers to demands (Brewster et al., 1997; Burgess & Connell, 2006; Kalleberg et al., 2003; Matusik & Hill, 1998; Sherer, P. D., 1996; Von Hippel et al., 1997; Vosko 1998). However, in order to secure a competitive advantage, organizations have to ensure that all of their employees are strongly involved with their jobs, high performing, and committed to the organizations (Lawler, 1993; Meyer & Allen, 1997). Thus, currently, organizations face the dilemma of attempting, simultaneously, to increase the flexibility of the labor force, and to increase job involvement and commitment by this part of the labor force to the organization (Champbel & Castanheira, 2006).

This dilemma is made more difficult by the inconclusive and contradictory results of various research studies that have attempted to understand the attitudes and behaviors of individuals at work (Connelly & Gallagher, 2004; De Cuyper et al., 2005; Guest, 2004; Virtanen et al., 2005). Some studies have found that contract IT workers have lower performance, engage in fewer organizational citizenship behaviors, and are perceived to be less loyal, obedient and trustworthy than permanent IT

[1]With respect to vocabulary, several terms have been used for alternate employment arrangements such as contracting. Contingent employment is used in US and Canadian literature, while temporary, fixed-term or non-permanent employment are used interchangeably in European research (Connelly & Gallagher, 2004; De Cuyper et al., 2005). For reasons of consistency, we use the term contract workers in this study, and do not distinguish it from temporary, part-time or contingent workers.

workers (Slaughter & Ang, 2001; Van Dyne & Ang, 1998). Other studies, although not necessarily focused on IT workers, have found no significant differences between the performance of temporary and permanent workers (Engellandt & Riphahn, 2005; De Cuyper & De Witte, 2005; Ellingson et al. 1998). Despite the contradictory research findings, it is important for IT managers to reconcile the flexibility achieved through the use of contract workers, with an understanding of the factors that drive the performance and behaviors of contract and permanent IT workers. Ultimately, such an insight, is necessary to implement management practices that will maximize the performance and behaviors of both contract and permanent IT workers.

In a review of the theory and research on the psychological impact of temporary employment, De Cuyper et al., (2008), called for investigation into the motivation and expectation related factors that affect the work outcomes of workers. We believe that while several research studies have focused on motivation factors, they have adopted an incomplete view focusing either on environment factors such as the nature of jobs (Slaughter & Ang, 2001), or individual factors such as preferred employment arrangement (Enns et al. 2002), versus focusing on environment and individual factors as joint determinants. Further, various studies that have examined the motivation factors of contract workers (Kunda et al., 2002; Meiksins & Whalley, 2002; Rogers, 2000; Smith, 2001), lack an explicit comparison to permanent workers (Bidwell & Briscoe, 2009). In this study, we compare the job characteristics experienced by contract and permanent IT workers (the environmental factors view), as well as the job characteristics expected and preferred by contract and permanent IT workers (the individual factors view). We further evaluate the effect of matching experienced job characteristics to the expected and preferred job characteristics on the performance and behaviors of contract and permanent IT workers.

Prior research (Slaughter & Ang, 2001) has found low performance and poor citizenship behaviors among contract software developers as compared to permanent software developers. In an effort to understand the cause of these differences, the researchers interviewed software developers regarding their jobs. The job experiences of the contract and permanent software developers were then coded into themes using the task dimensions of the Job Characteristics Model (Hackman & Oldham, 1976, 1980), namely, task variety, autonomy, significance, identity and feedback. The contract software developers were found to experience lower task variety, autonomy, significance, identity and feedback in their jobs than the permanent software developers. Based on these findings, Slaughter & Ang (2001) suggested that the low performance and poor citizenship behaviors among the contract software developers can be attributed to the job characteristics they experience.

However, the proposed relationship between the experienced job characteristics and the work attitudes and behaviors of contract and permanent IT workers (Slaughter & Ang, 2001) does not take into account the individual needs of the workers. Job Characteristics Theory (Hackman & Oldham, 1980) clearly states that job characteristics do not affect all employees in the same way because of the individual needs of the employees. Thus, the research on job characteristics proceeds from the premise that different individuals have different needs, or at least, different need strengths, and therefore, will respond differently to the same job characteristics (Hackman & Lawler, 1971). Therefore, a key to designing a job that motivates people to perform well, is matching the person's needs and the job. This needs-supplies perspective is well known in Person-Job (P-J) Fit Theory where the person's needs and the job's supplies operate as joint determinants of individual and organizational outcomes (Lewin, 1951; Murray, 1938). Thus, while job characteristics (supplies), as proposed by Slaughter & Ang (2001), may affect the performance and behaviors of contract and

Figure 1.1: Basic Work Status and Experienced Job Characteristics Model

permanent IT workers, these job characteristics must be considered jointly with other person-influenced characteristics (needs) of the contract and permanent IT workers.

This study addresses several questions: Do contract IT workers today exhibit the same desired performance and organizational citizenship behaviors as permanent IT workers? Are there differences in the job characteristics experienced by the contract and the permanent IT workers? Do contract and permanent IT workers have different individual needs and expectations with respect to their jobs? Does the interplay between the individual needs and the expectations of contract and permanent IT workers and their experienced job characteristics affect their performance and behavior?

First, the study evaluates a simple model based on the literature on Information Systems (IS) Contracting that suggests that contract and permanent IT workers experience different job characteristics. Figure 1.1 depicts this basic model.

Second, the study evaluates the effect of the experienced job characteristics of contract and permanent IT workers on their performance and behaviors, based on Slaughter & Ang's (2001) proposition that job characteristics mediate the relationship between the work status and attitudes, behaviors, and performance in software development teams. A mediation model, explained in more detail in Appendix B, hypothesizes that the predictor variable (e.g., work status) affects a mediator variable (e.g., experienced job characteristics), which in turn affects an outcome variable

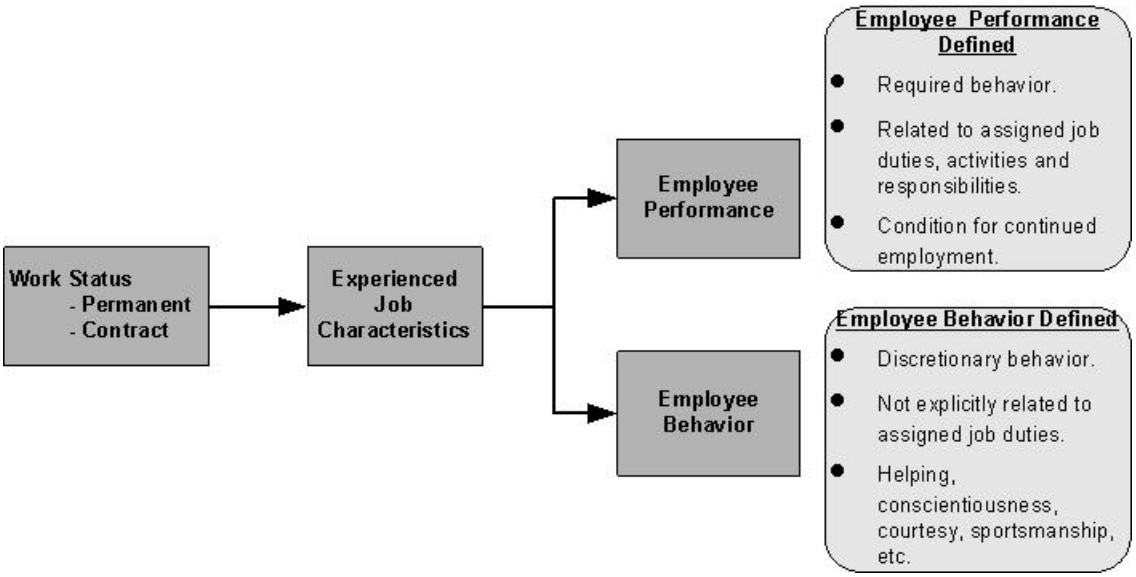

Figure 1.2: Experienced Job Characteristics Mediated Model

(e.g., performance). Figure 1.2 depicts the mediated model.

Third, the study compares a motivational need factor of contract and permanent IT workers, namely their expected job characteristics. The Psychological Contract theory (Rousseau, 1995) is used to compare the job-related expectations of the contract and the permanent IT workers. Psychological contracts are beliefs, based upon promises expressed or implied, regarding an exchange agreement between two parties (Rousseau, 1995). Applied to an employment context, an employee's expectations regarding the outcomes of the employment relationship form a psychological contract between the employee and the employing firm, or its agents. In addition to comparing the expected job characteristics of contract and permanent IT workers, the study applies the complementary needs-supplies perspective of Person-Job Fit theory, to evaluate the effect of the fit between the expected job characteristics (person factor, need) and the experienced job characteristics (job factor, supply) of the contract and the permanent IT workers on their performance and organizational citizenship behaviors. Person-Job (P-J) Fit Theory implies that the person and the job operate as

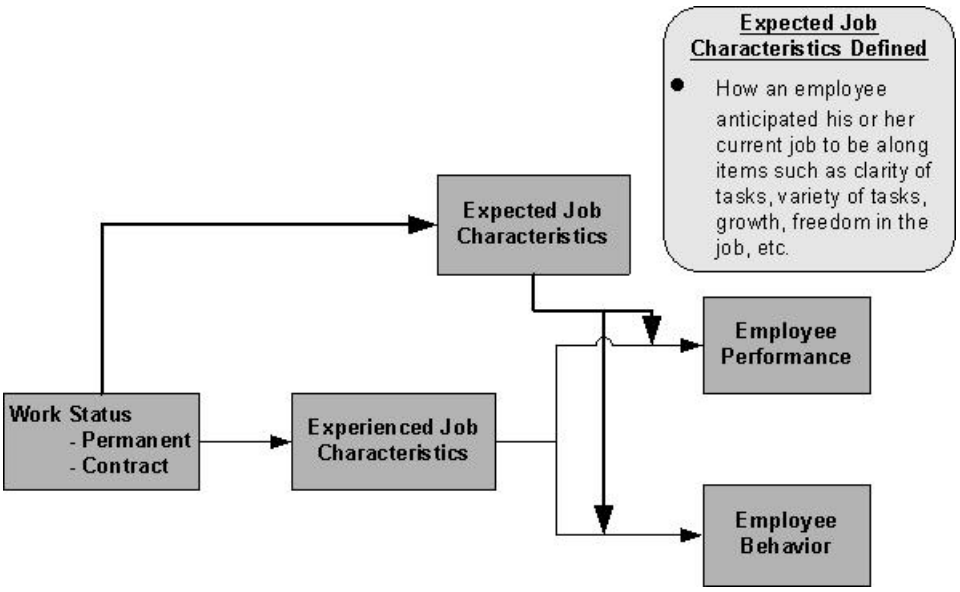

Figure 1.3: Expected-Experienced Job Characteristics Fit Model

joint determinants of individual and organizational outcomes (Lewin, 1951; Murray, 1938). If there is a match or fit between the person (P) and the job (J), there will be higher performance and stronger motivation resulting in desired organizational behaviors. If there is a mismatch or misfit, the employee's motivation could be negatively impacted, which in turn could negatively impact performance. The fit between expected and experienced job characteristics of IT workers is conceptualized using the moderation perspective. According to the moderation perspective, explained in more detail in Appendix C, the impact that a predictor variable (e.g., experienced job characteristics) has on a dependent variable (e.g., performance) is dependent on the level of a third variable, termed as the moderator (e.g., expected job characteristics). Figure 1.3 depicts the moderation fit model.

Finally, the study uses the concept of career anchors (Schein, 1971, 1974, 1978, 1985) to compare a second motivational need factor of contract and permanent IT workers, namely their preferred job characteristics. A career anchor refers to a cluster of self-perceived needs, values, and talents that give shape to an employee's career

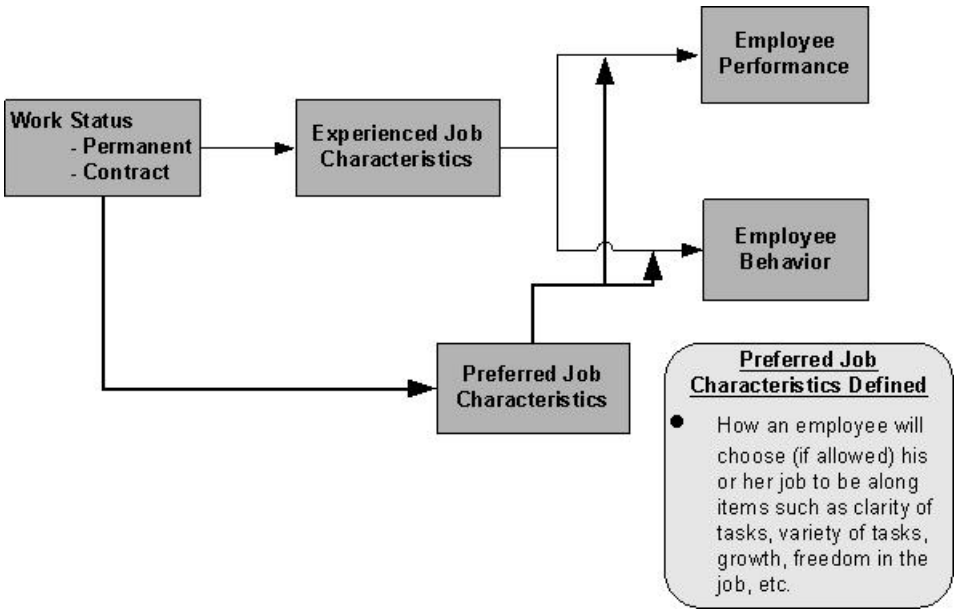

Figure 1.4: Preferred-Experienced Job Characteristics Fit Model

decisions (Igbaria et al., 1991, p 151). An employee's career anchor or career orientation is significant because it influences the selection of, or preferences for specific occupations and work settings and the employee's reactions to his or her work experiences (Schein, 1978). In addition to comparing the preferred job characteristics of contract and permanent IT workers, the study applies the complementary needs-supplies perspective of Person-Job Fit Theory again to understand the effect of the fit between the preferred job characteristics (person factor, need) and the experienced job characteristics (job factor, supply) of the contract and the permanent IT workers on their performance and behaviors. The fit between preferred and experienced job characteristics of IT workers is also conceptualized using the moderation perspective. Figure 1.4 depicts the moderation fit model.

'Performance' and 'behavior' are broad terms used in the organizational behavior literature and can comprise of a wide range of behavioral characteristics. In this study, we use the term 'performance' or 'in-role job performance' to refer to the

responsibilities associated with an individual's formal employment contract - e.g., completing assigned tasks, fulfilling responsibilities at work, etc. We use the term 'behavior' or 'organizational citizenship behavior' to refer to the voluntary yet desired behaviors of employees that are not usually specified in a contract - e.g., helping team members, protecting organizational property, giving advance notice for absence, etc. In the rest of the study, we use 'performance' and 'in-role job performance' as well as 'behavior' and 'organizational citizenship behavior' interchangeably.

Additionally, there are numerous classifications of contract and permanent IT workers - e.g., network administrators, database administrators, software developers, project managers, etc. In this study we focus on contract and permanent software developers.

To summarize, in this study we evaluate (1) the experienced job characteristics of contract and permanent software developers , (2) the effect of the experienced job characteristics on the performance and behaviors of contract and permanent software developers, (3) the expected job characteristics of contract and permanent software developers, (4) the effect of the fit between the experienced and expected job characteristics on the performance and behavior of contract and permanent software developers, (5) the preferred job characteristics of the contract and permanent software developers, and (6) the effect of the fit between the experienced and preferred job characteristics on the performance and behavior of contract and permanent software developers.

The primary contributions of this study are as follows:

First, this study makes a contribution to the literature in IS contracting by systematically evaluating the differences of the experienced, the expected and the preferred job characteristics of contract and permanent software developers. Further, the differences are analyzed along eighteen different motivational dimensions of job

characteristics by using the Multimethod Job Design Questionnaire (MJDQ). This not only enhances our understanding of contract and permanent IT workers but also provides a more holistic understanding of their jobs and informs IT managers who make decisions regarding the types of jobs to assign to contract and permanent IT workers.

Second, this study contributes to the literature in work motivation and organizational behavior by using widely adopted, valid and reliable measures to test the mediating effect of a Job factor, namely, the experienced job characteristics, on the Slaughter & Ang (2001) proposed relationship between work status and work outcomes of IT workers. Further, the study uses a robust quantitative statistical research methodology to test the effect of experienced job characteristics, thereby advancing the findings, and addressing the limitations of Slaughter and Ang's (2001) study.

Third, this study integrates two Person factors: the expected job characteristics and the preferred job characteristics of contract and permanent IT workers into Slaughter and Ang's (2001) explanatory model of the performance and behaviors of contract and permanent IT workers. The study uses the Person-Job Fit Theory (Lewin, 1951; Murray, 1938) to evaluate the effect of the fit between the experienced and the expected job characteristics and the effect of the fit between the experienced and the preferred job characteristics of contract and permanent IT workers on their performance and behaviors. In doing so, this study addresses one of the suggestions made in a recent review of theory and research on the psychological impact of temporary employment (De Cuyper et al., 2008) - that of the need to investigate motivation and expectations as moderators of the relationship between temporary employment and outcomes. It also contributes to the literature on Person-Job Fit Theory by addressing various criticisms and shortcomings of prior studies related to the nature and the type of the measures and the method used to evaluate fit (Edwards, 1991).

Fourth, this study makes an important methodological contribution by using a structural equation modeling approach using partial least squares (Wold, 1982, 1985a, 1985b), abbreviated as PLSSEM, to test the effect of fit as an interaction. PLSSEM is explained in more detail in AppendixB. Edwards (2009) criticized a recent study that used a latent congruence model approach using structural equation modeling (Cheung, 2009) because it was framed around algebraic differences of the components of fit. This study addressed that criticism by including quadratic terms specified in polynomial regression analysis (Edwards, 1993) in the tests of moderation in structural equation models (Chin et al., 2003; Jose et al., 2001). This is one of very few studies (Hrivnak, 2009) that has attempted to incorporate Edward's (1994, 2002) polynomial regression approach for fit analysis to a partial least square structural equation modeling (PLSSEM) framework. Polynomial regression is explained in Appendix E.

The remainder of this study is organized as follows: In Chapter 2, we provide the theoretical framework for the study, develop all the hypotheses and discuss the research model. In Chapter 3, we discuss the research methodology. In Chapter 4, we summarize the results. In Chapter 5 we provide a discussion of the results, their implications, limitations and significance. The references and the appendices with relevant study information are provided at the end.

CHAPTER 2: THEORETICAL FRAMEWORK

The increase in the use of contract workers has long fueled research aimed at comparing the attitudes, behaviors, and performance of contract and permanent workers (De Cuyper et al., 2008) resulting in a myriad of theories. Studies that found differences in the performance and behaviors of the contract and permanent workers in IT suggested the need to look at various organizational and individual factors that could further explain the differences (Slaughter & Ang, 2001; Van Dyne & Ang, 1998). Slaughter & Ang (2001), for example, suggested the need to evaluate the job characteristics experienced by contract workers as a factor that affects their performance and behaviors. Van Dyne and Ang (1998), on the other hand, suggested the need to evaluate individual factors that affect the relations between employee and organization, in particular, the expectations of contract workers as to mutual obligations, also known as the psychological contracts. Another aspect that started emerging in research studies on contract workers was the role of volition and preferences. For example, studies started differentiating between contract workers who preferred their work status and other work-related inducements versus those who did not (Holtom et al., 2002; Moorman & Harland, 2002). The emergence of both environmental factors (e.g., job-characteristics) and person-related factors (e.g., work status preference) spurred interest in Person-Job Fit Theory (Lewin, 1951; Murray, 1938) that recommends evaluating the fit, or, match of person and job factors as the determinant of the work outcomes of employees (Barling & Gallagher, 1996; De Cuyper et al., 2008).

In this chapter, we review the relevant literature to build the research model for this study.

We first describe the characteristics of software development jobs and the work status of software developers. In the second section, we review the literature that suggests that a Job factor, namely, the experienced job characteristics of software developers affect their work outcomes. We first compare the experienced job characteristics of contract and permanent software developers. We then review Job Characteristics Theory (Hackman & Oldham, 1976, 1980) to propose the relationships between the experienced job characteristics and the work outcomes of contract and permanent software developers.

In the third section of the chapter, we describe the needs-supplies perspective (Cable & DeRue, 2002; Edwards, 1991; Edwards & Snipp, 2007; French et al., 1982; Kristof, 1996) of Person-Job Fit Theory (Lewin, 1951; Murray, 1938) as a framework to discuss how the performance and behaviors of the contract and the permanent software developers are affected by two Person Factors: (1) job characteristics expected by contract and permanent software developers, and (2) job characteristics preferred by contract and permanent software developers.

In the fourth section we review relevant literature on a Person factor, namely, the job-related expectations of software developers, and the effect of expectations on the work outcomes of software developers. We draw on the Psychological Contract Theory (Rousseau, 1995) to compare the expected job characteristics of the contract and the permanent software developers. We then propose that the fit between the expected job characteristics (person factor) and the experienced job characteristics (job factor) will affect the work outcomes of contract and permanent software developers.

In the fifth section we review relevant literature on another Person factor, namely, the job-related preferences of software developers, on their work outcomes. We draw on the Career Anchors Theory (Schein, 1971, 1974, 1978, 1985) to compare the preferred job characteristics of contract and permanent software developers. We then

propose that the fit between the preferred job characteristics (person factor) and the experienced job characteristics (job factor) will affect the work outcomes of contract and permanent software developers.

In the final section of this chapter we summarize all the research hypotheses.

A conceptual model highlighting the various theories and literature reviewed in this chapter is shown in Figure 2.1.

2.1 Defining Jobs and Work Status of Software Developers

In this study, we evaluate the jobs of contract and permanent software developers as a factor that affects their performance and behaviors. In order to do so, it is important to understand the characteristics of software development jobs as well as the work status of software developers.

2.1.1 Software Development Jobs

IT jobs can be classified under various categories such as software development, network administration, security, systems integration, project management, technical analysis etc. In this study we focus mainly on software development[1] . Software development jobs include activities such as the creation, modification, reuse, re-engineering, maintenance, and configuration of software systems or applications that are used for business processes. Software development was chosen for several reasons.

First, most organizations typically recruit more people in software development than the other areas of IT work. Second, many organizations offer a variety of employment arrangements, i.e., work statuses, for IT employees in software development. Therefore, the population of IT employees with different work statuses in software development is likely to be bigger than the population of IT employees with different

[1]For the purposes of this study, the terms systems development and application development are considered to be synonymous with software development. We also do not limit the definition to developers of custom built software but also include those who configure standard packaged software such as ERP systems.

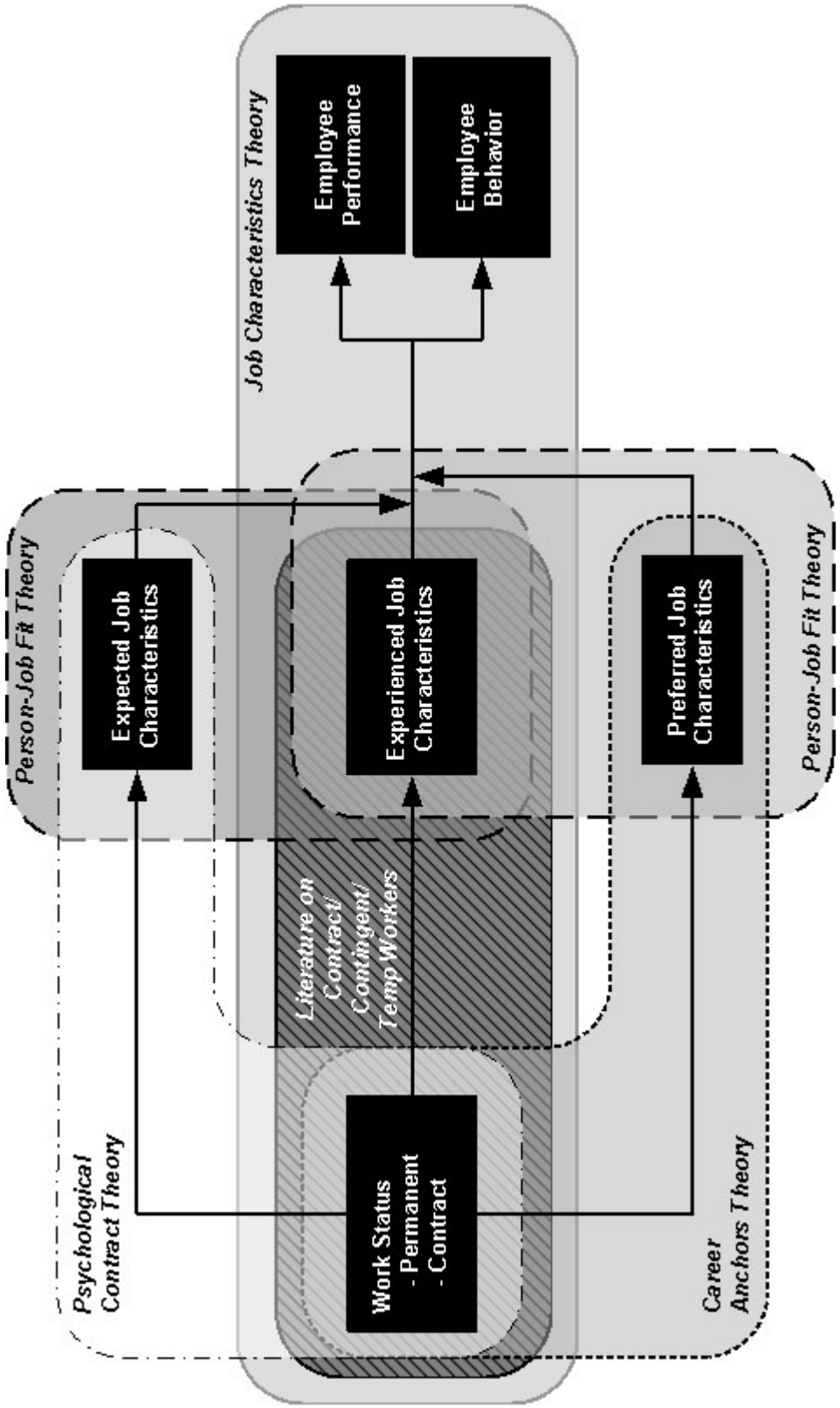

Figure 2.1: Conceptual Research Model with Underlying Theories and Constructs

work statuses in network administration, security, systems integration, project management, reporting, etc. Third, the job profiles experienced by software developers may vary drastically from employee to employee. This is because software development involves the creation and maintenance of diverse software applications using a variety of tasks and artifacts. Depending on the tasks assigned or artifacts created or accessed, the job characteristics experienced by software developers may vary. Examples of software development tasks are requirements gathering, analysis, design, programming, configurations, etc.,(Davis & Olson, 1985). Examples of software artifacts are source code, algorithms, documentation, flowcharts, workflows, configuration specifications, etc. Other IT jobs like network administration, server administrations, etc., are more standard in nature. The profiles of such jobs are not likely to vary from employee to employee. Finally, studies have reported that software developers have the highest growth needs of any computer-related group previously surveyed (Cougar & Zawacki, 1980, Cougar, 1986). Growth need represents an employee's desire to obtain personal growth and development from his or her work. According to Job Characteristics Theory (Hackman & Oldham, 1980), employees with high growth needs are more likely to respond positively to a job design that motivates them. Thus, we believe that the behavioral outcomes of software developers, as compared to other IT employees, are more likely to be influenced by the characteristics of the jobs that they experience. Future research should extend the results of this study to other kinds of IT work.

2.1.2 Characteristics of Software Development Jobs

Job design is a topic of enduring interest in the field of management dating back to the earliest days of Taylorism and Scientific Management (Taylor, 1911).

Jobs can be characterized along various dimensions such as the clarity, the variety, or significance of tasks involved in the job; the freedom; the opportunity for learning;

the growth or the advancement that the job allows; the security; the recognition; and, the sense of achievement it provides. The characteristics of a job define its design.

Different disciplines have emphasized different characteristics in their study of job design. The result has been the emergence of four major approaches to job design: (1) motivational, (2) mechanistic, (3), biological, and (4) perceptual-motor (Campion & Thayer, 1985; Campion & McClelland, 1991). Each approach focuses on different job characteristics.

The motivational approach to job design comes from the field of organizational psychology and focuses on the job characteristics of autonomy, feedback, social interaction, goal clarity, and participation (Hackman & Oldham, 1980; Herzberg, 1966). The mechanistic approach to job design comes from the field of industrial engineering and focuses on the job characteristics of automation, repetition, simplification, and specialization (Barnes, 1980; Taylor, 1911). The biological approach to job design comes from the fields of ergonomics, work physiology, and biomechanics. This approach focuses on the job characteristics of the strength and endurance required, the wrist movement allowed, seating, climate, and lighting (Astrand & Rodahl, 1977; Grandjean, 1980; Tichauer, 1978). The perceptual-motor approach to job design comes from the fields of human factors research and experimental psychology. This approach focuses on the job characteristics of stress, boredom, and memory requirements (Fogel, 1967; McCormick, 1976; Welford, 1976).

Each work-design approach emphasizes different outcomes (Campion & Thayer, 1985; Edwards et al., 2000). The motivational approach emphasizes affective, attitudinal reactions, and behavioral outcomes such as satisfaction, intrinsic motivation, absenteeism, turnover, and performance. The mechanistic approach emphasizes efficiency, flexibility, and employee utilization levels. The biological approach emphasizes

worker comfort in terms of reduced physical strain, effort, fatigue, and health complaints. The perceptual-motor approach emphasizes reliability in terms of error rates or accidents, and worker reactions to facilities and equipment.

In this study, we use the motivational approach to study the design of software development jobs because we are interested in the performance and organizational citizenship behavior of employees. Additionally, software development does not vary on the other dimensions, like physical strain, because it predominantly involves mental versus physical labor. In prior studies, software development jobs have been characterized along various dimensions such as task variety, autonomy, feedback, significance, identity (Hackman & Oldham, 1980), role ambiguity, role conflict (Baroudi, 1985; Goldstein & Rockart; 1984), goal specificity, goal difficulty (Rasch & Tosi; 1992), opportunity for growth, friendship or social interaction and job security (Lending & Chervany, 1997). In this study, we examine eighteen job characteristics related to software development: autonomy, intrinsic feedback, extrinsic feedback, social interaction, task/goal clarity, task variety, task identity, ability/skill-level requirements, ability/skill variety, task significance, growth/learning, promotion, achievement, participation, communication, pay adequacy, recognition, and job security. These eighteen items comprise the motivational scale items of the Multimethod Job Design Questionnaire (MJDQ) developed by Campion (1988).

In addition to characterizing jobs along the various dimensions, there are two main techniques used to measure job characteristics: objective and perceptual measurement techniques. Objective measurement techniques evaluate the characteristics of the job as defined by the organization. Perceptual measurement techniques examine the job characteristics as perceived by employees. These perceptions are, by definition, subjective. Nevertheless, how an individual perceives his job determines the effect of the job characteristics on the individual's work outcomes (Lending & Chervany,

1997). In this study, we use the perceptual measurement technique to examine the job characteristics experienced by software developers. According to Slaughter and Ang (2001), the perception of contract and permanent software developers regarding their jobs is influenced by their work status (contract and permanent).

2.1.3 Work Status of Software Developers

The Bureau of Labor Statistics defines five types of work status: permanent, independent contractors, on-call workers, workers paid by temporary help firms such as employment agencies and workers whose services are provided through contract firms such as outsourced technology workers (Matusik & Hill, 1998; Polivka, 1996).

Independent contractors are freelance consultants or self-employed workers. Workers who are called to work only as needed are termed as on-call workers. Workers paid by a temporary help agency regardless of whether or not their jobs are temporary are termed as temporary agency workers. Workers provided by contract firms are those employees who are hired by a company that provides their services to other companies based on a contractual agreement. Workers with traditional employment arrangements that are more long-term in nature are permanent employees.

In this study, we focus on software developers with two work statuses: permanent and contract. Permanent software developers are individuals who are hired by organizations on a long-term basis. Typically, they have open-ended, flexible employment arrangements with the organizations. They are salaried employees who get retirement, medical , and vacation benefits. Their roles and responsibilities may change over time.

Contract software developers are individuals who contract with organizations requiring their services on a temporary basis. These individuals either contract directly (i.e., independent contractors) or through a contract firm (e.g., temporary help agencies or out-sourcing firms) (Slaughter & Ang, 2001). The criteria used towards

including contract workers belonging to out-sourcing firms was that they had to be local and on-site as opposed to off-shore or off-site.

Contract software developers typically have bounded employment arrangements with the contracting organizations. They get paid according to an hourly rate. Usually, the contracting firm does not pay for contractor retirement, medical, and vacation benefits. Contract software developer roles and responsibilities are typically pre-defined for the given contract period.

Studies have found that the work status (contract versus permanent) of software developers also affects the job characteristics experienced by them (Slaughter & Ang, 2001). In other words, contract and permanent software developers experience different job characteristics.

2.2 Experienced Job Characteristics and Work Outcomes

In this section we review the literature on the job characteristics experienced by contract and permanent software developers. Drawing on Job Characteristics Theory (Hackman & Oldham, 1976, 1980) we develop hypotheses about the effect of the experienced job characteristics on the performance and behaviors of contract and permanent software developers. The portion of the conceptual research model (shown earlier in Figure 2.1) developed in this section is depicted in Figure 2.2.

2.2.1 Experienced Job Characteristics: The Effect of Work Status

Contract software developers are often recruited and assigned to specific projects such as maintenance or configuration of software and related activities such as writing code. Permanent software developers, on the other hand may be involved with various projects in the course of their tenure with the organization. As such, they engage in various activities such as analysis, design, implementation etc. Therefore, we expect that the overall variety of tasks experienced by the contract software developers will be less than the variety of tasks experienced by the permanent software developers.

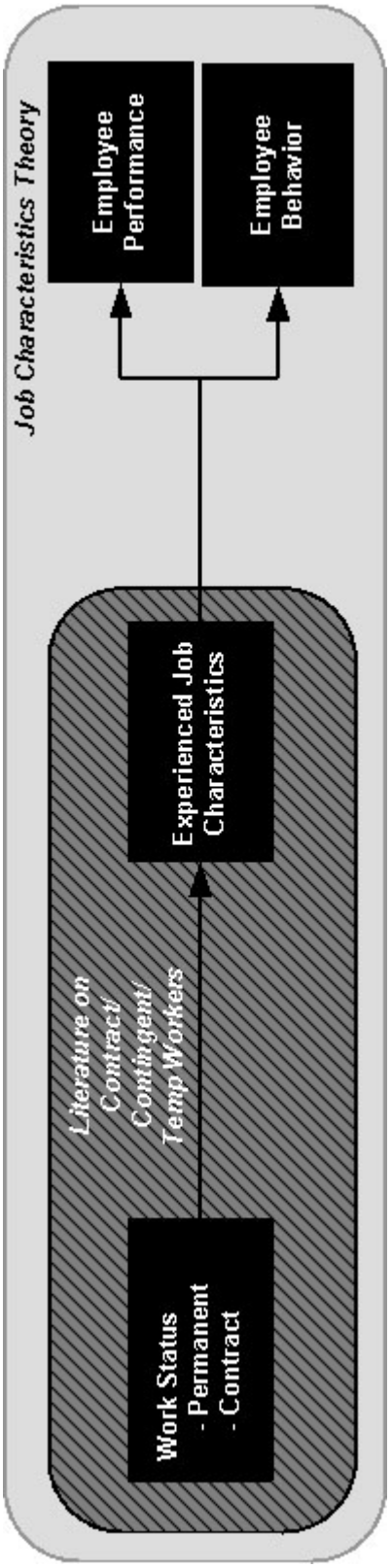

Figure 2.2: Experienced Job Characteristics and Work Outcomes

Contract software developers who work in multiple organizations over time may experience a variety of tasks, but while they are employed in a particular organization, we expect that their experience of the variety of tasks assigned to them will be limited as compared to their permanent counterparts in the same organization.

H1a: The task variety experienced by contract software developers is lower than the task variety experienced by permanent software developers.

Contract software developers are often hired for a specific period and assigned limited tasks or tasks with limited scope in order to manage the job within the hire period. As a result, they may not have the opportunity to understand the broader job context nor be around to see the full development outcome. This limits their ability to understand the scope, context or the history behind the work from an organizational perspective; understand the significance of their contribution to the organization; or, derive a sense of accomplishment intrinsically from the job. Permanent software developers, on the other hand, are often involved with tasks of longer duration or wider scope and are better positioned in the organization to understand the broader job context and see the full development outcome. Overall, we believe that this leads to contract software developers experiencing lower task identity, lower task significance, and a lower sense of accomplishment as compared to the permanent software developers.

H1b: The task identity experienced by contract software developers is lower than the task identity experienced by permanent software developers.

H1c: The task significance experienced by contract software developers is lower than the task significance experienced by permanent software developers.

H1d: The achievement experienced by contract software developers is

lower than the achievement experienced by permanent software developers.

Because contract software developers are recruited for specific tasks, they often have to utilize a narrow set of abilities/skills; whereas permanent software developers are typically expected to do multiple tasks requiring a wider variety of abilities/skills. Also, by virtue of being in the organization for a long time and being assigned to multiple tasks, permanent software developers develop a variety of technical and managerial skills. Contract software developers, in contrast, focus on a specific expertise that can be used in multiple organizations. Therefore, we expect that the ability/skill-level variety experienced by contract software developers will be lower than the ability/skill-level variety experienced by permanent software developers.

H1e: The ability/skill-level variety experienced by contract software developers is lower than the ability/skill variety experienced by permanent software developers.

Contract workers typically have more rigidly controlled access to organizational resources. They are given detailed instructions on what to do and how to do it with little room for negotiation (Slaughter & Ang, 2001). They are sometimes excluded from staff meetings, organizational events, team outings, etc. The reasons for the exclusion may be attributed to human resource policies, security policies, governance logistics, or issues of trust. Overall, we expect that contract software developers experience fewer opportunities for social interaction, communication, participation in job-related decisions, and autonomy than permanent software developers.

H1f: The communication experienced by contract software developers is lower than the communication experienced by permanent software developers.

H1g: The participation in job-related decisions experienced by contract

software developers is lower than the participation in job-related decisions experienced by permanent software developers.

H1h: The autonomy experienced by contract software developers is lower than the autonomy experienced by permanent software developers.

H1i: The social interaction experienced by contract software developers is lower than the social interaction experienced by permanent software developers.

Organizations often provide training and learning opportunities for their permanent employees. For permanent software developers, these opportunities are often factored into the IT budget. Often permanent software developers are allowed to participate in events like 'brown-bag' lunches or overview sessions on projects unrelated to their current project assignments. In contrast, contract software developers should have more limited training and learning opportunities provided to them by employers since these employees are contracted for a specific ability/skill. Contract software developers may receive an initial orientation during on-boarding but are unlikely to be sent to conferences or other training events that focus on growing specific technical competence, especially since their training would not typically be accounted for in the IT budget. Therefore, we believe that the growth/learning experienced by contract software developers will be lower than the growth/learning experienced by permanent software developers.

H1j: The growth/learning experienced by contract software developers is lower than the growth/learning experienced by permanent software developers.

Permanent software developers will have formal performance reviews, through which, they receive work-related feedback, recognitions, and possibly promotions. Contract software developers, on the other hand, typically are not promoted within

the organization that is contracting them. Further, they may not receive regular performance reviews where they are provided with direct feedback or recognition from supervisors or co-workers (extrinsic feedback) on their performance. Typically, organizations either terminate the contract (or do not renew the contract when it ends) or search/request a different contractor, if the performance of a contract software developer is not satisfactory. Sometimes, informal feedback may be provided, but most organizations do not have formal review processes in place for temporary or contract associates. In addition, due to the lack of direct feedback from their peers or supervisors, contract software developers may also not receive feedback from the job itself. This could be attributed to the limited scope of their work, an inability to access systems (less autonomy), or limited understanding of the broader context of their work (lack of organizational context). Thus, we believe that the contract software developers will experience fewer opportunities for promotions and recognition, lower extrinsic feedback, and lower intrinsic feedback than permanent software developers.

H1k: The promotions experienced by contract software developers are lower than the job related promotions experienced by permanent software developers.

H1l: The recognition experienced by contract software developers is lower than the recognition experienced by permanent software developers.

H1m: The extrinsic job feedback experienced by contract software developers is lower than the extrinsic job feedback experienced by permanent software developers.

H1n: The intrinsic job feedback experienced by contract software developers is lower than the intrinsic job feedback experienced by permanent software developers.

Contract software developers are typically hired either for a short term or with a

closed contract that does not guarantee them any long-term job security. Permanent software developers usually have an open-ended employment arrangement which offers higher job security. These conditions are true for a stable market environment. If the organization is going through financial difficulties or mergers and acquisitions, the job security of all employees, regardless of their work status, could be affected. However, overall permanent workers have more job security provisions than contract workers (Bidwell & Briscoe, 2009). They are eligible for severance pay if they were laid off (Kodrzycki, 1998); some states impose legal limitations on a firm's ability to terminate employees (Autor, 2003); and, firms face substantial legal uncertainties when they terminate employees (Colvin, 2006). Contractors are excluded from these security provisions and employer guarantees. Instead, they are hired with the explicit understanding that their relationship with a firm can be terminated at any time (Bidwell & Briscoe, 2009). Therefore we believe that the job security experienced by contract software developers will be lower than the job security experienced by permanent software developers.

H1o: The job security experienced by contract software developers is lower than the job security experienced by permanent software developers.

Not all the job characteristics experienced by contract software developers are lower than permanent software developers. Contract software developers are typically hired at an hourly rate of wages. Their hourly rates are higher than the salaries offered to permanent employees. This is because, unlike permanent employees, the contract employees do not receive any other form of compensation such as retirement benefits, paid vacation, bonus, etc. Also, where contract associates are hired by engaging a recruiting firm, a percentage of the hourly wage goes towards the fees of the recruitment firm. Therefore, we believe that the pay adequacy (considering just the basic wage and not the retirement, vacation, bonus, and other incentives) for

contract software developers is higher than that of the permanent software developers.

H1p: The pay adequacy experienced by contract software developers is higher than the pay adequacy experienced by permanent software developers.

Contract software developers are often recruited for tasks that require skills/expertise that are not readily available among the permanent software developers. Further, unlike permanent software developers, contract software developers are provided less time to learn the tasks they are assigned. Thus, we believe that the abilities/skills requirements of the jobs experienced by contract software developers will be higher than the abilities/skills requirements of the jobs experienced by permanent software developers.

H1q: The ability/skill-level requirements of jobs experienced by contract software developers are higher than the ability/skill-level requirements of jobs experienced by permanent software developers.

Contract software developers are often provided with detailed specifications and clearly defined tasks as compared to permanent software developers. This could be because contract software developers are hired either for specific tasks or immediate well-defined business needs within the organization. Permanent software developers, on the other hand, perform a variety of tasks and may have changing goals and projects assigned to them. We believe that this would result in higher task or goal clarity experienced by contract software developers than permanent software developers.

H1r: The task/goal clarity experienced by contract software developers is higher than the task/goal clarity experienced by permanent software developers.

Having reviewed the literature on the job characteristics experienced by contract

and permanent software developers, we review the literature on the effect of the experienced job characteristics on the performance and behaviors of the software developers.

2.2.2 Work Outcomes of Software Developers: The Effect of Jobs

Cappelli and Sherer (1991; Pg 97) asserted that "[w]hat is unique about behavior in organizations is presumably being in the organization - the context of the organization - somehow shapes behavior and it is impossible to explore that uniqueness without an explicit consideration of the organization." Cappelli and Sherer (1991) and Cummings (1981) suggest that context encompasses stimuli and phenomena that surround and, thus, exist in the environment external to an individual - stimuli and phenomena such as technology, internal labor markets, etc. Newman (1975) argued that the organizational context affects the work outcomes of employees through the mediating construct of the perceived work environment. Consistent with this approach, the perceived or experienced job characteristics of employees are well accepted as motivators of behavior among employees.

Job Characteristics Theory (Hackman & Oldham, 1980) is the most accepted framework for explaining the relationships between job characteristics and the work outcomes of employees (Glick et al., 1986; Griffin, 1987). According to this framework, the characteristics of an individual's job primarily determine the individual's perceptions of and responses to tasks. Job characteristics affect an employee's critical psychological states, namely, the experienced meaningfulness of the work, the experienced responsibility for the outcomes of the work, and the knowledge regarding the results of the work activities. These critical psychological states result in positive personal and work outcomes such as high internal motivation and high quality performance. If a job offers workers interesting tasks, challenging work, a sense of achievement and an opportunity to use and develop skills, they are more likely to be

motivated.

Although several researchers have extended and revised the Hackman and Oldham framework for the Job Characteristics Theory (Idaszak et al., 1988; Idaszak & Drasgrow, 1987; Kulik et al., 1988; Campion, 1988), the essence of the literature on job characteristics has remained the same: that a job can be designed to motivate workers to better performance. In other words, characteristics of a job design affect the work outcomes of employees, both contract and permanent. Though individual differences among people determine how they perceive a job and what they consider to be interesting and challenging, managers who wish to motivate employees need to keep in mind that the job design has to be interesting to the person doing the job to realize the performance benefits.

In this study we focus on the effect of job characteristics on two work outcomes of software developers: their in-role job performance and their organizational citizenship behavior. These two work outcomes were chosen because (1) they are important to employers and (2) they are well established in literature and have accepted measures.

2.2.2.1 Job Characteristics and In-role Job Performance

In-role job performance is defined as the behavior required or expected from employees in performing their assigned job duties, activities and responsibilities (Slaughter & Ang, 2001). In-role job performance is a condition for continued employment and is required of all employees regardless of their work status. In-role job performance is an important managerial metric for organizations to make various decisions regarding employees. For example, a contract software developer's period of employment may be extended based on his or her in-role job performance. Similarly, a permanent software developer's promotion, bonus or increment may depend on his or her in-role job performance. Maximizing the in-role job performance among employees is important for any organization in order to achieve higher productivity among

employees, higher flexibility, or improvements in core competencies.

Several studies have reported a significant effect of various job characteristics on the performance of employees (Wall & Jackson, 1995; Griffin, 1991; Wall et al., 1990). Wall and Jackson (1995) found that job autonomy facilitates the time necessary for learning and development, which in turn, improves performance. Griffin (1991) found that the performance of the bank tellers significantly improved following the re-design of their jobs. Wall et al. (1990) found increased performance among operators when the manufacturing technology implemented in the organization, increased the operator's autonomy, skill variety, task identity, and task significance.

According to Job Characteristics Theory (Hackman & Oldham, 1976, 1980), the nature of jobs induce psychological states that lead to satisfaction, motivation and job performance. According to the literature on employees with different work statuses, work status (contract versus permanent) determines the in-role job performance of employees. The question then is: how are the work status of employees, their experienced job characteristics and their in-role job performance related?

Slaughter & Ang (2001) found differences in the job characteristics experienced by contract and permanent software developers. They also found differences in the in-role performance of contract and permanent software developers. Based on these findings, they proposed that the in-role job performance of software developers is affected directly by the job characteristics they experience rather than by their work status. We believe that the job characteristics experienced by software developers affects the relationship between their work status (contract and permanent) and their in-role job performance.

H2a: Experienced job characteristics mediate the relationship between the work status of software developers (contract and permanent) and their in-role job performance.

2.2.2.2 Job Characteristics and Organizational Citizenship Behavior

Organizational citizenship behavior (OCB) is defined as the "individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system and that in aggregate promotes the effective functioning of the organization" (Organ, 1988; p. 4). It is behavior that goes beyond the formal requirements of the job and, yet, is beneficial to the organization.

Researchers have defined organizational citizenship behavior using a variety of dimensions, such as, altruism, conscientiousness, sportsmanship, courtesy, civic virtue (Organ, 1988), obedience, loyalty, advocacy participation, social participation, functional participation (Van Dyne et al., 1994), helping, voice (Van Dyne et al. 1995, Van Dyne & LePine, 1998), and organization-focused and interpersonal-focused organizational citizenship behaviors (Williams & Anderson, 1991). The most important aspect of all these dimensions is that unlike in-role job performance, they are voluntary rather than mandatory behaviors. Organ and Konovsky (1989) divided OCB into two categories of behaviors: interpersonal-focused citizenship behaviors and organization-focused citizenship behaviors. Interpersonal-focused citizenship behaviors (OCBI), or altruism, is helping another employee who has been absent or helping a supervisor with a problem or making suggestions to improve conditions, even though it is not required. Organization-focused citizenship behavior (OCBO), or compliance, is doing what needs to be done and following rules, such as coming to work on time, not wasting organizational assets, etc.

OCB is an interesting metric for organizations because of its effect on both the performance evaluation of employees and organizational effectiveness. According to DeNisi, Cafferty, and Meglino (1984), managers search for distinctiveness information when they are asked to evaluate employees. Since OCB is not considered to be formally required by the organization, they are particularly distinctive forms of behavior

that the managers seek out and remember in the evaluation process. Thus, similar to in-role job performance, the OCB of employees affects the managerial evaluations of performance and judgments regarding pay raises, promotions, etc., (Podsakoff et al., 2000).

Organ (1988) proposed that OCB, when aggregated over time and people will enhance organizational effectiveness. Some ways in which OCB may contribute to organizational success are to: (1) enhance coworker and managerial productivity; (2) strengthen the organization's ability to attract and retain the best employees; and, (3) enable the organization to adapt more effectively to the environmental changes (Podsakoff et al., 2000).

OCB among employees is affected by job characteristics. Job characteristics such as task feedback and task routinization have been found to be significantly related to OCB such as altruism, courtesy, conscientiousness, sportsmanship, and civic virtue (Podsakoff & MacKenzie, 1995; Podsakotf et al., 1996a, 1996b, 1993). Munene (1995) found that there was a small but significant correlation between OCB and salary levels. Employees who feel well-treated and have positive job attitudes are likely to respond with OCB. For example, if the job allows employees to access information regarding the overall organization, employees can understand better how their efforts contribute to overall organizational performance. The more employees understand the operations and activities of an organization, the more eager they are to help solve problems.

Based on the above, we expect that the job characteristics experienced by software developers will affect organizational citizenship behaviors. Studies have reported differences in organizational citizenship behaviors among contract and permanent software developers (Slaughter & Ang, 2001; Van Dyne & Ang, 1998). This raises the

following question: is there a relationship between the work status of software developers (contract and permanent), their experienced job characteristics and their organizational citizenship behaviors? We believe that the job characteristics experienced by contract and permanent software developers affect the relationship between their work status (contract and permanent) and organizational citizenship behaviors.

H2b: Experienced job characteristics mediate the relationship between the work status of software developers (contract and permanent) and their organizational citizenship behaviors.

In this section we reviewed evidence of the relationships between the experienced job characteristics and the performance and behaviors of contract and permanent software developers. As describer earlier in this chapter, environment factors like job characteristics are not the only factors that affect the performance and behaviors of employees. Employees may have different individual needs, such as their job-related expectations and preferences that may also affect their performance and behaviors. According to Person-Job (P-J) Fit Theory the person and the job operate as join determinants of individual and organizational outcomes (Lewin, 1951; Murray, 1938). If there is a match or fit between the person (P) and the job (J), there will be higher performance and stronger motivation resulting in desired organizational behaviors, than when there is a mismatch or misfit. In the next section, we review the literature on Person-Job Fit Theory as a framework to develop our hypotheses regarding the effect of Person factors (expected job characteristics and preferred job characteristics) on the relationship between Job factors (experienced job characteristics) and the performance and behaviors of contract and permanent software developers.

2.3 Person Job Fit

Theorists have debated the best ways to design jobs that result in high performance and desired organizational behaviors. Some theorists proposed making jobs

simpler, others such as Herzberg (1966), suggested making jobs more challenging and interesting. Both approaches, however, failed to take a contingency view of how individual factors may affect whether the job would motivate an employee. Hackman & Oldham (1976, 1980) proposed that to motivate an employee, managers must consider both the job-design and the individual employee needs. This needs-supplies perspective is well known in the Person-Job (P-J) Fit Theory where the person's needs and what the job supplies operate as join determinants of individual and organizational outcomes (Lewin, 1951; Murray, 1938). According to this theory, the key to designing a job that motivates employees to perform well is to match the employee and the job.

Person-Job (P-J) Fit is a specific conceptualization of a broader P-E (Person - Environment) Fit Theory (also termed as congruence, correspondence or match) which has pervaded theory and research across multiple domains, including job and candidate selection, job design, requirement, attitudes, stress, leadership, goals, teams, human resources management practices, and organizational design. At its core, P-E Fit Theory is concerned with selected individual characteristics in conjunction with selected work environment characteristics and the match, or alignment, between these characteristics at various levels of abstraction (Ostroff & Schulte, 2007). As such, P-E Fit Theory research reflects a multilevel perspective of organizations that include both micro, or individual-level variables and macro, or contextual or organizational variables. Since several aspects of P-E Fit Theoryare not relevant to this study, we describe only those aspects that are relevant to this study.

The notion of fit is often described from two perspectives: supplementary fit and complementary fit (Edwards, 2007, Kristof, 1996, Muchinsky & Monahan, 1987).

Supplementary fit occurs when the person "supplements, embellishes, or possesses characteristics that are similar to other individuals" in the environment (Muchinsky & Monahan, 1987, p. 269), e.g., when a person's values are similar to an organization's

values). In other words, supplementary fit is essentially interpersonal similarity, or, the comparison between the person and their social environment as defined by other people in the environment (Edwards & Shipp, 2007).

Complementary fit occurs when a "weakness or need of the environment is offset by the strength of the individual, and vice versa" (Muchinsky & Monahan, 1987, p. 271). Edwards & Shipp (2007) defined complementary fit as the extent to which the individual and the organization provide what the other requires. Complementary fit can be further distinguished in two ways (demands-abilities versus needs-supplies) based on whether the requirements are imposed by the person or the environment.

Demand-abilities fit describes the match between the demands of the environment, requirements placed on the person (task, work role, social context) by the environment, and the degree to which the demands are fulfilled by the abilities of the person (skills, aptitude, proxies for aptitude such as education and experience) (Edwards, 1991; Edwards & Shipp, 2007; French et al., 1982; Kristof 1996; McGrath, 1976). When applied to the Person-Job Fit Theory, this perspective concerns job demands and the employee's abilities available to meet those demands.

Needs-supplies fit describes the match between the needs of the person, requirements or desires (reflected by various personal attributes such as psychological needs, goals, values, interests, motives and preferences) placed on the environment by the person, and the degree to which the person's needs are fulfilled by the supplies in the environment (such as job and occupational characteristics) (Cable & DeRue, 2002; Edwards, 1991; Edwards & Shipp, 2007; French et al. 1982; Kristof, 1996). When applied to the Person-Job Fit Theory, this perspective concerns employee's needs (such as the need for recognition, autonomy in the job, and role-clarity with respect to the job) and the job characteristics that the environment supplies to meet those needs.

In this study, we leverage the Complementary Needs-Supplies perspective of Person-Job Fit Theory. We believe that contract and permanent software developers have needs related to their jobs and that their performance and behaviors are affected by the match between their needs and the supplies made available to them by their jobs. We evaluate two types of job-related needs of the contract and the permanent software developers: (1) the expectations regarding job characteristics, and (2) the preferences regarding job characteristics. The choice of these constructs to measure the needs of contract and permanent software developers is based on two factors. First, these constructs (job-related expectations and job-related preferences) lend themselves easily for a commensurate measurement of person-job fit. Commensurate measurement, i.e., describing both the source variables of fit using the same content dimensions, is often recommended for assessing fit because it ensures mutual relevance of the characteristics under investigation (Caplan, 1987, Kristof, 1996, Edwards, 1991). Commensurate measurement is explained in more detail in Chapter 3 when we discuss the study measures. Second, expectations and preferences have been used as motivation factors in studies related to contract and temporary workers (Morrison & Robinson, 1997; Wanous & Conella, 1989; Wanous et al., 1992).

In this section, we described the needs-supplies perspective of the Person-Job Fit Theory. In the next section, we use this needs-supplies perspective to predict the effect of the expected job characteristics of contract and permanent software developers on their performance and behaviors.

2.4 Expected Job Characteristics and Work Outcomes

The needs-supplies perspective of the Person-Job Fit Theory, when applied to the job-related expectations of employees implies that employees believe they will experience specific types of job characteristics, and these expectations represent their needs.

Specifically, such expectations (needs) may encompass attributes such as pay, benefits, training, and skill development. An employee's expectation, belief or perception regarding specific inducements from the organization in exchange for their service, is also known as the psychological contract of the employee (Rousseau, 1995). According to Psychological Contract Theory (Rousseau, 1995), if the expected inducements (needs) of employees are not met (supplied) by the organization, then the psychological contract of the employee is violated, resulting in several undesirable work outcomes. We believe that Psychological Contract Theory (Rousseau, 1995) provides a good framework to understand the differences in the job-related expectations of contract and permanent software developers and the impact of the fit between the expected and the experienced job characteristics on their performance and behaviors. We review Psychological Contract Theory (Rousseau, 1995) next and develop our hypotheses regarding the expected job characteristics of contract and permanent software developers. Figure 2.3 shows the portion of the conceptual research model developed in this section.

2.4.1 Expected Job Characteristics: The Effect of Psychological Contracts

Psychological contracts are beliefs, based upon promises expressed or implied, regarding an exchange agreement between an individual and, in organizations, the employing firm and its agents (Rousseau, 1995). The "beliefs" refer to employee perceptions and the implicit and the explicit promises regarding the exchange of the employee contributions (e.g., effort, loyalty) for organizational inducements (e.g., pay, promotion, security) (Robinson et al., 1994; Conway & Briner, 2002). Although psychological contracts share certain features, they can also take many forms depending upon the nature of the work, the employment relationship, and employee motives (Rousseau, 2004). Sometimes the psychological contracts can involve expectations regarding the simple economic transactions that temporary work entails. Other times,

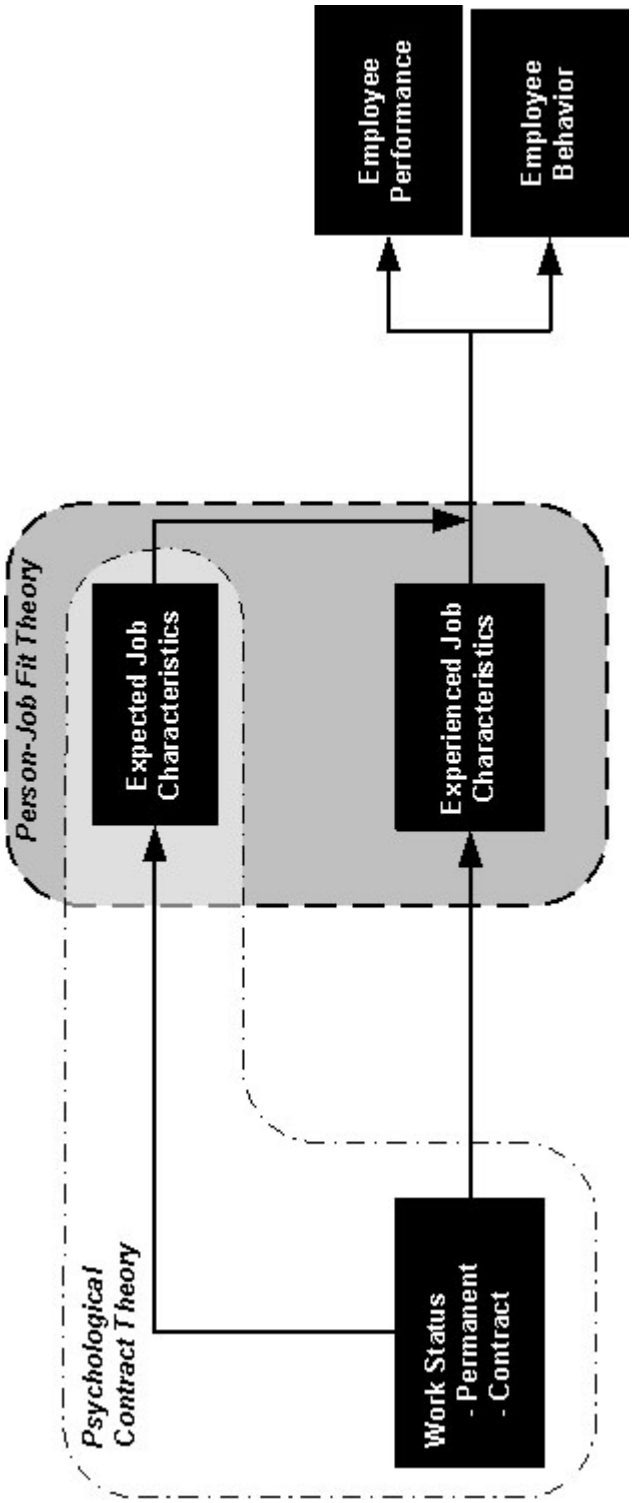

Figure 2.3: Work Status, Expected-Experienced Job Characteristics Fit, Work Outcomes

it involves expectations regarding various longer term relational commitments.

There are three types of psychological contracts that differ based on specificity, scope, and flexibility of the employment relationship: (1) transactional, (2) relational, and, (3) hybrid or balanced. Transactional psychological contracts are based on economic or extrinsic exchanges, closed ended employment terms, highly competitive wage rates, clear expectations (e.g., pay for time worked), narrow involvement in the organization and the absence of long-term commitment (Rousseau, 1989, 2004; Beard & Edwards, 1995). Relational psychological contracts are based on the exchange of socio-emotional as well as monetizable exchanges (e.g., an employee works hard in exchange for job security or recognition), long-term or open ended employment terms, high degree of flexibility, dynamic, evolving expectations, relationships between the employer and the employee and long-term stability (Rousseau, 1989, 2004, Beard & Edwards, 1995) . Hybrid or balanced contracts combine the involvement and long-term horizon of relational contracts while at the same time allowing for re-negotiation of the contract requirements as projects evolve and circumstances change (Rousseau, 2004).

The employment terms of contract and permanent employees differ in type, length, depth and other contractual aspects such as performance level agreements, incentives and penalties. From a social exchange perspective, we expect that contract workers will adopt a psychological contract with less emphasis on socioemotional resources (relational) than on economic ones (transactional). The contract employees are hired by agencies that provide temporary labor to client organizations. The agency provides a salary and certain limited human resource services for these contract employees. The contract employees form perceptions about what they receive in their exchange relationships with their agencies. But they also form perceptions of the way in which they are treated by their client organizations. Liden et. al. (2003) found that

because contract workers (contingents) work for consecutive months within the same client organization, they develop attitudes concerning their client organizations. Such attitudes may be related to work outcomes that are salient to the client organizations. Their work status causes them to receive fewer socio-emotional inducements from the organization they work for (e.g., opportunities for promotion and career development) than permanent workers. Based on this, we expect that job-related expectations of the contract and permanent software developers will be different.

Contract software developers are assigned specific tasks which are narrow or very specific in scope and can be completed within a limited or bound time-frame. Tasks that are narrow in scope reduce the degree of intrinsic feedback, identity or significance that an employee can achieve from them. The rigid time-frames of employment or the assigned projects/tasks restricts the variety that can be expected. Thus, we believe that the expectations of contract software developers regarding job characteristics such as intrinsic feedback, task variety, task identity, and task significance will be lower than the expectations of permanent software developers regarding the same job characteristics.

H3a: The task variety expected by contract software developers is lower than the task variety expected by permanent software developers.

H3b: The task identity expected by contract software developers is lower than the task identity expected by permanent software developers.

H3c: The task significance expected by contract software developers is lower than the task significance expected by permanent software developers.

H3d: The intrinsic feedback expected by contract software developers is lower than the intrinsic feedback expected by permanent software developers.

The nature of the employment relationship of the contract software developers is bounded. Therefore, it is likely that they will expect less freedom or discretion in work scheduling, methods, procedures, or other decision-making aspects of their job. Permanent software developers, on the other hand, have open ended flexible relationships with the organization. They are likely to expect freedom or discretion with respect to the decisions, processes or tasks involved in their jobs. Thus, we believe that contract software developers will expect lower autonomy in the jobs assigned to them than permanent software developers.

H3e: The autonomy expected by contract software developers is lower than the autonomy expected by permanent software developers.

The employment relationship of contract developers is short-term and primarily based on an economic exchange. Therefore, we believe that the expectations of contract developers regarding long-term or socio-economical job characteristics such as growth/learning, promotion, achievement, recognition, and job security will be lower than the expectations of permanent software developers.

H3f: The growth/learning expected by contract software developers is lower than the growth/learning, expected by permanent software developers.

H3g: The promotion expected by contract software developers is lower than the promotion expected by permanent software developers.

H3h: The achievement expected by contract software developers is lower than the achievement expected by permanent software developers.

H3i: The recognition expected by the contract software developers is lower than the recognition expected by the permanent software developers.

H3j: The job security expected by the contract software developers is

lower than the job security expected by the permanent software developers.

Contract software developers are typically paid hourly wages and permanent software developers are salaried. Organizations compensate permanent employees with benefits such as retirement, insurance, and bonuses. Contract software developers on the other hand, receive no other benefits besides their hourly premium. Therefore, we believe that that contract software developers will expect higher hourly wages and pay adequacy than permanent software developers.

H3k: The pay adequacy expected by contract software developers is higher than the pay adequacy expected by permanent software developers.

The type, depth, and duration of employment relationships are not the only factors that affect the psychological contracts of employees. The psychological contracts of employees are influenced by the nature of the work itself. For example, the psychological contracts of software developers with respect to their jobs may be different than the psychological contracts of network administrators with respect to their jobs. This is because of the different tasks or requirements that the two jobs involve. We believe that by virtue of being software developers, the expectations of both the contract and the permanent software developers regarding certain job characteristics will be similar. We discuss these job characteristics next.

Software development jobs involve the creation of software systems and applications based on pre-defined requirements. Software developers are used to being handed requirements and creating or configuring applications and systems based on those requirements. Clarity is important to their work. Therefore, we believe that all software developers (contract or permanent) will expect clarity in their tasks or goals and overall jobs.

H3l: There is no difference between contract and permanent software

developers with respect to their expected task/goal clarity in their jobs.

Whether the employees are hired on a permanent basis or contract basis, software development jobs require the same ability/skill-levels. For example, if the job is to develop a website then the requirements of the job include knowledge of web development software languages and tools. Software developers understand the skills and abilities required for the software development related jobs. Both contract and permanent software developers who apply for the job or are recruited for such jobs will expect the job to require the same knowledge of web development software languages and tools. Thus, we believe that both contract and permanent software developers will have identical expectations about the abilities and skill-level requirements of the job.

H3m: There is no difference between contract and permanent software developers with respect to their expected abilities and skill-level requirements of their jobs.

Software development involves working with a variety of software languages, tools, technologies, applications, users and requirements. Further, software languages, tools, technologies, applications and business requirements are constantly evolving. Thus software developers have to possess a variety of abilities and skill-levels, enhance abilities and skill-levels and develop new abilities and skills. Therefore, we believe that both contract and permanent software developers will expect their jobs to require a variety of ability/skill-levels.

H3n: There is no difference between contract and permanent software developers with respect to their expected abilities and skill-level variety needed in their jobs.

Software development jobs involve working in a team environment. Software systems and applications are developed and configured based on specifications and feedback from business representatives, users, testers, co-developers, analysts, etc. Thus, proper communication, participation, social interaction and feedback from other people within the organization or team are vital to software development. We believe that both contract and permanent software developers will expect the same extrinsic feedback, social interaction, participation and communication in their jobs.

H3o: There is no difference between contract and permanent software developers with respect to their expected communication access available in their jobs.

H3p: There is no difference between contract and permanent software developers with respect to their expected participation in job-related decisions.

H3q: There is no difference between contract and permanent software developers with respect to their expected social-interaction in their jobs.

H3r: There is no difference between contract and permanent software developers with respect to their expected extrinsic job feedback.

In this section we hypothesized the expectations of contract and permanent software developers with respect to eighteen job characteristics. This serves as a foundation to review how the performance and behaviors of software developers are affected when their job-related expectations are not met. In the next section, we theorize on the effect of the fit between the expected and experienced job characteristics on the performance and behaviors of contract and permanent software developers.

2.4.2 Work Outcomes of Software Developers: The Effect of Expectations

According to Psychological Contract Theory, employees are motivated to fulfill the commitments made to their employers when they are confident that the employers will

reciprocate and fulfill their end of the bargain (Rousseau, 2004). Breach or violation of psychological contracts (perceptions, beliefs or expectations regarding the mutual obligations) can lead to various negative employee attitudes and behavior, including poor in-role job performance, low organizational citizenship behavior (Kidder, 1998; Van Dyne & Ang, 1998), high turn-over intention, high actual turn-over (Turnley & Feldman, 2000), reduced job satisfaction, reduced trust, and reduced organizational commitment (Robinson & Rousseau, 1994; Robinson, 1996; Robinson & Morrison, 2000).

Similar to Psychological Contract Theory (Rousseau, 1995), the Met Expectations Theory (Porter & Steers, 1973) has been used to study the effect of "un-met" expectations on one or more work outcomes such as job satisfaction, organizational commitment, intention to remain, job performance and behaviors (Turnley & Feldman, 2000; Wanous et al., 1992). While studies have compared the difference between psychological contract violation and unmet expectations and their inter-relationships (Robinson, 1996; Turnley & Feldman, 2000), for the purpose of this study, we focus on the commonality in both the theories that suggests that there are differences in the work outcomes of employees resulting from a mismatch of their experiences with their expectations. Our focus is the expected job characteristics of the contract and the permanent software developers, which represents a form of their needs. A psychological contract violation or mismatch of expectations occurs when the job characteristics experienced by software developers do not match their expected job characteristics. Alternately, when the needs of the contract and permanent software developers (expected job characteristics) are not supplied in the job (experienced job characteristics), there is no Person-Job (P-J) Fit. We believe that this lack of P-J Fit, or, breach of the psychological contract, or unmet-expectations, will in turn affect the performance and behaviors of the contract and permanent software developers.

For example, let us consider that a contract software developer is recruited by an organization for a web development job because of his ability/skills related to web technologies such as Active Server Pages, Java Server Pages, HTML, etc. The contract software developer expects to be assigned to projects that require abilities/skills for designing websites or web components. After recruitment, let us consider that the organization assigns the same software developer to a data warehouse project. Even if the organization may feel justified in trying to assigning developers to projects as they deem appropriate, the contract software developer's expected job characteristic (ability/skill requirement for web site development) will not match his experienced job characteristics (ability/skill requirement for data warehouse development). We believe that this mismatch between the expected and experienced job characteristic will affect the performance and behavior of the contract software developer.

Similarly, a permanent software developer in an organization who has several years of experience designing a software application may expect to be assigned significant tasks (such as designing enhancements) related to the software application. Now, let us consider that a contract software developer is instead assigned to those significant tasks related to the software application. Again, the organization may have justifications regarding the task assignment. However, the permanent software developer's expected job characteristic (task significance) will not match his experienced job characteristics. We believe that this mismatch between the expected and experienced job characteristic will affect the performance and behavior of the permanent software developer.

The purpose of the above examples is not to suggest that organizations deliberately violate the job characteristics expected by software developers. The examples indicate that a mismatch may happen between the job characteristics experienced by the software developers and the job characteristics they expected, which in turn, based

on Psychological Contract Theory, may affect their work outcomes. The examples highlight the need for a P-J Fit for desirable work outcomes. Specifically, we believe that a P-J Fit, between the expected job characteristics (person factor, needs) of software developers and the experienced job characteristics (job factor, supplies) will have a positive effect on their in-role job performance and organizational citizenship behaviors.

H4a: The fit between the expected and the experienced job characteristics of software developers is a significant predictor of their in-role job performance.

H4b: The fit between the expected and the experienced job characteristics of software developers is a significant predictor of their organizational citizenship behaviors.

In this section, we applied Psychological Contract Theory to hypothesize the effect of the fit between expected job characteristics (person factor, needs) and experienced job characteristics (job factor, supplies) on the performance and behavior of contract and permanent software developers. In the next section, we compare another attribute of contract and permanent software developers, namely, their preferred job characteristics. We also review the literature on the effect of the preferred job characteristics on the performance and behaviors of software developers.

2.5 Preferred Job Characteristics and Work Outcomes

An employee's job-related needs are not manifested solely by their expectations. Given equal constraints on getting different kinds of jobs, employees end up in jobs they prefer (Bidwell & Briscoe, 2009). Therefore we believe that in addition to job-related expectations, the job-related preferences of employees also reflect employee

needs. Preferences are predispositions, choices or self selections favored by individuals. Unlike expectations, which exist in the context of a specific relationship, preferences can exist even in the absence of a specific relationship (work arrangement with a specific organization). Job-related preferences may stem from a set of needs and values, alternately known as, career anchors, that an employee aspires to fulfill from the selection of a career (Schein, 1990). Job-related preferences may vary from employee to employee. For example, some employees prefer low job security and leapfrog between jobs using one job as a stepping-stone to another job (Rousseau, 1990). Some employees prefer to work for virtual teams because the incentives may include opportunities for high income or challenging work (March, 1995). Job-related preferences guide employees to look for jobs that offer those characteristics.

Schein's Career Anchors Theory (1975) suggests that an employee's career orientation influences the selection of (preferences for) specific occupations and work settings and if the preferences (needs) of employees are not met (supplied), then the employee's reactions to his or her work experiences are affected. Thus, Career Anchors Theory provides a good framework to understand the job-related preferences of contract and permanent software developers and the impact of the fit between the preferred (person factor, needs) and experienced job characteristics (job factor, supplies) of contract and permanent software developers on their performance and behaviors. In this section we review Career Anchors Theory and develop our hypotheses regarding the preferred job characteristics of contract and permanent software developers. The portion of the conceptual research model (shown in Figure 2.1) developed in this section is depicted in Figure 2.4.

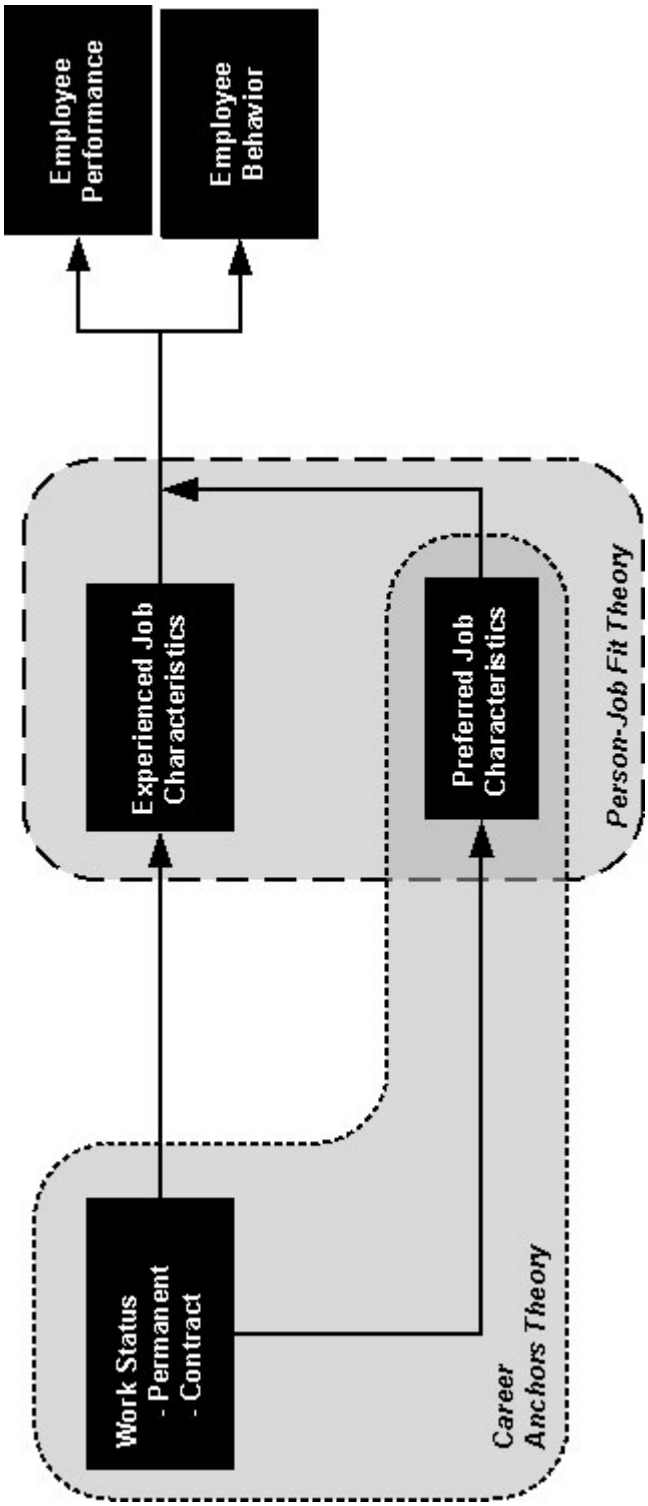

Figure 2.4: Work Status, Preferred-Experienced Job Characteristics Fit, Work Outcomes

2.5.1 Preferred Job Characteristics: The Effect of Career Anchors

In the context of an employment relationship, preferences of employees are work conditions and outcomes they would choose if they were given the opportunity. Employee preferences include preferences regarding their careers, work status (contract versus permanent), job characteristics, organizations, teams, etc. Various factors affect employee preferences. For example, employees' preferences regarding their careers are affected by self-perceived talents and abilities, basic values, and the evolved sense of motives and needs as they pertain to their careers (Schein, 1996). We believe that the needs that influence career choices, also known as the career anchors, will also influence the preferences regarding job characteristics.

Schein's original work (1978) described five career anchors: autonomy/independence, security/stability, technical/functional competence, general managerial competence, and entrepreneurial creativity. Subsequent work (1990) has revealed three additional anchors: service or dedication to a cause, pure challenge, and life-style. Career anchors of individuals affect their choice of careers. Although most people may have a predominant career anchor that they will not give up, most careers permit the fulfilling of several of the needs that underlie different anchors. Further, multiple career anchors drive various preferences that individuals may have with respect to their jobs. Studies have found that IT professionals have various career anchors such as technical competence, managerial competence, autonomy, service, challenge, etc. (Crepeau et al., 1992, Igbaria et al., 1991, Igbaria & Baroudi, 1993).

We believe that the choice of working as a contract or permanent employee for a career reflects various needs and values that software developers aspire to fulfill. This choice itself may be affected by career anchors such as autonomy/independence and security/stability. Contract software developers may prefer independence and jobs that offer a higher pay to benefits such as job security, promotions, achievement,

and recognition associated with a permanent work arrangement. Similarly, permanent software developers, may prefer the security of a long-term relationship with an organization, along with benefits such as, promotions, achievement, and recognition even if the trade off is a lower salary.

H5a: The promotion preferred by contract software developers is lower than the promotion preferred by permanent software developers.

H5b: The achievement preferred by contract software developers is lower than the achievement preferred by permanent software developers.

H5c: The recognition preferred by contract software developers is lower than the recognition preferred by permanent software developers.

H5d: The job security preferred by contract software developers is lower than the job security preferred by permanent software developers.

H5e: The pay adequacy preferred by contract software developers is higher than the pay adequacy preferred by permanent software developers.

While work status preference and career anchors such as autonomy/independence and security/stability may influence the preferences for certain job characteristics among contract and permanent software developers, both contract and permanent software developers may have similar preferences for other job characteristics based on other career anchors.

Software developers constantly have to keep up with the changing technological world. In order to remain technically competent, they constantly have to update and relearn skills. We expect that both the contract and the permanent software developers will prefer jobs that have a variety of tasks that enhance their technical and managerial competence, enhance their learning, and require a variety and high levels of abilities and skills. Therefore, we believe that both contract and permanent software developers will have similar preferences for job characteristics such as task

variety and ability/skill variety. We also believe that they will have similar preferences for growth/learning where growth represents personal growth and not career advancement via promotions.

H5f: There is no difference between contract and permanent software developers with respect to their preferred task variety in their jobs.

H5g: There is no difference between contract and permanent software developers with respect to their preferred ability/skill variety in their jobs.

H5h: There is no difference between contract and permanent software developers with respect to their preferred ability/skill level requirements of their jobs.

H5i: There is no difference between contract and permanent software developers with respect to their preferred growth/learning in their jobs.

Schein (1996) suggested that as work becomes more technically complex, everyone will be expected to be somewhat competent at self-management and leadership. Therefore, we believe that technical workers such as software developers, regardless of their work status (contract or permanent), will prefer jobs that provide self-management and leadership opportunities, such as, making choices regarding their work (autonomy), participating in job-related decisions (participation), owning a task from beginning to end (task identity), and executing tasks that are significant to the organization.

H5j: There is no difference between contract and permanent software developers with respect to their preferred autonomy in their jobs.

H5k: There is no difference between contract and permanent software developers with respect to their preferred participation in their job-related decisions.

H5l: There is no difference between contract and permanent software

developers with respect to their preferred task identity in their jobs.

H5m: There is no difference between contract and permanent software developers with respect to their preferred task significance in their jobs.

Schein (1996) states that the service career anchor will guide employees towards jobs that are meaningful in a larger context. As the IT industry moves towards a more service oriented approach, we believe that software developers, regardless of their work status (contract or permanent), will prefer to understand the value of their service. To that end, we believe that they will prefer job characteristics such as, access to communication that helps them understand the organizational processes in a larger context and identify with the organizational mission. We also believe that they will prefer to get feedback about their service that will help them improve. Finally, we believe that social interaction will be important to software developers as they collaborate with each other on teams to provide services.

H5n: There is no difference between contract and permanent software developers with respect to their preferred communication in their jobs.

H5o: There is no difference between contract and permanent software developers with respect to their preferred social interactions in their jobs.

H5p: There is no difference between contract and permanent software developers with respect to their preferred extrinsic feedback in their jobs.

Software developers create, maintain, or configure applications for business needs. In order to meet business requirements successfully, task/goal clarity is important. In addition, the tasks themselves must be measurable in terms of quality and quantity so that the software developers can understand their performance and adjust it to meet the needs of the business. Therefore, we believe that both contract and permanent software developers will have similar preferences with respect to job characteristics like task/goal clarity and intrinsic job feedback.

H5q: There is no difference between contract and permanent software developers with respect to their preferred task/goal clarity in their jobs.

H5r: There is no difference between contract and permanent software developers with respect to their preferred intrinsic job feedback in their jobs.

In this section, we hypothesized the preferences of contract and permanent software developers as they relate to eighteen job characteristics. This serves as a foundation to review how the performance and behaviors of software developers are affected when their job-related preferences are not met by the jobs they experience. In the next section, we review the literature on the effect of the fit between the preferred and experienced job characteristics on the performance and behaviors of contract and permanent software developers.

2.5.2 Work Outcomes of Software Developers: The Effect of Preferences

The literature on career-anchors suggests that an employee's career orientation influences the selection of specific occupations and work settings and it affects the employee's reactions to his or her work experiences (Schein, 1975). A job is compatible with a career orientation when it involves job duties and assignments that the employee finds interesting (or prefers), when it requires abilities that the employee values (or prefers) and when it provides rewards that the employee finds desirable (or prefers) (Igbaria et al., 1991).

Job Characteristics Theory (Hackman & Oldham, 1980) also suggests that the need for fulfillment of high order needs such as personal growth, autonomy or achievement (growth need strength) moderates the relationship between job characteristics and the psychological states that affect work related outcomes. Growth Need Strength represents the individual's desire (preferences) to obtain growth satisfactions from his or her job. It affects how positively employees respond to a job with high motivating

potential. Individuals who strongly value and desire personal feelings of accomplishment and growth, respond positively to a job high in motivating potential. Individuals who do not value personal growth and accomplishment may find such a job stressful.

Work motivation and Person-Job Fit studies have also found that the variation in the individual employees' preferences for employment arrangements result in attitudinal and behavioral differences related to different employment arrangements (Enns et al., 2002). Holtom et al., (2002), found that the degree to which employers match employee preferences for full-time versus part-time status, schedule, shift and number of hours, is associated with positive attitude and behaviors such as in-role job performance, extra-role performance, organizational commitment, satisfaction, and retention. Stamper and Van Dyne (2001) found that when employees were dissatisfied with their work status (i.e., experienced a mismatch between their preferred work status and actual work status), they avoided citizenship behavior.

Let us consider that a contract software developer prefers a job that always involves the same task (low variety), but, the job assigned to the contract software developer involves multiple tasks that vary in nature. The high task variety of the job will result in a violation of the contract software developer's preference for low task variety. This mismatch between the preferred and experienced job characteristics may negatively influence his performance and behavior. Now let us consider that a permanent software developer prefers a job that involves learning opportunities, but, he is assigned a job that does not provide any opportunities for learning. This will result in a violation of his preferences, ultimately leading to lower organizational citizenship behavior and poorer in-role job performance.

The examples indicate that a mismatch may exist between the job characteristics experienced by the software developers and the job characteristics they prefer, which in turn may negatively affect their work outcomes. Ultimately, the need for a

Person-Job fit for desirable work outcomes is highlighted. Specifically, we believe that a Person-Job (P-J) fit between the preferred job characteristics (person factor, needs) and the experienced job characteristics (job factor, supplies) of contract and permanent software developers will have a positive effect on their in-role job performance and organizational citizenship behaviors.

H6a: The fit between the preferred and experienced job characteristics of software developers is a significant predictor of their in-role job performance.

H6b: The fit between the preferred and experienced job characteristics of software developers is a significant predictor of their organizational citizenship behavior.

In this section, we applied Career Anchors Theory to hypothesize the effect of the Person-Job Fit between the preferred job characteristics (person factor, needs) and the experienced job characteristics (job factor, supplies) on the performance and behavior of contract and permanent software developers. In the next section, we summarize the research model and the hypotheses developed.

2.6 Model and Summary of Research Hypotheses

In the previous sections we developed the hypotheses for our study. In this section we present the research model (2.5) depicting the hypothesized relationships between the main constructs in the study. In addition, a summary of all study hypotheses is presented in Table 2.1.

The main constructs in the research model are the work status of software developers, the job characteristics-related constructs (experienced, expected, and preferred job characteristics), and the work outcome-related constructs (in-role job performance and organizational citizenship behavior).

Hypotheses H1a through H1r associate the work status of software developers

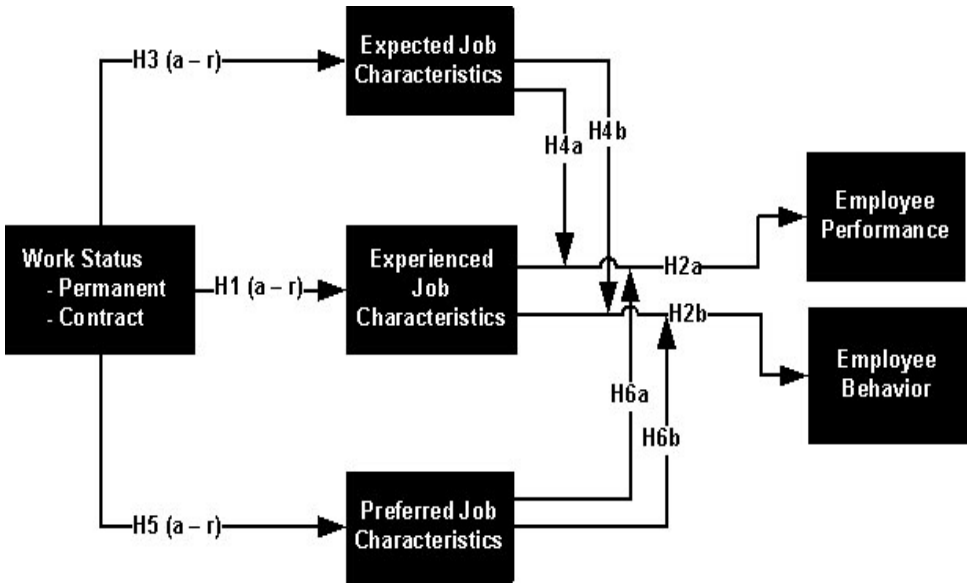

Figure 2.5: Research Model

(contract versus permanent) with their experienced job characteristics. Hypotheses H3a through H3r associate the work status of software developers (contract versus permanent) with their expected job characteristics. Hypotheses H5a through H5r associate the work status of software developers (contract versus permanent) with their preferred job characteristics. Hypotheses H2a and H2b propose the mediating effect of experienced job characteristics on the relationship between work status and in-role job performance and organizational citizenship behavior. Hypotheses H4a and H4b propose the effect of Person-Job Fit between the expected job characteristics (Person Factor, needs) and the experienced job characteristics (Job Factor, supplies) on the in-role job performance and organizational citizenship behavior of software developers. Hypotheses H6a and H6b propose the effect of the Person-Job Fit between the preferred job characteristics (Person Factor, needs) and the experienced job characteristics job characteristics (Job Factor, supplies) on the in-role job performance and organizational citizenship behavior of software developers.

Table 2.1: Summary of Hypotheses

	Experienced Job Characteristics
H1a	The task variety experienced by contract software developers is lower than the task variety experienced by permanent software developers.
H1b	The task identity experienced by contract software developers is lower than the task identity experienced by permanent software developers.
H1c	The task significance experienced by contract software developers is lower than the task significance experienced by permanent software developers.
H1d	The achievement experienced by contract software developers is lower than the achievement experienced by permanent software developers.
H1e	The ability/skill-level variety experienced by contract software developers is lower than the ability/skill variety experienced by permanent software developers.
H1f	The communication experienced by contract software developers is lower than the communication experienced by permanent software developers.
H1g	The participation in job-related decisions experienced by contract software developers is lower than the participation in job-related decisions experienced by permanent software developers.
H1h	The autonomy experienced by contract software developers is lower than the autonomy experienced by permanent software developers.
H1i	The social interaction experienced by contract software developers is lower than the social interaction experienced by permanent software developers.
H1j	The growth/learning experienced by contract software developers is lower than the growth/learning experienced by permanent software developers.

Table 2.1: (continued)

H1k	The promotions experienced by contract software developers are lower than the job related promotions experienced by permanent software developers.
H1l	The recognition experienced by contract software developers is lower than the recognition experienced by permanent software developers.
H1m	The extrinsic job feedback experienced by contract software developers is lower than the extrinsic job feedback experienced by permanent software developers.
H1n	The intrinsic job feedback experienced by contract software developers is lower than the intrinsic job feedback experienced by permanent software developers.
H1o	The job security experienced by contract software developers is lower than the job security experienced by permanent software developers.
H1p	The pay adequacy experienced by contract software developers is higher than the pay adequacy experienced by permanent software developers.
H1q	The ability/skill-level requirements of jobs experienced by contract software developers are higher than the ability/skill-level requirements of jobs experienced by permanent software developers.
H1r	The task/goal clarity experienced by contract software developers is higher than the task/goal clarity experienced by permanent software developers.
	Experienced Job Characteristics and Work Outcomes
H2a	Experienced job characteristics mediate the relationship between the work status of software developers (contract and permanent) and their in-role job performance.

Table 2.1: (continued)

H2b	Experienced job characteristics mediate the relationship between the work status of software developers (contract and permanent) and their organizational citizenship behaviors.
	Expected Job Characteristics
H3a	The task variety expected by contract software developers is lower than the task variety expected by permanent software developers.
H3b	The task identity expected by contract software developers is lower than the task identity expected by permanent software developers.
H3c	The task significance expected by contract software developers is lower than the task significance expected by permanent software developers.
H3d	The intrinsic feedback expected by contract software developers is lower than the intrinsic feedback expected by permanent software developers.
H3e	The autonomy expected by contract software developers is lower than the autonomy expected by permanent software developers.
H3f	The growth/learning expected by contract software developers is lower than the growth/learning, expected by permanent software developers.
H3g	The promotion expected by contract software developers is lower than the promotion expected by permanent software developers.
H3h	The achievement expected by contract software developers is lower than the achievement expected by permanent software developers.
H3i	The recognition expected by contract software developers is lower than the recognition expected by permanent software developers.

Table 2.1: (continued)

H3j	The job security expected by contract software developers is lower than the job security expected by permanent software developers.
H3k	The pay adequacy expected by contract software developers is higher than the pay adequacy expected by permanent software developers.
H3l	There is no difference between contract and permanent software developers with respect to their expected task/goal clarity in their jobs.
H3m	There is no difference between contract and permanent software developers with respect to their expected abilities and skill-level requirements of their jobs.
H3n	There is no difference between contract and permanent software developers with respect to their expected abilities and skill-level variety needed in their jobs.
H3o	There is no difference between contract and permanent software developers with respect to their expected communication access available in their jobs.
H3p	There is no difference between contract and permanent software developers with respect to their expected participation in job-related decisions.
H3q	There is no difference between contract and permanent software developers with respect to their expected social-interaction in their jobs.
H3r	There is no difference between contract and permanent software developers with respect to their expected extrinsic job feedback.
Experienced-Expected Job Characteristics Fit and Work Outcomes	
H4a	The fit between the expected and the experienced job characteristics of software developers is a significant predictor of their in-role job performance.

Table 2.1: (continued)

H4b	The fit between the expected and the experienced job characteristics of software developers is a significant predictor of their organizational citizenship behaviors.
	Preferred Job Characteristics
H5a	The promotion preferred by contract software developers is lower than the promotion preferred by permanent software developers.
H5b	The achievement preferred by contract software developers is lower than the achievement preferred by permanent software developers.
H5c	The recognition preferred by contract software developers is lower than the recognition preferred by permanent software developers.
H5d	The job security preferred by contract software developers is lower than the job security preferred by permanent software developers.
H5e	The pay adequacy preferred by contract software developers is higher than the pay adequacy preferred by permanent software developers.
H5f	There is no difference between contract and permanent software developers with respect to their preferred task variety in their jobs.
H5g	There is no difference between contract and permanent software developers with respect to their preferred ability/skill variety in their jobs.
H5h	There is no difference between contract and permanent software developers with respect to their preferred ability/skill level requirements of their jobs.
H5i	There is no difference between contract and permanent software developers with respect to their preferred growth/learning in their jobs.

Table 2.1: (continued)

H5j	There is no difference between contract and permanent software developers with respect to their preferred autonomy in their jobs.
H5k	There is no difference between contract and permanent software developers with respect to their preferred participation in their job-related decisions.
H5l	There is no difference between contract and permanent software developers with respect to their preferred task identity in their jobs.
H5m	There is no difference between contract and permanent software developers with respect to their preferred task significance in their jobs.
H5n	There is no difference between contract and permanent software developers with respect to their preferred communication in their jobs.
H5o	There is no difference between contract and permanent software developers with respect to their preferred social interactions in their jobs.
H5p	There is no difference between contract and permanent software developers with respect to their preferred extrinsic feedback in their jobs.
H5q	There is no difference between contract and permanent software developers with respect to their preferred task/goal clarity in their jobs.
H5r	There is no difference between contract and permanent software developers with respect to their preferred intrinsic job feedback in their jobs.
Preferred-Experienced Job Characteristics Fit and Work Outcomes	
H6a	The fit between the preferred and the experienced job characteristics of software developers is a significant predictor of their in-role job performance.

Table 2.1: (continued)

H6b	The fit between the preferred and the experienced job characteristics of software developers is a significant predictor of their organizational citizenship behavior.

In this chapter we developed the theoretical framework for this study, developed the research model, and presented the hypotheses. In the next chapter, we discuss the participants, measures, procedures, and steps used for testing the various hypotheses in the study.

CHAPTER 3: RESEARCH METHODS

In the previous chapter, the research model for this study was discussed. In this chapter, we detail the methods used to test the model. The following sections describe the participants, the measures, the procedure and the steps for testing the hypotheses in the study.

3.1 Participants

The participants in this study were contract and permanent software developers employed at the IT division of 5 organizations in Charlotte, North Carolina. The companies represented various verticals such as Finance, Energy, Manufacturing, and Food Services. Originally, the Heads of IT of 14 organizations in Charlotte were approached with the proposal to participate in the study. Five (5) organizations did not respond and 4 organizations declined.

Each participating organization had to provide a list of contract and permanent software developers who could be approached to participate. The types of contract software developers who could participate were independent contractors, contract workers placed by staffing agencies, or contract workers working for outsourcing companies. The only criteria applied to the participation of contract employees was that they had to be in an on-site work arrangement, i.e., only local contract workers could participate. Contract workers directly employed by outsourcing companies and working off-shore, or off-site, were not included.

The total numbers of participants recruited across the 5 organizations were 153 software developers (112 permanent, 41 contract) and 33 managers (32 permanent,1 contract). A total of 109 software developers (84 permanent, 25 contract) and 28

managers (27 permanent, 1 contract) responded to the surveys for an overall estimated response rate of 74%. Within group response rates and demographic characteristics are discussed next.

Complete responses were received from 25 of the 41 contract software developers that were administered the survey (61% response rate). Most of the contract software developers who responded were older than 40 years. Eighty five percent (85%) of the contract software developers who responded were male and 15% were female. Most of the contract developers who participated had been with the organization for 1 - 3 years, had post-baccalaureate degrees, and more than 10 years of work experience.

Complete responses were received from 84 of the 112 permanent software developers that were administered the survey (71% response rate). Most of the permanent software developers who responded were older than 40 years. Sixty four percent (64%) of the permanent software developers who responded were male and 36% were female. Most of the permanent developers who participated had been with the organization for 7 - 10 years, had a baccalaureate degree, and more than 10 years of work experience.

Complete responses were received from 28 of the 33 managers that were administered the survey (85% response rate). The average age category for the managers was older than 40 years. Seventy one percent (71%) of the managers who responded were male and 29% were female. Most of the managers who participated had been with the organization for 7 - 10 years, had a baccalaureate degree, and more than 10 years of work experience. Table 3.1 shows the response rates.

3.2 Procedure

A list of contract and permanent software developers and their managers was received from each participating company. Two types of surveys, the employee survey and the manager survey, were administered at each company. The employee survey

Table 3.1: Response Rate Statistics

	Total	**Permanent**	**Contract**	**%P**	**%C**	**%Total**
Employees Survey Administered	153	112	41	73.2	26.8	100.0
Employees Responded*	**109**	**84**	**25**	**75.0**	**61.0**	**71.2**
Employees Not Responded	44	28	16	25.0	39.0	28.8
Managers Survey Administered	33	32	1	97.0	3.0	100.0
Managers Responded	28	27	1	84.4	100.0	84.8
Employees Rated by Managers	131	92	39	82.1	95.1	85.6
Employees Not Rated	22	20	2	17.9	4.9	14.4
Employees Responded and Rated**	**98**	**73**	**25**	**65.2**	**61.0**	**64.1**
Employees Responded Not Rated	11	11	0	9.8	0.0	9.2
Employees Not Responded and Rated	33	19	14	17.0	34.1	21.6
Employees Not Responded Not Rated	11	9	2	8.0	4.9	7.2

*** sample size for testing differences between contract and permanent IT workers, ** sample size for testing the effect of fit on the performance and behaviors of IT workers**

consisted of items that measured employee work status, demographics, and their experienced, expected, and preferred job characteristics. Five (5) identical employee surveys (1 for each participating company) were developed using a web-based survey technology (surveymonkey.com). A unique URL to the employee survey was sent via email to each employee provided in each company's list. Participation in the study was voluntary. Participants completed the survey via a web interface without providing any personal identification information.

The manager survey consisted of items that measured the performance and organizational citizenship behavior of the participating employees. Thirty-three (33) manager surveys (1 for each participating manager at each company) were developed using the same web-based survey technology (surveymonkey.com). Each manager's survey was comprised of a common set of questions for each employee they were expected to rate. The common set of questions repeated for each employee with each page listing the name of the employee to be rated. A unique URL to the manager's survey was sent to each of the participating managers via email. Participation of the supervisors/managers was also voluntary.

3.3 Measures

The measures chosen for this study were based on their validity, reliability, and pervasiveness in the relevant literature. Software developers rated their experienced job characteristics, expected job characteristics, and preferred job characteristics. IT Managers rated the in-role job performance and the organizational citizenship behavior of the software developers. All participants provided demographic information such as age, gender, education level, tenure , and years of work experience. A summary of the main constructs used in the study, the authors, the items, and their rating source is provided in Table 3.2.

Table 3.2: Constructs, Authors, Items, and Rating Source

Construct	Source	Items	Reported By
Work Status	Designed for this study	1	Software Developers and Managers
Experienced Job Characteristics	Motivational Questions from the Multimethod Job Design Questionnaire (MJDQ) (Campion, 1988)	18	Software Developers
Expected Job Characteristics	Modified version of the MJDQ (Campion 1988)	18	Software Developers
Preferred Job Characteristics	Modified version of the MJDQ (Campion 1988)	18	Software Developers
In-role Job Performance	Questions 1 – 7 of the performance scale developed by William & Anderson (1991)	7	Managers
Organizational Citizenship Behavior - Individual (OCBI)	Questions 8 – 14 of the performance scale developed by William & Anderson (1991)	7	Managers
Organizational Citizenship Behavior - Organization (OCBO)	Questions 15 – 21 of the performance scale developed by William & Anderson (1991)	7	Managers

3.3.1 Work Status

Participants indicated their work status (0 = contract, 1 = permanent).

3.3.2 Experienced Job Characteristics

Eighteen (18) items from the motivational scale of the Multimethod Job Design Questionnaire (MJDQ, Campion, 1988) were used to examine the job characteristics experienced by contract and permanent software developers. MJDQ provides an interdisciplinary approach to job design by combining the motivational, mechanistic, biological, and perceptual/motor aspects. However, in this study we focused only on the motivational aspect of this instrument. This focus was chosen because our purpose was to examine the characteristics of jobs that affect the motivation of employees and lead to higher in-role job performance and organizational citizenship behavior. This scale was also chosen because of its psychometric properties (Latham & Pinder, 2005). Although prior research on job characteristics of IT employees has mostly used the Job Diagnostic Survey (JDS, Hackman & Oldham, 1976), Sein & Bostrom (1991) found the JDS to be unstable across samples. The items and their definitions are listed in Table 3.3.

Contract and permanent software developers indicated the extent to which each statement is descriptive of their job experience on a 6 point Likert scale where 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree, & 6 = don't know or not applicable. Prior to analysis the responses were reverse coded.

3.3.3 Expected Job Characteristics

The expected job characteristics of the participants were measured by using a modified version of the eighteen motivational scale items of the Multimethod Job Design Questionnaire (MJDQ, Campion, 1988). This modified version was developed by altering each question to use the phrase "I expect." For example, the original item

Table 3.3: Motivational scale items of Multimethod Job Design Questionnaire (MJDQ)(Campion, 1988)

#	**Item**	**Question**
1	Autonomy	The job allows freedom independence or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making.
2	Intrinsic job feedback	The work activities themselves provide direct and clear information as to the effectiveness (e.g. quality and quantity) of your job performance.
3	Extrinsic job feedback	Other people in the organization such as managers, and co-workers, provide information as to the effectiveness (e.g. quality and quantity) of your job performance.
4	Social Interaction	The job provides for positive social interaction such as teamwork or co-worker assistance.
5	Task/Goal Clarity	The job duties requirements and goals are clear and specific.
6	Task Variety	The job has a variety of duties, tasks, and activities.
7	Task Identity	My current job requires completion of a whole and identifiable piece of work. It gives me a chance to do an entire piece of work from beginning to end.
8	Ability/skill-level requirements	The job requires a high level of knowledge, skills, and abilities.
9	Ability/skill variety	The job requires a variety of knowledge, skills, and abilities.
10	Task significance	The job is significant and important compared to other jobs in the organization.
11	Growth/learning	The job allows opportunities for learning and growth in competence and proficiency.
12	Promotion	There are opportunities for advancement to higher-level jobs.
13	Achievement	The job provides for feelings of achievement and task accomplishment.
14	Participation	The job allows participation in work-related decision making.
15	Communication	The job has access to relevant communication channels and information flows.
16	Pay Adequacy	The pay on this job is adequate compared with the job requirements and with the pay in similar jobs.
17	Recognition	The job provides acknowledgement and recognition from others.
18	Job security	People on this job have high job security.

from the MJDQ regarding the job characteristic 'Autonomy' is 'The job allows freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making.' The modified question used to measure the expected 'autonomy' is 'I expect that the job will allow freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making'. The questions with the 18 items are listed in Table 3.4.

Contract and permanent software developers indicated the extent to which each statement is descriptive of their job related expectations on a 6 point Likert scale where 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree, and 6 = don't know or not applicable. Prior to analysis the responses were reverse coded.

3.3.4 Preferred Job Characteristics

The preferred job characteristics of the participants were also measured by using a modified version of the eighteen motivational scale items of the Multimethod Job Design Questionnaire (MJDQ, Campion, 1988). This modified version was developed by altering each question to use the phrase "I prefer a job [that]." For example, the original item from the MJDQ regarding the job characteristic 'Autonomy' is 'The job allows freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making.' The modified question used to measure preference for the job characteristic 'autonomy' is 'I prefer a job that allows freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making.' The questions with the 18 items are listed in Table 3.5.

Contract and permanent software developers indicated the extent to which each statement is descriptive of their job related preferences on a 6 point Likert scale where 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree,

Table 3.4: Modified MJDQ (Campion, 1988) used to measure Expected Job Characteristics

#	**Item**	**Question**
1	Autonomy	I expect that the job will allow freedom independence or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making.
2	Intrinsic job feedback	I expect that the work activities themselves provide direct and clear information as to the effectiveness (e.g. quality and quantity) of your job performance.
3	Extrinsic job feedback	I expect that other people in the organization such as managers, and co-workers, provide information as to the effectiveness (e.g. quality and quantity) of your job performance.
4	Social Interaction	I expect that the job will provide for positive social interaction such as teamwork or co-worker assistance.
5	Task/Goal Clarity	I expect that the job duties, requirements, and goals will be clear and specific.
6	Task Variety	I expect that the job will have a variety of duties, tasks, and activities.
7	Task Identity	I expect that the job will require completion of a whole and identifiable piece of work. It will give me a chance to do an entire piece of work from beginning to end.
8	Ability/skill-level requirements	I expect that the job will require a high level of knowledge, skills, and abilities.
9	Ability/skill variety	I expect that the job will require a variety of knowledge, skills, and abilities.
10	Task significance	I expect that the job will be significant and important compared to other jobs in the organization.
11	Growth/learning	I expect that there will be opportunities for learning and growth in competence and proficiency.
12	Promotion	I expect that there will be opportunities for advancement to higher-level jobs.
13	Achievement	I expect that the job will provide for feelings of achievement and task accomplishment.
14	Participation	I expect that the job will allow participation in work-related decision making.
15	Communication	I expect that the job will have access to relevant communication channels and information flows.
16	Pay Adequacy	I expect that the pay on this job will be adequate compared with the job requirements and with the pay in similar jobs.
17	Recognition	I expect that the job will provide acknowledgement and recognition from others.
18	Job security	I expect that the people on this job will have high job security.

5 = strongly disagree, and 6 = don't know or not applicable. Prior to analysis the responses were reverse coded.

3.3.5 In-role Job Performance and Organizational Citizenship Behavior

The performance scale developed by William and Anderson (1991) was used to measure the in-role job performance and the organizational citizenship behavior of the contract and permanent software developers. The complete scale with 21 items is listed in Table 3.6. The first 7 items measure the in-role performance. Questions 8 through 14 measure the organizational citizenship behavior that benefits the individual (OCBI). Questions 15 through 21 measure the organizational citizenship behavior that benefits the organization (OCBO). Managers rated the extent to which each statement is applicable for every software developer they rated on a 5 point Likert scale where 1 = always, 2 = usually, 3 = rarely, 4 = never, 5 = don't know or not applicable.

3.3.6 Control Variables

Based on a review of the literature, we included five individual-level controls that may also influence performance and citizenship behaviors: gender, age, education level, tenure in the organization, and the number of years of work experience (Holtom et al., 2002). We controlled for these characteristics to rule out alternative explanations of our results.

Gender was coded as a binary variable equal to 0 if male and 1 if female. Age was coded as 1 if less than or equal to 20, 2 if greater than or equal to 21 but less than or equal to 25, 3 if greater than or equal to 26 but less than or equal to 30, 4 if greater than or equal to 31 but less than or equal to 35, 5 if greater than or equal to 36 but less than or equal to 40, and 6 if greater than 40.

Education was coded as 1 for high school, 2 for vocational or technical school, 3 for associate degree, 4 for undergraduate degree, and 5 for graduate degree.

Table 3.5: Modified MJDQ (Campion, 1988) used to measure Preferred Job Characteristics

#	**Item**	**Question**
1	Autonomy	I prefer a job that allows freedom independence or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making.
2	Intrinsic job feedback	I prefer work activities that themselves provide direct and clear information as to the effectiveness (e.g. quality and quantity) of your job performance.
3	Extrinsic job feedback	I prefer a job where other people in the organization such as managers, and co-workers, provide information as to the effectiveness (e.g. quality and quantity) of your job performance.
4	Social Interaction	I prefer a job that provides for positive social interaction such as teamwork or co-worker assistance.
5	Task/Goal Clarity	I prefer a job where duties, requirements, and goals will be clear and specific.
6	Task Variety	I prefer a job that has a variety of duties, tasks, and activities.
7	Task Identity	I prefer a job that requires completion of a whole and identifiable piece of work. It gives me a chance to do an entire piece of work from beginning to end.
8	Ability/skill-level requirements	I prefer a job that requires a high level of knowledge, skills, and abilities.
9	Ability/skill variety	I prefer a job that requires a variety of knowledge, skills, and abilities.
10	Task significance	I prefer a job that is significant and important compared to other jobs in the organization.
11	Growth/learning	I prefer a job that allows opportunities for learning and growth in competence and proficiency.
12	Promotion	I prefer a job with opportunities for advancement to higher-level jobs.
13	Achievement	I prefer a job that provides for feelings of achievement and task accomplishment.
14	Participation	I prefer a job that allows participation in work-related decision making.
15	Communication	I prefer a job will has access to relevant communication channels and information flows.
16	Pay Adequacy	I prefer a job that has an adequate pay compared with the job requirements and with the pay in similar jobs.
17	Recognition	I prefer a job that provides acknowledgement and recognition from others.
18	Job security	I prefer a job with high job security.

Table 3.6: Items for In-role Job Performance (IRJP), Organization Citizenship Behaviors-Individual (OCBI) and Organizational Citizenship Behaviors (OCBO) (Williams & Anderson, 1991)

#	Item	Construct
1	Adequately completes assigned duties.	IRJP
2	Fulfills responsibilities specified in the job description.	IRJP
3	Performs tasks that are expected of him/her.	IRJP
4	Meets formal performance requirements of the job.	IRJP
5	Engages in activities that will directly affect his/her performance evaluation.	IRJP
6	Neglects aspects of the job he/she is obligated to perform.	IRJP
7	Fails to perform essential duties.	IRJP
8	Helps others who have been absent.	OCBI
9	Helps others who have heavy work loads.	OCBI
10	Assists supervisor with his/her work (when not asked).	OCBI
11	Takes time to listen to co-worker's problems and worries.	OCBI
12	Goes out of way to help new employees.	OCBI
13	Takes a personal interest in other employees.	OCBI
14	Passes along information to co-workers.	OCBI
15	Attendance at work is above the norm.	OCBO
16	Gives advance notice when unable to come to work.	OCBO
17	Takes undeserved work breaks.	OCBO
18	Great deal of time spent with personal phone conversations.	OCBO
19	Complains about insignificant things at work.	OCBO
20	Conserves and protects organizational property.	OCBO
21	Adheres to informal rules devised to maintain order.	OCBO

Years of experience was coded as 1 for none, 2 for less than a year, 3 for greater than or equal to 1 year but less than or equal to 5 years, 4 for greater than or equal to 6 years but less than or equal to 10 years, and 5 for greater than 10 years.

Tenure at the current organization was coded as 1 for less than a year, 2 for greater than or equal to 1 year but less than or equal to 3 years, 3 for greater than or equal to 4 years but less than or equal to 6 years, 4 for greater than or equal to 7 years but less than or equal to 9 years, and 5 for greater than or equal to 10 years.

3.3.7 Measures of Fit

Kristof made a distinction between person (P) - environment (E) fit studies based on whether they assess fit directly or indirectly (Kristof, 1996). Direct measurement involves asking people explicitly whether they believe that a good fit exists. Direct measures are good for perceived fit, i.e., a good fit exists as long as it is perceived to exist, regardless of whether or not it actually exists. Indirect measurement involves the researcher making an indirect assessment of fit through explicit comparisons of separately rated measures. French et al. (1974) further differentiated these explicit comparisons into subjective fit, defined as the match between the person and the environment as perceived and reported by the same person, and objective fit as the match between the person as he or she really is and the environment as it exists "independently" of the person's perception of it (French et al., 1974, p 316). Kristof-Brown et al. (2005) combined these terms as follows: (a) perceived fit, when an individual makes a direct assessment of the compatibility between P and E; (b) subjective fit, when fit is assessed indirectly through the comparison of P and E variables reported by the same person; and (c) objective fit, when fit is calculated indirectly through the comparison of P and E variables as reported by different sources.

In our study, the fit between the experienced and the expected job characteristics of software developers and the fit between the experienced and the preferred job

characteristics of software developers are both subjective fits. The software developers reported their experienced, expected, and preferred job characteristics separately. Since it was the same person reporting all three measures, it is subjective, and since the ratings were used after the fact to determine a fit, it is indirect. Although subjective fit does not fully negate consistency biases (because they are reported by the same source - i.e., software developers), we reduce the bias in the relationship between the subjective fit and the criteria (performance and organizational citizenship behavior) by using a separate source (i.e., managers of software developers) to measure the criteria (performance and organizational citizenship behavior).

Describing both the source variables of fit using the same content dimensions is known as commensurate measurement. Commensurate measurement is often recommended for assessing fit because it ensures mutual relevance of the characteristics under investigation (Kristof, 1996, Edwards, 1991, Caplan, 1987). Commensurate dimensions have two features: nominal equivalence and scale equivalence (Edwards & Shipp, 2007). Nominal equivalence means defining both of the source variables of fit in the same terms. For example, experienced job characteristics are comprised of experienced autonomy and expected job characteristics are comprised of expected autonomy. Scale equivalence means that both the source variables of fit are assessed on the same metric, example, if experienced autonomy is measured using a 5 point response scale for the question "I experience autonomy in this job," that the expected autonomy is also measured using a 5 point response scale for the question "I expect autonomy in this job."

In our study, the measure of the fit between the experienced and the expected job characteristics and the measure of the fit between the experienced and the preferred job characteristics are commensurate. They have both nominal and scale equivalence because the same set of questions, response scales and dimensions are used for the

experienced, the expected, and the preferred job characteristics by slightly varying the questions with the use of words such as "expect" and "prefer."

In this section, we defined the various measures and constructs used in this study. In the next section, we define the relationships between constructs and measures.

3.4 Nature and Direction of Relationships between Constructs and Measures

Per Edwards and Bagozzi (2000), researchers usually pay little attention to the nature and the direction of relationships between constructs and measures. These relationships are particularly important when constructs with multi-item measures are used. In this section we describe the nature and the relationships between the constructs and the measures used in this study.

A theory can be divided into two parts: one that specifies the relationships between theoretical constructs, and another that specifies relationships between constructs and measures (Bagozzi & Phillips, 1982; Costner, 1969). A measure is an observed score gathered through self-report, interview, observation, or some other means, while a construct, is a conceptual term used to describe a phenomenon of theoretical interest (Edwards & Bagozzi, 2000). In this study, the relationship between experienced job characteristics and in-role job performance is an example of a relationship between theoretical constructs; while the relationship between the 18 job characteristic items or measures (autonomy, intrinsic feedback, extrinsic feedback, social interaction, task/goal clarity, task variety, task identity, ability/skill-level requirements, ability/skill variety, task significance, growth/learning, promotion, achievement, participation, communication, pay adequacy, recognition, and job security) and the theoretical construct of experienced job characteristics is an example of the relationship between a construct and its measures.

Hypotheses H1a through H1r, H3a through H3r, and H5a through H5r focus on constructs with single item measures. Example: hypothesis 1h is regarding the

difference between experienced autonomy of contract software developers versus experienced autonomy of permanent software developers, where experienced autonomy is measured with a single question: "The job allows freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control, or other decision making." For these hypotheses (H1a through H1r, H3a through H3r, and H5a through H5r), the relationship between the construct and its measure is one to one and straightforward.

Hypotheses H2a, H2b, H4a, H4b, H6a, and H6b explore the relationships between multiple constructs (experienced job characteristics, expected job characteristics, preferred job characteristics, in-role job performance, and organizational citizenship behaviors). All the constructs have multi-item measures: experienced job characteristics (18 items), expected job characteristics (18 items), preferred job characteristics (18 items), in-role job performance (7), and organizational citizenship behaviors (two internal constructs: OCBI (7 items) and OCBO (7 items)).

We referred to the literature on construct validity, structural equation modeling, and formative versus reflective constructs (Blacock, 1971; Bollen, 1989; Edwards & Bagozzi, 2000; Gefen et al., 2000; Diamantopolous et al., 2006; Petter et al., 2007; Roberts & Thatcher, 2009) to define the relationships between the multi-item constructs and their measures. Based on the review of the differences between formative and reflective constructs, summarized in Appendix A, we define the 18 measures for each of the three job characteristic constructs: experienced job characteristics, expected job characteristics and preferred job characteristics, to be formative indicators. This is because the 18 job characteristic measures are the defining characteristics of the construct and are not interchangeable (autonomy is not interchangeable with task variety etc.). On the other hand, we believe that the indicators of the in-role job performance construct, the OCBI construct, and the OCBO construct, are reflective

indicators. This is because the indicators essentially measure the same thing, are interchangeable, and the removal of one item does not alter the domain of the construct. For example, the measures, "Adequately completes assigned duties", "Fulfills responsibilities specified in the job description", "Performs tasks that are expected of him/her", "Meets formal performance requirements of the job", "Engages in activities that will directly affect his/her performance evaluation", "Neglects aspects of the job he/she is obligated to perform", and "Fails to perform essential duties", are all interchangeable and reflected by in-role job performance.

3.5 Hypotheses Testing

3.5.1 Independent Sample t-tests & Analysis of Covariance

Hypothesis H1a through H1r, H3a through H3r, and H5a through H5r were all tested using separate independent-sample t-tests and Analysis of Covariance (ANCOVA) tests. An initial Levene's Test was conducted to determine if the variances in the two samples being compared, contract and permanent, were equal for the job characteristic in question. If Levene's F was significant, indicating unequal variance between contract and permanent workers, an independent-sample t test was conducted. If Levene's F was not significant, an ANCOVA test was conducted for each job characteristic, with work status as the fixed variable, and all the demographic variable (age, education, gender, tenure, and years of work exprience) as covariates. All the tests (Levene's, t-test, and ANCOVA) were conducted using SPSS 15.0. The results are discussed in Chapter 4.

3.5.2 Partial Least Squares Structural Equation Modeling

Hypothesis H2a, H2b, H4a, H4b, H6a, and H6b were tested using a structural equation modeling approach using partial least squares (abbreviated as PLSSEM) (Wold, 1982, 1985a, 1985b). PLSSEM is suitable to research where: (1) the theoretical model is new or not well-formed; (2) the model is relatively complex with

many latent variables and/or structural paths; (3) the model uses both formative and reflective latent variables; and (4) the sample size is small and/or assumptions of normality may not be met (Chin & Newsted, 1999). All of these are characteristics of this study, and therefore support the selection of PLSSEM for the analyses. Appendix B provides additional details on PLSSEM.

All PLSSEM analyses were conducted using the SmartPLS (Ringle et al., 2005) software application. SmartPLS generates estimates of standardized regression coefficients for the paths of the model (similar to regression analysis) and the factor loadings of each of the items on their respective constructs (similar to principal components analysis). The significance tests for the path coefficients are estimated using a bootstrap procedure using random samples from the original data set via replacement sampling.

Various PLS models were analyzed for hypotheses H2a, H2b, H4a, H4b, H6a, and H6b. The models and the PLS procedures for the hypotheses are described next.

3.5.2.1 Mediation Model for Hypotheses 2a and 2b

Hypothesis 2a proposes that the experienced job characteristics of software developers mediate the relationship between their work status (contract and permanent) and their in-role job performance. Hypothesis 2b proposes that the experienced job characteristics of software developers mediate the relationship between their work status (contract and permanent) and their organizational citizenship behavior. Mediation is explained in more detail in Appendix C.

To test hypotheses H2a and H2b, a series of PLS models were evaluated. First, a control model was evaluated to establish a baseline R^2 for the outcome variables (in-role job performance, OCBI, and OCBO). Second, a model where experienced job characteristics fully mediated the relationship between work status and the outcome variables (in-role job performance, OCBI, and OCBO), was evaluated. In the third

step, the experienced job characteristics latent variable was modeled as a partial mediator. The change in R^2 and its F ratio was used to compare the models and their predictive ability. The results are discussed in Chapter 4.

3.5.2.2 Moderation Model for Hypotheses H4a, H4b, H6a, and H6b

Hypotheses H4a, H4b, H6a, and H6b use the concept of fit to test the effect of the relationships between experienced and expected job characteristics as well as experienced and preferred job characteristics on the in-role job performance and the organizational citizenship behavior of software developers. The concept of fit has been used in several areas of organizational research such as person-context fit, contingency theory and strategic management. Also fit has been tested using various methods and perspectives (for details, see Venkatraman, 1989; Edwards, 2007). In this study, fit is conceptualized using the moderation perspective, explained in more detail in Appendix D.

The two main limitations of this approach are: (1) the role and impact of multi-collinearity, and (2) partialling out the effect of higher order terms (such as quadratic effects).

Multicollinearity arises when correlations between independent variables are high producing large standard errors of regression coefficients and unstable coefficients. This is relevant because interaction term (predictor X moderator) is likely to be correlated to the predictor and the moderator. According to Venkatraman (1989), while multicollinearity poses statistical estimation problem, it is not problematic to establish the existence of moderation effects. However, in order to be sure that the relationship is that of interaction rather than parabolic curvilinearity, it is necessary to test for the presence of higher order terms such as X^2 and Y^2. This can be avoided by using a polynomial regression approach to assess fit (Edwards, 1993, 1994). Polynomial regression approach and its advantages as well as limitations are discussed

in Appendix E.

We adapted Edward's (1994) exploratory polynomial regression approach to to the PLSSEM framework. PLSSEM models with latent variables were used to determine the effect of fit (or congruence). Edwards (2009) criticized a recent study that used a latent congruence model approach using structural equation modeling (Cheung, 2009) because it was framed around algebraic differences of the components of the congruence (or fit). Our study avoids this problem by including the quadratic terms specified in polynomial regression analysis (Edwards, 1993) in the tests of moderation in structural equation models (Chin et al., 2003; Jose et al., 2001). The results are discussed in Chapter 4.

In this chapter we described the participants, the procedure, the measures, and the methods used in this study. In the next chapter we present the results.

CHAPTER 4: RESULTS

In the previous chapter, the participants, the procedure, the measures and the methods used in this study were discussed. In this chapter, we detail the results of all the tests conducted. Preliminary data analysis and preparation was performed using SPSS 15.0 (SPSS Inc.). All PLS tests were performed using SmartPLS (Ringle et al., 2005).

4.1 Descriptive Statistics

4.1.1 Missing Values

Data were first examined for missing values. Missing values were handled in two different ways. For the t-tests that compared the experienced, the expected and the preferred job characteristics of the contract and the permanent software developers, pairwise case exclusion was used. This way, the total number of cases included in each t-test was different. However this allowed for maximum utilization of the data collected. Also, since each t-test was separate for each characteristic, the pairwise case exclusion did not pose any threats.

For the PLS models used to test mediation and moderation, listwise case exclusion was used. This way, any case that had a missing value for any of the variables in the dependent list was excluded from the test. This was done because these tests needed to generate higher order product terms and missing values would have resulted in inaccurate number of product terms. Mediation tests were used for hypotheses that tested the relationship of work status with in-role job performance and organizational citizenship behaviors. Moderation tests were used for hypotheses that tested the relationship of the experienced, expected, and preferred job characteristics with in-role

job performance and organizational citizenship behaviors. The job characteristics related data were provided by the software developers. The in-role job performance and the organizational citizenship behaviors related data were provided by the managers. Because the developers and managers took independent surveys, only those cases could be included where we had data from both sources. For example, developer responses that did not have the corresponding manager's rating for performance and behaviors were excluded. This strategy resulted in the inclusion of 98 software developers only, of which 73 were permanent employees and 25 were contract employees. The ratio of contract to permanent software developers included in the final set (25:73) was not drastically different from the ratio of contract to permanent software developers recruited for the study (41:112) or the ratio of contract to permanent software developers who responded (25:84).

4.1.2 Normality Test

Tests for skewness and kurtosis were conducted to test distributional symmetry of all the dependent variables. Skewness is a measure of the asymmetry of the probability distribution of a real-valued random variable. The distribution is said to be left-skewed if the left tail is longer, there are a few relatively low values and the mean is to the left of the distribution. The distribution is said to be right-skewed if the right tail is longer, there are a few relatively high values and the mean is to the right of the distribution.

Table 4.1: Skewness & Kurtosis of Experienced Job Characteristic Indicators

Variable	**Skewness**	**Kurtosis**
Experienced Autonomy	**-0.64**	0.65
Experienced Intrinsic Feedback	-0.56	0.21
Experienced Extrinsic Feedback	**-1.00**	**2.07**
Experienced Social Interaction	**-1.34**	**3.15**
Experienced Task Clarity	**-0.86**	0.56
Experienced Task Variety	-0.44	1.07
Experienced Task Identity	**-0.97**	1.23
Experienced Skill Requirement	**-0.73**	1.19
Experienced Skill Variety	**-0.69**	1.49
Experienced Task Significance	-0.22	-0.51
Experienced Growth	**-1.16**	**2.58**
Experienced Promotion	-0.26	-0.63
Experienced Achievement	**-0.91**	**1.57**
Experienced Participation	**-0.99**	**1.95**
Experienced Communication	**-0.62**	0.63
Experienced Pay Adequacy	**-0.72**	-0.17
Experienced Recognition	**-0.91**	1.33
Experienced Job Security	-0.36	-0.06

$p < 0.02$

Table 4.2: Skewness & Kurtosis of Expected Job Characteristic Indicators

Variable	**Skewness**	**Kurtosis**
Expected Autonomy	**-0.64**	1.19
Expected Intrinsic Feedback	-0.30	1.39
Expected Extrinsic Feedback	-0.28	**1.71**
Expected Social Interaction	**-1.34**	**1.70**
Expected Task Clarity	**-0.60**	**1.55**
Expected Task Variety	-0.21	**1.94**
Expected Task Identity	**-0.59**	0.94
Expected Skill Requirement	0.10	**-1.14**
Expected Skill Variety	0.28	**-1.40**
Expected Task Significance	-0.36	0.10
Expected Growth	**-1.37**	**3.69**
Expected Promotion	**-0.79**	0.61
Expected Achievement	**-0.89**	**2.64**
Expected Participation	**-0.92**	**2.36**
Expected Communication	**-0.99**	**3.04**
Expected Pay Adequacy	-0.49	0.73
Expected Recognition	**-0.77**	1.07
Expected Job Security	-0.33	0.34

$p < 0.02$

Table 4.3: Skewness & Kurtosis of Preferred Job Characteristic Indicators

Variable	**Skewness**	**Kurtosis**
Preferred Autonomy	-0.34	-0.73
Preferred Intrinsic Feedback	-0.47	0.78
Preferred Extrinsic Feedback	-0.08	0.37
Preferred Social Interaction	**-0.59**	0.28
Preferred Task Clarity	**-0.62**	0.76
Preferred Task Variety	-0.57	1.15
Preferred Task Identity	**-0.84**	0.71
Preferred Skill Requirement	**-0.70**	0.76
Preferred Skill Variety	**0.66**	1.02
Preferred Task Significance	**0.65**	0.22
Preferred Growth	-0.27	**-1.17**
Preferred Promotion	**-0.88**	1.14
Preferred Achievement	-0.22	**-1.50**
Preferred Participation	0.05	-0.69
Preferred Communication	0.25	-0.68
Preferred Pay Adequacy	**-1.07**	**2.23**
Preferred Recognition	-0.31	-0.15
Preferred Job Security	**0.84**	0.45

$p < 0.02$

Kurtosis is a measure of the "peaked-ness" of the probability distribution of a real-valued random variable. A distribution with positive excess kurtosis is called leptokurtic, or leptokurtotic, with a more acute peak around the mean (a higher probability than a normally distributed variable of values near the mean) and fatter tails (a higher probability than a normally distributed variable of extreme values). A distribution with negative excess kurtosis is called platykurtic, or platykurtotic, with a lower, wider peak around the mean (a lower probability than a normally distributed variable of values near the mean) and thinner tails (a lower probability than a normally distributed variable of extreme values).

A visual inspection of the data using histograms showed that several of the study variables demonstrated skewness and/or kurtosis. Statistical tests for skewness and kurtosis were conducted. The results of the tests are shown in Tables 4.1 through 4.4. Typically data transformations are used to address skewness and/or kurtosis.

Table 4.4: Skewness & Kurtosis of Performance & OCB Indicators

Variable	**Skewness**	**Kurtosis**
Perf Assigned Duties	-0.51	-0.71
Perf Job Responsibilities	-0.56	**-0.84**
Perf Expected Tasks	**-0.76**	-0.56
Perf Meets Job Requirements	**-0.93**	-0.15
Perf Activities Evaluation	**-1.03**	**2.17**
Perf Meets Obligation	**-0.70**	-0.65
Perf Essential Duties	**-0.82**	-0.45
OCB Helps Absentees	-0.41	0.11
OCB Helps Load	-0.46	0.28
OCB Helps Manager	-0.29	-0.19
OCB Listens to Coworkers	-0.31	0.07
OCB Helps New Employees	-0.35	-0.36
OCB Interest	-0.34	-0.33
OCB Information Exchange	-0.56	**1.59**
OCB Attendance	0.19	-0.54
OCB Advance Notice	-0.24	**-1.27**
OCB No Breaks	**-1.04**	0.01
OCB Time Conserve	-0.12	**-1.06**
OCB No Complains	**-0.86**	0.95
OCB Protects Property	-0.52	1.07
OCB Adheres to Rules	0.02	**-2.03**

$p < 0.02$

However they increase difficulties with respect to data interpretation. Standard transformations such as inverse, log, square root and natural logs did not provide drastic changes to the skewness and in some cases, increased it. Further, since most of the tests used for the hypotheses were either independent sample t-tests or PLSSEM, it was decided to leave the data untransformed. PLSSEM is robust to violations of the assumption of normality, and Levene's test was used in association with the independent sample t-tests to avoid assumptions of equality of variance.

4.2 Independent Two Sample T-Tests & Analysis of Covariance Test

4.2.1 Hypotheses H1a through H1r

Hypotheses H1a through H1r compare the 18 job characteristics experienced by contract and permanent software developers. Table 4.5 shows the results of the Levene's test conducted to determine the equality of variance between the two samples (contract and permanent) for each experienced job characteristic.

Based on Levene's test, we found unequal variance between contract and permanent software developers with respect to their experienced task variety (H1a). Therefore, an independent two sample t-test was performed to test the difference in the means between the two groups for experienced task variety. Table 4.6 shows the t-test result.

Based on the t-test result, hypothesis H1a was rejected. Given that the 95% confidence interval included the value 0, and the t test value was not significant, the null hypothesis for the t tests was accepted, indicating no difference in the two samples. Therefore, contrary to what was hypothesized, there is no difference in the task variety experienced by contract and permanent software developers.

Based on Levene's test, we found equal variance between contract and permanent software developers with respect to their experienced task identity (H1b), task significance (H1c), achievement (H1d), ability/skill variety (H1e), communication (H1f), participation (H1g), autonomy (H1h), social interaction (H1i), growth & learning (H1j), promotion (H1k), recognition (H1l), extrinsic feedback (H1m), intrinsic feedback (H1n), job security (H1o), pay adequacy (H1p), ability/skill-level requirements (H1q), and task/goal clarity (H1r). Therefore, an analysis of covariance (ANCOVA) test was conducted for hypotheses H1b through H1r . The ANCOVA test for each experienced job characteristic was performed with work status as the fixed variable,

Table 4.5: Levene's Test - Experienced Job Characteristics

Job Characteristic	**F**	**Sig.**	**Equal Variance**
Experienced Task Variety	11.28	0.00	**N**
Experienced Task Identity	1.02	0.32	Y
Experienced Task Significance	0.12	0.73	Y
Experienced Achievement	0.34	0.56	Y
Experienced Skill Variety	3.80	0.05	Y
Experienced Communication	0.01	0.94	Y
Experienced Participation	0.13	0.72	Y
Experienced Autonomy	0.11	0.74	Y
Experienced Social Interaction	0.17	0.68	Y
Experienced Growth	0.00	0.96	Y
Experienced Promotion	2.32	0.13	Y
Experienced Recognition	0.08	0.78	Y
Experienced Extrinsic Feedback	1.07	0.30	Y
Experienced Intrinsic Feedback	0.43	0.51	Y
Experienced Job Security	1.47	0.23	Y
Experienced Pay Adequacy	0.69	0.41	Y
Experienced Skill Requirement	1.41	0.24	Y
Experienced Task Clarity	0.15	0.70	Y

If F > critical value & Sig. <= 0.05, Equality of variance may not be assumed

Table 4.6: T-Test Results - Experienced Job Characteristics

Job Characteristics	**t**	**df**	**Mean Diff.**	**Std. Error**	**95% CI**	
Experienced Task Variety	-1.94	49.98	-0.22	0.11	-0.45	0.01

the demographic variables (age, education, gender, tenure, and years of work experience) as covariates, and the experienced job characteristic as the dependent variable. The results are shown in Table 4.7.

The ANCOVA test results show that the work status F statistic was significant only for experienced job security, indicating that after controlling for tenure, age, gender, education, and years of work experience, the work status of contract and permanent software developers affects their experienced job security. An analysis of the means of the two samples shows that contract software developers experience lower levels of job security than permanent software developers. Thus, hypothesis H1o was accepted. The comparison of the means is shown in Table 4.8.

Based on the ANCOVA test results, hypotheses H1b through H1n, and H1p through H1r were rejected. Contrary to what was hypothesized, there was no difference found between contract and permanent software deveopers with respect to their experienced task identity, task significance, achievement, ability/skill variety, communication, participation, autonomy, social interaction, growth & learning, promotion, recognition, extrinsic feedback, intrinsic feedback, pay adequacy, ability/skill-level requirements, and task/goal clarity.

In this section, we presented the hypotheses test results for the experienced job characteristics of contract and permanent software developers. In Chapter 5, we present the explanations for the results. In the next section we present the hypotheses test results for the expected job characteristics of contract and permanent software developers.

4.2.2 Hypotheses H3a through H3r

Hypotheses H3a through H3r compare the 18 job characteristics expected by contract and permanent software developers. Table 4.9 shows the results of the Levene's

Table 4.7: ANCOVA - Experienced Job Characteristics

			F Values					
Job Characteristics	**n**	**df**	**Tenure**	**Age**	**Gender**	**Education**	**YWE**	**WorkStatus**
Experienced Task Identity	109	(1, 102)	0.00	0.08	0.44	1.87	0.45	1.51
Experienced Task Significance	107	(1, 100)	0.00	0.32	0.16	0.43	0.39	0.00
Experienced Achievement	109	(1, 102)	0.77	0.80	0.01	1.06	1.01	1.04
Experienced Skill Variety	108	(1, 101)	0.30	0.25	**4.50**	0.31	0.50	0.11
Experienced Communication	109	(1, 102)	0.12	0.05	0.07	0.36	0.10	0.83
Experienced Participation	109	(1, 102)	0.45	0.03	0.38	2.14	0.14	0.17
Experienced Autonomy	108	(1, 101)	0.61	0.46	0.55	0.39	3.54	0.75
Experienced Social Interaction	109	(1, 102)	1.92	0.28	0.00	**5.16**	0.20	2.06
Experienced Growth	109	(1, 102)	0.46	1.34	0.74	0.00	0.05	1.38
Experienced Promotion	102	(1, 95)	**4.12**	0.21	0.01	0.01	1.00	0.10
Experienced Recognition	107	(1, 100)	**4.55**	0.78	1.23	0.25	1.05	1.92
Experienced Extrinsic Feedback	108	(1, 101)	0.51	0.01	0.51	1.81	3.00	0.55
Experienced Intrinsic Feedback	108	(1, 101)	0.00	0.08	0.80	0.75	0.00	0.08
Experienced Job Security	105	(1, 98)	0.57	2.52	0.81	0.10	2.40	**5.22**
Experienced Pay Adequacy	103	(1, 96)	0.01	1.66	0.21	0.03	1.49	0.63
Experienced Skill Requirement	109	(1, 102)	0.77	0.17	0.96	1.62	1.27	0.78
Experienced Task Clarity	109	(1, 102)	0.05	0.07	0.22	0.10	0.89	0.18

$p < 0.05$; ANCOVA Fixed Factor = Work Status (WS), Covariates = Tenure, Age, Gender, Education, Years of Work Experience (YWE)

Table 4.8: Mean Comparison for Experienced Job Security

Job Characteristic	Work Status	N	Mean	Std. Dev	Std. Error	Analysis of Mean
Experienced Job Security	Contract(C)	21	3.00	0.84	0.18	C<P
	Permanent(P)	84	3.46	0.86	0.09	

Table 4.9: Levene's Test - Expected Job Characteristics

Job Characteristic	F	Sig.	Equal Variance
Expected Task Variety	3.44	0.07	Y
Expected Task Identity	3.88	0.05	Y
Expected Task Significance	6.36	0.01	**N**
Expected Intrinsic Feedback	0.54	0.46	Y
Expected Autonomy	0.37	0.54	Y
Expected Growth	1.49	0.23	Y
Expected Promotion	1.02	0.32	Y
Expected Achievement	4.94	0.03	**N**
Expected Recognition	7.51	0.01	**N**
Expected Job Security	10.74	0.00	**N**
Expected Pay Adequacy	7.69	0.01	**N**
Expected Task Clarity	3.77	0.05	Y
Expected Skill Requirement	1.24	0.27	Y
Expected Skill Variety	0.33	0.57	Y
Expected Communication	13.40	0.00	**N**
Expected Participation	4.02	0.05	**N**
Expected Social Interaction	8.35	0.00	**N**
Expected Extrinsic Feedback	5.15	0.03	**N**

If F > critical value & Sig. <= 0.05, Equality of variance may not be assumed

test conducted to determine the equality of variance between the two samples (contract and permanent) for each expected job characteristic.

Based on Levene's test, we found unequal variances between contract and permanent software developers with respect to their expected task significance (H3c), achievement (H3h), recognition (H3i), job security (H3j), pay adequacy (H3k), communication (H3o), participation (H3p), social interaction (H3q), and extrinsic feedback (H3r). Therefore, we performed independent two sample t-tests for hypotheses H3c, H3h, H3i, H3j, H3k, H3o, H3p, H3q, and H3r. Table 4.10 shows the t-test results.

Table 4.10: T-Test Results - Expected Job Characteristics

Job Characteristics	**t**	**df**	**Mean Diff.**	**Std. Error**	**95% CI**	
Expected Task Significance	-0.20	27.55	-0.04	0.22	-0.49	0.40
Expected Achievement	1.16	30.96	0.20	0.17	-0.15	0.54
Expected Recognition	-0.13	30.05	-0.03	0.22	-0.49	0.43
Expected Job Security	-0.72	24.70	-0.18	0.25	-0.69	0.33
Expected PayAdequacy	-0.53	26.50	-0.11	0.21	-0.54	0.32
Expected Communication	1.83	29.27	0.33	0.18	-0.04	0.69
Expected Participation	1.38	32.75	0.23	0.17	-0.11	0.57
Expected Extrinsic Feedback	1.40	33.03	0.20	0.14	-0.09	0.48
Expected Social Interaction	0.31	30.38	0.05	0.17	-0.29	0.40

The t-test results (insignificant t statistic value and inclusion of 0 in the 95% confidence interval) show that there are no differences among contract and permanent software developers with respect to expected task significance, achievement, recognition, job security, pay adequacy, communication, participation, social interaction, and extrinsic feedback.

We had hypothesized that the expected task significance (H3c), achievement (H3h), recognition (H3i), job security (H3j), and pay adequacy (H3k) of contract software developers will be lower than permanent software developers. Based on the t-test results, H3c, H3h, H3i, H3j, and H3k were rejected.

We had also hypothesized that there will be no differences between contract and permanent software developers for expected communication (H3o), participation (H3p), social interaction (H3q), and extrinsic feedback (H3r). Based on the t-test results, H3o, H3p, H3q, and H3r were accepted.

Based on Levene's test, we found equal variance between contract and permanent software developers with respect to their expected task variety (H3a), task identity (H3b), intrinsic feedback (H3d), autonomy (H3e), growth & learning (H3f), promotion (H3g), task clarity (H3l), skill requirements (H3m), and skill variety (H3n). Therefore, ANCOVA tests were performed for hypotheses H3a, H3b, H3d through H3g, and H3l

through H3n. Each ANCOVA test was performed with work status as the fixed variable, the demographic variables (age, education, gender, tenure, and years of work experience) as covariates, and the expected job characteristic as the dependent variable. The results are shown in Table 4.11.

The ANCOVA test results show that the F value for work status was significant only for expected skill variety, indicating that after controlling for tenure, age, gender, education, and years of work experience; the expected skill variety of contract and permanent software developers were different. Therefore, hypothesis H3n was rejected. Contrary to the hypothesis, the skill variety expected by contract software developers was found to be higher than the skill variety expected by permanent software developers. The comparison of the means of the two samples is shown in Table 4.12.

We had hypothesized that the expected task variety (H3a), task identity (H3b), intrinsic feedback (H3d), autonomy (H3e), growth/learning (H3f), and promotion (H3g) of contract software developers will be lower than that of permanent software developers. However, the ANCOVA results show no significant differences between contract and permanent software developers with respect to their expected task variety, task identity, intrinsic feedback, autonomy, growth/learning, and promotion. Therefore, hypotheses H3a, H3b, H3d, H3e, H3f, and H3g were rejected.

The ANCOVA results also show no significant differences between contract and permanent software developers with respect to their expected task/goal clarity (H3l) and expected ability/skill requirements (H3m). Thus hypotheses H3l and H3mwere accepted.

In this section, we presented the results of the hypotheses tests for the expected job characteristics of contract and permanent software developers. The explanations for the results are presented in Chapter 5. In the next section we present the results

Table 4.11: ANCOVA - Expected Job Characteristics

			F Values					
Job Characteristics	**n**	**df**	**Tenure**	**Age**	**Gender**	**Education**	**YWE**	**WorkStatus**
Expected Task Variety	108	(1, 101)	0.05	0.36	0.02	1.98	0.03	0.02
Expected Task Identity	108	(1, 101)	0.54	0.15	0.10	0.80	0.04	0.14
Expected Intrinsic Feedback	107	(1, 100)	0.04	0.85	0.49	1.80	1.60	0.33
Expected Autonomy	108	(1, 101)	0.37	2.91	0.31	0.94	0.52	0.07
Expected Growth	101	(1, 94)	0.11	1.15	0.31	0.01	0.07	0.54
Expected Promotion	102	(1, 95)	1.41	3.32	0.21	0.46	1.57	0.39
Expected Task Clarity	108	(1, 101)	1.58	0.00	0.59	0.00	1.09	0.91
Expected Skill Requirement	108	(1, 101)	0.00	0.00	0.05	1.32	0.53	3.83
Expected Skill Variety	108	(1, 101)	0.74	0.05	2.78	0.39	0.76	**6.59**

$p < 0.05$; ANCOVA Fixed Factor = Work Status (WS), Covariates = Tenure, Age, Gender, Education, Years of Work Experience (YWE)

Table 4.12: Mean Comparison for Expected Skill Variety

Job Characteristic	**Work Status**	**N**	**Mean**	**Std. Dev**	**Std. Error**	**Analysis of Mean**
Expected Skill Variety	Contract(C)	24	4.63	0.49	0.10	C>P
	Permanent(P)	84	4.31	0.49	0.05	

of the hypotheses tests for the preferred job characteristics of contract and permanent software developers.

4.2.3 Hypotheses H5a through H5r

Hypotheses H5a through H5r compare the 18 job characteristics preferred by the contract and the permanent software developers. Table 4.13 shows the results of the Levene's test conducted to determine the equality of variance between the two samples (contract and permanent) for each preferred job characteristic.

Based on Levene's test, we found unequal variances between contract and permanent software developers with respect to their preferred recognition (H5c), job security (H5d), pay adequacy (H5e), and task identity (H5l). Therefore, independent two sample t-tests were performed for hypotheses H5c, H5d, H5e, and H5l. Table 4.14 shows the t-test results.

We had hypothesized that the preferred recognition (H5c) of contract software developers will be lower than that of permanent software developers. The t-test result (insignificant t statistic value and inclusion of 0 in the 95% confidence interval) shows no difference in the two samples for preferred recognition. Therefore, hypothesis H5c was rejected.

We had hypothesized that the preferred job security (H5d) of contract software developers will be lower than that of permanent software developers. The t-test result (significant t statistic value) shows differences between contract and permanent software developers with respect to their preferred job security. An analysis of the means shows that the contract software developers have lower preference for job

Table 4.13: Levene's Test - Preferred Job Characteristics

Job Characteristic	**F**	**Sig.**	**Equal Variance**
Preferred Promotion	1.49	0.23	Y
Preferred Achievement	0.07	0.80	Y
Preferred Recognition	12.77	0.00	**N**
Preferred Job Security	11.27	0.00	**N**
Preferred Pay Adequacy	21.35	0.00	**N**
Preferred Task Variety	2.56	0.11	Y
Preferred Skill Variety	1.33	0.25	Y
Preferred Skill Requirement	1.88	0.17	Y
Preferred Growth	0.03	0.87	Y
Preferred Autonomy	0.04	0.84	Y
Preferred Participation	0.34	0.56	Y
Preferred Task Identity	4.69	0.03	**N**
Preferred Task Significance	2.26	0.14	Y
Preferred Communication	2.26	0.14	Y
Preferred Social lnteraction	2.58	0.11	Y
Preferred Extrinsic Feedback	3.22	0.08	Y
Preferred Task Clarity	0.00	0.95	Y
Preferred Intrinsic Feedback	1.83	0.18	Y

Table 4.14: T-Test Results - Preferred Job Characteristics

Job Characteristics	**t**	**df**	**Mean Diff.**	**Std. Error**	**95% CI**	
Preferred Recognition	-0.93	29.78	-0.18	0.20	-0.59	0.22
Preferred Job Security	-2.13	29.38	-0.41	0.19	-0.80	-0.02
Preferred Pay Adequacy	-0.41	28.04	-0.08	0.20	-0.49	0.33
Preferred Task Identity	0.09	32.13	0.02	0.21	-0.40	0.44

Table 4.15: Mean Comparisons for Preferred Job Security

Job Characteristic	Work Status	N	Mean	Std. Dev	Std. Error	Analysis of Mean
Preferred Job Security	Contract(C)	25	4.08	0.91	0.18	C<P
	Permanent(P)	84	4.49	0.55	0.06	

security than permanent software developers, thus, supporting hypothesis H5d. The comparisons of the means of the two samples are shown in Table 4.15.

We had hypothesized that the preferred pay adequacy (H5e) of contract software developers will be higher than that of permanent software developers. The t-test result (insignificant t statistic value and inclusion of 0 in the 95% confidence interval) shows no difference in the two samples for preferred pay adequacy. Therefore, hypothesis H5e was rejected.

Finally, we had hypothesized that there will be no differences between contract and permanent software developers for preferred task identity (H5l). The t-test result (insignificant t statistic value and inclusion of 0 in the 95% confidence interval) supports this finding. Hypothesis H5l was accepted.

Based on Levene's test, we found equal variance between contract and permanent software developers with respect to their preferred promotion (H5a), achievement (H5b), task variety (H5f), skill variety (H5g), skill requirements (H5h), growth & learning (H5i), autonomy (H5k), task significance (H5m), communication (H5n), social interactions (H5o), extrinsic feedback (H5p), task clarity (H5q), and intrinsic feedback (H5r). Therefore, ANCOVA tests were performed for hypotheses H5a, H5b, H5f through H5k, and H5m through H5r. Each ANCOVA test was performed with work status as the fixed variable, the demographic variables (age, education, gender, tenure, and years of work experience) as covariates, and the preferred job characteristic as the dependent variable. The results are shown in Table 4.16.

Table 4.16: ANCOVA - Preferred Job Characteristics

			F Values					
Job Characteristics	**n**	**df**	**Tenure**	**Age**	**Gender**	**Education**	**YWE**	**WorkStatus**
Preferred Promotion	108	(1, 101)	0.80	**8.72**	1.67	0.75	1.51	1.95
Preferred Achievement	109	(1, 102)	0.44	3.16	2.86	0.74	1.40	1.78
Preferred Task Variety	109	(1, 102)	0.00	3.83	**4.65**	0.27	1.36	0.46
Preferred Skill Variety	109	(1, 102)	1.79	0.13	0.06	0.00	0.19	0.19
Preferred Skill Requirement	109	(1, 102)	1.27	0.23	1.22	0.42	0.02	3.10
Preferred Growth	109	(1, 102)	1.45	**6.19**	0.75	0.40	1.48	1.61
Preferred Autonomy	109	(1, 102)	0.00	2.39	0.90	0.00	0.38	0.28
Preferred Participation	109	(1, 102)	0.25	2.42	3.78	3.12	1.83	1.53
Preferred Task Significance	109	(1, 102)	0.00	0.09	1.55	0.57	0.09	0.00
Preferred Communication	109	(1, 102)	0.10	2.25	0.42	1.06	1.06	3.35
Preferred Social Interaction	109	(1, 102)	0.90	2.47	3.17	2.24	1.00	0.60
Preferred Extrinsic Feedback	108	(1, 101)	2.74	1.62	0.07	0.06	4.96	0.08
Preferred Task Clarity	109	(1, 102)	0.27	1.85	0.45	**5.42**	**6.64**	0.05
Preferred Intrinsic Feedback	109	(1, 102)	0.20	1.29	0.45	0.27	2.51	0.86

$p < 0.05$; ANCOVA Fixed Factor = Work Status (WS), Covariates = Tenure, Age, Gender, Education, Years of Work Experience (YWE)

The ANCOVA results show that the F statistic for work status was not significant for any of the tested preferred job characteristics, namely, preferred promotion, achievement, task variety, ability/akill variety, ability/skill requirement, growth, autonomy, participation, task significance, communication, social interaction, extrinsic feedback, task clarity, and intrinsic feedback. This implies that having controlled for the tenure, age, gender, education, and years of work experience of contract and permanent software developers, their work status did not affect the above listed preferred job characteristics.

We had hypothesized that the preferred promotion (H5a) and achievement (H5b) of contract software developers will be lower than permanent software developers. Based on the ANCOVA results, hypotheses H5a and H5b were rejected.

We had, however, hypothesized that there will be no difference between contract and permanent software developers with respect to their preferred task variety (H5f), ability/akill variety (H5g), ability/skill requirement (H5h), growth/learning (H5i), autonomy (H5j), participation (H5k), task significance (H5m), communication (H5n), social interaction (H5o), extrinsic feedback (H5p), task clarity (H5q), and intrinsic feedback (H5r). Based on the ANCOVA results, H5f through H5k, and H5m through H5r were accepted.

In this section, we presented the results of the hypotheses tests for the preferred job characteristics of contract and permanent software developers. In Chapter 5, we discuss the explanations for these results. In the next section we present the results of the PLSSEM models for mediation and moderation.

4.3 PLSSEM - Measurement Model Evaluation

PLSSEMs are analyzed in two stages. The first stage involves the analysis of the validity and the reliability of the measurement model. The second stage involves the testing and the interpretation of the structural model. The measurement model is

assessed by evaluating: (a) the reliability of individual items; (b) internal consistency of each scale; and (c) the discriminant validity among constructs (Barclay et al., 1995).

Table 4.17 shows the loadings and cross-loadings of all indicators and latent variables used in the model that have more than one indicator. Indicator loadings greater than .70 indicate that there is greater shared variance between the latent variable and its indicators than error variance. Most indicators related to experienced, expected and preferred job characteristic latent variables had loadings below .706. Although this is a potential concern, several other factors should be considered. First, the indicators were adapted from the MJDQ scale that has been used extensively in the organizational studies. Second, the calculation procedures underlying PLSSEM perform better as the number of items per construct increases (Chin, 1998). Thus, keeping an indicator with a low loading is likely to improve model predictiveness, assuming that the indicator does not load higher on any other latent variable in the model. None of the indicators with loadings below .70 load higher on the other latent variables. These cross loadings also evaluate discriminant validity in PLSSEM. Specifically, discriminant validity is established when no indicator loads more highly on any latent variable other than the latent variable it is expected to measure. Finally, as described in Chapter 3, the experienced, expected, and preferred job characteristic latent variables were measured as formative constructs. Therefore, the loadings are not assumed to be correlated or measuring the same phenomenon. Instead, they are assumed to cause their respective constructs, each measuring a unique dimension of the overall construct. Removing any of these items would therefore, fundamentally change this construct. Considering all of these factors, it was decided to retain all of these items.

In reviewing the indicator loadings for in-role job performance (IRJP) and organizational citizenship behaviors-organization (OCBO) we found some indicators with loadings below 0.70. However, per Chin (1998), indicator loadings of 0.50 and 0.60 are acceptable when there are additional indicators related to the latent variable to which they may be compared. A review of the cross loadings also validated that none of the indicators with lower loadings loaded higher on any other latent variables. Therefore we decided to retain these items.

In the case of organizational citizenship behaviors-individual (OCBI), however, one indicator (the "Helps Manager" indicator) had a particularly low loading. In reviewing the data, most of the responses were "Not Applicable". Thus, it appeared that the managers who rated this attribute did not expect the developers to help them. Therefore we decided to remove this indicator from the OCBI construct. OCBI was modeled as a reflective construct. By definition, removing an indicator from a reflective construct does not alter the domain of the construct. Furthermore, there were other indicators in this construct (helps with load, helps new employees, helps absentees) that also establish the helping behavior of the employees and had higher loadings. This ensured that the construct domain was not affected by the removal of the "helps manager" indicator.

The next step to assess the reliability of the model was to evaluate the internal consistency. Cronbach's alpha is the most popular measure of reliability. By convention, alpha should be greater or equal to .80 for a good scale, .70 for an acceptable scale, and .60 for a scale for exploratory purposes. SmartPLS generates the Cronbach's alpha values for all reflective latent variables as shown in Table 4.18. The values are all greater than 0.80.

SmartPLS also generates the composite reliability (Dillon Goldstein's Rho) for the

Table 4.17: Indicator Loadings and Cross Loadings

Indicators	**EXPDJC**	**EXRJC**	**PRFJC**	**IRJP**	**OCBI**	**OCBO**
ExpectedAchievement	**0.54**[1]	-[2]	-	-	-	-
ExpectedAutonomy	**0.64**	-	-	-	-	-
ExpectedCommunication	**0.50**	-	-	-	-	-
ExpectedExtrinsicFeedback	**0.43**	-	-	-	-	-
ExpectedGrowth	**0.56**	-	0.36	-	-	-
ExpectedIntrinsicFeedback	**0.42**	-	-	-	-	-
ExpectedJobSecurity	**0.57**	0.35	-	-	-	-
ExpectedParticipation	**0.60**	-	-	-	-	-
ExpectedPayAdequacy	**0.49**	-	-	-	-	-
ExpectedPromotion	**0.42**	-	-	-	-	-
ExpectedRecognition	**0.45**	-	-	-	-	-
ExpectedSkillRequirement	**0.51**	-	-	-	-	-
ExpectedSkillVariety	**0.53**	-	-	-	-	-

[1]Loadings in bold reflect that the indicator is associated with the latent variable in the header

[2]Loading values below 0.30 not shown

Table 4.17: (continued)

ExpectedSocialInteraction	**0.51**	-	-	-	-	-
ExpectedTaskClarity	**0.57**	-	-	-	-	-
ExpectedTaskIdentity	**0.50**	-	-	-	-	-
ExpectedTaskSignificance	**0.56**	-	-	-	-	-
ExpectedTaskVariety	**0.60**	-	-	-	-	-
ExperiencedAchievement	-	**0.52**	-	-	-	-
ExperiencedAutonomy	-	**0.50**	-	-	-	-
ExperiencedCommunication	-	**0.57**	-	-	-	-
ExperiencedExtrinsicFeedback	-	**0.47**	-	-	-	-
ExperiencedGrowth	-	**0.55**	0.42	-	-	-
ExperiencedIntrinsicFeedback	-	**0.54**	-	-	-	-
ExperiencedJobSecurity	0.38	**0.54**	-	-	-	-
ExperiencedParticipation	-	**0.43**	-	-	-	-
ExperiencedPayAdequacy	-	**0.48**	-	-	-	-
ExperiencedPromotion	-	**0.57**	-	-	-	-
ExperiencedRecognition	0.35	**0.51**	-	-	-	-

Table 4.17: (continued)

ExperiencedSkillRequirement	-	**0.42**	-	-	-	-
ExperiencedSkillVariety	-	**0.53**	-	-	-	-
ExperiencedSocialinteraction	-	**0.44**	-	-	-	-
ExperiencedTaskClarity	-	**0.41**	-	-	-	-
ExperiencedTaskIdentity	-	**0.52**	-	-	-	-
ExperiencedTaskSignificance	0.39	**0.65**	-	-	-	-
ExperiencedTaskVariety	-	**0.68**	-	-	-	-
PreferredAchievement	-	-	**0.41**	-	-	-
PreferredAutonomy	-	-	**0.59**	-	-	-
PreferredCommunication	-	-	**0.56**	-	-	-
PreferredExtrinsicFeedback	-	-	**0.41**	-	-	-
PreferredGrowth	-	-	**0.46**	-	-	-
PreferredIntrinsicFeedback	-	-	**0.48**	-	-	-
PreferredJobSecurity	-	-	**0.56**	-	-	-
PreferredParticipation	-	-	**0.59**	-	-	-
PreferredPayAdequacy	-	-	**0.60**	-	-	-

Table 4.17: (continued)

PreferredPromotion	-	-	**0.41**	-	-	-
PreferredRecognition	-	-	**0.44**	-	-	-
PreferredSkillRequirement	-	-	**0.43**	-	-	-
PreferredSkillVariety	-	-	**0.61**	-	-	-
PreferredSocialInteraction	-	-	**0.49**	-	-	-
PreferredTaskClarity	-	-	**0.43**	-	-	-
PreferredTaskIdentity	-	-	**0.41**	-	-	-
PreferredTaskSignificance	-	-	**0.43**	-	-	-
PreferredTaskVariety	-	-	**0.46**	-	-	-
PerfActivitiesEvaluation	-	-	-	**0.66**	0.36	-
PerfAssignedDuties	-	0.30	-	**0.81**	-	0.38
PerfEssentialDuties	0.40	0.31	-	**0.77**	-	0.55
PerfExpectedTasks	-	0.32	-	**0.90**	-	0.38
PerfJobResponsibilities	0.34	0.39	-	**0.84**	-	0.41
PerfMeetsJobRequirements	-	0.38	-	**0.89**	-	0.35
PerfObligations	0.33	0.38	0.21	**0.80**	0.35	0.48

Table 4.17: (continued)

OCBHelpsAbsentees	-	0.37	0.46	0.33	**0.81**	0.36
OCBHelpsLoad	-	0.42	0.46	0.36	**0.82**	0.38
OCBHelpsManager	-	-	-	-	**0.25**	0.19
OCBHelpsNewEmployees	-	0.37	0.45	-	**0.91**	-
OCBInformationExchange	-	0.35	-	-	**0.71**	-
OCBInterest	-	0.32	-	-	**0.81**	-
OCBListenstoCoworkers	-	0.37	0.45	-	**0.77**	-
OCBAdherestoRules	-	-	-	-	-	**0.66**
OCBAdvanceNotice	-	-	-	-	-	**0.65**
OCBAttendance	-	0.30	-	0.46	0.33	**0.63**
OCBNoBreaks	0.47	0.38	-	0.51	-	**0.77**
OCBNoComplain	-	-	-	0.39	-	**0.64**
OCBProtectsProperty	0.33	-	-	-	-	**0.73**
OCBTimeConserve	0.39	0.30	-	0.39	-	**0.79**

reflective latent variables. Composite reliability is a preferred alternative to Cronbach's alpha as a measure of reliability because Cronbach's alpha may over or underestimate scale reliability. In an adequate model for exploratory purposes, composite reliabilities should be greater than .60 (Chin, 1998; Höck & Ringle, 2006, p. 15) and greater than .70 for an adequate model for confirmatory purposes. Other authors require greater than .80 (Daskalakis & Mantas, 2008, p288). As shown in Table 4.18, the composite reliability values for all reflective latent variables are greater than 0.80.

A final measure to establish convergent validity is known as AVE or average variance extracted (Fornell & Larcker, 1981), which reflects the average communality for each latent factor. Thus, it is also only applicable for reflectively modeled latent variables. In an adequate model, AVE should be greater than .50 (Chin, 1998; Höck & Ringle, 2006, p. 15) indicating that at least 50% of the variance is accounted for the indicators. Based on the results shown in Table 4.18, organizational citizen behavior - organization construct (OCBO) had an AVE slightly below the recommended value. However, given the measures of internal consistency, the measure was deemed acceptable.

AVE is also an indicator of discriminant validity. In PLSSEM analysis, a construct should share more variance with its indicators than it does with other constructs in the model. Discriminant validity can be tested by using the square root of the AVE for each of the reflective constructs. These measures should be greater than the inter-correlations with any other constructs in the model. As shown in Table 4.19 all of the square roots of the AVEs are greater than their corresponding inter-correlations. Thus, the assessments of reliability and validity suggest that the measurement model is satisfactory.

In reviewing the inter-correlations of all the constructs, we found that the control variables (age, education, gender, tenure and years of experience) were not significantly related to any of the outcome variables (in-role job performance, organizational citizenship behavior-individual, and organizational citizenship behavior-organization). Also, an initial bootstrap test in SmartPLS revealed that there was no significant effect of any of the control variables on the outcome variables. Since PLS computes the principal components by iteratively selecting scores from the latent independent variables that have maximum covariance with other latent independent variables as well as the dependent latent variables, removing any control variables from the model that did not have any covariance with other dependent or independent variables did not affect the outcome of the models tested. For example, Tenure was correlated to Work Status. However, tenure was not correlated to the dependent variables, IRJP, OCBI, and OCBO. Tenure also did not have a significant effect on the dependent variables. Therefore removing Tenure from the pls models did not result in a difference.

Among the other constructs of interest, experienced job characteristics was found to be moderately co-related to in-role job performance, organizational citizenship behavior-individual, and organizational citizenship behavior-organization. Expected job characteristics was found to be moderately correlated to in-role job performance and organizational citizenship behavior-organization, but with a relatively weaker correlation to organizational citizenship behavior-individual. Preferred job characteristics was found to be moderately correlated to organizational citizenship behavior-individual only.

Table 4.18: Average Variance Extracted (AVE), Composite Reliability and Cronbach's Alpha for Reflective Latent Variables*

Latent Variables	AVE	Composite Reliability	Cronbach's Alpha
IRJP	0.63	0.92	0.89
OCBI	0.56	0.89	0.84
OCBO	0.47	0.86	0.82

*values cannot be computed for formative latent variables

4.4 PLSSEM - Structural Model Evaluation for Mediation

4.4.1 Hypotheses H2a and H2b

The structural equation model using partial least squares is tested by assessing the R^2 value of the latent variables in the model. Various structural models are compared by comparing the changes in R^2 value. The significance of the R^2 change can be evaluated using an F-ratio (Chin, 1998). We used a three step method to test hypotheses H2a and H2b.

First, a control model was generated with work status, the control variables, and the outcome latent variables (in-role job performance, organizational citizenship behaviors-individual and organizational citizenship behaviors-organization). In the second step, the experienced job characteristics variable was added as a partial mediator. In the third step, the experienced job characteristics variable was modeled as a full mediator. The SmartPLS path diagrams for each of the three models are shown in Figures 4.1, 4.2 and 4.3.

Table 4.20 shows the R^2 value for the outcome variables, the change in R^2 value and the effect size. The overall R^2 values for each outcome in each model was small showing very weak effect of the independent variables (work status and experienced job characteristics) on the outcome variables (in-role job performance, organizational citizenship behaviors-individual, and organizational citizenship behaviors-organization).

Mediation models (full or partial) hold true only when the variations in the levels of the independent variable (work status) accounts for variations in the presumed

Table 4.19: Intercorelations and Square Root of AVE

#	**Variables**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	Age	-											
2	Education	**-0.26**[a]	-										
3	Gender	-0.15	**0.33**	-									
4	Tenure	**0.37**	**0.43**	-0.13	-								
5	Years of Experience	**0.61**	**-0.22**[b]	0.01	**0.30**	-							
6	Work Status	**0.26**	**-0.37**	-0.19	**0.54**	0.12	-						
7	EXPDJC	0.10	-0.17	-0.03	-0.02	-0.03	0.04	-					
8	EXRJC	0.04	-0.06	-0.05	0.07	0.12	0.10	**0.23**	-				
9	PRFJC	0.08	-0.19	-0.08	0.06	0.04	0.07	0.11	**0.20**	-			
10	IRJP	-0.07	0.00	-0.02	0.02	0.01	-0.10	**0.36**	**0.42**	0.16	(0.79)[c]		
11	OCBI	-0.09	-0.06	0.02	-0.13	-0.09	-0.05	**0.26**	**0.45**	**0.49**	**0.32**	(0.75)	
12	OCBO	-0.01	0.18	0.13	-0.12	0.00	-0.17	**0.46**	**0.37**	-0.02	**0.41**	**0.31**	(0.69)

[a] **p < 0.01**

[b] **p < 0.05**

[c] Items in the diagnoal are the square roots of AVE

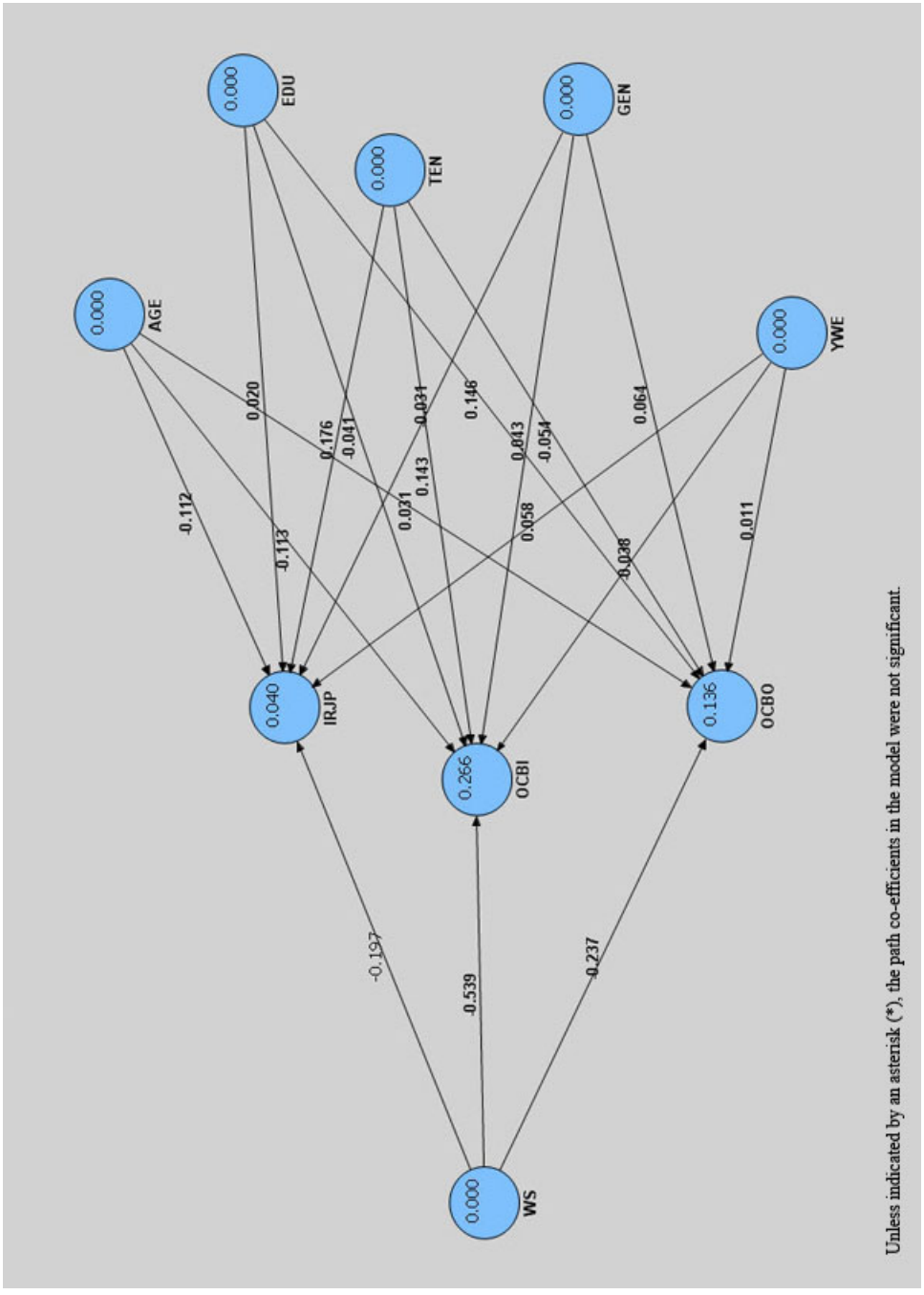

Figure 4.1: PLSSEM Mediation Control Model

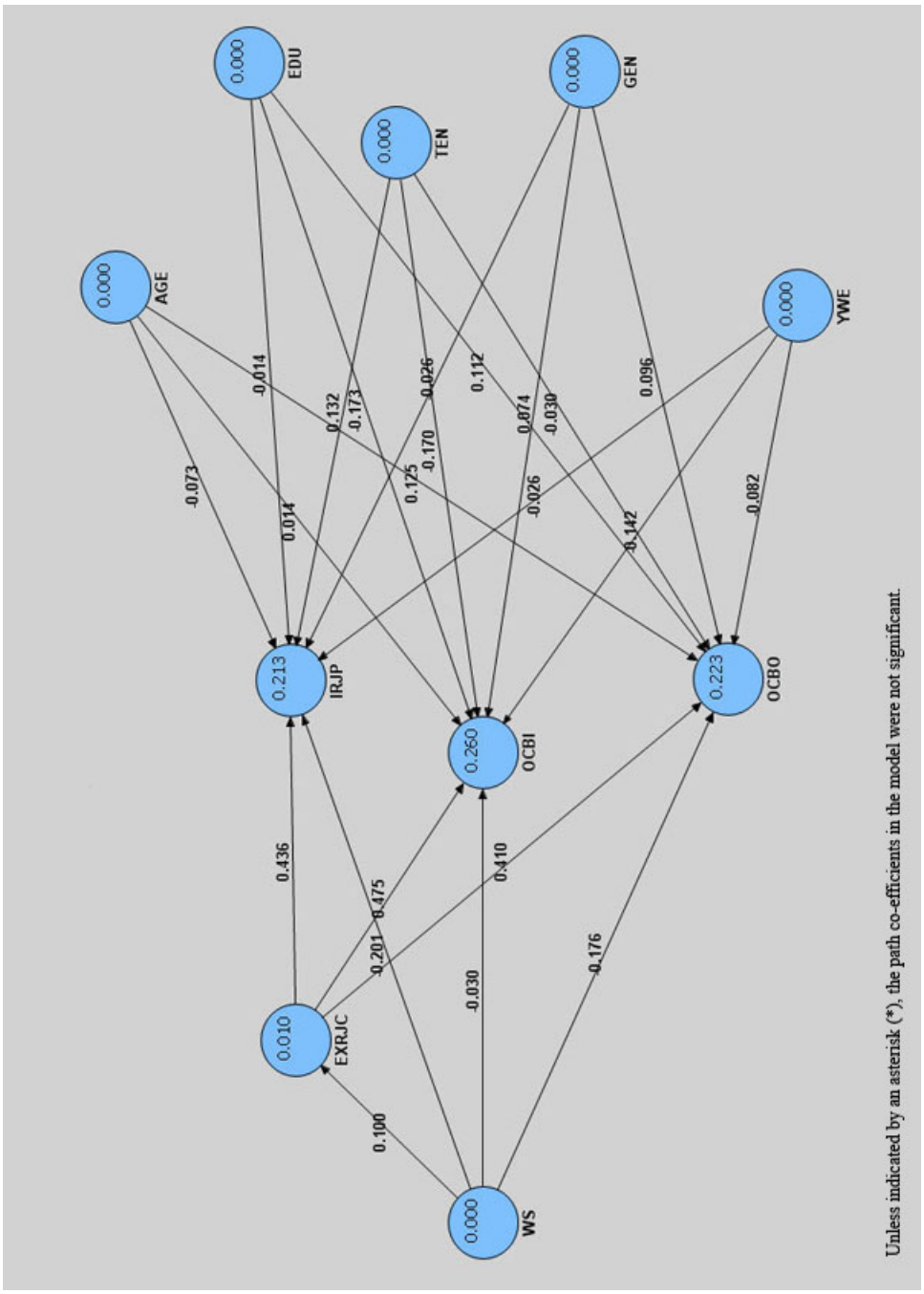

Figure 4.2: PLSSEM Partial Mediation Model

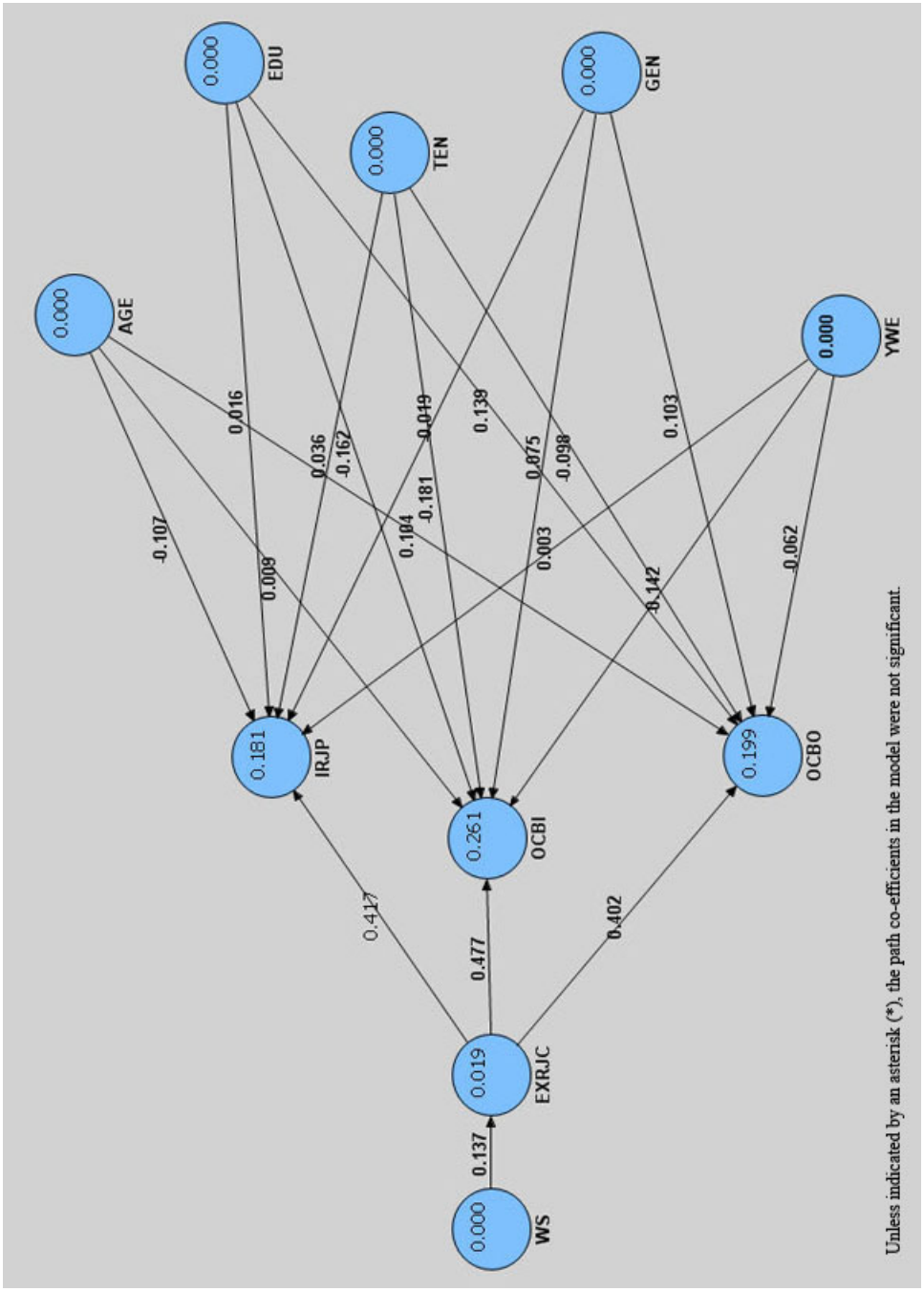

Figure 4.3: PLSSEM Full Mediation Model

Table 4.20: Comparison of PLSSEM Models Showing R^2, $R^2\Delta$ and Effect Size for Mediation Tests

Latent Variables	**1: Control Model**		**2: Partially Mediated Model**			**3: Fully Mediated Model**		
	R^2	**$R^2\Delta$**	**R^2**	**$R^2\Delta$**	**Effect Size**	**R^2**	**$R^2\Delta$**	**Effect Size**
EXRJC	0.00	0.00	0.01	0.01	0.01	0.02	0.01	0.01
IRJP	0.04	0.04	0.21	0.17	**0.22***	0.18	-0.03	-0.04
OCBI	0.27	0.27	0.26	-0.01	-0.01	0.26	0.00	-0.01
OCBO	0.14	0.14	0.22	0.09	**0.11***	0.20	-0.02	-0.03

*Effect Size (Cohen, 1988): 0.02 - 0.15: Weak, 0.16 - 0.35: Moderate, $>$ 0.35: Strong

mediator (experienced job characteristics). Since neither the full mediation model, nor the partial mediation model indicate a significant effect of work status on the experienced job characteristics, we cannot conclude that experienced job characteristics mediate the relationship between work status and the performance and organizational citizenship behaviors of the contract and the permanent software developers.

However, it is interesting to note that the partial mediation model had the highest explanatory value of all models for both the in-role job performance (IRJP) and the organization citizenship behaviors - organization (OCBO). A review of the effect size indicates moderate effect (0.22) for the partial mediation model of in-role job performance (IRJP) and weak effect (0.11) for the partial mediation model of organization citizenship behaviors - organization (OCBO).

The T statistics for the direct effects of work status and experienced job characteristics on job performance and citizenship behaviors is shown in table 4.21. The T statistics for the total effect of work status on job performance and citizenship behaviors is shown in table 4.22. The T statistics for the direct effect of all the control variables is shown in table 4.23. The T statistics of all the tables correspond to the

Table 4.21: Direct Effect of Experienced Job Characteristics (EXRJC) and Work Status (WS) on Work Outcomes

Direct Effect	Beta	Std. Dev.	Std. Error	T statistic
EXRJC -> IRJP	0.44	0.52	0.52	0.84
EXRJC -> OCBI	0.48	0.52	0.52	0.91
EXRJC -> OCBO	0.41	0.51	0.51	0.80
WS -> EXRJC	0.10	0.34	0.34	0.29
WS -> IRJP	-0.20	0.15	0.15	1.34
WS -> OCBI	-0.03	0.18	0.18	0.17
WS-> OCBO	-0.18	0.16	0.16	1.07

IRJP - In-role Job Performance, OCBI - Organizational Citizenship Behaviors - Individual, OCBO - Organizational Citizenship Behaviors - Organization

Table 4.22: Total Effect of Work Status (WS) on Work Outcomes

Total Effect	Beta	Std. Dev.	Std. Error	T statistic
WS -> IRJP	-0.16	0.12	0.12	1.28
WS -> OCBI	0.02	0.18	0.18	0.10
WS-> OCBO	-0.13	0.14	0.14	0.95

IRJP - In-role Job Performance, OCBI - Organizational Citizenship Behaviors - Individual, OCBO - Organizational Citizenship Behaviors - Organization

Table 4.23: Direct Effect of Control Variables on Work Outcomes

Direct Effect	Beta	Std. Dev.	Std. Error	T Statistics
AGE -> IRJP	-0.07	0.11	0.11	0.65
AGE -> OCBI	0.01	0.11	0.11	0.13
AGE -> OCBO	0.12	0.13	0.13	0.96
EDU -> IRJP	-0.01	0.12	0.12	0.11
EDU -> OCBI	-0.17	0.12	0.12	1.40
EDU -> OCBO	0.11	0.11	0.11	1.04
GEN -> IRJP	-0.03	0.11	0.11	0.24
GEN -> OCBI	0.07	0.10	0.10	0.78
GEN -> OCBO	0.10	0.11	0.11	0.91
TEN -> IRJP	0.13	0.13	0.13	1.03
TEN -> OCBI	-0.17	0.13	0.13	1.31
TEN -> OCBO	-0.03	0.12	0.12	0.24
YWE -> IRJP	-0.03	0.11	0.11	0.24
YWE -> OCBI	-0.14	0.11	0.11	1.31
YWE -> OCBO	-0.08	0.13	0.13	0.62

IRJP - In-role Job Performance, OCBI - Organizational Citizenship Behaviors - Individual, OCBO - Organizational Citizenship Behaviors - Organization, EDU - Education, TEN - Tenure, YWE - Years of Work Experience, GEN - Gender

partial mediation model. As shown, none of the path coefficients were significant. Thus hypotheses H2a and H2b were rejected.

The above result is in line with the findings of the earlier hypotheses (i.e., H1a - H1r) in the study. The contract and permanent software developers who participated in the study rated eighteen dimensions of their experienced job characteristics. Of these eighteen dimensions, only the experienced job security was found to vary. For all other dimensions, there was no difference reported among the contract and the permanent software developers. Therefore, it is consistent that the mediating effect of the experienced job characteristics on the relationship between the work status and the performance and behaviors of the software developers was not supported. In Chapter 5, we discuss the possible explanations of these results.

4.5 PLSSEM - Structural Model Evaluation for Moderation

4.5.1 Hypotheses H4a and H4b

The tests for the effect of fit between the expected and experienced job characteristics of software developers on their performance and behaviors were conducted using multiple structural equation models. SmartPLS allows testing moderating effect by introducing the product terms as latent variables in the structural models.

The first structural equation model served as a control model with no mediating or moderating effects; work status (WS), experienced job characteristics (EXRJC), along with the demographic variables, age (AGE), gender (GEN), tenure (TEN), years of work experience (YWE), and education (EDU) were used as independent variables and in-role job performance (IRJP), organizational citizenship behaviors-individual (OCBI), and organizational citizenship behaviors-organization (OCBO) were the dependent variables.

In the second structural equation model, the expected job characteristics (EXPJC) variable was added as an independent variable affecting the dependendent variables

Table 4.24: Comparison of PLSSEM Models for Moderation Test of Expected-Experienced Job Characteristics Fit

Latent Variables	**1: Control Model**		**2: Linear Model**			**3: Quadratic Fit Model**		
	R^2	**$R^2\Delta$**	**R^2**	**$R^2\Delta$**	**Effect Size**	**R^2**	**$R^2\Delta$**	**Effect Size**
IRJP	0.21	0.21	0.30	0.09	**0.12***	0.31	-0.01	0.02
OCBI	0.25	0.25	0.27	0.01	0.02	0.27	0.00	0.00
OCBO	0.22	0.22	0.38	0.17	**0.27***	0.38	0.00	0.00

*Effect Size (Cohen, 1988): 0.02 - 0.15: Weak, 0.16 - 0.35: Moderate, $>$ 0.35: Strong
IRJP - In-role Job Performance, OCBI - Organizational Citizenship Behaviors - Individual, OCBO - Organizational Citizenship Behaviors - Organization

IRJP, OCBI, and OCBO.

In the third structural equation model, the quadratic 2nd order terms, namely, $(EXRJC)^2$, (EXRJC*EXPJC), and $(EXPJC)^2$ were added as independent variables affecting IRJP, OCBI, and OCBO. Because experienced job characteristics and expected job characteristics were modeled as formative latent variables, all higher order terms were computed using element-wise products of the latent variable scores in SmartPLS (Chin et al., 2003). The SmartPLS path diagrams for each of the three models are shown in Figures 4.4, 4.5, and 4.6.

Table 4.24 shows the R^2 value for the outcome variables in each model as well as the change in R^2 value. The R^2 change was the highest for the linear simple effect model when the expected job characteristic variable was added. The change in R^2 corresponded toa weak effect size for OCBI (0.02) and in-role job performance (0.12), and a moderate effect size for OCBO (0.27). However, as shown in Table 4.25, the T statistics of the path co-efficients for expected job characteristics, experienced job characteristics, or work status were not significant. Since the other PLS models tested did not have a significant R^2 or R^2 change, the T statistics are not shown.

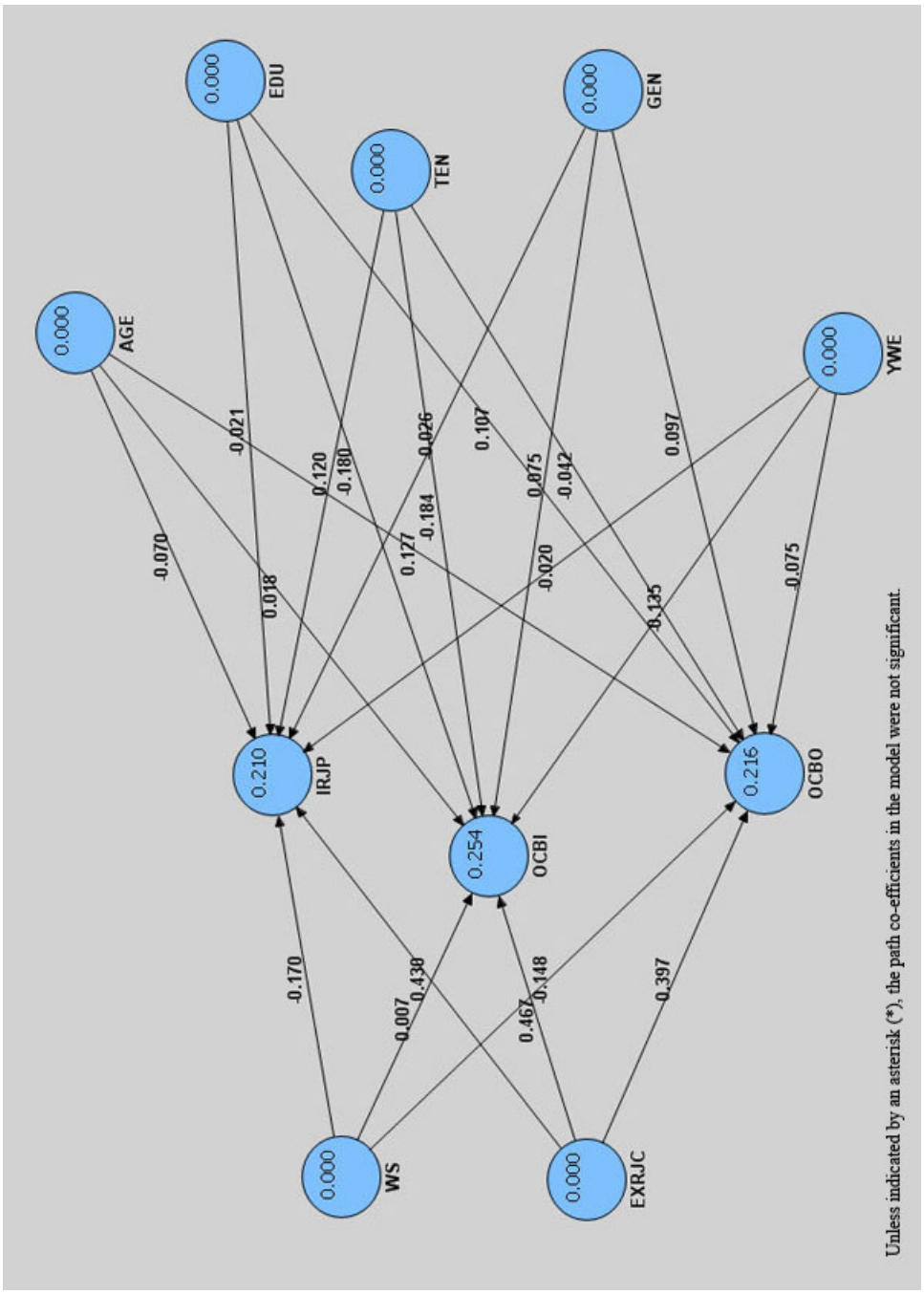

Figure 4.4: PLSSEM Moderation Control Model - Expected Job Characteristics

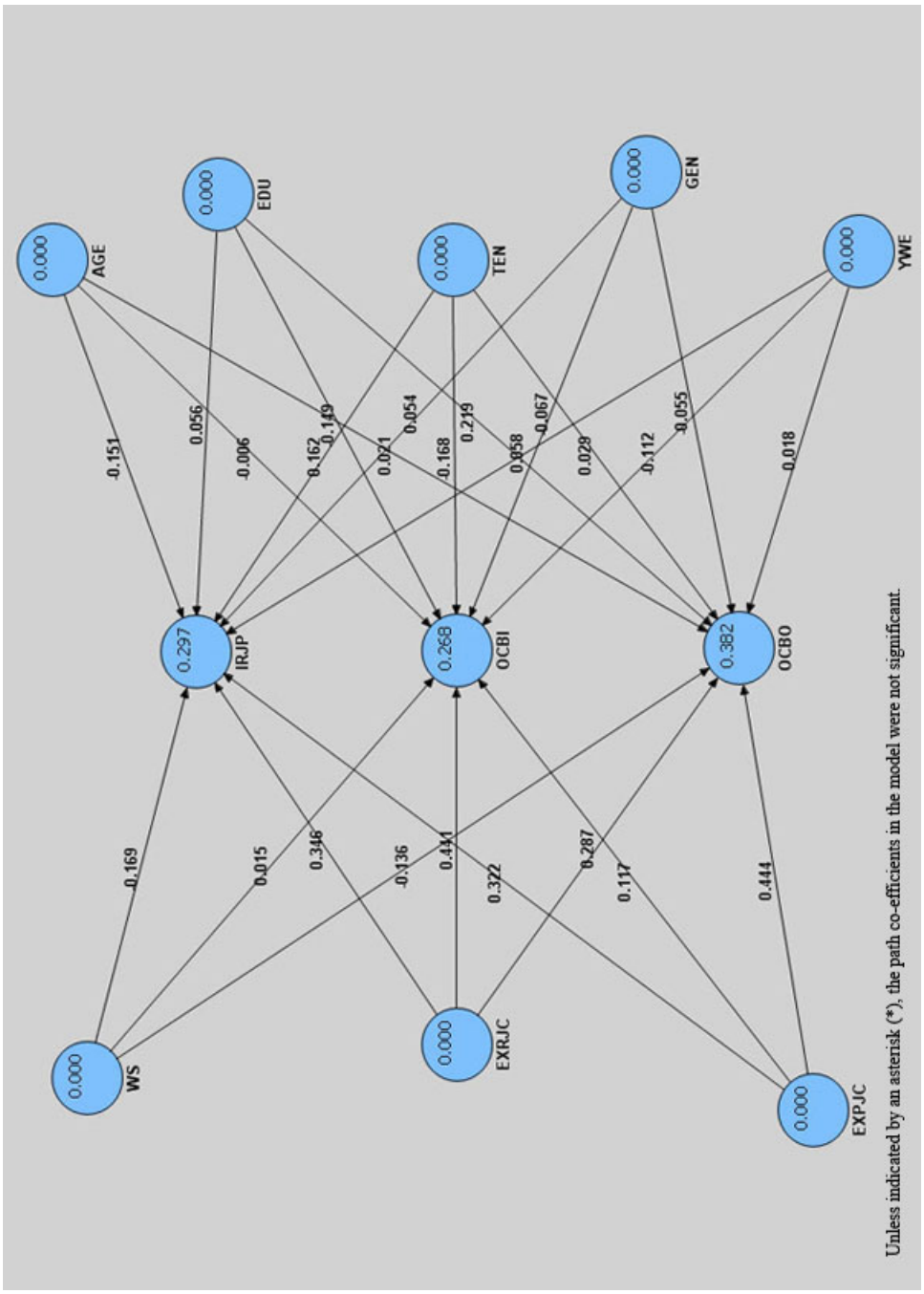

Figure 4.5: PLSSEM Moderation Linear Model - Expected Job Characteristics

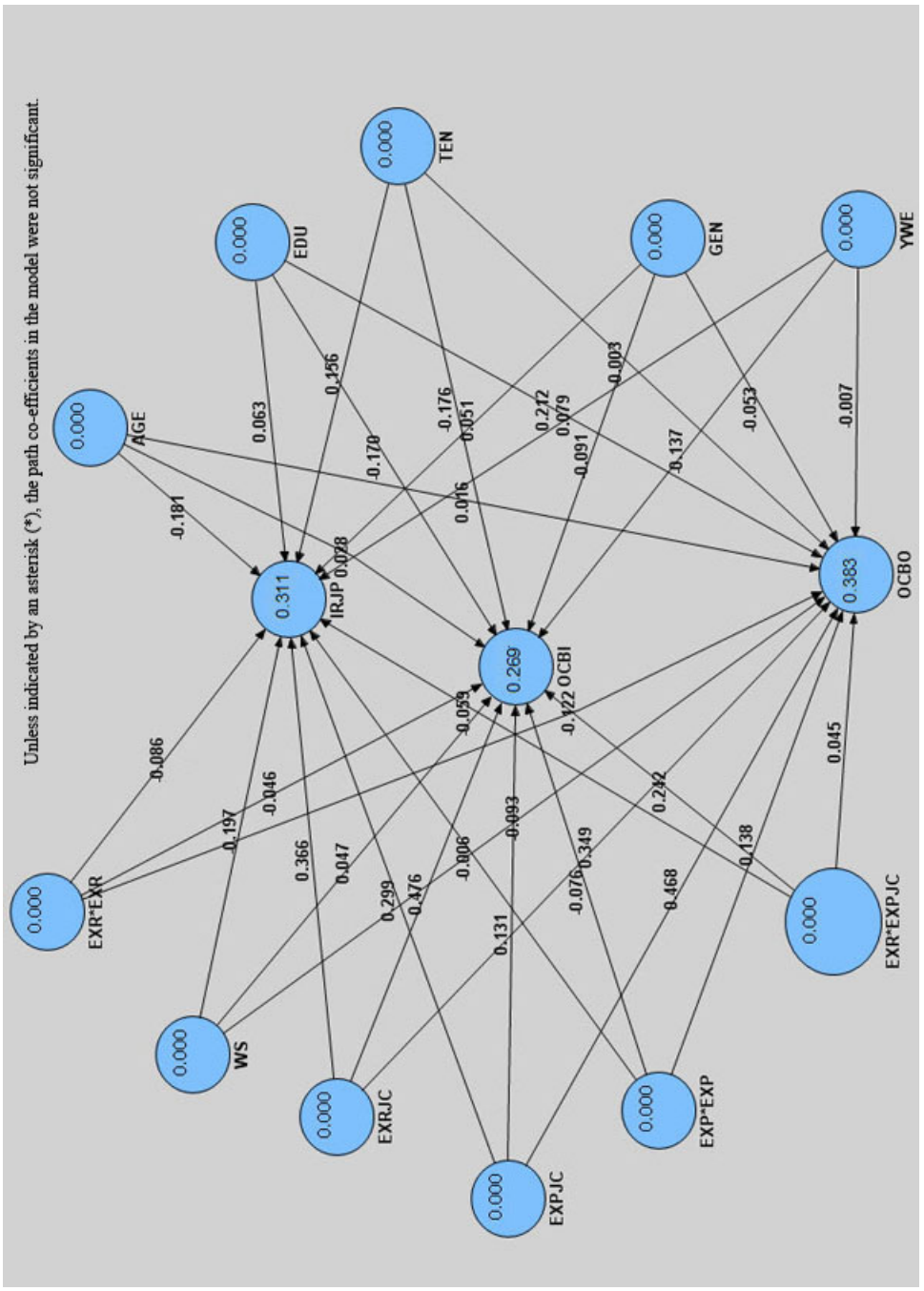

Figure 4.6: PLSSEM Moderation Quadratic Fit Model - Expected Job Characteristics

Table 4.25: T Statistics of the Path Coefficients for the Linear Model - Expected Job Characteristics

Direct Effect	Beta	Std. Dev.	Std. Error	T statistic
EXPJC -> IRJP	0.32	0.33	0.33	0.99
EXPJC -> OCBI	0.12	0.26	0.52	0.45
EXPJC -> OCBO	0.44	0.43	0.43	1.04
EXRJC -> IRJP	0.35	0.41	0.41	0.85
EXRJC -> OCBI	0.44	0.46	0.46	0.96
EXRJC -> OCBO	0.29	0.34	0.34	0.84
WS -> IRJP	-0.17	0.09	0.09	1.89
WS -> OCBI	-0.02	0.11	0.11	0.13
WS-> OCBO	-0.14	0.10	0.10	1.41

IRJP - In-role Job Performance, OCBI - Organizational Citizenship Behaviors - Individual, OCBO - Organizational Citizenship Behaviors - Organization
WS - Work Status, EXRJC - Experienced Job Characteristics, EXPJC - EXPJC - Expected Job Characteristics
Note: Path Coefficients of the demographic variables not shown

The quadratic effect model did not have a significant change in R^2 for any of the outcome variables when compared to the linear simple effect model, thus showing no significant non-linear or interaction effect (fit). Based on this evidence, hypotheses H4a and H4b are rejected. The fit between expected and experienced job characteristics of software developers is not a significant predictor of either their in-role job performance or their organizational citizenship behaviors.

4.5.2 Hypotheses H6a and H6b

Similar to hypotheses H4a and H4b, the tests for the effect of fit between the preferred and experienced job characteristics of software developers on their performance and behaviors were conducted using multiple structural equation models. SmartPLS allows testing moderating effect by introducing the product terms as latent variables in the structural models.

The first structural equation model was a control model with no mediating or moderating effects; work status (WS), experienced job characteristics (EXRJC), along with the demographic variables, age (AGE), gender (GEN), tenure (TEN), years of

work experience (YWE), and education (EDU) were used as independent variables and in-role job performance (IRJP), organizational citizenship behaviors-individual (OCBI), and organizational citizenship behaviors-organization (OCBO) were the dependent variables.

In the second structural equation model, the preferred job characteristics (PRFJC) variable was added as an independent variable affecting the dependendent variables IRJP, OCBI, and OCBO.

In the third model, the quadratic 2nd order terms, $(EXRJC)^2$, (EXRJC*PRFJC) and $(PRFJC)^2$ were added as independent variables affecting IRJP, OCBI, and OCBO. Because experienced job characteristics and preferred job characteristics were modeled as formative latent variables, all higher order terms were computed using element-wise products of the latent variable scores in SmartPLS (Chin et al., 2003). The SmartPLS path diagrams for each of the three models are shown in Figures 4.7, 4.8, and 4.9.

Table 4.26: Comparison of PLSSEM Models for Moderation Test of Preferred-Experienced Job Characteristics Fit

Latent Variables	**1: Control Model**		**2: Linear Model**			**3: Quadratic Fit Model**		
	R^2	**$R^2\Delta$**	**R^2**	**$R^2\Delta$**	**Effect Size**	**R^2**	**$R^2\Delta$**	**Effect Size**
IRJP	0.21	0.21	0.21	0.00	0.00	0.21	0.00	0.00
OCBI	0.25	0.25	0.28	0.03	**0.04***	0.28	0.00	0.00
OCBO	0.22	0.22	0.23	0.01	0.02	0.23	0.00	0.00

*Effect Size (Cohen, 1988): 0.02 - 0.15: Weak, 0.16 - 0.35: Moderate, $>$ 0.35: Strong
IRJP - In-role Job Performance, OCBI - Organizational Citizenship Behaviors - Individual, OCBO - Organizational Citizenship Behaviors - Organization

Table 4.26 shows the R^2 value for the outcome variables in each model and the change in R^2 value. As shown in the table, the R^2 change was the highest for the

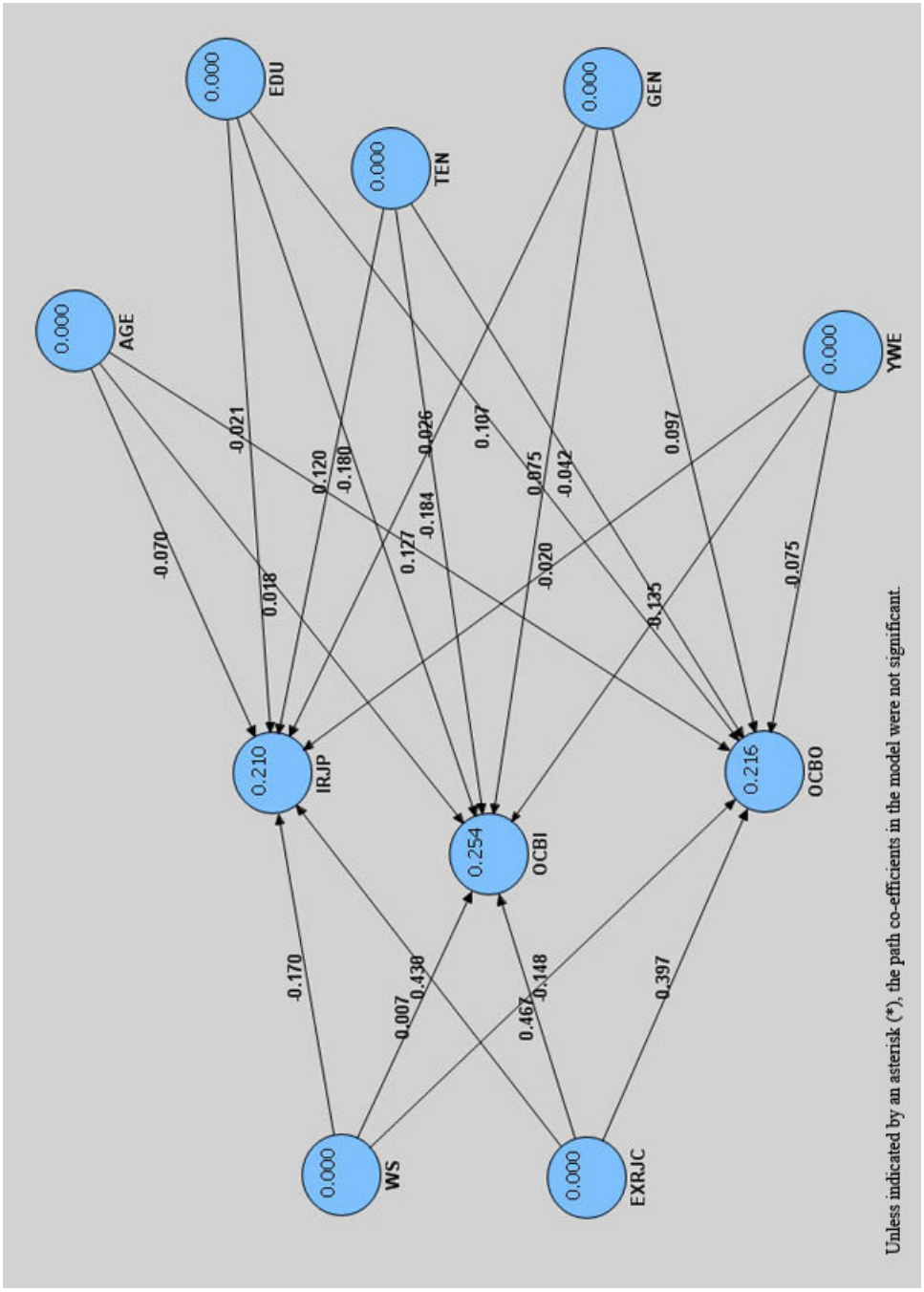

Figure 4.7: PLSSEM Moderation Control Model - Preferred Job Characteristics

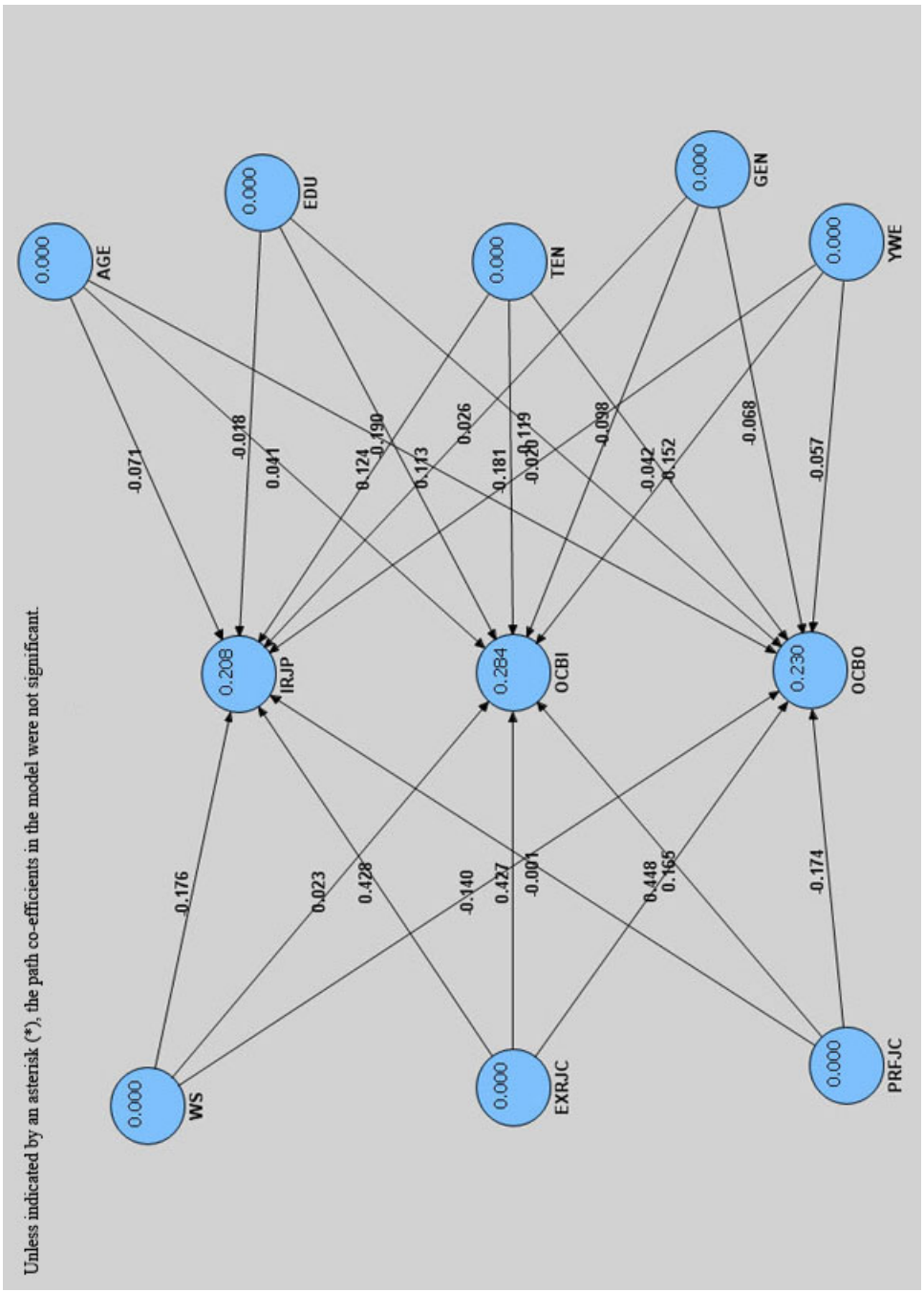

Figure 4.8: PLSSEM Moderation Linear Model - Preferred Job Characteristics

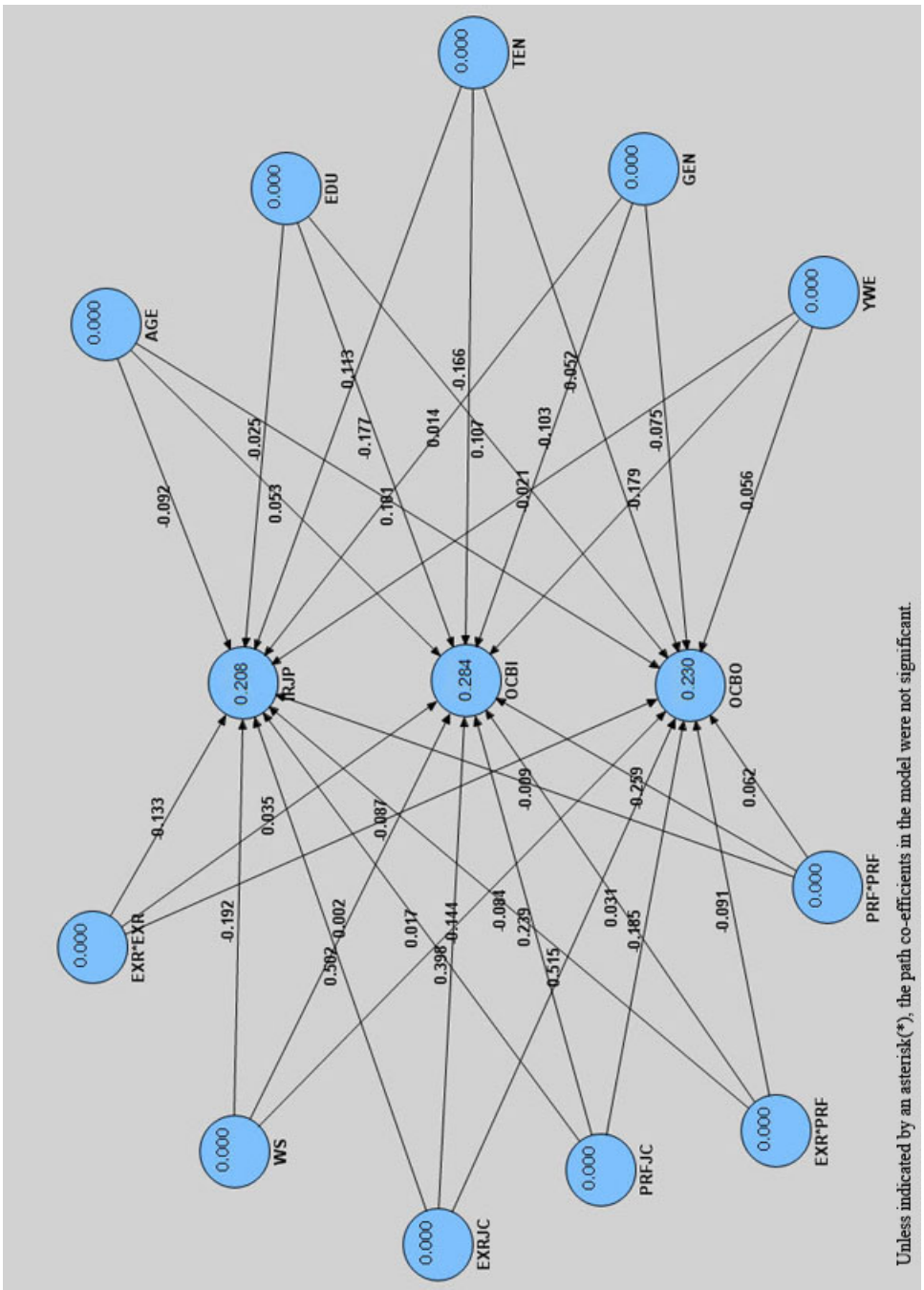

Figure 4.9: PLSSEM Moderation Quadratic Fit Model - Preferred Job Characteristics

Table 4.27: T Statistics of the Path Coefficients for the Linear Model - Preferred Job Characteristics

Direct Effect	Beta	Std. Dev.	Std. Error	T statistic
EXRJC -> IRJP	0.43	0.50	0.50	0.86
EXRJC -> OCBI	0.43	0.48	0.48	0.88
EXRJC -> OCBO	0.45	0.52	0.52	0.86
PRFJC -> IRJP	0.00	0.12	0.12	0.01
PRFJC -> OCBI	0.16	0.11	0.11	1.55
PRFJC -> OCBO	-0.17	0.12	0.12	1.42
WS -> IRJP	-0.18	0.09	0.09	1.90
WS -> OCBI	0.02	0.10	0.10	0.23
WS-> OCBO	-0.14	0.11	0.11	1.23

IRJP - In-role Job Performance, OCBI - Organizational Citizenship Behaviors - Individual, OCBO - Organizational Citizenship Behaviors - Organization, WS - Work Status, EXRJC - Experienced Job Characteristics, PRFJC - Preferred Job Characteristics

linear simple effect model when the preferred job characteristic variable was added. However, the effect size was weak for all outcome variables. The quadratic effect model did not have a significant change in R^2 for any of the outcome variables when compared to the linear simple effect model, thus showing no presence of a significant non-linear or interaction effect (fit). Based on this, hypotheses H6a and H6b are rejected. The fit between preferred and experienced job characteristics of software developers is not a significant predictor of either their in-role job performance or their organizational citizenship behaviors.

The value of the change in R^2 was the highest for the linear simple effects model. Table 4.27 shows the T statistics of the path co-efficients for this model. As shown in the table, the path co-efficients for preferred job characteristics, experienced job characteristics and work status were not significant. Since the other PLS models tested did not have a significant R^2 or R^2 change, the T statistics are not shown.

In this chapter the results of the tests of the hypotheses were presented. In the next chapter we discuss the contributions and limitations of the study and the recommendations for future work.

CHAPTER 5: DISCUSSION

In the previous chapter, the results of the hypotheses tests were presented. In this chapter, we summarize and discuss the results of all the hypotheses, provide the implications for theory and practice, and identify the limitations of the study as well as directions for future studies.

5.1 Summary of Findings

The purpose of this study was to develop and investigate an explanatory model for the performance and citizenship behaviors of both permanent and contract IT employees, specifically software developers. We adapted fit procedures developed by Edwards (1994, 2002, 2007) using partial least squares structural equation modeling (PLS-SEM) to investigate the effects of fit between the experienced and the expected job characteristics as well as the experienced and the preferred job characteristics of the software developers on their performance and citizenship behaviors. We also compared the experienced, the expected and the preferred job characteristics of the contract and the permanent software developers.

The results did not demonstrate any significant effect of the fit between the expected and experienced job characteristics as well as the fit between the preferred and experienced job characteristics of contract and permanent software developers on their performance and behaviors. Also, there were very few differences found in the job characteristics-related experiences, expectations and the preferences of the permanent and the contract software developers. A summary of the results is provided in Table 5.1.

In the following sections we provide explanations for all the findings.

Table 5.1: Summary of Results of Hypotheses Tests

No.	Hypothesis Description	Supported
H1a	The task variety experienced by contract software developers is lower than the task variety experienced by permanent software developers.	No
H1b	The task identity experienced by contract software developers is lower than the task identity experienced by permanent software developers.	No
H1c	The task significance experienced by contract software developers is lower than the task significance experienced by permanent software developers.	No
H1d	The achievement experienced by contract software developers is lower than the achievement experienced by permanent software developers.	No
H1e	The ability/skill-level variety experienced by contract software developers is lower than the ability/skill variety experienced by permanent software developers.	No
H1f	The communication experienced by contract software developers is lower than the communication experienced by permanent software developers.	No
H1g	The participation in job-related decisions experienced by contract software developers is lower than the participation in job-related decisions experienced by permanent software developers.	No
H1h	The autonomy experienced by contract software developers is lower than the autonomy experienced by permanent software developers.	No
H1i	The social interaction experienced by contract software developers is lower than the social interaction experienced by permanent software developers.	No
H1j	The growth/learning experienced by contract software developers is lower than the growth/learning experienced by permanent software developers.	No

Table 5.1: (continued)

No.	Hypothesis Description	Supported
H1k	The promotions experienced by contract software developers are lower than the job related promotions experienced by permanent software developers.	No
H1l	The recognition experienced by contract software developers is lower than the recognition experienced by permanent software developers.	No
H1m	The extrinsic job feedback experienced by contract software developers is lower than the extrinsic job feedback experienced by permanent software developers.	No
H1n	The intrinsic job feedback experienced by contract software developers is lower than the intrinsic job feedback experienced by permanent software developers.	No
H1o	The job security experienced by contract software developers is lower than the job security experienced by permanent software developers.	Yes
H1p	The pay adequacy experienced by contract software developers is higher than the pay adequacy experienced by permanent software developers.	No
H1q	The ability/skill-level requirements of jobs experienced by contract software developers are higher than the ability/skill-level requirements of jobs experienced by permanent software developers.	No
H1r	The task/goal clarity experienced by contract software developers is higher than the task/goal clarity experienced by permanent software developers.	No
H2a	Experienced job characteristics mediate the relationship between the work status of software developers (contract and permanent) and their in-role job performance.	No

Table 5.1: (continued)

No.	Hypothesis Description	Supported
H2b	Experienced job characteristics mediate the relationship between the work status of software developers (contract and permanent) and their organizational citizenship behaviors.	No
H3a	The task variety expected by contract software developers is lower than the task variety expected by permanent software developers.	No
H3b	The task identity expected by contract software developers is lower than the task identity expected by permanent software developers.	No
H3c	The task significance expected by contract software developers is lower than the task significance expected by permanent software developers.	No
H3d	The intrinsic feedback expected by contract software developers is lower than the intrinsic feedback expected by permanent software developers.	No
H3e	The autonomy expected by contract software developers is lower than the autonomy expected by permanent software developers.	No
H3f	The growth/learning expected by contract software developers is lower than the growth/learning, expected by permanent software developers.	No
H3g	The promotion expected by contract software developers is lower than the promotion expected by permanent software developers.	No
H3h	The achievement expected by contract software developers is lower than the achievement expected by permanent software developers.	No
H3i	The recognition expected by contract software developers is lower than the recognition expected by permanent software developers.	No

Table 5.1: (continued)

No.	Hypothesis Description	Supported
H3j	The job security expected by contract software developers is lower than the job security expected by permanent software developers.	No
H3k	The pay adequacy expected by contract software developers is higher than the pay adequacy expected by permanent software developers.	No
H3l	There is no difference between contract and permanent software developers with respect to their expected task/goal clarity in their jobs.	Yes
H3m	There is no difference between contract and permanent software developers with respect to their expected abilities and skill-level requirements of their jobs.	Yes
H3n	There is no difference between contract and permanent software developers with respect to their expected abilities and skill-level variety needed in their jobs.	No
H3o	There is no difference between contract and permanent software developers with respect to their expected communication access available in their jobs.	Yes
H3p	There is no difference between contract and permanent software developers with respect to their expected participation in job-related decisions.	Yes
H3q	There is no difference between contract and permanent software developers with respect to their expected social-interaction in their jobs.	Yes
H3r	There is no difference between contract and permanent software developers with respect to their expected extrinsic job feedback.	Yes
H4a	The fit between the expected and the experienced job characteristics of software developers is a significant predictor of their in-role job performance.	No

Table 5.1: (continued)

No.	Hypothesis Description	Supported
H4b	The fit between the expected and the experienced job characteristics of software developers is a significant predictor of their organizational citizenship behaviors.	No
H5a	The promotion preferred by contract software developers is lower than the promotion preferred by permanent software developers.	No
H5b	The achievement preferred by contract software developers is lower than the achievement preferred by permanent software developers.	No
H5c	The recognition preferred by contract software developers is lower than the recognition preferred by permanent software developers.	No
H5d	The job security preferred by contract software developers is lower than the job security preferred by permanent software developers.	Yes
H5e	The pay adequacy preferred by contract software developers is higher than the pay adequacy preferred by permanent software developers.	No
H5f	There is no difference between contract and permanent software developers with respect to their preferred task variety in their jobs.	Yes
H5g	There is no difference between contract and permanent software developers with respect to their preferred ability/skill variety in their jobs.	Yes
H5h	There is no difference between contract and permanent software developers with respect to their preferred ability/skill level requirements of their jobs.	Yes
H5i	There is no difference between contract and permanent software developers with respect to their preferred growth/learning in their jobs.	Yes

Table 5.1: (continued)

No.	Hypothesis Description	Supported
H5j	There is no difference between contract and permanent software developers with respect to their preferred autonomy in their jobs.	Yes
H5k	There is no difference between contract and permanent software developers with respect to their preferred participation in their job-related decisions.	Yes
H5l	There is no difference between contract and permanent software developers with respect to their preferred task identity in their jobs.	Yes
H5m	There is no difference between contract and permanent software developers with respect to their preferred task significance in their jobs.	Yes
H5n	There is no difference between contract and permanent software developers with respect to their preferred communication in their jobs.	Yes
H5o	There is no difference between contract and permanent software developers with respect to their preferred social interactions in their jobs.	Yes
H5p	There is no difference between contract and permanent software developers with respect to their preferred extrinsic feedback in their jobs.	Yes
H5q	There is no difference between contract and permanent software developers with respect to their preferred task/goal clarity in their jobs.	Yes
H5r	There is no difference between contract and permanent software developers with respect to their preferred intrinsic job feedback in their jobs.	Yes
H6a	The fit between the preferred and the experienced job characteristics of software developers is a significant predictor of their in-role job performance.	No

Table 5.1: (continued)

No.	Hypothesis Description	Supported
H6b	The fit between the preferred and the experienced job characteristics of software developers is a significant predictor of their organizational citizenship behavior.	No

5.1.1 Experienced Job Characteristics of Software Developers

The basic research model used for this study, shown in Figure 5.1, was drawn from the literature on IS Contracting that suggests that contract and permanent IT workers experience different job characteristics (Slaughter and Ang, 2001; Bidwel and Briscoe, 2009). We compared 18 different job characteristics experienced by contract and permanent software developers.

Contrary to the findings of Slaughter and Ang (2001), we found no differences between contract and permanent software developers with respect to their experienced autonomy, task variety, task identity, task significance and feedback (instrinsic or extrinsic). In addition, we found no differences in the experienced achievement, promotions, recognition, communication, social interaction, growth/learning, participation, pay adequacy, ability/skill-level requirements, ability/skill variety, and task clarity. The only difference found between contract and permanent software developers with respect to their experienced job characteristics was related to job security (lower among contract as compared to permanent).

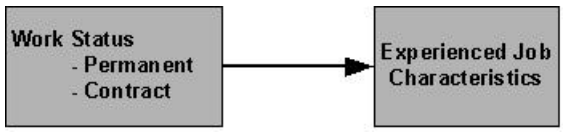

Figure 5.1: Basic Work Status and Experienced Job Characteristics Model

There are several differences between this study and Slaughter & Ang's study

(2001). Slaughter & Ang interviewed 12 software developers (6 permanent, 6 contract). The data were collected using semi-structured interviews and coded along five dimensions of job characteristics (task variety, task identity, task significance, task autonomy, and task feedback). In this study, the responses of 109 software developers (84 permanent, 25 contract) across five organizations were used. The data was collected using a questionnaire where the contract and the permanent software developers rated eighteen dimensions of job characteristics, namely, autonomy, intrinsic feedback, extrinsic feedback, social interaction, task/goal clarity, task variety, task identity, ability/skill-level requirements, ability/skill variety, task significance, growth/learning, promotion, achievement, participation, communication, pay adequacy, recognition, and job security. Further, the data for this study were collected in 2008-2009, nearly seven to eight years after Slaughter & Ang's study in 2001.

The current study improves on Slaughter & Ang's (2001) study by testing the hypotheses on a larger sample set (109 versus 12 developers), using more dimensions of job characteristics (18 versus 5), and using the preferred quantitative statistical method for data collection (survey versus interviews). Any of the above differences (sample type, sample size, research method used, and time/year) could have resulted in the differences in the outcomes of the two studies.

An interesting characteristic of the sample in this study was that all the organizations that participated were using standard Enterprise Resource Planning (ERP) software systems like SAP as opposed to custom developed software. In all the participating organizations, both the contract and the permanent developers were responsible for making configuration changes to the standard ERP modules based on the business need. Configuration changes to standard software packages may involve standard tasks as opposed to custom software development which may involve a variety of tasks. This could also explain why there were no differences reported by the

contract and the permanent software developers with respect to the type of tasks they were assigned.

Studies have also proposed that if contract workers were hired to replace permanent workers for the same jobs, then there may not be signficant differences in what they experience (Beard and Edwards, 1995; Sverke et al., 2000).

The time/year of the data collection could also explain the results. The data collection was conducted between October and December 2008. During this time, there were several changes affecting the political and economic climates in the United States. Some of the prevailing climatic factors were the 2008 presidential elections, the economic downturn, electoral debates over outsourcing of jobs, and bankruptcies reported by various organizations in the country (though, not the organizations participating in the study). Given these conditions, contract workers may be less inclined to report any negative experiences at their jobs.

It is also possible that the organizations that recruit contract software developers have matured in their management practices to provide equal recognition, learning, social interaction, etc., opportunities such that contract software developers do not experience differences in their job characteristics compared to their permanent counterparts.

A particular unexpected outcome was the lack of differences found between contract and permanent software developers with respect to their experienced promotion opportunities. Given the HR policies within the participating organizations, we know that the contract workers could not experience promotions. Therefore, the expected result was that permanent developers would experience more opportunities for promotions than contract developers. In analyzing the responses further, we found that 50% of the contract developers and 32% of the permanent developers had neither agreed nor disagreed to the question of experienced promotion. Of the remaining,

23% contract developers had agreed to experiencing promotion opportunities, 27% contract developers had disagreed, 32% permanent developers had agreed, and 36% permanent developers had disagreed.

In order to eliminate any organization specific biases, we analysed the responses within each participating organization. There were a few contract developers in 4 of the 5 participating organizations who had responded favorably to the question of whether they experienced promotions in the job. Similarly, there were several permanent developers in all 5 organizations who had disagreed to experiencing promotions. Thus, the outcome was not restricted to a specific organization.

Having eliminated organizational biases as a possibility, we reviewed the survey item used to measure the experienced job characteristics (promotion). In the Multimethod Job Design Questionnaire, the question used to determine promotion is worded as "there are opportunities for advancement to higher-level jobs." In IT work, there are several roles created for projects that are not necessary associated with formal titles or ranks in the organizational hierarchy. For example, "lead developer" or "team lead" are roles created for projects. While these roles may not correspond to a rank or a title within the organizatonal hierarchy, advancement to such roles for projects could be perceived as advancement to higher-level jobs. This is because such roles usually entail higher-levels of responsibilities. Thus, it is possible that the contract workers in the study experienced such advancements at their respective organizations.

A factor that could explain the responses of the permanent developers who disagreed to experiencing promotion opportunities, is the fact that organizations that recruit contract workers often eliminate higher-level (and higher-cost) positions thereby reducing advancement opportunities for the permanent workers.

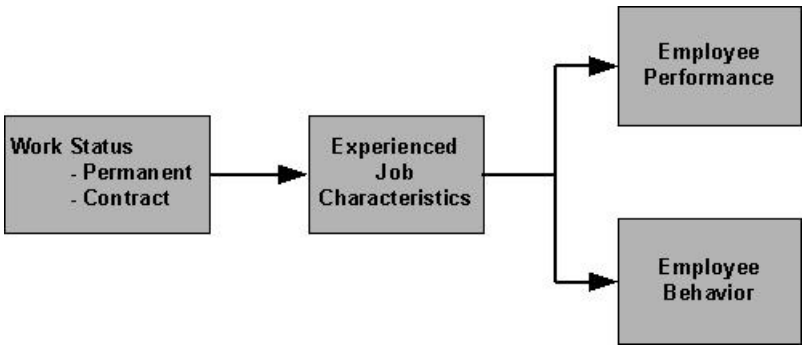

Figure 5.2: Experienced Job Characteristics Mediating Model

This finding also reflects the inability of the measures used in the study to capture the nuances of IT jobs at higher levels of granularity. Thus, it is possible that the job characteristic dimensions and the questions used to measure them, were not granular enough to reveal the differences in the job characteristics related experiences of contract and permanent software developers.

5.1.2 Experienced Job Characteristics and Work Outcomes of Software Developers

The second building block of the research model evaluated in this study was based on the proposition made by Slaughter and Ang (2001) that job characteristics mediate the relationships between work status and attitudes, behaviors, and performance in software development teams. Figure 5.2 depicts the mediating model.

The hypothesized mediating effect of the experienced job characteristics on the relationship between work status (contract versus permanent) and the performance and behaviors of software developers was not supported. Thus we did not find support for Slaughter & Ang's (2001) proposition.

First, as discussed earlier, the experienced job characteristics of contract and permanent software developers were found to be similar, indicating no effect of work status on the experienced job characteristics. Second, the performance and citizenship behaviors of contract and permanent software developers were also found to be

similar, indicating no effect of work status on performance and behaviors. Finally, the experienced job characteristics of the software developers was found to have no effect on their performance or behaviors. This supports the lack of a mediating effect of experienced job characteristics on the relationship between work status and the performance and behaviors of contract and permanent software developers.

In general, the lack of differences in the performance and behaviors of the contract and the permanent software developers could be attributed to the fact that only those employees who demonstrate acceptable performance would continue to remain in an organization. Thus, poor performing/behaving employees may not have been part of the sample. These findings contradict Slaughter & Ang's (2001) findings, but are consistent with other recent studies (De Cuyper & De Witte, 2005; Ellingson et al., 1998) which do not find differences in the performance of contract and permanent workers.

Overall, the lack of a significant effect of the experienced job characteristics on the performance or behaviors of contract and permanent software developers could be related to a variety of factors. As discussed in the previous section, there were several differences between the current study and Slaughter & Ang's study (2001), which proposed the mediating effect of experienced job characteristics on work outcomes. Any of those differences (sample size, type, distribution characteristics, and method) could explain the different findings.

We focused on IT workers, specifically, software developers, who were coincidentally all working on ERP systems. The narrow scope of the sample could have attributed to the lack of variance found in the sample with respect to experienced job characteristics, resulting in the failure to accept the mediation hypotheses. It is possible that ERP software development jobs have standard characteristics that do not vary between contract and permanent employees.

Finally, these findings highlight the contradictory evidence in the contracting literature with respect to the effect of job characteristics on the performance and behaviors of contract and permanent employees. For example, studies have often cited the detrimental impact of contract employment on work outcomes, primarily based on job characteristics like job security (Beard & Edwards, 1995). Yet other studies (De Cuyper & De Witte, 2005) have failed to accept the mediating effect of job security on the performance of temporary and permanent employees. The result, therefore, expose the need to investigate further the effect of experienced job characteristics on the performance and behavior of contract and permanent employees using different samples and job types.

5.1.3 Expected Job Characteristics and Work Outcomes of Software Developers

The third aspect of the research model was to compare a motivational need factor between contract and permanent IT workers, namely their expected job characteristics. As shown in Figure 5.3, we applied the complementary needs-supplies perspective of Person-Job Fit Theory, to evaluate the effect of the fit between the expected job characterstics (person factor, needs) and the experienced job characteristics (job factor, supplies) of the contract and the permanent IT workers on their performance and organizational citizenship behaviors.

There were very few differences found among the contract and the permanent software developers with respect to their expected job characteristics. Further, the fit between the experienced and the expected job characteristics of the software developers was not found to be a significant predictor of their performance or behaviors.

The only expected job characteristic found to be different between contract and permanent software developers was expected skill variety (higher among contract versus permanent).

The hypothesized differences in the expected job characteristics of contract and

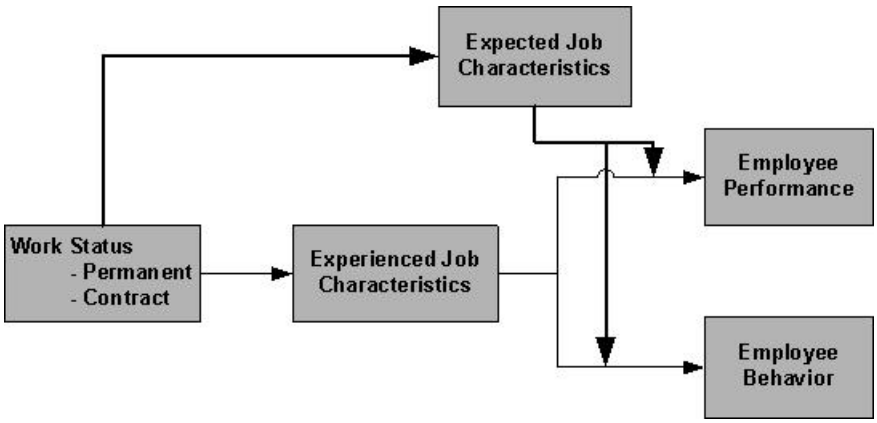

Figure 5.3: Expected-Experienced Job Characteristics Fit Model

permanent software developers were based on the assumed differences in the psychological contracts (relational versus transactional) of the contract and permanent software developers. The lack of differences found exposes the need to evaluate the antecedents of psychological contracts, such as tenure, organizational culture, human resource management practices, social information processing, etc. While it was not possible to investigate all the factors mentioned, we analyzed the differences in the tenure of the contract and the permanent software developers. Most of the contract software developers in the sample had been with their client organizations for 1-3 years,and most of the permanent software developers in the sample had been with their organizations for 7-10 years. Thus, the expected job characteristics were found to be similar despite the differences in the tenure period of the contract and software developers.

The lack of differences in the expected job characteristics also suggests that software developer expectations regarding job characteristics may be influenced by the profession itself rather than psychological contracts. It is possible that the socialization of software developers into their profession results in similar expectations regardless of their work status. Socialization into a profession refers to the process of

learning the ropes, being indoctrinated and trained for a profession (Schein, 1968).

Other reasons for the lack of differences between contract and permanent software developers with respect to their expected job characteristics are factors such as prior and current experiences in similar jobs or organizations. In this study, the job-related expectations were not measured prior to job entry. The expectations were rated by employees post entry while they were employed at their respective organizations. Further, there were no differences found with respect to several experienced job characteristics of the software developers. Therefore, it is possible that the experienced job characteristics affected their recollection of their expectations.

The fit between the expected and experienced job characteristics of the software developers was not found to be a significant predictor of their performance or behaviors. In addition to some of the reasons offered in previous sections (sample size, type, distribution characteristics, and method), one reason often cited in fit studies for the lack of support of the effect of fit on outcomes, is related to the operationalization of the fit outcome. In other words, the effect of P-J Fit on work outcomes are expected to be the strongest when the outcomes are commensurate with the person and job factor (Edwards & Shipp, 2007). For example, needs-supplies fit regarding task variety would have a stronger effect on performance with respect to handling a variety of tasks than overall job performance. While our study used commensurate measurements for the P-J Fit variables, the outcome variables were not commensurate.

Another reason for the lack of effect of the expected-experienced job characteristics fit on the performance and behaviors of contract and permanent IT workers maybe the argument that needs fulfilled by current supplies may not have a motivating potential. A current unfulfilled need, on the other hand, may motivate performance when anticipated supplies are expected to fulfill this need, provided the abilities of the person are sufficient to fulfill the demands. This suggests the need to evaluate a more

complex P-J Fit Model for performance, where the effect of the fit between unmet needs, expectations and abilities, on performance and behaviors can be examined.

As far as a more complex P-J Fit Model is concerned, some recent studies have categorized performance and behavioral outcomes as distal or indirect, versus proximal or direct, implying that the effect of P-J Fit on these outcomes may depend on job attitudes such as satisfaction (De Cuyper et al., 2008; Edwards & Shipp, 2007).

One interesting finding was that a linear simple effect model with the expected job characteristics variable had a moderate effect on the organizational citizenship behavior - organization (OCBO), a weak effect on the in-role job performance (IRJP), and no effect on the organizational citizenship behavior - individual (OCBI). We believe that because expectations develop in the context of an "exchange" relationship with the organization, they are likely to affect organization centric work outcomes like OCBO or IRJP versus individual focused behaviors such as OCBI.

5.1.4 Preferred Job Characteristics and Work Outcomes of Software Developers

The final aspect of the research model was to compare the preferred job characteristics between contract and permanent software developers. As shown in Figure 5.4, we applied the complementary needs-supplies perspective of Person-Job Fit Theory, to evaluate the effect of the fit between the preferred job characterstics (person factor, needs) and the experienced job characteristics (job factor, supplies) of the contract and the permanent IT workers on their performance and organizational citizenship behaviors.

The only difference found in the preferred job characteristics of contract and permanent software developers was with respect to job security. Further, the fit between preferred and experienced job characteristics was not found to be a significant predictor of the performance and behaviors of contract and permanent software developers.

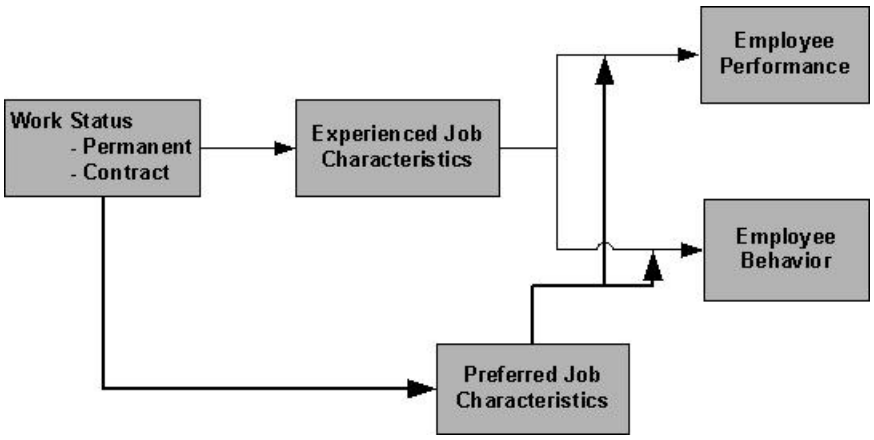

Figure 5.4: Preferred-Experienced Job Characteristics Fit Model

Contract software developers reported lower preference for job security than permanent software developers. This matches our hypothesis made on the assumption that the choice to contract itself may reflect a lower preference for job security. On the same basis, we had hypothesized that contract software developers would have a lower preference for promotion, achievement and recognition opportunities than permanent software developers. The results however, show that both contract and permanent software developers have similar preferences for promotion, achievement and recognition opportunities. ANCOVA test for preferred promotion revealed a significant effect of age. Although there was no significant impact of tenure, age, gender, education, and years of work experience on the preferred achievement and recognition of contract and permanent software developers, the lack of differences in their preferred achievement and recognition could be attributed to other personality factors which were not controlled for in the study.

All other preferred job characteristics of contract and permanent software developers were found to be similiar, supporting the assumptions of similar preferences among technology workers.

The fit between the preferred and experienced job characteristics of the software

developers was not found to be a significant predictor of their performance or behaviors. The possible reasons for this outcome are the same as the reasons cited in the previous section for the lack of a significant effect of the expected-experienced job characteristics fit, i.e., operationalization of outcome variables, the motivating potential of met needs, and the presence of mediating or proximal outcomes such as satisfaction on the effect of P-J Fit on performance and behaviors.

Despite the lack of significance of the quadratic fit model, an interesting finding, was that adding the preferred job characteristics variable in a linear model had a weak effect on the organizational citizenship behavior - individual (OCBI), and, no effect on the organizational citizenship behavior - organization (OCBO), or in-role job performance (IRJP). On the other hand, as discussed in the previous section, adding the expected job characteristics variable in a linear model had a moderate effect on OCBO, a weak effect on IRJP, and no effect on OCBI. We believe that unlike expectations, which develop in the context of an "exchange" relationship with the organization, and may affect organization-influenced outcomes such as, OCBO and IRJP, preferences are influenced by the individual, and therefore, are more likely to affect individual-focused outcomes such as, OCBI.

In this section we discussed the results of the study along with various explanations for the results. The next section provides insight into the implications of this study for theory and practice.

5.2 Implications for Theory and Practice

The results of this study have several theoretical and practical implications. First, this study makes a contribution to the literature in IS contracting by systematically evaluating the differences of the experienced, expected and preferred job characteristics of contract and permanent software developers. Further, the differences are analyzed along eighteen different motivational dimensions of job characteristics by

using the Multimethod Job Design Questionnaire (MJDQ). This not only enhances our understanding of contract and permanent IT workers but also creates a more holistic understanding of their jobs. The practical significance of these analyses is that they facilitate the decisions IT managers have to make regarding the types of jobs to assign to contract and permanent IT workers. Contrary to the findings of prior studies (Slaughter & Ang, 2001; Van Dyne & Ang, 1998) and the potential stereotypes, that contract IT workers experience "different" job characteristics than permanent IT workers, have very "different" job-related expectations and preferences than permanent IT workers, and consequently have lower performance and citizenship behaviors, this study found very few differences in the experienced, expected and preferred job characteristics of contract and permanent software developers, and did not find support for the effect of the job characteristics-related factors on their performance and citizenship behaviors.

This study also found no differences in the in-role job performance or the individually focused organizational citizenship behaviors of contract and permanent IT workers. This is an encouraging finding for companies that have already invested in contract software developers or are planning to do so.

Second, this study contributes to the literature in work motivation and organizational behavior by testing the proposed (Slaughter & Ang, 2001) mediating effect of the experienced job characteristics on the relationship between work status and work outcomes of IT workers. The study uses a robust quantitative statistical research methodology to test the effect of experienced job characteristics, thereby advancing the findings, and addressing the limitations of Slaughter & Ang's (2001) study. It also exposes the need to investigate and validate further the effect of experienced job characteristics on the performance and behavior of contract and permanent IT workers using different sample types and methods.

Third, this study integrates two person factors: the expected job characteristics and the preferred job characteristics of contract and permanent IT workers in Slaughter & Ang's (2001) explanatory model of the performance and behaviors of contract and permanent IT workers. The study uses the Person-Job (P-J) Fit Theory (Lewin, 1951; Murray, 1938) and evaluates both Person and Job factors as joint determinants of the performance and behaviors of contract and permanent IT workers. In doing so, this study incorporates the suggestion made in a recent review of theory and research on the psychological impact of temporary employment (De Cuyper et al., 2008) - that of the need to investigate motivation and expectations as moderators of the relationship between temporary employment and outcomes. Contrary to what was hypothesized, the study did not find support for the effect of the expected-experienced job characteristics fit, or the preferred-exprienced job characteristics fit on the performance and behaviors of contract and permanent software developers. This finding suggests that needs fulfilled by current supplies may not have motivating potential. It also suggests the need to evaluate further the needs-supplies perspective of P-J Fit and its impact on distal work outcomes such as, performance and behaviors, by incorporating mediating proximal outcomes such as satisfaction, or, by operationalizing outcome values commensurate to the fit variable.

Fourth, the study contributes to the literature on Person-Job Fit Theory by addressing various criticisms and shortcomings of prior studies related to the nature and the type of measures as well as the method used to evaluate fit (Edwards, 1991). The following items present each approach used in this study:

(a) The study used commensurate measurement of P-J Fit by measuring all the source variables for fit (experienced, expected and preferred job characteristics) using the same number and content dimensions (eighteen job characteristics), thereby ensuring mutual relevance of the characteristics under investigation as well as nominal

and scale equivalence (Kristof, 1996; Edwards, 1991; Caplan, 1987).

(b) The study used an indirect measure of fit by analyzing fit based on software developers' ratings on both the person and the job variables of the fit (experienced, expected and preferred job characteristics). In the direct approach, the person and the job factors are not assessed separately. Rather, individuals are asked to report on the extent to which they believe a good fit exists in their job. Edwards (1991) recommends against the use of direct measures of fit in favor of indirect measures primarily because the former confound the constructs of the fit, prevent the estimation of the independent effects of both the fit variable, and do not allow for the examination of whether an individual actually fits the environment.

(c) The study reduced the consistency bias in the relationship between the subjective fit measure (expected-experienced job characteristics fit, preferred-experienced job characteristics fit) and the dependent variables (performance and behaviors) by using separate sources of measurement. Studies suggest that the dependent variables in fit studies should be operationalized at a time and contact definition that is far enough removed from the fit measures to minimize cognitive carryover (Podsakoff et al., 2003) but near enough for the causal forces to still be active (Harrison & Hulin, 1989). We incorporated this suggestion by choosing managers to report on the dependent variables (performance and behaviors), and software developers to report on the subjective fit measures (expected-experienced job characteristics fit, preferred-experienced job characteristics fit).

(d) The study ensured variability of the Person (P) and the Job (J) factors of the P-J Fit by collecting data across multiple organizations. Fit studies conducted within a single organization exhibit severe restrictions on the variability of both the Person and the Job factors.

Finally, this study makes an important methodological contribution by using a

structural equation modeling approach using partial least squares (Wold, 1982, 1985a, 1985b), abbreviated as PLSSEM, to test the effect of fit as an interaction. Edwards (2009) criticized a recent study that used a latent congruence model approach using structural equation modeling (Cheung, 2009) because it was framed around algebraic differences of the components of fit. This study addressed that criticism by including quadratic terms specified in polynomial regression analysis (Edwards, 1993) in the tests of moderation in structural equation models (Chin et al., 2003; Jose, 2001). This is one of very few studies (Hrivnak, 2009) that has attempted to incorporate Edward's (1994, 2002) polynomial regression approach for fit analysis to a partial least square structural equation modeling (PLSSEM) framework.

5.3 Limitations and Future Research Directions

As with any research study, this study has several notable limitations. The first set of limitations is related to the sample characteristics. The sample used for PLS analysis was small (n = 98) when compared to the largest number of indicators (18) for a construct (formative construct used for the job characteristics latent variable). Chin & Newsted (1999) state that to use a regression heuristic of 10 cases per predictor, the sample size requirement should be 10 times the most complex regression relationship in the model. In our study, the sample size is about 5 times (18: 98) the most complex relationship. Several recent papers (Goodhue et al., 2006; Marcoulides & Saunders, 2006; Marcoulides et al., 2009) have clarified that sample size considerations should take into account effect size, reliability, number of indicators and other factors.

Another limitation of the sample is the non-normal distribution characteristic of some indicators as shown in the skewness Table 4.1 through Table 4.4 in Chapter 4. The skewed data could be attributed to various environmental and organizational factors. For example, the employees who participated in the study had to have demonstrated acceptable performance and behaviors to remain employed at their

respective organizations. This could explain why the performance and behavior data were skewed. It is also possible that the employee responses regarding their jobs were influenced by the political and economic climate-related factors affecting the IT job market at the time of data collection.

Typically, it is recommended to transform data to address skewness and kurtosis. However, we did not transform the data in this study to avoid complications with interpreting the data after transforming both the predictor and the dependent variables. It is however noted as a limitation because, while PLS is robust to non-normal distribution, the distribution characteristics affects sample size considerations over and above reliable indicators (Marcoulides & Saunders, 2006).

Another limitation of this study is that the sample was homogenous with respect to the type of software development work, namely configuring ERP systems, in the organizations that participated. Future studies should address this limitation by recruiting participants from diverse types of software development jobs and/or other types of IT workers.

The next set of limitations is in regards to the research design and methodologies used in this study. First, this study was cross-sectional. The experiences, expectations and preferences of employees, as well as their performance and behavior change over time. The consideration of fit as a dynamic process that occurs over time is important (Tinsley, 2000). The notion that individuals can change the environment (e.g., jobs) and that the environment can change individual's attributes over time requires longitudinal and panel type of designs as opposed to concurrent measurement strategies. Still, cross-sectional studies do have a role in the early stages of model development. One area of future work would be to collect data on the expected and the preferred job characteristics of software developers prior to and post getting a job. This would facilitate analysis of various types of fit and their effect on the

performance and the behaviors of software developers.

Second, the study did not examine the effects of various contextual variables such as age, tenure, education, etc., on the expected, the experienced and the preferred job characteristics of software developers. While these were used as control variables and their effects on the outcome variables were examined, their effects on the independent variables were not examined.

Third, the mediation and moderation tests did not examine ways in which the two effects could be combined (example mediated moderation or moderated mediation or multiple moderators). This is because there is a lack of theory supporting those relationships. Additionally, it was not possible to test those combined effects given the constraints of the sample size as well as the measures, the method and the software (SmartPLS) used. However, this would be another area for future research.

A final limitation with respect to the research method is related to the software used (SmartPLS) for the tests. This study incorporated Edward's (1994, 2002) polynomial regression approach for fit analysis to a partial least square structural equation modeling (PLSSEM) framework. Although the technique was made possible in SmartPLS, SmartPLS is essentially a linear PLSSEM modeling software tool. This should be noted as a limitation, because it is possible that the non-linear effects were not exposed due to the software. WarpPLS (ScriptWarp Systems), is a new non-linear PLSSEM modeling software, which promises the ability to fit non-linear SEM models, including U curve and the first derivate S curve fits. This is a very ripe area for future research as several fit studies, could be re-analyzed for non-linear trends. Although it should be noted that we did attempt to analyze a quadratic fit in this study.

The next set of limitations of this study are related to the effects of common method and common source variance. Although the constructs and measures selected for this study are conceptually and theoretically distinct, the data for both the

job-related and the person-related measure of fit (e.g., experienced job characteristics and expected job characteristics), was collected from a single source (software developers) using the same method (survey) and similar measures (MJDQ). This results in a common source bias as well as a common method bias that could exacerbate the relationships between the fit variables. An alternative is to take a split sample approach whereby half the respondents provide measures for one fit variable and the other half provide measures for the other fit variable. This would help minimize response bias problems (Ostroff et al. 2002). Another method is to assess the job variable independently of the responding people under investigation in order to minimize subjective biases. In this approach, the job variable is often based on the aggregate responses of others or on some objective measure. This approach conceptualizes fit as the extent to which an individual's characteristics match or fit job attributes that are separate from the individual's cognitions and perceptions.

In addition to the use of a common source for the fit variables, the dependent variables (performance and behaviors) were measured using a single source (manager ratings). In Slaughter & Ang's study (2001), the performance and behaviors of software developers were assessed by collecting data from three sources: self, peer, and supervisor. Although the use of manager ratings versus self-reported measures of performance from the software developers allowed us to address response biases, the perceptions of peers is also essential for assessing the performance and behaviors of individuals who work in teams. Future studies could address this by using multiple sources for the performance and behavior measures.

Since the common source and method bias in this study was with respect to the higher order job characteristics fit constructs (predictor) and not with respect to the predictor and criterion, several methods proposed by Podsakoff et al., (2003) to conduct a post-hoc test of common source and common method bias could not be

used.

Another area for future studies is to consider the role of job attitudes and the employee abilities on the relationship between the needs-supplies perspective of Person-Job (P-J) Fit on job-related behaviors. This study focused on the direct effect of a needs-supplies P-J Fit on job-related behaviors. However, needs-supplies fit can affect the behaviors of employees indirectly, mediated by job attitudes such as, satisfaction and commitment (Edwards & Shipp, 2007).

Studies have shown that job attitudes such as satisfaction and commitment, result from the fit between needs and supplies (French et al., 1982; Lawler, 1973; Locke, 1976; Meyer & Allen, 1991; Meyer & Herscovitch, 2001; Smith et al., 1969;). Further, satisfaction and commitment, are viewed as predictors of citizenship behaviors (Edwards & Shipp, 2007; Morrison, 1994; Organ, 1990; Organ & Ryan, 1995; Podsakoff et al., 2000). Employees who are satisfied are motivated to reciprocate as part of the exchange relationship with the employer (Organ, 1990). Also, employees who are satisfied or committed tend to define their job responsibilities broadly, viewing citizenship behaviors as part of their work role (Morrison, 1994). Future studies should test an indirect effect of P-J Fit on behavioral outcomes.

In the case of employee abilities, Edwards & Shipp (2007) suggest that a needs-supplies misfit could lead to performance when anticipated supplies are expected to meet the needs, provided the abilities of the employees are sufficient to fulfill the task demands. Thus, the role of the employee's abilities could be incorporated into future studies.

Finally, the effects of P-J Fit on work outcomes are expected to be the strongest when the outcomes are commensurate with the person and job factor (Edwards & Shipp, 2007). Although this study utilized commensurate measurements for the P-J Fit variables, the outcome variables were not commensurate. Future studies could

use outcome measures that have the same content dimension as the P-J Fit measures.

5.4 Conclusions

In the beginning of the study, we raised several questions that emerged after reviewing prior work in IS contracting and work motivation studies. Do contract IT workers today exhibit the desired performance and organizational citizenship behaviors as permanent IT workers? Are there still differences in the job characteristics experienced by the contract and the permanent IT workers? Do we understand other types of differences in the motivational factors among the contract and permanent IT workers? And do those factors matter when it comes to their performance and their organizational citizenship behaviors?

This study found no differences in the in-role job performance and the organizational citizenship behaviors (indvidual and organization) of the contract and the permanent software developers. Managers rated both contract and permanent software developers as high performing as well as exhibiting desired behaviors. Only one of eighteen experienced job characteristic dimensions was found to be different among contract and permanent software developers: experienced job security (lower among contract versus permanent). One of eighteen expected job characteristic dimensions was found to be different among contract and permanent software developers: expected skill/ability variety (higher among contract versus permanent). One of eighteen preferred job characteristic dimensions was found to be different among contract and permanent software developers: preferred job security (higher among contract versus permanent). Finally, all three job characteristics related factors, namely, experienced job characteristics, expected job characteristics and preferred job characteristics were not found to be significant predictors of the performance or the behaviors of the contract and permanent software developers, in the context of the hypothesized relationships.

The results of this study are encouraging for IT companies that have already invested in contract software developers, or are planning to do so in future. The study suggests that contract software developers do not perceive their work environments to be very different from their permanent counterparts, and do not have very different job-related expectations or preferences. Another encouraging find for organizations that participated in the study as well as for organizations in general was that managers did not perceieve differences in the performance and behaviors of contract versus permanent software developers. Ultimately, this study suggests that work status-related differences among software developers may have diminished over the past decade, either due to the standardization of software development jobs, or the socialization of software developers into their professions, or other environmental and individual factors discussed in the study. Future studies should evaluate these factors for software development as well as other types of IT jobs.

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APPENDIX A: FORMATIVE AND REFLECTIVE CONSTRUCTS

Constructs could be viewed as producing behavior that is captured by its indicators, such that variation in the construct leads to variation in its indicators. Such measures are termed reflective because they represent reflections, or manifestations, of a construct. Measures can also be viewed as causes of a construct. Such measures are termed formative, meaning the construct is formed or induced by its measures (Edwards & Bagozzi, 2000). In addition to the difference in the direction of causality, reflective and formative indicators differ with respect to the interchangeability of indicators, and the methods used to assess validity. These differences are summarized in Table A.1 (Roberts & Thatcher, 2009, p12) as shown below.

Table A.1: Differences Between Formative and Reflective Indicators (Roberts & Thatcher, 2009, p. 12)

Concept	**Formative Indicators**	**Reflective Indicators**
Causality	Formative indicators are viewed as causes of constructs (Blalock 1971). The construct is formed or induced by its measures (Fornell and Bookstein 1982).	Constructs are viewed as causes of reflective indicators (Bollen 1989). Reflective indicators represent manifestations of a construct (Fornell and Bookstein 1982).
Interchangeable	Not interchangeable. Omitting an indicator is omitting a part of the construct (Bollen & Lennox 1991 p. 308).	Interchangeable. The removal of an item does not change the essential nature of the construct. Although every item need not be the same, researchers need to capture the domain space of the construct (Little et al. 1999).
Validity	Indicators are exogenously determined; hence, correlations are not explained by the measurement model (Bollen 1989).	Validity of indicators can be assessed through the measurement model (Bagozzi et al. 1991).

APPENDIX B: PARTIAL LEAST SQUARE STRUCTURAL EQUATION MODELING

Structural equation modeling approach using partial least squares (abbreviated as PLSSEM) has been used in various research domains, such as strategy (Hulland, 1999), marketing (Fornell & Bookstein, 1982), management information systems (Pavlou & Fygenson, 2006), decision sciences (Preston, Chen, & Leidner, 2008), and organization studies (Goldberg & Waldman, 2000). Both PLSSEM and the covariance-based structural equation modeling (abbreviated as CBSEM) approaches belong to the second generation of multivariate data analysis techniques (Fornell & Bookstein, 1982) that provide significant advantages over first-generation techniques such as factor analysis and multiple regression because they facilitate the modeling of relationships between variables. Further, these techniques allow researchers to model latent variables (i.e., constructs) and estimate the measurement error for the associated observed manifest variables (i.e., measures or items).

Unlike CBSEM, which is concerned with the accuracy of parameter estimation through the fitting of covariance matrices, PLSSEM is prediction-oriented and the relationships among latent variables are estimated and tested within the context of a measurement model by combining regression and factor analysis within the same statistical procedure. CBSEM requires the data to be multivariate normal, the sample sizes to be relatively large, and the model to have a strong theoretical basis. PLSSEM does not require the data to be multivariate normal and is more suitable for the analysis of small samples (Wold, 1985). The approach also allows researchers to model both reflective and formative constructs (Chin, 1998). For a detailed comparison between CBSEM and PLSSEM, see Fornell & Bookstein, 1982, or, Tenenhaus et al 2005.

APPENDIX C: MEDIATION

A mediation model hypothesizes that an independent variable causes a mediator variable, which in turn causes a dependent variable. This causal model is explained using a path diagram in Figure C.1 (Baron and Kenny, 1986).

This model assumes a three variable system such that there are two causal paths leading to the outcome variable: the direct influence of the independent variable on the outcome (path c) and the influence of the mediator (path b). A variable behaves as a mediator when it meets the following conditions: (1) variations in the levels of the independent variable accounts for variations in the presumed mediator (i.e., path a), (2) variations in the mediator significantly accounts for variations in the dependent variable (i.e., path b), and (3) when paths a and b are controlled, a previously significant relation between the independent and dependent variables is no longer significant, with the strongest mediation demonstrated when path c is zero. If the residual path c is not zero, it indicates the presence of multiple mediating factors or partial mediation.

We use the mediation model in this study for Hypotheses H2a and H2b. The three variables for hypothesis H2a are: work status (independent variable), experienced job

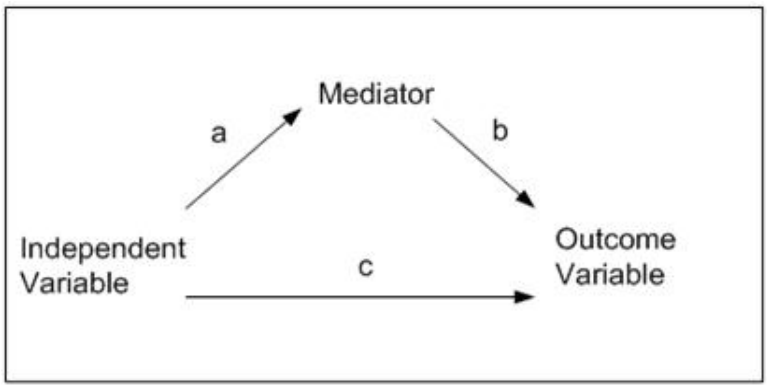

Figure C.1: Mediation Model (Baron and Kenny, 1986)

characteristics (mediator variable) and in-role job performance of software developers (dependent variable). The three variables for hypothesis H2b are: work status (independent variable), experienced job characteristics (mediator variable), and organizational citizenship behaviors of software developers (2 dependent variables, one for organizational citizenship behaviors-individual, or, OCBI, and one for organizational citizenship behaviors-organization, or, OCBO).

APPENDIX D: MODERATION

A moderation model hypothesizes that the impact that a predictor variable has on a dependent variable is dependent on the level of a third variable, termed as the moderator. The properties of a moderator variable can be summarized using a model as shown in Figure D.1 (Baron and Kenny, 1986).

There are three causal paths that lead to the outcomes variable: (1) the influence of the predictor variable (Path a), (2) the effect of the moderator variable (Path b) and (3) the effect of the interaction or product of the predictor and the moderator (Path c). The moderator hypothesis is supported if the interaction (Path c) is significant.

Moderation is tested using regression equations such as the following:

$Z = b_0 + b_1X + b_2Y + e$ (1)

$Z = b_0 + b_1X + b_2Y + b_3XY + e.$ (2)

The moderation hypothesis is supported if the coefficient b_3 differs significantly from zero, validating the effect of fit between X and Y on Z.

In this study, we conceptualize both the fit between expected and experienced job characteristics of software developers and the fit between preferred and experienced job characteristics of software developers using the moderation perspective. We hypothesize (hypotheses H4a, H4b, H6a, and H6b) that the fit between the predictor

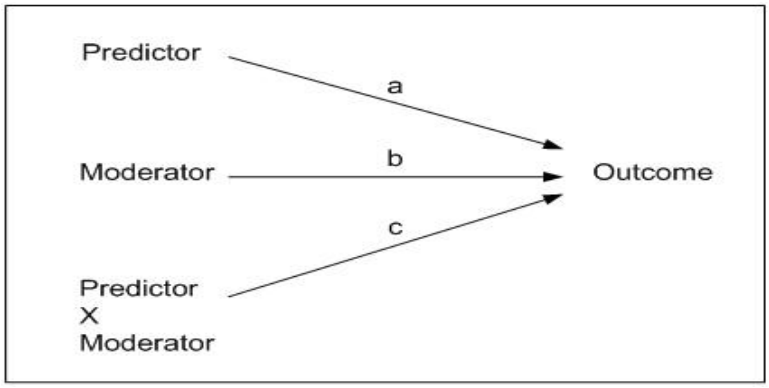

Figure D.1: Moderator Model (Baron and Kenny, 1986)

(experienced job characteristics) and moderator (expected job characteristics, preferred job characteristics) is the primary determinant of the outcome variable (in-role job performance, organizational citizenship behavior).

APPENDIX E: POLYNOMIAL REGRESSION

Simply stated, a polynomial regression model computes the expected value of an outcome (Z) as an nth order polynomial of its dependent variables. Example, a 2nd order polynomial or quadratic polynomial model would look like the below equation:

$Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e.$

The polynomial regression approach, has its limitations. First, polynomial regression assumes that predictors are measured without error because the higher order terms in quadratic equations can result in a decrease of measure reliability, which could subsequently bias coefficient estimates (Edwards, 2002). Yet, measurement error issues can be addressed by using structural equation modeling with latent variables and by using highly reliable initial component measures (Edwards, 2007). Second, this approach requires additional terms in the regression equation which result in the loss in degrees of freedom and impacts sample size requirements. Lastly, this approach applies only when fit is conceptualized as the predictor of an outcome.

Despite the general limitations, the flexibility and insight offered to fit researchers by polynomial regression provides obvious advantages over alternative methods (discussed in detail in Edwards, 2001). This generalized analytical framework allows for the analysis and testing of the fit relationships described by any of the bivariate difference scores and multivariate profile similarity indices. By conceptualizing the effects of fit as a three-dimensional surface rather than a two dimensional function, an enormous range of hypotheses can be pursued. These hypotheses can address asymmetries in the effects of misfit, variation in outcomes along the line of fit, surface rotations indicating that the optimal combination of the factors depends on whether both are high or low, and so forth (Edwards, 1996; Edwards & Rothbard, 1999).

Edwards' (1994) suggests an exploratory approach when no a priori hypotheses can be predicted regarding the fit, that involves the estimation of regression equations

of progressively higher order until the change in the F test is no longer significant. Using hierarchical regression, the analysis begins by entering the predictors (X and Y) into the model. If the resulting R^2 is not significant, the researcher can conclude that the predictors (X and Y) are not related to the criterion (Z). However, if the R^2 from this linear equation is significant, the quadratic terms (X^2, XY, and Y^2) are then added as a set to the regression model. If the change in R^2 is not significant, the linear equation is retained as the best-fitting model of the data. Alternatively, if the change in R^2 is significant, a cubic model (X^3, X^2Y, XY^2, and Y^3) is then tested. Entering the terms corresponding to each successive model as a set also helps to minimizes Type I error, or the risk of rejecting the null hypothesis when it is true (Edwards, 2002). Again, if the change in R^2 is not significant, the quadratic equation is retained. This procedure can be continued to subsequently higher levels, although the data in most fit studies rarely require treatment beyond a quadratic model (Edwards & Parry, 1993). Individual beta coefficients are only examined after the highest order significant model has been thus identified.

Opportunity to Participate in a Research Study about IT Employees

UNC CHARLOTTE

Why do Permanent and Contract IT Employees Perform and Behave Differently?

Research on IT Employee Behaviors suggests that contract IT employees are perceived to be lower-performing and less loyal, obedient, helpful, etc., than the permanent IT employees. The differences in the performance and the behavior of the permanent and contract IT employees are explained in significant part by the job characteristics they experience.

Will similar job characteristics for contract and permanent IT employees lead to similar performance and behavior? Can IT managers create similar jobs for contract and permanent IT employees? More importantly, do contract and permanent IT employees expect and prefer the same job characteristics? Do job-related expectations and preferences matter?

Do Job-Related Expectations and Preferences Matter?

The proposed research study will examine if matching the kinds of jobs that contract and permanent IT employees do, with the kinds of jobs that they expect to do, or the kinds of jobs that they prefer to do, influences employee performance and behavior. The study will also explore if contract and permanent IT employees have similar expectations and preferences about the nature of their jobs.

Research Model

Who can Participate?

Contract and permanent software developers and their managers can participate in this study. Each will complete a brief online survey that will take 10 - 15 minutes. ***Individual participant responses will be kept confidential.***

Benefits of Participating

IT Managers will receive reports on how preferred, experienced, and expected job characteristics affect the performance & behaviors of contract and permanent software developers. They will receive recommendations that can improve IT employee performance and behavior. Software developers will understand how their job-related expectations and preferences compare to other software developers. Companies will benefit from motivated employees and understanding managers, which will increase retention and productivity among all IT employees, ultimately resulting in reduced cost and increased flexibility.

This study is being conducted at the University of North Carolina at Charlotte (UNC Charlotte). The principal investigator is Tanusree Pai, a doctoral candidate at the College of Computing & Informatics at UNC Charlotte. The study will be supervised by Dr. William Tolone, Associate Professor and Interim Chair of the Department of Software and Information Systems at UNC Charlotte, and, Dr. Susan Winter, Adjunct Graduate Faculty Member at the Belk College of Business.

APPENDIX G: EMPLOYEE JOB CHARACTERIZATION SURVEY

Job Characterization Survey

1. Welcome Page

Welcome to the Software Development Job Characterization Survey!

If you write any kind of software code, review software code, design and architect software systems, fix bugs and maintain code, configure software applications and perform any other development related work, you are eligible to participate in this study on your job! Both permanent (full time) and contract (consultant) software developers can participate.

The goal of this survey is to find out about the kinds of jobs you currently do, the kinds of jobs you expected to do and the kinds of jobs you prefer to do. Filling out the survey will help us learn more about the kinds of jobs you enjoy and expect to be doing. Your managers will also be filling out a different survey about your work. However your individual responses will not be revealed to your managers and vice versa.

Your organization is participating because it would like to know more about its employees and how to support them in their jobs. Your participation in the study will allow the researchers to provide information to your managers about the kinds of jobs workers like you enjoy. It will help your employer understand how to create the kinds of jobs that software developers enjoy.

To participate, all you do is complete the next 60 multiple-choice questions. The survey will take 10-15 minutes to complete.

The decision to participate in this study is completely up to you. If you decide not to be in the study, you may stop at any time. You will not be treated any differently if you decide not to participate in the study or if you stop once you have started.

Any information about your participation, including your identity, will be kept completely confidential. Only the investigators will have access to individual responses. Your responses will not be disclosed to your managers or employer. In the reports to participating organizations, the researchers will not report any data that would enable organizations to identify any individuals by name, personal demographic information, or any other information. Access to the data on the web is only available to those who have the administrative software to access, download, export and read the data. Without the administrative software, the data is unreadable and unrecognizable.

This research is being conducted as part of the doctoral dissertation of Ms. Tanusree Pai, a graduate student at the Software Information Systems Department at the University of North Carolina at Charlotte. It will be supervised by Dr. William Tolone, Associate Professor & Interim Chair at the Software Information Systems Department at the University of North Carolina at Charlotte, and Dr. Susan Winter, Adjunct Graduate Faculty Member at the Belk College of Business at the University of North Carolina at Charlotte. For more information regarding the research, please contact Tanusree Pai (704-962-2621,

tpai1@uncc.edu).

UNC Charlotte wants to make sure that you are treated in a fair and respectful manner. Contact the University's Research Compliance Office (704-687-3309) if you have any questions about how you are treated as a study participant.

To begin, hit the next button.

2. Participant Demographics

The following are a list of benchmarking questions.
Please be assured your confidentiality will be respected and that this information will not be reported back to your organization. This information is being collected for benchmarking purposes only and we will not share this information with any parties, including your organization.

*1. Current work status

- ◯ Contract
- ◯ Permanent

*2. Age

- ◯ <= 20
- ◯ 21 - 25
- ◯ 26 - 30
- ◯ 31 - 35
- ◯ 35 - 40
- ◯ > 40

*3. Gender

- ◯ Male
- ◯ Female

*4. Education

- ◯ High School
- ◯ Vocational/Tech
- ◯ Associate Degree
- ◯ Undergraduate Degree
- ◯ Graduate Degree

*5. Years of Work Experience

- ◯ None
- ◯ < 1 yr
- ◯ 1 - 5 yrs
- ◯ 6 - 10 yrs
- ◯ > 10 yrs

*6. Tenure at Current Organization

- ◯ < 1 yr
- ◯ 1 - 3 yrs
- ◯ 4 - 6 yrs
- ◯ 7 - 10 yrs
- ◯ > 10 yrs

3. Experienced Job Characteristics

This page consists of questions regarding your experiences at your current job. Think of your current job and its nature and use the questions below to describe the characteristics that you are experiencing.

*1. The job allows freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control or other decision making.

○ Strongly agree ○ Agree ○ Neither agree nor disagree ○ Disagree ○ Strongly Disagree ○ Dont Know or Not Applicable

*2. The work activities themselves provide direct and clear information as to the effectiveness (e.g. quality and quantity) of my job performance.

○ Strongly agree ○ Agree ○ Neither agree nor disagree ○ Disagree ○ Strongly Disagree ○ Dont Know or Not Applicable

*3. Other people in the organization, such as managers and co-workers, provide information as to the effectiveness (e.g. quality and quantity) of my job performance.

○ Strongly agree ○ Agree ○ Neither agree nor disagree ○ Disagree ○ Strongly Disagree ○ Dont Know or Not Applicable

*4. My current job provides for positive social interaction such as teamwork or co-worker assistance.

○ Strongly agree ○ Agree ○ Neither agree nor disagree ○ Disagree ○ Strongly Disagree ○ Dont Know or Not Applicable

*5. The job duties, requirements, and goals are clear and specific.

○ Strongly agree ○ Agree ○ Neither agree nor disagree ○ Disagree ○ Strongly Disagree ○ Dont Know or Not Applicable

*6. The job has a variety of duties, tasks and activities.

○ Strongly agree ○ Agree ○ Neither agree nor disagree ○ Disagree ○ Strongly Disagree ○ Dont Know or Not Applicable

*7. The job requires completion of a whole and identifiable piece of work. It gives me a chance to do an entire piece of work from beginning to end.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*8. The job requires a high level of knowledge, skills and abilities.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*9. The job requires a variety of knowledge, skills and abilities.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*10. The job is significant and important compared to other jobs in the organization.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*11. The job allows opportunities for learning and growth in competence and proficiency.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*12. There are opportunities for advancement to higher-level jobs.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*13. The job provides for feelings of achievement and task accomplishment.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*14. The job allows participation in work-related decision making.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*15. The job has access to relevant communication channels and information flows.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*16. The pay on this job is adequate compared with the job requirements and with the pay in similar jobs.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*17. The job provides acknowledgement and recognition from others.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*18. People on this job have high job security.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

4. Expected Job Characteristics

This page consists of questions regarding your expectations from your job. Think of the expectations you had about this job before you started/ at start. Use the questions below to describe the nature of the job you expected/expect.

*1. I expect that the job will allow freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control or other decision making.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*2. I expect that the work activities themselves will provide direct and clear information as to the effectiveness (e.g. quality and quantity) of my job performance.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*3. I expect that other people in the organization, such as managers and co-workers, will provide information as to the effectiveness (e.g. quality and quantity) of my job performance.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*4. I expect that the job will provide for positive social interaction such as teamwork or co-worker assistance.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*5. I expect that the job duties, requirements, and goals will be clear and specific.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*6. I expect that the job will have a variety of duties, tasks and activities.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*7. I expect that the job will require completion of a whole and identifiable piece of work. It will give me a chance to do an entire piece of work from beginning to end.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*8. I expect that the job will require a high level of knowledge, skills and abilities.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*9. I expect that the job will require a variety of knowledge, skills and abilities.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*10. I expect that the job will be significant and important compared to other jobs in the organization.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*11. I expect that the job will allow opportunities for learning and growth in competence and proficiency.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*12. I expect that there will be opportunities for advancement to higher-level jobs.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*13. I expect that the job will provide for feelings of achievement and task accomplishment.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*14. I expect that the job will allow participation in work-related decision making.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*15. I expect that the job will have access to relevant communication channels and information flows.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*16. I expect that the pay on this job will be adequate compared with the job requirements and with the pay in similar jobs.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*17. I expect that the job will provide acknowledgement and recognition from others.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*18. I expect that the people on this job will have high job security.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

5. Preferred Job Characteristics

This page consists of questions regarding your preferences at it relates to your job. Think about the nature of the job that you would prefer if you had a choice. Use the questions below to describe the characteristics that you enjoy and would like to see in a job.

*1. I prefer a job that allows freedom, independence, or discretion in work scheduling, sequence, methods, procedures, quality control or other decision making.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*2. I prefer work activities that themselves provide direct and clear information as to the effectiveness (e.g. quality and quantity) of my job performance.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*3. I prefer a job where other people in the organization, such as managers and co-workers, provide information as to the effectiveness (e.g. quality and quantity) of my job performance.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*4. I prefer a job that provides for positive social interaction such as teamwork or co-worker assistance.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*5. I prefer a job where duties, requirements, and goals are clear and specific.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*6. I prefer a job that has a variety of duties, tasks and activities.

Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree | Dont Know or Not Applicable

*7. I prefer a job that requires completion of a whole and identifiable piece of work. It gives me a chance to do an entire piece of work from beginning to end.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*8. I prefer a job that requires a high level of knowledge, skills and abilities.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*9. I prefer a job that requires a variety of knowledge, skills and abilities.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*10. I prefer a job that is significant and important compared to other jobs in the organization.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*11. I prefer a job that allows opportunities for learning and growth in competence and proficiency.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*12. I prefer a job with opportunities for advancement to higher-level jobs.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*13. I prefer a job that provides for feelings of achievement and task accomplishment.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*14. I prefer a job that allows participation in work-related decision making.

☐ Strongly agree	☐ Agree	☐ Neither agree nor disagree	☐ Disagree	☐ Strongly Disagree	☐ Dont Know or Not Applicable

*15. I prefer a job that has access to relevant communication channels and information flows.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Dont Know or Not Applicable

*16. I prefer a job that has adequate pay compared with the job requirements and with the pay in similar jobs.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Dont Know or Not Applicable

*17. I prefer a job that provides acknowledgement and recognition from others.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Dont Know or Not Applicable

*18. I prefer a job with high job security.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Dont Know or Not Applicable

6. Thank You

Thank you for your participation! Your responses are very important to us and we will maintain the confidentiality of your responses. You can expect to see the results of the research study and our findings soon!

APPENDIX H: PERFORMANCE AND BEHAVIOR SURVEY

Employee Performance and Behavior Survey

1. Welcome Page

Welcome to the Software Developer Performance & Behavior Survey!

If you monitor, supervise, provide feedback or participate in personnel - related decisions (hiring, firing, bonuses) about software developers (permanent or contract) you are eligible to participate in our study!

The goal of this survey is to find out about the kinds of jobs that software developers currently do, the kinds of jobs that they expected to do and the kinds of jobs they prefer to do. We want to find out how the expectations and preferences affect the performance & behaviors of software developers. As managers, you can provide information about the performance and work-related behaviors of software developers. Your staff will be filling out a separate survey describing their jobs. At the end of the study, we will provide you with information about the job expectations and preferences of software developers along with insights into methods for improving their motivation and performance.

Your organization is participating because it would like to know more about its employees and how to support them in their jobs. Filling out the survey will help us learn more about the performance and behavior of software developers.

To participate, all you do is complete the next 28 multiple-choice questions. There are two sections in the survey. The first section has 6 demographic questions which you will fill out once. This section will take 1-2 minutes. The second section has 22 questions which will repeat as many times as the number of developers that report to you. The second section will take 4-5 minutes to complete per developer. Everytime you complete this section, please select a different developer.

The decision to participate in this study is completely up to you. If you decide not to be in the study, you may stop at any time. You will not be treated any differently if you decide not to participate in the study or if you stop once you have started.

Any information about your participation, including your identity, is completely confidential. Only the investigators will have access to individual responses. Your responses will not be disclosed to your staff or employer. In the reports to participating organizations, the researchers will not report any data that would enable organizations to identify any individuals by name, personal demographic information, or any other information. Access to the data on the web is only available to those who have the administrative software to access, download, export and read the data. Without the administrative software, the data is unreadable and unrecognizable.

This research is being conducted as part of the doctoral dissertation of Ms. Tanusree Pai, a graduate student at the Software Information Systems Department at the University of North Carolina at Charlotte. It will be

supervised by Dr. William Tolone, Associate Professor & Interim Chair at the Software Information Systems Department at the University of North Carolina at Charlotte, and Dr. Susan Winter, Adjunct Graduate Faculty Member at the College of Computing and Informatics at the University of North Carolina at Charlotte. For more information regarding the research, please call Tanusree Pai at 704-962-2621.

UNC Charlotte wants to make sure that you are treated in a fair and respectful manner. Contact the University's Research Compliance Office (704-687-3309) if you have any questions about how you are treated as a study participant. To begin, hit the next button.

2. Participant Demographics

The following are a list of benchmarking questions.
Please be assured your confidentiality will be respected and that this information will not be reported back to your organization. This information is being collected for benchmarking purposes only and we will not share this information with any parties, including your organization.

*1. Current work status

◯ Contract	◯ Permanent

*2. Age

◯ <= 20	◯ 21 - 25	◯ 26 - 30	◯ 31 - 35	◯ 35 - 40	◯ > 40

*3. Gender

◯ Male	◯ Female

*4. Education

◯ High School	◯ Vocational/Tech	◯ Associate Degree	◯ Undergraduate Degree	◯ Graduate Degree

*5. Years of Work Experience

◯ None	◯ < 1 yr	◯ 1 - 5 yrs	◯ 6 - 10 yrs	◯ > 10 yrs

*6. Tenure at Current Organization

◯ < 1 yr	◯ 1 - 3 yrs	◯ 4 - 6 yrs	◯ 7 - 10 yrs	◯ > 10 yrs

3. Performance Evaluation of Employees

This page consists of statements that allow you to provide feedback regarding your employee's performance and behavior. The 23 questions in this section will repeat as many times as the number of employees that report to you. Everytime you complete this section, please select a different employee's name in the first drop down.

*1. Name of Employee

*2. Work Status of the Employee being rated

Contract Permanent

*3. He/she adequately completes assigned duties.

Always Usually Rarely Never Dont Know or Not Applicable

*4. He/she fulfills responsibilities specified in the job description.

Always Usually Rarely Never Dont Know or Not Applicable

*5. He/she performs tasks that are expected of him/her.

Always Usually Rarely Never Dont Know or Not Applicable

*6. He/she meets formal performance requirements of the job.

Always Usually Rarely Never Dont Know or Not Applicable

*7. He/she engages in activities that will directly affect his/her performance evaluation.

Always Usually Rarely Never Dont Know or Not Applicable

*8. He/she neglects aspects of the job he/she is obligated to perform.

Always Usually Rarely Never Dont Know or Not Applicable

*9. He/she fails to perform essential duties.

Always Usually Rarely Never Dont Know or Not Applicable

*10. He/she helps others who have been absent.

Always Usually Rarely Never Dont Know or Not Applicable

*11. He/she helps others who have heavy work loads.

Always Usually Rarely Never Dont Know or Not Applicable

*12. He/she assists supervisor/manager with his/her work (when not asked).

Always Usually Rarely Never Dont Know or Not Applicable

*13. He/she takes time to listen to co-worker's problems and worries.

Always Usually Rarely Never Dont Know or Not Applicable

*14. He/she goes out of way to help new employees.

Always Usually Rarely Never Dont Know or Not Applicable

*15. He/she takes a personal interest in other employees.

Always Usually Rarely Never Dont Know or Not Applicable

*16. He/she passes along information to co-workers.

Always Usually Rarely Never Dont Know or Not Applicable

*17. His/her attendance at work is above the norm.

Always Usually Rarely Never Dont Know or Not Applicable

*18. He/she gives advance notice when unable to come to work.

Always Usually Rarely Never Dont Know or Not Applicable

*19. He/she takes undeserved work breaks.

Always Usually Rarely Never Dont Know or Not Applicable

*20. He/she spends a great deal of time on personal phone conversations.

○ Always ○ Usually ○ Rarely ○ Never ○ Dont Know or Not Applicable

*21. He/she complains about insignificant things at work.

○ Always ○ Usually ○ Rarely ○ Never ○ Dont Know or Not Applicable

*22. He/she conserves and protects organizational property.

◉ Always ○ Usually ○ Rarely ○ Never ○ Dont Know or Not Applicable

*23. He/she adheres to informal rules devised to maintain order.

○ Always ○ Usually ○ Rarely ○ Never ○ Dont Know or Not Applicable

6. Thank You

Thank you for your participation! Your responses are very important to us and we will maintain the confidentiality of your responses. You can expect to see the results of the research study and our findings soon!