JOB EMBEDDEDNESS VERSUS TRADITIONAL MODELS OF VOLUNTARY TURNOVER: A TEST OF VOLUNTARY TURNOVER PREDICTION

John Besich, B.S., M.S.

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

December 2005

APPROVED:

Michael Beyerlein, Major Professor
Roger Ballentine, Committee Member
Joe Huff, Committee Member
Victor Prybutok, Committee Member
Linda Marshall, Chair of the Department of Psychology
Sandra L. Terrell, Dean of the Robert B. Toulouse School of Graduate Studies

Voluntary turnover has historically been a problem for today’s organizations. Traditional models of turnover continue to be utilized in a number of ways in both academia and industry. A newer model of turnover, job embeddedness, has recently been developed in an attempt to better predict voluntary turnover than existing models. Job embeddedness consists of organizational fit, organizational sacrifice, and organizational links.

The purpose of this study is to two fold. First, psychometric analyses were conducted on the job embeddedness model. Exploratory factor analyses were conducted on the dimensions of job embeddedness, which revealed a combined model consisting of five factors. This structure was then analyzed using confirmatory factor analysis, assessing a 1, 3, and 5 factor model structure. The confirmatory factor analysis established the use of the 5 factor model structure in subsequent analysis in this study.

The second purpose of this study is to compare the predictive power of the job embeddedness model versus that of the traditional models of turnover. The traditional model of turnover is comprised of job satisfaction, organizational commitment, and perceived job alternatives.

In order to compare the predictive power of the job embeddedness and traditional model of voluntary turnover, a series of structural equation model analyses
were conducting using LISREL. The job embeddedness model, alone, was found to be the best fit with the sample data. This fit was improved over the other two models tested (traditional model and the combination of the traditional and job embeddedness model).

In addition to assessing which model better predicts voluntary turnover, it was tested which age group and gender is a better fit with the job embeddedness model. It was found that the job embeddedness model better predicts turnover intention for older respondents and males.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Overview</td>
<td></td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td></td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td></td>
</tr>
<tr>
<td>Summary of the Literature</td>
<td></td>
</tr>
<tr>
<td>Traditional Models of Voluntary Turnover</td>
<td></td>
</tr>
<tr>
<td>Non-Traditional Models of Voluntary Turnover</td>
<td></td>
</tr>
<tr>
<td>Embeddedness</td>
<td></td>
</tr>
<tr>
<td>Embeddedness v. Traditional Model of Turnover</td>
<td></td>
</tr>
<tr>
<td>Age and Turnover</td>
<td></td>
</tr>
<tr>
<td>Gender and Turnover</td>
<td></td>
</tr>
<tr>
<td>Problem Statement and Research Propositions</td>
<td></td>
</tr>
<tr>
<td>II. METHOD</td>
<td>36</td>
</tr>
<tr>
<td>Survey Development and Administration</td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td></td>
</tr>
<tr>
<td>Measures</td>
<td></td>
</tr>
<tr>
<td>Turnover Intention</td>
<td></td>
</tr>
<tr>
<td>Job Embeddedness</td>
<td></td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td></td>
</tr>
<tr>
<td>Organizational Commitment</td>
<td></td>
</tr>
<tr>
<td>Perceived Job Alternatives</td>
<td></td>
</tr>
<tr>
<td>Data Analysis</td>
<td></td>
</tr>
<tr>
<td>III. RESULTS</td>
<td>45</td>
</tr>
<tr>
<td>IV. SUMMARY AND DISCUSSION OF FINDINGS</td>
<td>78</td>
</tr>
</tbody>
</table>

LIST OF TABLES.........................................................................................................................iv

LIST OF FIGURES......................................................................................................................... v

Chapter

I. INTRODUCTION..........................................................................................................................1
   Overview
   Purpose of the Study
   Theoretical Framework
   Summary of the Literature
   Traditional Models of Voluntary Turnover
   Non-Traditional Models of Voluntary Turnover
   Embeddedness
   Embeddedness v. Traditional Model of Turnover
   Age and Turnover
   Gender and Turnover
   Problem Statement and Research Propositions

II. METHOD .................................................................................................................................36
   Survey Development and Administration
   Participants
   Measures
   Turnover Intention
   Job Embeddedness
   Job Satisfaction
   Organizational Commitment
   Perceived Job Alternatives
   Data Analysis

III. RESULTS .............................................................................................................................45

IV. SUMMARY AND DISCUSSION OF FINDINGS..............................................................................78
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sample Demographics in Percentages</td>
<td>47</td>
</tr>
<tr>
<td>2.</td>
<td>KMO and Bartlett’s Test of Sphericity</td>
<td>48</td>
</tr>
<tr>
<td>3.</td>
<td>Correlations of All Items</td>
<td>49</td>
</tr>
<tr>
<td>4.</td>
<td>Exploratory Factor Analysis of Organizational Fit</td>
<td>53</td>
</tr>
<tr>
<td>5.</td>
<td>Exploratory Factor Analysis of Organizational Sacrifice</td>
<td>53</td>
</tr>
<tr>
<td>6.</td>
<td>Exploratory Factor Analysis of Organizational Links</td>
<td>53</td>
</tr>
<tr>
<td>7.</td>
<td>Exploratory Factor Analysis of Embeddedness</td>
<td>55</td>
</tr>
<tr>
<td>8.</td>
<td>Goodness-of-Fit for Measurement Models ($n=1379$)</td>
<td>59</td>
</tr>
<tr>
<td>9.</td>
<td>Comparison of Hypotheses and Models</td>
<td>68</td>
</tr>
<tr>
<td>10.</td>
<td>Means, Standard Deviations, and Correlations</td>
<td>69</td>
</tr>
<tr>
<td>11.</td>
<td>Comparison of Models – Males vs. Females</td>
<td>74</td>
</tr>
<tr>
<td>12.</td>
<td>Comparison of Hypotheses and Models – Young vs. Old</td>
<td>77</td>
</tr>
</tbody>
</table>
### LIST OF FIGURES

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Traditional Model of Voluntary Turnover</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Dimensions of the Embeddedness Model of Voluntary Turnover</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>One-Factor Embeddedness Model Path Diagram</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Three-Factor Embeddedness Model Path Diagram</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>Five-Factor Embeddedness Model Path Diagram</td>
<td>62</td>
</tr>
<tr>
<td>6</td>
<td>Traditional Model of Turnover Intention</td>
<td>64</td>
</tr>
<tr>
<td>7</td>
<td>Organizational Embeddedness Model to Predict Turnover Intention</td>
<td>65</td>
</tr>
<tr>
<td>8</td>
<td>Embeddedness-Enhanced Model of Turnover Intention</td>
<td>67</td>
</tr>
<tr>
<td>9</td>
<td>Embeddedness Model of Turnover Intention - Males</td>
<td>71</td>
</tr>
<tr>
<td>10</td>
<td>Embeddedness Model of Turnover Intention - Females</td>
<td>73</td>
</tr>
<tr>
<td>11</td>
<td>Embeddedness Model of Turnover Intention – Young Employees</td>
<td>75</td>
</tr>
<tr>
<td>12</td>
<td>Embeddedness Model of Turnover Intention – Older Employees</td>
<td>76</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION TO THE STUDY

Overview

Today’s workforce has historically been plagued with high turnover rates. The U.S. Bureau of Labor Statistics reports that by 2010, the U.S. labor pool of all job types will be deficient by approximately 10 million workers (Herman, 2003). In response to these figures, management scholars have focused on the causes and antecedents of employee turnover intention (Maertz & Campion, 1998).

These voluntary turnover problems, coupled with insufficient job candidates to fill positions, will continue until organizations and managers are able to understand and deal with the causes of such high turnover rates. The United States Federal Government is especially in jeopardy because in the next three years over half of its workers will be eligible for retirement (National Academy of Public Administration, 2001). One of the most important aspects of IT workforce planning is understanding the factors that lead to voluntary turnover so that valuable employees can be retained.

Voluntary turnover has become a problem for many organizations, regardless of job industry, in today’s society. The costs of this turnover reach beyond organizational impact, but also affect the employees themselves. Prior research has examined the costs of an employee’s decision to voluntarily leave an organization. For example, a recent figure explained that it costs a company
$78,000 to replace an employee in a $46,000 per year job (Ramsey-Smith, 2004). These costs have included the recruitment and training of employees (Alexander, Bloom, & Nichols, 1994), loss of firm-level social capital (Dess & Shaw, 2001), decreases in temporary productivity (Osterman, 1987), and loss of important tacit knowledge (Droege & Hoobler, 2003).

For this reason, there have been a plethora of research studies conducted over the past 40 years by both academicians and practitioners on the causes and consequences of voluntary turnover. Many of the results reflect a similar vein of thought, but this is partially attributed to the assumption that most appropriate models of turnover (Hulin, Roznowski, & Hachiya, 1985; Lee & Mitchell, 1994; Mobley, 1977; Mobley, Horner, & Hollingsworth, 1978; Mobley, Griffeth, Hand, & Meglino, 1979; Price, 1977; Steers & Mowday, 1981) are derived from the March and Simon model (1958).

These models suggest there are two factors attributing to voluntary turnover, ease of movement and desirability of movement. Nevertheless, the variance accounted for by these models is relatively low, comprising about 15-25% of the variance in voluntary turnover, with the individual variables rarely accounting for more than 10 percent of variance (Griffeth, Hom, & Gaertner, 2000).

Despite the acceptance of the traditional model of voluntary turnover, few turnover models depart from the March and Simon model. In 2001, Mitchell, Holtom, Lee, Sablynski & Erez (2001) introduced a new construct entitled Job
Embeddedness that explained significant incremental variance over and above traditional turnover models. According to Mitchell et al. (2001, p, 1104), the essential aspects of Job Embeddedness are “(1) the extent to which people have links to other people or activities, (2) the extent to which their jobs and communities are similar to or fit with other aspects in their life spaces, and, (3) the ease with which links can be broken-what they would give up if they left, especially is they had to physically move to other cities or homes.” These three new variables, defined as organizational links, fit, and sacrifice, had previously been overlooked in the much of the voluntary turnover research literature.

Purpose of the Study

Because of its relative newness, little empirical work exists on testing Job Embeddedness’ relevance to different workforce populations or cultures. In addition, Mitchell et al. (2001) did not provide rigorous validation of their Embeddedness instrument. The purpose of this study is, therefore, four-fold: 1) to assess the psychometric properties of the Embeddedness scale brought forth in the Mitchell et al. (2001) article, 2) investigate the relationships among the three different components of the Embeddedness construct, 3) compare the validity of Embeddedness with that of the traditional model of turnover to determine its applicability to information technology professionals, 4) further examine the effects of demographic factors (age and gender) in the traditional model and Embeddedness model.
For Job Embeddedness to surpass the traditional model’s utility, Job Embeddedness must account for a more substantial portion of the variance in voluntary turnover than do the traditional models. This paper will serve as a test of the construct validity and generalizability of the Job Embeddedness construct.

This study attempts to provide several major contributions to the management literature. The Embeddedness construct potentially explains significant incremental variance on why IT employees voluntarily leave their organization. This would provide organizations with additional insight on why employees choose to leave, allowing development of new strategies that reduce voluntary turnover. Next, by rigorously analyzing the Embeddedness scale, an instrument that can be used by future researchers will be provided. In addition, the relationships among the Embeddedness components are investigated to obtain a deeper understanding of the antecedents and outcomes for each of the three Job Embeddedness subscales that affect the voluntary turnover equation.

Theoretical Framework

The seminal work introducing the Job Embeddedness model of turnover used information technology as its initial framework (Mitchell et al., 2001). There is an ever increasing reliance on the components of information technology in today’s organizations. Because of this dependence on information technology, the ability to retain high performing information technology employees is imperative for organizations to thrive in the global market. As mentioned by Moore (2000), the gap between the number of open jobs and the availability of
talented information technology employees is growing. This phenomenon results in the increase of job alternatives, allowing IT workers to flow more freely from one organization to the other.

Voluntary turnover is not isolated to the information technology industry. According to U.S. Department of Labor figures, there will be replacement needs for 60 percent of the projected 56 million job openings between 2002 and 2012 across all industries. Many of these job opening will be due to voluntary turnover.

The availability of job alternatives allows the higher performing employees to seek employment elsewhere provided they feel their current situation is not favorable or conducive to their needs. This phenomenon known as “ease of movement” has been assessed quite often in the past literature (Gerhart, 1990; Trevor, 2001; Holtom, 2004).

Nevertheless, organizations and managers must devote time and energy in attempting to determine the causes of voluntary turnover, especially among information technology employees. Although there has been 30 years of extensive research in voluntary turnover, the amount of variance accounted for by the current models of voluntary turnover is relatively low to moderate (about 15-25%) (Cotton & Tuttle, 1986; Griffeth et al., 2000). The most common model of voluntary turnover used in the literature today stems from the March and Simon (1958) model. This model has been the most influential model in the voluntary turnover research, with little done to change its original tenets. March
and Simon postulated that the two contributing factors of voluntary turnover were the ease of movement, known as perceived availability of job alternatives in today’s literature, and desirability of movement, known today as job satisfaction. Ease of movement can not be controlled directly by the organization, which can prove to be problematic for the organization when retaining high quality employees is paramount.

The inclusion of organizational commitment into the traditional model of voluntary turnover is a result of the work done by Meyer and Allen (1991) concerning three facets of organizational commitment. Within their model are dimensions labeled affective, continuance, and normative commitment. Affective commitment is the emotional attachment, identification, and involvement an employee has to their organization. Continuance commitment involves the recognition of costs associated with leaving the organization. Normative commitment is similar to peer pressure in that it is the sense of obligation of the employee to remain with their organization. The Meyer and Allen (1991) model is the most commonly used organizational commitment scale as evidenced by the prevalence of its use in today’s literature.
As Figure 1 shows, combining the constructs of job satisfaction, perceived availability of job alternatives, and organizational commitment is one method for predicting voluntary turnover in organizations. A problem lies in the percentage of variance in voluntary turnover accounted for by the model. As mentioned previously, recent testing of the model results in between 15 and 25 percent of the variance accounted for in voluntary turnover and intention to quit (Lee & Mitchell, 1994; Mitchell et al., 2001).

As Figure 2 shows, the new model of Job Embeddedness (Mitchell et al., 2001) assesses three ostensibly unique constructs rather than the three in the traditional model. Job Embeddedness is comprised of three different dimensions, combining to form one overall construct of Job Embeddedness. The first dimension in the Job Embeddedness construct is organizational links which involves the number of employees, teams, or work related projects the employee is closely associated with. This dimension measures the actual number of these links, as opposed to a subjective attitudinal rating of the teams, employees, or
work-related projects the employee is involved with. The second dimension is organizational fit which represents how the employee perceives the compatibility with the organization, otherwise known as person-organization fit. The last dimension of the Job Embeddedness is organizational sacrifices. Organizational sacrifices include the costs of the employee leaving their current organization for another.

Figure 2 Dimensions of the Embeddedness Model of Voluntary Turnover

Job Embeddedness does not measure job satisfaction or perceived availability of job alternatives. The overlap between the traditional model of voluntary turnover and the Job Embeddedness model occurs in the organizational commitment dimension. However, Job Embeddedness does not overtly assess organizational commitment. Delving into the principles of organizational commitment (Allen & Meyer, 1991) reveals something different. Using the Meyer and Allen (1991) organizational commitment definitions as a
standard, Job Embeddedness does assess various aspects of the three dimensions found within their scale.

It is unclear which model of voluntary turnover is more effective at predicting turnover in organizations, though both are undoubtedly useful in theory and practice. Many studies have been done to determine the validity of the traditional model of turnover consisting of job satisfaction, organizational commitment, and perceived availability of job alternatives. However, because of the relative newness of Job Embeddedness, little work has been done on testing its validity or relevance to different populations.

Summary of the Literature

Numerous voluntary turnover models are derivatives of the general March and Simon (1958) model, incorporating their ideas regarding the ease and desirability of movement of the organizational employees. It was the early efforts of March and Simon (1958) at predicting voluntary turnover that continues to spur today’s academicians and practitioners in their dealing with the same subject. Prior to the economic downturn of the early 2000s, voluntary turnover had reached very high levels. These trends will most likely re-establish itself if nothing is done to deal with the situation at hand.

The paucity of differing voluntary turnover models is potentially due to the difficulties in identifying those constructs that cause voluntary turnover. Even using the models that exist today, empirical evidence shows that models are able to account for a small to moderate percentage (≤ 25%) of the variance in
voluntary turnover. Another problem with the existing models of voluntary turnover is that most are attitudinally based. That is, the scales used are reported through subjective feelings on the part of the employee. Each attitudinal variable within the model has traditionally accounted for only 4-10 percent of the variance in voluntary turnover, which is rather low. Depending upon which variables are included in the model, the total variance can vary greatly.

The inherent use of voluntary turnover models allows managers to address the issues relevant to their workers in a scientific manner which will reduce the bias involved in decision making and planning strategies. By using the knowledge gained from testing the various models available to the public, managers will be equipped with the information needed to reduce an employee’s likelihood of voluntarily leaving. More specifically, by examining the antecedents of intent to leave and leaving, managers will have a better understanding of what is needed to reduce voluntary turnover.

In particular, voluntary turnover in the information technology field is reaching almost epidemic proportions. It is projected that within a 12 month span in 2000, 40% of IT staff members planned on intending to quit (Watson, 2000). Granted, the economy of 2005 is much different than that of the Watson article, although there is still evidence of the fluidity of the information technology field. The high percentage of intention to quit, as referenced by Watson, is rather remarkable in that the cost to the already hemorrhaging IT firms will be so exhaustive that many of the firms that exist today may not be doing business in
the upcoming years. According to the Institute of Management and Administration (2001), the cost of voluntary turnover can be between 50% to 150% of the annual salary of the employee. The cost can affect organizational budgets and the ability to strategically plan.

According to many of the popular trade magazines, money is the primary motivator of voluntary turnover within the IT industry. According to Weldon (1999), entry level employees are dissatisfied with their current salaries and up to 50% of the current IT employees are also dissatisfied with their bonuses (Weldon, 1999). Some very exhaustive literature reviews have been published recently (Cotton & Tuttle, 1986; Griffeth et al., 2000) in an effort to confront this growing problem of voluntary turnover.

The cost of voluntary turnover can be two-fold, affecting both the organization and the individual who seeks employment with a different organization. Within the literature, two types of voluntary turnover have been identified (Johnson, Griffeth, & Griffin, 2000). Johnson et al. (2000) suggest that both functional and dysfunctional voluntary turnover exist within organizations. Mobley (1982) also suggests that some turnover can prove to have positive consequences, such as having poor performing employees voluntarily leave, leaving room for better performing employees. This argument is supported only with the assumption that an empirically tested, and validated selection system is in place. In fact, the type of turnover can be a byproduct of the industry (Johnson et al., 2000). Having a low performing salesforce can harm an organization’s
reputation and viability in the marketplace (Russ & McNeily, 1995). Some industries or groups are at more risk for turnover, like Big 5 accounting firms with their raging turnover, high-tech industries, and blue collared jobs. However, voluntary turnover has drastically decreased with the recent downturn in the economy.

Regardless of the type of voluntary turnover, the organization will incur a number of costs that could otherwise be avoided (Gemignani, 1998; Johnson et al., 2000; March & Simon, 1958; Mitchell, Holtom, & Lee, 2001; Rouse, 2001; Russ & McNeily, 1995). The time and energy exhausted by the organization in a search for potential employees represents costs, because these efforts could be put to other uses. The recruiting process that organizations conduct can be both lengthy and costly, including having to advertise on the internet, local newspapers, radio, and television. The cost of actually hiring employees is also expensive due to the interviews, drug tests, background checks, training, overtime for current employees, lost productivity, temporary workers, etc.

An often overlooked consequence of turnover is that managers must now be forced to deal with issues pertaining to employees staying with the organization instead of focusing on the everyday tasks and duties needed to maintain an organizational profit. With high unemployment rates, especially in some sectors like telecom, managers are more focused on downsizing than recruiting. However, managers must be able to deal with the satisfaction of the employees, co-workers, and management as a whole, as well as keep an eye on
the labor-market. Voluntary turnover has now become a salient issue in the workforce and must be dealt with accordingly (Lee & Mitchell, 1994).

As was mentioned previously, voluntary turnover is a double edged sword, cutting both ways. Employees that leave organizations voluntarily must be ready to deal with a number of both tangible and intangible losses. These types of losses can include, but are not limited to seniority, vested benefits, and most all other aspects of benefits associated with having tenure in a position (Mobley, 1977). Losses such as these are similar to those assessed by the organizational sacrifice dimension of Job Embeddedness. Employees must also take into consideration the off-the-job aspects of leaving an organization. The added changes and ambiguity of a situation can lead to stress for the individual and their family.

Traditional Models of Voluntary Turnover. There have been many attempts to create a model to explain the process through which employees voluntarily leave an organization (Hulin, Roznowski, & Hachiya, 1985; Lee & Mitchell, 1994; March & Simon, 1958; Mitchell et al., 2001; Mobley, 1977; Mobley, Horner, & Hollingsworth, 1978; Mobley, Griffeth, Hand, & Meglino, 1979; Price, 1977; Steers & Mowday, 1981). However, individuals often have different reasons for leaving and/or devising a model encompassing all of the different factors involved which would be both cumbersome and impractical.

Two specific constructs have been deemed as the most relevant with dealing with voluntary turnover. The first construct, Ease of Movement, involves
the ability of the employee to leave their current jobs and find comparable and equitable employment elsewhere. There are a myriad of events that can take place to influence this ease of movement construct. The second antecedent March and Simon found to predict voluntary turnover was desirability of movement, also known as job satisfaction in today’s literature. Job satisfaction refers to the overall feeling people have toward different aspects of their jobs (Spector, 1997). These two constructs serve as the major conceptual foundation for much of the literature on voluntary turnover (Hulin et al., 1985).

Mobley (1977) provided a turnover model that suggests job attitudes are most directly related to withdrawal cognitions of intending to quit, but only indirectly related to those actual turnover behaviors (Mowday, Koberg, & McArthur, 1984). Empirical evidence for Mobley’s model is somewhat mixed (Lee & Mitchell, 1994). This particular model is weak in the ability to predict voluntary turnover (Hom & Griffeth, 1991; Hom, Griffeth, & Sellaro, 1984; Lee, 1988). However, using five variables from Mobley’s model (job satisfaction, expectation to find an alternative job, search behavior, thoughts of quitting, and intention to quit) is effective at predicting turnover for full-time rather than part-time employees (Peters, Jackofsky, & Salter, 1981). Perhaps the needs for the two groups differ enough to warrant different models of voluntary turnover.

The Mobley, Horner, and Hollingsworth model of voluntary turnover (1978) is an extension on the Mobley model of 1977. The suggested causal linkage in this model begins with job dissatisfaction which results in the individual thinking
about leaving the organization. This expansion of the 1977 model suggests that intent to search and intent to quit are the most immediate predictors of turnover.

The Mobley, Griffeth, Hand, and Meglino model (1979) included labor market, organizational, job, cognitive and individual variables (i.e., satisfaction, attraction-expected utility in the present job, and attraction-expected utility for alternative jobs) as integral parts of the voluntary turnover process. Additional variables entered into the model focus on factors external to the person. This gave rise to the pull theory, which suggests that factors external to the person play a significant role in “pulling” the employee from the current organization. The primary focus of the Mobley et al., (1979) model was on a broader range of predictors to capture the outlying variance in voluntary turnover.

The next major model of voluntary turnover to emerge was the Steers and Mowday model (1981) which also included cognitive variables. Unlike the Mobley model, non-work variables were also included in the model including family, hobbies, religion, political influences that can influence job attitudes and organizational attachment (Cohen, 1995; Mitchell et al., 2001; Rouse, 2001). This model includes some aspects which are similar to the organizational links dimension of Job Embeddedness.

While Mobley (1977, 1979) suggested that searching for a job leads to an intention to quit, Steers and Mowday (1981) propose that intention to leave precedes searching for job alternatives. The Steers and Mowday model propose the interaction between employee intention to leave and alternative job
opportunities as the immediate antecedent of the behavior of the employee leaving. The Steers and Mowday model explains 6 percent of the total variance in employee voluntary turnover (Lee & Mowday, 1987).

The Steers and Mowday (1981) model was unique because it explicitly recognized the role of available information about a job and an organization, introduced job performance as an influence on affective responses, and considered job attitudes other than satisfaction as antecedents to an employee’s intentions to leave. In regard to the intention to leave an organization, this model suggests non-work factors had greater influences than did previous research. Steers and Mowday recognized the possibility that dissatisfied employee may try to change a situation before leaving.

In a meta-analysis performed by Cotton and Tuttle (1986) a comparison of 26 predictors relating to voluntary turnover was conducted. According to the results of the meta-analysis, overall job satisfaction, perceived employment alternatives, age, tenure, pay were all found to be stable, reliable correlates with turnover (Cotton & Tuttle, 1986).

Griffeth et al. (2000) performed the most exhaustive study of employee turnover antecedents and correlates to date. Griffeth et al.’s (2000) meta-analysis yielded similar results to previous meta-analyses in terms of predictive validity of overall job satisfaction ($r = -.19$) on turnover. The best predictive facet of satisfaction of turnover is the facet of work satisfaction ($r = -.16$). The Griffeth et al. (2000) study showed perceived alternatives ($r = .12$) and organizational
commitment ($r = -.23$) again mimicked results from previous meta-analyses (Steel & Griffeth, 1989; Hom & Griffeth, 1995).

It has been consistently found that job dissatisfaction correlates with intention to leave (Cotton & Tuttle, 1986; Jaros, 1997; Lee & Mitchell, 1987; Sager et al., 1994). This, however, reveals very little to both the practitioner and the academician. That is, what exactly does overall job satisfaction encompass? A number of factors can influence aspects of job satisfaction, including, but not limited to, the job itself and tasks itself, management beliefs, future opportunities, work environment, pay, benefits, rewards, and co-worker relationships (Locke, 1976).

The causes of job satisfaction take place both in the employee and the workplace. Characteristics of the employee and the work environment interact and determine the level of job satisfaction or job dissatisfaction (Spector, 1997). It is assumed that likelihood of the employee staying with an organization is contingent upon how satisfied the employee is (Mitchell et al., 2001). Given the same level of dissatisfaction, people who are afforded more opportunities to pursue employment elsewhere will do so (Mitchell et al., 2001). It was found that different facets of satisfaction (pay, $r = -.07$; supervisory, $r = -.10$; co-worker, $r = -.11$; work, $r = -.16$) were associated with turnover intention (Griffeth et al., 2000).

Job satisfaction is also linked with organizational commitment (Brooke, Russell, & Price, 1993; Porter, Steer, Mowday, Boulian, 1988; Tett & Meyer, 1993). It has been argued that job satisfaction and organizational commitment
may share common determinants, as the correlates between the two can be quite high ($\alpha = .71$) (Tett & Meyer, 1993).

In addition to job satisfaction, the concept of perceived job alternatives is also a prominent component of traditional voluntary turnover models. This particular concept, not unlike the construct of job satisfaction, is a derivative of March and Simon’s (1958) model of turnover. However, there is little empirical evidence suggesting that there is a strong direct correlation between perceived available job alternatives and employee turnover (Arnold & Feldman, 1982; Cotton & Tuttle, 1986; Griffeth et al, 2000; Hulin et al., 1985; Lee & Mowday, 1987). According to early studies, perceived job alternatives explained less than one percent of the variance in voluntary turnover (Lee & Mowday, 1987), while more recent accounts show perceived job alternatives having modest predictability of voluntary turnover ($r = .12$) (Griffeth et al., 2000).

One of the problems with the predictability of the perceived job alternatives scale is that many employees leave their jobs without ever having looked for another one (Mitchell et al., 2001). This result is also supported by Campion (1991), when he purports that in many cases, voluntary turnover is not associated with negative attitudes or the intent to search but rather a byproduct of circumstances not within their control, such as spousal relocation, new additions to the family, etc. (Mitchell et al., 2001; Rouse, 2001).

It has also been found that if the perceived job alternatives are considered good, the employee will then form an intention to quit (Hom et al., 1981; Sager et
al., 1988). According to Johnson et al. (2000), the likelihood of finding an appealing job opportunity that fits the needs of the employee will increase as the actual number of opportunities increase. This perceived favorable evaluation of the job landscape can result in voluntary turnover (Price & Mueller, 1981). In the event that quality job alternatives do not exist, strong job commitment can result (Rusbult & Farrell, 1983).

In the past, there have been indirect effects for perceived job opportunities on organizational commitment (Lance, 1991). Though this relationship is well established in the literature, Jaros (1997) cautions that the relationship between organizational commitment and turnover intention may not be as simple as is proposed in many of the turnover models. For example, in Meyer and Allen’s (1991) model, three separate components comprise the one construct that is organizational commitment. Simplifying this organizational commitment concept in a manner that provides one global measure of organizational commitment may be naïve, and although the Meyer and Allen model is the most prominent model in the research, there has been much research conducted with a global measure of organizational commitment.

Organizational commitment is a construct that has been used in innumerable studies concerning voluntary turnover in organizations. It has been consistently linked with withdrawal cognitions, resulting in withdrawal behaviors, or coping mechanisms, such as diminished commitment, depersonalization, and eventually voluntary turnover. Overall, empirical tests consistently support the
significant negative relationships between organizational commitment and job satisfaction with turnover intention, and that turnover intention is a direct antecedent of actual turnover (see Griffeth et al., 2000 for a meta-analysis).

The commitment an employee has towards an organization can be a strong factor in how well the organization is able to retain their most valued employees. When assessing different facets of organizational commitment, it has been found that having affective commitment to an organization is the best predictor of retention (Jaros, 1997; Meyer, Allen, & Smith, 1993; Somers, 1995; Whitener & Walz, 1993).

As it stands today, the traditional model of turnover is still comprised of organizational commitment, job satisfaction, and perceived availability of job alternatives. These three constructs have combined in a model resulting in only modest predictability. The components are significant predictors of voluntary turnover, but again, modest in size.

**Non-Traditional Models of Voluntary Turnover.** The voluntary turnover research has been dominated by two contrasting orientations (Lee & Mitchell, 1994). First, traditional models of turnover suggest that employee voluntary turnover has many roots and can not be isolated to one, or even a few factors. Second, there is a predominant focus on the satisfaction-turnover link. Hulin (1991) suggested moving away from this particular focus and concentrating more on the adaptation/withdrawal link. Refocusing on the adaptation/withdrawal link researchers will be able to capitalize on the classical theories of psychology.
regarding adaptation and withdrawal behaviors (transfer, sabotage, absenteeism, etc.), not just those associated with turnover intention.

The unfolding model of turnover (Lee & Mitchell, 1994) operates on the premise that there exist many different ways that an individual can leave a job. It is not only the requisite job dissatisfaction and/or available job opportunities that lead to voluntary turnover. That is, one can be satisfied with their current job and still voluntarily leave because a more appealing position is offered at another organization.

Lee and Mitchell’s (1994) unfolding model of voluntary turnover suggests two theories of how turnover occurs. They propose the presence of a pull theory, which tends to focus on the factors external to an organization that are not in its immediate control such as an unsolicited job offer, spousal relocation, or other family obligations. Alternatively, a push theory is analogous to the organization pushing the employee out based on a number of different situations. For example, the organization may demand too much time from the employee, forcing them to make the decision between family or work. Employees can become dissatisfied with the organization itself which can result in their commitment waning.

There are a myriad of other influences and factors that can affect whether or not individuals chose to remain with their current employer. As Rouse (2001) states, the unfolding model is an instinctual model. Most of the previous models of turnover have assumed that employees make calculated, rational, decisions
concerning their current and future employment opportunities. This thinking may be fundamentally flawed, however, with the research done by Herb Simon in the 1950s showing humans were not typically rational decision makers (Simon, 1955; Simon, 1956). However, many people often leave their jobs before beginning a search for alternatives, because the situation does not permit this premeditated measure of assurance. The unfolding model takes into consideration the many different ways in which employees voluntarily leave their jobs, understanding that different employees have different methods and experiences of dealing with leaving organizations.

In some professions, the need for achievement is high and has much influence on the employee's attitudes towards the organization. Rouse (2001) proposes that this unfilled need for achievement will result in job dissatisfaction. According to models previously described, this job dissatisfaction will potentially lead to turnover intention. Organizations can avoid this voluntary turnover by incorporating newer technologies into its infrastructure. This adoption of newer technologies will allow employees to train and advance their skill sets, resulting in the satisfaction of the need for achievement.

Jiang and Klein (2002) used a discrepancy model to examine how the difference between what employees want and how the organization satisfies those wants affected the employee's intentions to leave the organization. Their data show that to improve turnover indicators, managers must find ways to narrow the gap between employee wants and their perceptions of what the
organization provides. Others examined nontraditional models that incorporated organizational factors, such as involvement with teams being a disincentive for people to leave (Cohen & Bailey, 1997) or off-the-job factors, such as family attachments. Drawing upon this nontraditional turnover research and the psychological attachment literature, Mitchell et al., (2001) proposed a new construct called “Job Embeddedness.”

**Embeddedness.** The final nontraditional model to be discussed is the main focus of this study. In 2001, Mitchell and his colleagues proposed a new model of voluntary turnover called Job Embeddedness (Mitchell et al., 2001). The Embeddedness scale items stem from field theory and the psychological concept of embedded figures (Lewin, 1951). Field theory proposes that aspects of people’s lives are represented by proximal and distal connections with their perceptual life space. Embedded figures are used in psychological testing in which figures that appear attached to their backgrounds are difficult to separate or differentiate. Applying these concepts within an organizational context, Mitchell et al. (2001, p 1104) described Embeddedness like “a web or net in which an individual can become stuck.” Individuals with many connections are more enmeshed in the organizational web, and therefore have a more difficult time leaving.

The Embeddedness construct is substantially different from many of the previous models of voluntary turnover that exist in the research literature. Job Embeddedness takes a very broad perspective in attributing an employee’s
intentions to leave to a number of different potential influences. Job
Embeddedness assesses aspects of the organization and community that have
been previously ignored or forgotten in previous research. Instead of focusing on
the attitudes and perceptions of the employees, which may not be within the
organization’s locus of control, Embeddedness focuses on those aspects of the
organization that organizations can potentially influence. However, it is
understood that organizations can not control all factors affecting employee
voluntary turnover.

There is an inclusion of organizational-based characteristics in the model
by including facets of the organization such as work-related groups or individuals
that are deemed important enough to have some influence in voluntary turnover.
It is also assumed in the Embeddedness model that people can leave an
organization voluntarily from a number of different events, not only based on
some attitudinal response to or perception of the organization.

Mitchell et al. (2001) identified three critical aspects to the organizational
Embeddedness construct, each of which have both on-the-job (organizational)
and off-the-job (community) facets. The first dimension is organizational fit and is
broadly defined as an employee’s perceived congruence of the employee’s
personal values, goals, careers plans with that of the parent organization’s and
how the knowledge, skills and abilities of the employee will allow for this melding.
Mitchell et al. (2001) refine the definition by saying fit is the degree to which
people’s “jobs and communities are similar to or fit with the other aspects of their
life spaces.” The greater the compatibility of an employee’s career goals, personal values, knowledge, skills and abilities with the requirements of the job and culture of the organization, the greater the fit.

In simple terms, organizational fit can be described as the “chemistry” an individual has with an organization. Chemistry is often defined as how a group of people interact or communicate, how their goals align, and their ability to work together towards a common goal in the most efficient manner. Organizational fit deals with a person’s intrinsic motivations, goals, attitudes, values, interests, and needs (Judge & Cable, 2000). These facets of a person’s inner qualities are called upon everyday in an organization in how the employee approaches their work. If the individuals overarching approach to work and the organization are not congruent, then the fit with the organization is diminished. Determining whether these characteristics of the individual mesh with that of the organization pertain to the employee fit with the organization.

Organizational fit has proven to be an important variable in the hiring and retention of employees for a number of different reasons. For example, it has been found that individuals with a poor person-organization fit are more likely to leave an organization (Chatman, 1991). In addition, as the level of organizational fit increases, there is a decrease in turnover and intention to quit (O’Reilly, Chatman, & Caldwell, 1991; Vandenbarghe, 1999; Van Vianen, 2000). Villanova, Bernardin, Johnson, and Dahmus (1994) have also found that turnover has been predicted by perceived job incompatibility. For example, the degree to
which employee Organizational Culture Profiles (OCP), completed shortly after employment began, matched with their organization’s culture predicted turnover 24 months later (O’Reilly et al., 1991).

The second dimension is organizational links, and is defined as the degree to which people have links to other people or activities. That is, the psychological or social connections the employee has with the organization, other employees within the organization, or the community as a result of being employed by their current organization in that particular location.

It is thought that the more connections one has with an organization or group the more embedded the individual may become (Mitchell, et al., 2001). The formal and informal links that exist for the employee act as the strands that maintain the integrity of the web of Embeddedness. In this vein, it stands to reason that the higher the number of links that exist for an employee the stronger the web of Embeddedness.

Unlike the attitudinal variables that exist in many of the voluntary turnover models, such as job satisfaction or organizational commitment, organizational links are discernable connections between the employee and other facets of the organization. For example, the number of employees one interacts with both formally and informally on a regular basis can be identified and can be observed while job satisfaction can be hidden from the casual observer in a number of ways. Also, the organization has some control of increasing or decreasing the number of employees one interacts with by instituting organization-wide policies,
such as teams. It is these interactions and connections with the team, department, or organization that bind the employees closer and stronger than those with little or no involvement with or within the company. In the end, just as there must be strong links between different departments within an organization to ensure their viability and existence, there must also be links between the individual employees to ensure their retention.

The last dimension of the model, organizational sacrifice, pertains to those tangibles or intangibles, given up if the employee were to leave the organization. These loses can include things such tangible things as pension packages, health benefits or intangible sacrifices such as seniority or leaving an interesting project. This dimension identifies the perceived losses, both financial and psychological, that may be surrendered upon leaving the job. However, the importance of the entities being given up likely varies between individuals depending upon their life situation, overall goals, etc.

This recent addition to the voluntary turnover research is substantially different than many of the existing models of turnover in the literature. In summation, the Job Embeddedness construct is based on three veins of thought. The first vein is the impact of non-work factors in the prediction of voluntary turnover and attachment. Many of the non-work factors include family/work conflict, extracurricular activities such as church, community activities, or political ties, etc. Cohen (1995) concluded that all of these non-work factors had significant impact on employee job attitudes and organizational attachment.
Second, there is an inclusion of quantifiable organization-based characteristics into the model by including facets of the organization such as teams, project groups, or some other work-related group that are deemed important enough to have some influence in voluntary turnover. Third, an overarching assumption of Job Embeddedness is that not all people leave their current jobs because of some attitudinal justification or job dissatisfaction, but instead can be motivated by a number of different events, such as those which would precipitate voluntary turnover under the unfolding model. For example, unsolicited job offers, spousal relocations, and unavoidable familial problems (Lee et al., 1999).

Embeddedness vs. Traditional Model of Voluntary Turnover. Few similarities exist when reviewing the two different models. For example, it can be conceived that the Job Embeddedness sub-dimension of organizational fit assesses certain aspects that can be similar to that of the affective commitment sub-scale of the Meyer and Allen scale (1991). According to this sub-scale of the organizational commitment scale, people would stay with their organization based upon their positive feelings, emotion and attachment to the organization, which is similar to the dimension of organizational fit. Cable and DeRue (2002) suggest that organizational fit characterizes a cognitive belief rather than an emotional response. Agreeing with this statement would lead one to believe that organizational fit is fundamentally different than that of organizational commitment because the latter is affect-driven (Mitchell et al., 2001).
The organizational links dimension is somewhat similar to the normative commitment sub-scale. The normative commitment scale assesses employee subjective perceptions of their obligations to the organization, team, department, etc. (Meyer and Allen, 1991). Conversely, the organizational linkage dimension assesses the concrete number of teams the employee is on, the number of co-workers they interact with on a daily basis, etc. This difference separates the two scales in terms of the predictability of turnover.

When comparing organizational sacrifices to job satisfaction we are again reminded of the affective-driven nature of the job satisfaction scales while the Job Embeddedness dimensions are more cognitive in nature. A few items on the organizational sacrifice dimension pertain to compensation and benefits, which ostensibly can be connected to some sort of pay or compensation satisfaction scale.

There is an overwhelming need for a robust, validated new model of voluntary turnover to explain the variance which is unaccounted for by the traditional models. This importance will only grow as time passes and organizations world-wide are confronted with the growing problem of employee mobility and voluntary turnover. In addition, moderating variables (i.e., age and gender) may enable the existing models to account for more of the variance in voluntary turnover.

Age and Turnover. Despite the large number of studies done on the topic of voluntary turnover, a number of questions still remain. It has been concluded...
(Carsten & Spector, 1987; Hulin, 1991; Mobley, Griffeth, & Meglino, 1979) that certain economic conditions can lead to an increase in voluntary turnover.

On a more individual level, the most prevalent and accepted individual-level antecedent for voluntary turnover has been job dissatisfaction (Hulin, 1991). Despite this construct being deemed the best predictor of turnover, it still only accounts for roughly 16-20% of the variance in turnover (Cotton & Tuttle, 1986; Griffeth et al., 2000; & Mobley et al., 1979). Few studies have actually addressed the issue of age and its influence on the propensity of an individual to voluntarily turnover.

In the few studies that do address the issue of age and its effect on voluntary turnover (Cotton & Tuttle, 1986; Griffeth, Hom, & Gaertner, 2000; Hom & Griffeth, 1995; Rhodes, 1983), age has generally been negatively related (-.12, Griffeth et al., 1995; -.10, Griffeth et al., 2000) to turnover. Rebuttals for these findings have surfaced (Healy, Lehman, McDaniel, 1995). The claims of this study cite the narrative views of studies concluding the relatedness of these variables and other quantitative methodologies leading to inflated and false conclusions.

In one follow-up study of age and turnover, Healy et al. (1995), combined age and job tenure. They concluded that the correlation between age and tenure with turnover reached -.14, up from -.08 with age by itself. Healy et al. (1995) conclude the relationship of age on turnover (-.08) provides little information in
predicting turnover among employees. However, by adding age and tenure the relationship becomes a more robust -.14.

**Gender and Turnover.** A plethora of research has been conducted that aims at discerning the differences between the predictors and/or antecedents of turnover and turnover intention between males and females. One approach has been to use gender, in association with other work-related factors such as organizational commitment, job satisfaction, etc., to predict voluntary turnover. A major problem with this vein of research happens to be the complexity of the many variables involved with this type of prediction. For example, studies have shown that females are more susceptible to withdrawal behaviors due to family-work concerns, inflexible work hours, and overall dissatisfaction with current work environments (Phelan, Bromet, & Schwartz, 1994; Rosin & Korabik, 1995; Weisberg & Kirschenbaum, 1993; Wenk & Rosenfield, 1992).

Males and females interact with their work environments differently due to the fact that women’s work lives ostensibly involve two parallel worlds, work and family. Women traditionally take care of their families in addition to working, sometimes creating a more volatile situation in regards to their ability to stay with an organization for a prolonged period of time. Women’s work behavior is often related to their family responsibilities and not the perceived work opportunities or need for career advancement or achievement (Steir & Lewin-Epstein, 2001). Women’s employment often reflects the life stages of being single, getting married, having children, and dealing with the empty nest. However, operating
under this ideology can pigeon-hole women into a “quitter profile” which would could be devastating to employment opportunities for females (Felmlee, 1995; Stroh, Brett, & Reilly, 1996).

It is true for both genders that voluntary turnover is generally low when job satisfaction is high, and organizational commitment, and perceived job alternatives are low. Life events, such as starting a family and getting married may play a larger role in a female leaving an organization than an attitudinal variable.

According to a recent meta-analyses, gender has been found to be unrelated to turnover intention ($\rho = -.03$) (Griffeth et al., 2000). Despite the numerous studies and meta-analyses conducting research on this topic, there is still some conflicting results being reported, possibly due to methodological differences, industries included in the study, etc. There is a need for more in-depth research regarding this potentially important factor in predicting turnover in organizations.

Overall, there have been mixed results in terms of age predicting turnover intention. There is also some evidence to show that there may be a moderating effect between age and gender on turnover intention. Griffeth et al. (2000) provided results which indicate that women are more likely to remain than men as they age. However, there may be a simple economic reason for this. Men tend to make more money than their female counterparts, this allowing them to
retire earlier or seek employment elsewhere while relying on their built up nest egg.
Problem Statement and Research Propositions

There is a limitation on voluntary turnover research. Traditional models of turnover have accounted for between 15-25% of the total variance of voluntary turnover. Though this percentage is significant, it must be improved upon for the benefit of the organization in dealing with the costs of voluntary turnover.

Use of the existing models in organizations can be problematic, as the factors within the traditional models of turnover (job satisfaction, organizational commitment, and perceived job alternatives) are difficult for organizations to influence. However, the Job Embeddedness model includes a number of items directly in the control of the organization, such as the number of teams an individual works with, the retirement packages offered, and increased promotional opportunities. The Job Embeddedness dimensions are organizational fit, organizational sacrifice, and organizational linkages. The instruments used in this study have been used in the recent literature in regards to dealing with and predicting voluntary turnover, although the Job Embeddedness construct has not been thoroughly validated.

To determine the use of Job Embeddedness as a predictor of turnover intention, the hypotheses structures are in a manner to test the validity and generalizability of Job Embeddedness. The hypotheses are also patterned after the research questions posed by Mitchell et al. (2001). Research propositions and questions will be answered through statistical methods and procedures outlined in the following chapter. The hypotheses for this study are:
H1: Embeddedness will improve the prediction of turnover intention, adding to the variance accounted for by the traditional turnover intention model.

H2a: The Job Embeddedness dimension of organizational fit will be negatively correlated with turnover intention.

H2b: The Job Embeddedness dimension of organizational sacrifice will be negatively correlated with turnover intention.

H2c: The Job Embeddedness construct dimensions of organizational links will be negatively correlated with turnover intention.

H3: The Job Embeddedness construct will predict turnover intention better for males than females.

H4: The Job Embeddedness construct will predict turnover intention better for older employees than younger employees.
CHAPTER II

METHOD

This chapter describes the process used to develop the Veteran Affairs Information Technology Workforce Survey. Section one describes the process of survey development and administration. The second section defines overview of the sample used in this study. The third section explains the sampling and data collection methodology. And, the final section describes the measures, the procedure, and the data analysis to be used.

Sample

The target population of this study was 6,718 workers across all a large federal agency and geographical locations. Of those 6,718 employees, 3,078 (45.82%) participated in the study. The sample demographics identified are age range, gender, and education level. Complete demographics are shown in Appendix B.

Survey Development and Administration

From the outset, the research team worked with a taskforce comprised of 27 employees from across the entire targeted organization. The survey went through conceptual development and a thorough piloting process. The research team searched the academic literature and selected preexisting scales for inclusion in the survey based upon their desires and perceived needs for an organizational assessment. An initial set of survey questions consisting of the
research constructs, demographic, training, and career aspirations were presented to the taskforce.

The research team and the taskforce met both in person and through teleconferencing in an effort to develop an on-line survey able to both gather the required information and satisfy the legal and regulatory concerns of all parties, including five unions. These concerns were focused on the functionality of the survey for disabled employees.

Once the initial survey was developed it was put on a secured Internet site. A complete list of the items is listed in Appendix A. The taskforce and their designees completed the survey several times in a pilot study effort to ensure its fluidity and operation. Written and oral feedback was provided through email and teleconferencing, respectively. The piloting process also allowed the researchers to test the database responsible for holding the responses. The database was accessible by the research team only and not the participating organization. Modifications were made and after two additional rounds of pilot testing, to resolve technical problems, the final survey was established.

Once the survey was acceptable to all parties, the taskforce sent an initial electronic message to federal agency supervisors announcing that the survey was available. The supervisors then forwarded the email to the workers in their departments, along with a letter from the Chief Information Officer asking that all identified workers complete the survey. Each email contained the URL of the survey website, instructions for logging in and completing the survey, and the
phone and email contact information of the research team and help desk in case of emergencies or questions. Each potential respondent was informed that all individual responses would be kept anonymous and the only results the federal agency would receive would be aggregate data. In compliance with the employee union’s requirements, it was mentioned that the survey was voluntary and could be completed on company time.

Two weeks later a second email was sent to the supervisors, asking them to remind their employees to complete the survey. Copies of the letters and email sent in regards to the federal agency workforce survey can be found in Appendix C. In addition, the importance of participating in the survey was discussed at a conference for managers. The survey was accessible for six and one-half weeks, two weeks longer than originally planned per the request of the managers at the conference. The on-line survey was then removed and all data collection was finalized.

Measures

While Mitchell et al. (2001) proposed that Embeddedness includes both organizational and community dimensions, only the organizational aspects are potentially influenced by employers. In addition, because of organizational policies or other labor unions restrictions, many employers may not be able to ask personal demographic questions related to the community-oriented dimensions. We therefore included only the organizational dimensions of
Embeddedness in the current study. A complete listing of all the scales used in this study is located in Appendix C.

**Turnover Intention.** In this study, true turnover numbers were not available for use, resulting in the use of a turnover intention scale as a surrogate measure. However, turnover intention has been shown to be highly correlated with actual turnover ($r = .41$) (Griffeth, et al., 2000). Turnover intention was assessed using items from the Jackson & Turner (1987) Turnover Intention Scale, also used by Moore (2000). Turnover intention is operationalized as the likelihood that a person will seek employment elsewhere rather than remaining in his/her present job ($\alpha = .88$). Items asked questions such as the probability of looking for another organization in the near future or if the employee planned to stay with their current organization for a number of years. Employee responses can be found in Appendix D.

**Job Embeddedness.** The items used to assess Job Embeddedness came from the scale developed by Mitchell et al. (2001). Job Embeddedness consists of three dimensions that combine to form one overall assessment of Job Embeddedness. The first dimension of the Job Embeddedness is organizational fit. Organizational fit is the perceived compatibility or comfort of an employee with an organization and with his/her environment. It encompasses the ideas of how well the employee perceives their personal values, goals, and needs to be in harmony with that of the organizations. Organizational fit assesses, using 9
items, whether coworkers are similar to themselves and whether employees can reach their professional goals working for a particular organization.

The second dimension of Job Embeddedness is organizational sacrifice, the perceived cost of material or psychological benefits that may be forfeited by leaving one’s job. This facet of Job Embeddedness uses 10 items to assess attitudes regarding compensation for performance level, potential sacrifices if leaving their current job, and the freedoms of the job.

The last dimension of the Job Embeddedness is organizational links and is comprised of 7 items. This component of Job Embeddedness assesses the quantifiable links the employee has with the organization, other employees within the organization, and other various links established as a by-product of being employed by their current organization. Links assess quantifiable numbers associated with things such as current tenure, the number of coworkers worked with regularly, etc.

**Job Satisfaction.** To assess overall job satisfaction, we used an abbreviated version of the Cammann et al. (1979) Michigan Organizational Assessment Questionnaire Subscale.

Job satisfaction is defined as the degree to which an individual has a positive emotional state of feeling resulting from the appraisal of his/her job or job experience. After adjusting for the highest reliability coefficient, two items remained in the scale ($\alpha = .74$).
Organizational Commitment. To assess overall organizational commitment, we used an abbreviated version of the Mowday, Steers, and Porter (1979) organizational commitment scale ($\alpha = .80$). Organizational commitment is the strength of one’s identification with an organization and its objectives. There were a total of 7 items used for this scale. A few of the items assessing organizational commitment were “I am willing to put in more than the expected effort to help the organization be successful,” “I talk up the organization as a great place to work.,” and “I would accept almost any job to stay with the organization.”

Perceived Job Alternatives. The two items used for this scale were adapted from Lee and Mowday (1987) ($\alpha = .72$). The items were “There is a good probability that I could find an acceptable alternative to my job outside of (federal agency)” and “If I searched for an alternative job, within a year I could find an acceptable job.”

Data Analysis

It is suggested that factor analysis, internal consistency, and test-retest reliability provide sufficient evidence of construct validity (Hinkin, 1995). This study utilized two sets of data for the purposes of validation and construct testing, thus avoiding an increase in source/common method variance. The total sample was randomly split to create two data sets. All psychometrics work was performed on the first set of data while the second set of data was utilized for testing purposes.
The overall objective of this study is to compare two ostensibly different turnover models to clarify which model accounts for the most variance in turnover intention. The first model was the traditional model of turnover composed of job satisfaction, organizational commitment, and perceived job alternatives. The second model is the newly developed Job Embeddedness Scale (Mitchell et al., 2001). Using a feature in SPSS, the original data set was randomly split into two groups, the first being for the exploratory analyses and the second half for the confirmatory analyses.

In order to determine the validity of the newer Embeddedness scale, an exploratory factor analysis was conducted. The factor analysis results were used to select the best set of items for the scale. Reliability tests were run on the Embeddedness items using the best items in all the scales to assess internal consistency. The anticipated Cronbach’s Alpha coefficient is greater than .70, which is the standard accepted level of reliability for newly created scales (Nunnally, 1978). Confirmatory factor analyses will be conducted using a separate set of data to ensure the generalizability of the initial results of the exploratory factor analysis to other data sets.

The first decision with factor analysis was to determine whether the appropriateness of this statistical method. Correlation matrices can be examined for the level of correlations between items. High correlations indicate that the items can be grouped together such that each measures a unique portion of the variance in explaining the dependent variable, turnover intention.
Next, the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy was used to assess the extent to which indicators of a construct or dimension belong together. The desired KMO value is greater than .80, though .6 is acceptable (Kaiser & Rice, 1974). In addition to the KMO, Bartlett’s test of sphericity assesses whether the data set is orthogonal, which would suggest it is not appropriate for factoring. For factor analysis, high significance of Bartlett’s test of sphericity of this test is desired.

Mitchell et al. (2001) used Embeddedness as a single construct in their logistic regression analysis on turnover, however, three dimensions of Embeddedness were discussed as previously noted: organizational fit, organizational sacrifice, and organizational links. Therefore, three exploratory factor analyses, one for each Embeddedness dimension proposed by Mitchell et al. (2001), were performed. Principal axis factoring was used in this study because of the assumption of high correlations among the individual items. The combination of principle axis factoring and varimax rotation was used in this study. Exploratory factor analysis typically uses the eigenvalue as an indicator. The rule of thumb is to include factors with eigenvalues greater than one. This will generally result in a suitable portion of variance explained with the respective set of items. The exploratory factor analysis conducted for this study utilized this rule of thumb using eigenvalues greater than 1 to dictate the number of factors. The results from this step are used in the confirmatory factor analysis. A
confirmatory factor analysis done on the Embeddedness construct was conducted using LISREL 8.52 on the second half of the data.
CHAPTER III

RESULTS

The results are presented in this study in three subsections. First, we discuss the demographics of the respondents. Next, we assess the psychometric properties of the Organizational Embeddedness Scale. And third, we assess nomonological validity and provide the results of the hypotheses tests.

Data Cleaning

As with all data, a cleaning process was conducted in order to prepare the data points for statistical analysis. The first step in the data cleaning process was eliminating the responses which were submitted with invalid IDs. The IDs associated with the data were the employee email addresses, which were, again, kept confidential and available only to the researchers. Of the 3,078 responses received from the 6,718 employees within the federal agency, 2,741 responses were kept after the data cleaning, resulting in an overall response rate of close to 41%.

Within the survey roughly ten percent of the questions were reverse scored. Those respondents who submitted invalid data were removed from the data sample. Invalid data is defined as those responses that answered similar question with opposing attitudes. For example, if an individual responded strongly agree with the question “All in all, I enjoy working for this organization” and also responded strongly disagree with “All in all, I do not enjoy working for this organization” they documented and eliminated from the sample.
Scaling Items

The original source for the Job Embeddedness model (Mitchell et al., 2001) of voluntary turnover omitted a detailed description as to how the organizational links items were scaled. Raw data of these particular items were not assessed using a 7-point Likert scale, but instead asked the specific number of links the employee currently has. Raw scores for the links items ranged greatly (Link1, 0-33; Link2, 0-38; Link3, 0-100; Link4, 0-2000; Link5, 0-15000; Link6, 0-200; and Link7, 0-70) resulting in the need to transform or scale the raw data points into a more statistical friendly format. Frequencies were run for each of the raw data link items and upper-most cutoff values for each of the seven equal percentage categories were given. For example, based on the output of the frequencies, the first 14.28% of the raw data had an upper value of 1.00. Therefore, all data points within that link item from the lowest value to 1.00 were recoded as a “1” in the newly defined variable. The second 14.28% had an upper limit of 2.00, which resulted in the values greater than 1.00 through 2.00 being recoded as “2” in the newly defined variable. This process was repeated for all seven percentile categories as well as all seven link items. This resulted in the link item values being scaled in the same manner as the rest of the survey items used within this study.

Respondent Demographics

Table 1 shows the distribution of respondents by gender, age, and education. Slightly more males participated in the survey across all four divisions
of the federal agency, as well as the sample as a whole. About 63% of the respondents were between the ages of 31 and 50. There were less than 7% of the respondents that were less than 30 years of age or over 61 years of age. 60.3% of the federal agency workforce is above the age of 46, which means they will be eligible for retirement within 10 years. Males make up nearly 59% of the agency’s workforce. The federal agency is a well-educated organization; with 43.6% of its workforce holding a college degree and another 25.6% having some graduate school experience or holding a graduate or terminal degree.

Table 1 Sample Demographics in Percentages

<table>
<thead>
<tr>
<th>Whole Sample</th>
<th>N=2741</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>39.8</td>
</tr>
<tr>
<td>Male</td>
<td>60.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 30</td>
<td>3.5</td>
</tr>
<tr>
<td>31-40</td>
<td>21.6</td>
</tr>
<tr>
<td>41-50</td>
<td>41.5</td>
</tr>
<tr>
<td>51-60</td>
<td>30.7</td>
</tr>
<tr>
<td>61 +</td>
<td>2.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highest Level of Education</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Some High School</td>
<td>.2</td>
</tr>
<tr>
<td>High School</td>
<td>6.6</td>
</tr>
<tr>
<td>Some College</td>
<td>25.7</td>
</tr>
<tr>
<td>A.A.</td>
<td>18.1</td>
</tr>
<tr>
<td>B.A/B.S.</td>
<td>26.4</td>
</tr>
<tr>
<td>Some Graduate School</td>
<td>8.1</td>
</tr>
</tbody>
</table>
An overall Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) value of .752 suggests the correlations matrix (Table 3) of the Job Embeddedness items are high enough to warrant factoring. In addition, the data set is not orthogonal, as noted by the highly significant Bartlett’s Test of Sphericity statistic ($p < .001$). This information is shown in Table 2, below.

Table 2 KMO and Bartlett’s Test of Sphericity

<table>
<thead>
<tr>
<th>KMO Measure of Sampling Adequacy</th>
<th>0.752</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>1920.292</td>
</tr>
<tr>
<td>df</td>
<td>78</td>
</tr>
<tr>
<td>Sig.</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 3 shows correlations between all items on the workforce survey. The correlations shown reflect those of the total sample used for this study.
## Table 3 Correlations of All Items

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FIT1</td>
<td>4.88</td>
<td>1.41</td>
<td>1.10</td>
<td>.28**</td>
<td>.27**</td>
<td>.26**</td>
<td>.18**</td>
<td>.46**</td>
</tr>
<tr>
<td>2</td>
<td>FIT2</td>
<td>5.27</td>
<td>1.10</td>
<td>.14**</td>
<td>.24**</td>
<td>.20**</td>
<td>.28**</td>
<td>.14**</td>
<td>.44**</td>
</tr>
<tr>
<td>3</td>
<td>FIT3</td>
<td>3.85</td>
<td>1.53</td>
<td>.32**</td>
<td>.26**</td>
<td>.18**</td>
<td>.46**</td>
<td>.40**</td>
<td>.36**</td>
</tr>
<tr>
<td>4</td>
<td>FIT4</td>
<td>4.47</td>
<td>1.52</td>
<td>.33**</td>
<td>.23**</td>
<td>.11**</td>
<td>.29**</td>
<td>.30**</td>
<td>.12**</td>
</tr>
<tr>
<td>5</td>
<td>FIT5</td>
<td>4.09</td>
<td>1.60</td>
<td>.25**</td>
<td>.22**</td>
<td>.06**</td>
<td>.36**</td>
<td>.30**</td>
<td>.06**</td>
</tr>
<tr>
<td>6</td>
<td>FIT6</td>
<td>4.15</td>
<td>1.58</td>
<td>.21**</td>
<td>.20**</td>
<td>.09**</td>
<td>.30**</td>
<td>.26**</td>
<td>.14**</td>
</tr>
<tr>
<td>7</td>
<td>FIT7</td>
<td>3.32</td>
<td>1.58</td>
<td>.20**</td>
<td>.14**</td>
<td>.09**</td>
<td>.31**</td>
<td>.27**</td>
<td>.26**</td>
</tr>
<tr>
<td>8</td>
<td>FIT8</td>
<td>3.24</td>
<td>1.70</td>
<td>.18**</td>
<td>.09**</td>
<td>.14**</td>
<td>.38**</td>
<td>.27**</td>
<td>.22**</td>
</tr>
<tr>
<td>9</td>
<td>SAC1</td>
<td>4.89</td>
<td>1.39</td>
<td>.28**</td>
<td>.12**</td>
<td>.38**</td>
<td>.29**</td>
<td>.37**</td>
<td>.19**</td>
</tr>
<tr>
<td>10</td>
<td>SAC2</td>
<td>5.07</td>
<td>1.71</td>
<td>.13**</td>
<td>.14**</td>
<td>.05*</td>
<td>.14**</td>
<td>.11**</td>
<td>.18**</td>
</tr>
<tr>
<td>11</td>
<td>SAC3</td>
<td>4.61</td>
<td>1.41</td>
<td>.18**</td>
<td>.12**</td>
<td>.30**</td>
<td>.29**</td>
<td>.30**</td>
<td>.06**</td>
</tr>
<tr>
<td>12</td>
<td>SAC4</td>
<td>4.19</td>
<td>1.58</td>
<td>.10**</td>
<td>.11**</td>
<td>.09**</td>
<td>.37**</td>
<td>.30**</td>
<td>.03**</td>
</tr>
<tr>
<td>13</td>
<td>SAC5</td>
<td>4.82</td>
<td>1.26</td>
<td>.25**</td>
<td>.18**</td>
<td>.06**</td>
<td>.37**</td>
<td>.30**</td>
<td>.02**</td>
</tr>
<tr>
<td>14</td>
<td>SAC6</td>
<td>3.67</td>
<td>1.66</td>
<td>.17**</td>
<td>.14**</td>
<td>.07**</td>
<td>.31**</td>
<td>.30**</td>
<td>.26**</td>
</tr>
<tr>
<td>15</td>
<td>SAC7</td>
<td>4.61</td>
<td>1.41</td>
<td>.21**</td>
<td>.20**</td>
<td>.09**</td>
<td>.37**</td>
<td>.30**</td>
<td>.03**</td>
</tr>
<tr>
<td>16</td>
<td>SAC8</td>
<td>3.32</td>
<td>1.58</td>
<td>.20**</td>
<td>.14**</td>
<td>.09**</td>
<td>.31**</td>
<td>.27**</td>
<td>.26**</td>
</tr>
<tr>
<td>17</td>
<td>SAC9</td>
<td>3.24</td>
<td>1.70</td>
<td>.18**</td>
<td>.09**</td>
<td>.14**</td>
<td>.38**</td>
<td>.27**</td>
<td>.22**</td>
</tr>
<tr>
<td>18</td>
<td>SAC1</td>
<td>4.89</td>
<td>1.39</td>
<td>.28**</td>
<td>.12**</td>
<td>.38**</td>
<td>.29**</td>
<td>.37**</td>
<td>.19**</td>
</tr>
</tbody>
</table>

49
Table 3, cont. Correlations of All Items

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>4.09</td>
<td>1.6</td>
<td>0.39**</td>
<td>0.32**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>4.89</td>
<td>1.39</td>
<td>0.27**</td>
<td>0.32**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>5.07</td>
<td>1.71</td>
<td>0.10**</td>
<td>0.14**</td>
<td>0.17**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>4.61</td>
<td>1.41</td>
<td>0.26**</td>
<td>0.33**</td>
<td>0.25**</td>
<td>0.09**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>4.44</td>
<td>1.41</td>
<td>0.19**</td>
<td>0.22**</td>
<td>0.20**</td>
<td>-0.01</td>
<td>0.47**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4.19</td>
<td>1.58</td>
<td>0.14**</td>
<td>0.18**</td>
<td>0.14**</td>
<td>-0.03</td>
<td>0.41**</td>
<td>0.36**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4.82</td>
<td>1.26</td>
<td>0.33**</td>
<td>0.33**</td>
<td>0.21**</td>
<td>0.02</td>
<td>0.17**</td>
<td>0.17**</td>
<td>0.13**</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>3.67</td>
<td>1.66</td>
<td>0.26**</td>
<td>0.37**</td>
<td>0.26**</td>
<td>0.10**</td>
<td>0.44**</td>
<td>0.27**</td>
<td>0.22**</td>
<td>0.15**</td>
</tr>
<tr>
<td>17</td>
<td>4.15</td>
<td>1.55</td>
<td>0.38**</td>
<td>0.46**</td>
<td>0.26**</td>
<td>0.09**</td>
<td>0.27**</td>
<td>0.18**</td>
<td>0.13**</td>
<td>0.28**</td>
</tr>
<tr>
<td>18</td>
<td>3.32</td>
<td>1.58</td>
<td>0.27**</td>
<td>0.31**</td>
<td>0.20**</td>
<td>0.02</td>
<td>0.38**</td>
<td>0.28**</td>
<td>0.29**</td>
<td>0.15**</td>
</tr>
<tr>
<td>19</td>
<td>3.24</td>
<td>1.7</td>
<td>0.23**</td>
<td>0.33**</td>
<td>0.22**</td>
<td>0.01</td>
<td>0.19**</td>
<td>0.16**</td>
<td>0.12**</td>
<td>0.15**</td>
</tr>
<tr>
<td>20</td>
<td>3.44</td>
<td>1.61</td>
<td>-0.01</td>
<td>-0.11**</td>
<td>-0.07**</td>
<td>-0.03</td>
<td>-0.04</td>
<td>-0.02</td>
<td>0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>21</td>
<td>5.38</td>
<td>1.86</td>
<td>0.10**</td>
<td>0.05*</td>
<td>0.07**</td>
<td>0.06*</td>
<td>0.07**</td>
<td>0.09**</td>
<td>0.05*</td>
<td>0.05*</td>
</tr>
<tr>
<td>22</td>
<td>6.15</td>
<td>1.44</td>
<td>0.06**</td>
<td>-0.04</td>
<td>0.04</td>
<td>0.01</td>
<td>0.04</td>
<td>0.05*</td>
<td>0.05*</td>
<td>0.02</td>
</tr>
<tr>
<td>23</td>
<td>4.02</td>
<td>1.41</td>
<td>0.09**</td>
<td>0.05*</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.03</td>
<td>-0.01</td>
<td>0.01</td>
<td>0.07**</td>
</tr>
<tr>
<td>24</td>
<td>3.08</td>
<td>1.88</td>
<td>0.09**</td>
<td>0.04</td>
<td>0.01</td>
<td>0.00</td>
<td>-0.07**</td>
<td>-0.02</td>
<td>-0.02</td>
<td>0.05**</td>
</tr>
<tr>
<td>25</td>
<td>2.70</td>
<td>1.34</td>
<td>0.08**</td>
<td>0.05*</td>
<td>0.04*</td>
<td>0.01</td>
<td>-0.04*</td>
<td>-0.03</td>
<td>-0.04</td>
<td>0.05*</td>
</tr>
<tr>
<td>26</td>
<td>2.73</td>
<td>1.72</td>
<td>0.10**</td>
<td>0.05*</td>
<td>0.03</td>
<td>0.04</td>
<td>-0.03</td>
<td>-0.02</td>
<td>-0.03</td>
<td>0.10**</td>
</tr>
</tbody>
</table>
Table 3, cont. Correlations of All Items

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23</th>
<th>24</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 SAC8</td>
<td>.28**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 SAC9</td>
<td>.38**</td>
<td>.29**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 SAC10</td>
<td>.29**</td>
<td>.30**</td>
<td>.29**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 LINK1</td>
<td>-.06**</td>
<td>-.08**</td>
<td>-.07**</td>
<td>-.16**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 LINK2</td>
<td>.08**</td>
<td>0.04</td>
<td>0</td>
<td>-0.04</td>
<td>.39**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 LINK3</td>
<td>.05*</td>
<td>0</td>
<td>-0.03</td>
<td>-.07**</td>
<td>.28**</td>
<td>.65**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 LINK4</td>
<td>-0.03</td>
<td>0.03</td>
<td>-0.04</td>
<td>0.04</td>
<td>0.04</td>
<td>.08**</td>
<td>0.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 LINK5</td>
<td>.10**</td>
<td>0.02</td>
<td>-0.04</td>
<td>.05*</td>
<td>.07**</td>
<td>.06**</td>
<td>.05*</td>
<td>.32**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 LINK6</td>
<td>-0.03</td>
<td>0.02</td>
<td>-0.02</td>
<td>-0.02</td>
<td>0.04</td>
<td>0.01</td>
<td>-0.02</td>
<td>.15**</td>
<td>.16**</td>
<td></td>
</tr>
<tr>
<td>26 LINK7</td>
<td>0.01</td>
<td>0.02</td>
<td>-.06*</td>
<td>0.02</td>
<td>0.01</td>
<td>.13**</td>
<td>.06**</td>
<td>.19**</td>
<td>.17**</td>
<td>.30**</td>
</tr>
</tbody>
</table>
Organizational Embeddedness: Psychometric Property Validation Results

To ensure the psychometric properties of the Embeddedness scales, we first performed exploratory factor analysis on a random split half of the data. Next, confirmatory factor analysis was performed using the second half of the data. The details for each are discussed below.

**Exploratory Factor Analysis.** Embeddedness was used as a single construct in Mitchell et al. (2001) in their logistic regression analysis on turnover. However, three dimensions of Embeddedness were discussed as previously noted: organizational fit, organizational sacrifice, and organizational links. Therefore, three exploratory factor analyses were conducted for each Embeddedness dimension proposed by Mitchell et al. (2001). For each of the dimensions of Embeddedness, a principle axis exploratory factor analysis with varimax rotation was conducted. Varimax rotation was utilized in this instance in an effort to maximize the sum of the variances of the loadings. This will create a factor structure which lends itself to interpretability. In each case, the results showed items with low factor loadings. Items that did not have a primary loading of at least .5 or cross-loading of .33 or greater were eliminated from further analysis. Inspecting scree plots in which eigenvalues were plotted against their ordinal positions (Broadbent, Weil, and Sinclair 1999), one factor was apparent for the organizational fit and sacrifice scales. Three factors were apparent for the organizational links scale. Gutman's rule, in which eigenvalues of greater than 1...
are retained, confirmed these results (see Tables 4-6 for details and Appendix A for all Embeddedness items on the survey).

Table 4  Exploratory Factor Analysis of Organizational Fit

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Fit 1</td>
<td>0.500</td>
</tr>
<tr>
<td>Organizational Fit 4</td>
<td>0.676</td>
</tr>
<tr>
<td>Organizational Fit 5</td>
<td>0.698</td>
</tr>
<tr>
<td>Organizational Fit 6</td>
<td>0.601</td>
</tr>
<tr>
<td>Organizational Fit 8</td>
<td>0.577</td>
</tr>
<tr>
<td>Organizational Fit 9</td>
<td>0.709</td>
</tr>
</tbody>
</table>

Table 5  Exploratory Factor Analysis of Organizational Sacrifice

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Sacrifice 3</td>
<td>.760</td>
</tr>
<tr>
<td>Organizational Sacrifice 4</td>
<td>.548</td>
</tr>
<tr>
<td>Organizational Sacrifice 5</td>
<td>.534</td>
</tr>
<tr>
<td>Organizational Sacrifice 7</td>
<td>.514</td>
</tr>
<tr>
<td>Organizational Sacrifice 9</td>
<td>.550</td>
</tr>
</tbody>
</table>

Table 6  Exploratory Factor Analysis of Organizational Links

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Links 2</td>
<td>.118</td>
<td>-.825</td>
<td>.138</td>
</tr>
<tr>
<td>Organizational Links 3</td>
<td>.076</td>
<td>-.819</td>
<td>.079</td>
</tr>
<tr>
<td>Organizational Links 4</td>
<td>.805</td>
<td>-.093</td>
<td>.311</td>
</tr>
<tr>
<td>Organizational Links 5</td>
<td>.793</td>
<td>-.090</td>
<td>.256</td>
</tr>
<tr>
<td>Organizational Links 6</td>
<td>.167</td>
<td>.003</td>
<td>.511</td>
</tr>
<tr>
<td>Organizational Links 7</td>
<td>.211</td>
<td>-.161</td>
<td>.519</td>
</tr>
</tbody>
</table>

A factor analysis of all surviving Embeddedness items was conducted.

The results are shown in Table 7. The overall reliability coefficients for the resulting organizational fit, organizational sacrifice, and the three organizational
links scales were .79, .71, .81, .77, and .43, respectively. These reliability scores are acceptable, except Links 3, which is low (Nunnally 1976). Upon investigation, we discovered that depending on their level, employees tended to either be on teams or committees, but not typically both. Therefore, the standard reliability measure is not appropriate. Future research should employ more generic wording so that organizational nomenclature will not affect the responses. The analysis identified five factors with eigenvalues greater than 1.0 rather than the three proposed by Mitchell et al. (2001). These factors collectively explain 59.919 percent of the variance.
<table>
<thead>
<tr>
<th>Items</th>
<th>Org Fit</th>
<th>Link 2</th>
<th>Link 1</th>
<th>Org Sac</th>
<th>Link 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Fit 1</td>
<td>0.526</td>
<td>-0.028</td>
<td>-0.060</td>
<td>-0.039</td>
<td>0.069</td>
</tr>
<tr>
<td>Organizational Fit 4</td>
<td>0.654</td>
<td>0.037</td>
<td>0.044</td>
<td>0.007</td>
<td>-0.022</td>
</tr>
<tr>
<td>Organizational Fit 5</td>
<td>0.744</td>
<td>0.003</td>
<td>0.071</td>
<td>-0.055</td>
<td>-0.054</td>
</tr>
<tr>
<td>Organizational Fit 6</td>
<td>0.616</td>
<td>0.074</td>
<td>-0.035</td>
<td>-0.006</td>
<td>0.028</td>
</tr>
<tr>
<td>Organizational Fit 8</td>
<td>0.496</td>
<td>0.034</td>
<td>0.023</td>
<td>0.078</td>
<td>0.094</td>
</tr>
<tr>
<td>Organizational Fit 9</td>
<td>0.689</td>
<td>-0.016</td>
<td>0.027</td>
<td>0.039</td>
<td>-0.069</td>
</tr>
<tr>
<td>Organizational Sacrifice 3</td>
<td>0.098</td>
<td>-0.047</td>
<td>-0.016</td>
<td>0.694</td>
<td>-0.002</td>
</tr>
<tr>
<td>Organizational Sacrifice 4</td>
<td>-0.062</td>
<td>0.065</td>
<td>0.065</td>
<td>0.595</td>
<td>-0.050</td>
</tr>
<tr>
<td>Organizational Sacrifice 5</td>
<td>-0.065</td>
<td>-0.015</td>
<td>0.003</td>
<td>0.590</td>
<td>0.049</td>
</tr>
<tr>
<td>Organizational Sacrifice 7</td>
<td>0.368</td>
<td>-0.098</td>
<td>0.033</td>
<td>0.323</td>
<td>-0.092</td>
</tr>
<tr>
<td>Organizational Sacrifice 9</td>
<td>0.208</td>
<td>-0.017</td>
<td>-0.115</td>
<td>0.448</td>
<td>-0.019</td>
</tr>
<tr>
<td>Organizational Links 2</td>
<td>0.039</td>
<td>0.001</td>
<td>0.906</td>
<td>-0.003</td>
<td>0.010</td>
</tr>
<tr>
<td>Organizational Links 3</td>
<td>0.010</td>
<td>-0.007</td>
<td>0.767</td>
<td>0.002</td>
<td>0.020</td>
</tr>
<tr>
<td>Organizational Links 4</td>
<td>0.040</td>
<td>0.716</td>
<td>0.020</td>
<td>0.037</td>
<td>0.046</td>
</tr>
<tr>
<td>Organizational Links 5</td>
<td>0.008</td>
<td>0.866</td>
<td>-0.029</td>
<td>-0.020</td>
<td>-0.036</td>
</tr>
<tr>
<td>Organizational Links 6</td>
<td>0.009</td>
<td>0.005</td>
<td>-0.035</td>
<td>-0.021</td>
<td>0.420</td>
</tr>
<tr>
<td>Organizational Links 7</td>
<td>0.011</td>
<td>0.014</td>
<td>0.086</td>
<td>0.039</td>
<td>0.671</td>
</tr>
</tbody>
</table>
Confirmatory Factor Analysis. A confirmatory factor analysis done on the Embeddedness construct was conducted using LISREL 8.52 on the second half of the data. Several different fit indices are examined to determine the fit of these data with the proposed models. The ability to reproduce the correlation/covariance matrix use tests of absolute fit. The goodness-of-fit (GFI) index is the percent of observed covariances explained by the covariances in the proposed model. GFI can vary from 0 to 1, with .9 as the standard acceptance level. The goodness-of-fit index can be driven up due to increased sample size. Adjusted goodness-of-fit is similar to the goodness-of-fit index, but instead uses mean squares instead of total sums of squares. As with goodness-of-fit, adjusted goodness-of-fit can vary from 0 to 1 and should be at least .9 to be considered a good fit. Root mean square residuals (RMSR) are the coefficients which result from taking the square root of the mean of the squared residuals. The residuals are the amount by which the variances and covariances of the sample differ with the estimated variances and covariances, assumed your model is correct. The normed fit index (NFI) demonstrates the percentage of fit improvement of the proposed model over that of the null hypothesis. That is, the null hypothesis is being tested with random variables as opposed to the collected sample of the researcher.

The goodness-of-fit indexes for the three models being testing are summarized in Table 8. The three models attempt to fit the data to a one-factor,
three-factor, and five-factor model. The one-factor model is based on the original work of Mitchell et al. (2001) and their use of this one-factor model in the regression analyses. As expected, the one-factor model, shown in Figure 3, is a poor fit to the data with GFI (.82), AGFI (.77), and RMSR (.42). From the exploratory factor analysis, evidence of a multi-factor solution exists. This level of goodness-of-fit is conclusive that the Job Embeddedness model as presented by Mitchell et al. (2001) is not a uni-dimensional model for this data set, but instead a construct consisting of multiple factors or dimensions.
Figure 3 One-Factor Embeddedness Model Path Diagram
The original Embeddedness construct consisted of three dimensions (Mitchell, et al., 2001), organizational fit, organizational sacrifice, and organizational links. Therefore, a 3-factor model was tested using confirmatory factor analysis. The 3-factor model, as shown in Figure 4, shows moderate to good model-data fit, as determined by the absolute indexes. From a purely empirical rationale, the 3-factor model is a much better fit than the single-factor model of Embeddedness. Therefore, the single-factor model will not be used for further analysis in this paper.

<table>
<thead>
<tr>
<th>Model</th>
<th>NFI</th>
<th>GFI</th>
<th>AGFI</th>
<th>RMSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1-Factor Model</td>
<td>.70</td>
<td>.82</td>
<td>.77</td>
<td>.42</td>
</tr>
<tr>
<td>2. 3-Factor Model</td>
<td>.85</td>
<td>.90</td>
<td>.87</td>
<td>.32</td>
</tr>
<tr>
<td>3. 5-Factor Model</td>
<td>.96</td>
<td>.97</td>
<td>.95</td>
<td>.13</td>
</tr>
</tbody>
</table>
Figure 4 Three-Factor Embeddedness Model Path Diagram
Based on the exploratory factor analysis previously conducted, a 5-factor model is tested. The five-factor model assumed organizational fit and organizational sacrifice were each uni-dimensional, however, because of the results of the exploratory factor analysis, the link items were used in a three-factor manner as opposed to a single dimension. The best overall model was the 5-factor model used for the Embeddedness items, shown in Figure 5. The absolute indexes were the highest of the three models tested (GFI, .97; AGFI, .95; and RMSR, .13). The root mean square residual (RMSR) remains relatively high, which is in indication that variances and covariances in the sample data differ greatly from the estimated variances and covariances of the models tested. Based on these results, it is conclusive the 5-factor model is the best model-data fit, thus, it will be used for the structural equation models in this study.
Figure 5 Five-Factor Embeddedness Model Path Diagram
Hypothesis 1

Hypothesis 1 suggests that Embeddedness will improve the prediction of turnover intention, adding to the variance accounted for by the traditional turnover intention model. The results summary in Table 9 indicates support for Hypothesis 1. Theory indicates correlations between constructs; therefore, all correlations near 0.70 were incorporated into the structural equation model (see Table 10: Job Satisfaction and Organizational Commitment; Organizational Fit and Organizational Commitment, and 0.72; Organizational Fit and Job Satisfaction, 0.72). Figure 6 shows organizational commitment, job satisfaction, and perceived job alternatives on turnover intention. The Goodness-of-Fit index for the traditional model on turnover intention is 0.90. The Adjusted Goodness-of-Fit index (AGFI) is 0.84, which is slightly less than the recommended value of 0.90. The root mean square error of approximation (RMSEA) value of 0.118 is above the recommended value of 0.08. The Normed Fit index (NFI) value of 0.90 indicates the traditional model of turnover intention is a moderately good fit for these data.
The Organizational Embeddedness model, alone, resulted in a chi-square ($145, N=1362$) = 501.07 ($p<.01$). The Goodness-of-Fit index (GFI) value of 0.96 was the highest all three models tested, and also indicates the Embeddedness model is a great fit with these data. Also, the Adjusted Goodness-of-Fit (0.95) and Normed Fit Index (0.96) show the data are an excellent fit with these data. The root mean square error of approximation value of 0.042 is below the acceptable level of 0.080.
Figure 7 Organizational Embeddedness Model to Predict Turnover Intention
This “Embeddedness-enhanced” model shown in Figure 8, which combined traditional and Embeddedness model, resulted in all the critical indices, including Goodness-of-Fit (0.91), Adjusted Goodness-of-Fit (0.90), Normed Fit Index (0.95), and the root mean square error of approximation (0.056) indicating a good fit with these data.
Figure 8 Embeddedness-Enhanced Model of Turnover Intention
Table 9  Comparison of Hypotheses and Models

<table>
<thead>
<tr>
<th>Model Tested</th>
<th>See Figure</th>
<th>NFI</th>
<th>GFI</th>
<th>AGFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC, JS, and JA as predictors of TI</td>
<td>6</td>
<td>0.90</td>
<td>0.90</td>
<td>0.84</td>
<td>0.118</td>
</tr>
<tr>
<td>EMB alone as predictor of TI</td>
<td>7</td>
<td>0.95</td>
<td>0.96</td>
<td>0.95</td>
<td>0.042</td>
</tr>
<tr>
<td>OC, JS, and JA, and EMB, with correlations, as</td>
<td>8</td>
<td>0.95</td>
<td>0.91</td>
<td>0.90</td>
<td>0.056</td>
</tr>
<tr>
<td>predictors of TI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OC = Organizational Commitment  
JS = Job Satisfaction  
JA = Job Alternatives  
EMB = Embeddedness

Hypotheses 2a-2c

A correlation matrix (Table 10) was used to test Hypothesis 2a, 2b, and 2c, which stated that all components of organizational Embeddedness would have a negative correlation with turnover intention. This hypothesis is partially supported. Organizational fit ($r = -.30, p<.01$) organizational sacrifice ($r = -.08, p<.05$), and organizational links 3 ($r = -.10, p<.01$) are all significantly and negatively correlated with turnover intention; however, organizations links 1 ($r = .01, p>.05$) and 2 ($r = .00, p>.05$) are not.
Table 10 Means, Standard Deviations, and Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organizational Fit</td>
<td>4.46</td>
<td>1.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Organizational Sacrifice</td>
<td>3.99</td>
<td>1.10</td>
<td>.47*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Organizational Links 1</td>
<td>3.96</td>
<td>1.87</td>
<td>.06*</td>
<td>.08*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Organizational Links 2</td>
<td>3.83</td>
<td>1.85</td>
<td>.09*</td>
<td>-.02</td>
<td>.09*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Organizational Links 3</td>
<td>3.21</td>
<td>2.04</td>
<td>.08*</td>
<td>-.06*</td>
<td>.06*</td>
<td>.26*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Organizational Commitment</td>
<td>4.46</td>
<td>1.14</td>
<td>.72*</td>
<td>.37*</td>
<td>.00</td>
<td>.10*</td>
<td>.09*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Job Satisfaction</td>
<td>4.84</td>
<td>1.26</td>
<td>.72*</td>
<td>.37*</td>
<td>.02</td>
<td>.07*</td>
<td>.03</td>
<td>.68*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Perceived Job Alternatives</td>
<td>4.63</td>
<td>1.38</td>
<td>-.05</td>
<td>-.07*</td>
<td>-.04</td>
<td>.02</td>
<td>.07*</td>
<td>-.08*</td>
<td>-.10*</td>
<td></td>
</tr>
<tr>
<td>9. Turnover Intention</td>
<td>3.05</td>
<td>1.76</td>
<td>-.30*</td>
<td>-.08*</td>
<td>.01</td>
<td>.00</td>
<td>-.10*</td>
<td>-.29*</td>
<td>-.37*</td>
<td>.22*</td>
</tr>
</tbody>
</table>

*n* ranges from 799 to 1362 for all variables.

**Correlation is significant at the 0.01 level (2-tailed).**

*Correlation is significant at the 0.05 level (2-tailed).*
Hypothesis 3

Hypothesis 3 states that the Job Embeddedness construct will predict turnover intention better for males than females. To test whether prediction was better for males of females two analyses were conducted. Embeddedness model The results summary in Table 11 indicate slight support for this hypothesis. The males, shown in Figure 9, resulted in the critical indices, including Goodness-of-Fit (0.95), Adjusted Goodness-of-Fit (0.93), Normed Fit Index (0.93), and the root mean square error of approximation (0.047) showing a good fit with the data.
Figure 9 Embeddedness Model of Turnover Intention – Males

- Org Fit
- Org Sac
- Links
- Turnover Intention

Embeddedness:
- Org Fit → -1.31
- Org Sac → -0.46
- Links → 0.17
- Turnover Intention → 0.28

Links:
- Link1 → -0.25
- Link2 → -0.41
- Link3 → -0.67
The females, shown in Figure 10, also resulted in the critical indices, including Goodness-of-Fit (0.93), Adjusted Goodness-of-Fit (0.91), Normed Fit Index (0.90), and the root mean square error of approximation (0.054) showing a good fit with the data. Although these indices do show the female data as a good fit, males do show a better fit for the data.
Figure 10 Embeddedness Model of Turnover Intention - Females

- Org Fit
- Org Sac
- Links
  - Link1
  - Link2
  - Link3

Embeddedness

Turnover Intention

-0.72
-0.50
-0.09

-3.10
-0.21
0.11
0.13
-0.09
-0.50
-0.72

0.11
### Table 11  Comparison of Models – Males vs. Females

<table>
<thead>
<tr>
<th>Model Tested</th>
<th>See Figure</th>
<th>NFI</th>
<th>GFI</th>
<th>AGFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2: Males</td>
<td>9</td>
<td>0.93</td>
<td>0.95</td>
<td>0.93</td>
<td>0.047</td>
</tr>
<tr>
<td>H2: Females</td>
<td>10</td>
<td>0.90</td>
<td>0.93</td>
<td>0.91</td>
<td>0.054</td>
</tr>
</tbody>
</table>

#### Hypothesis 4

Hypothesis 4 states that the Job Embeddedness construct will predict turnover intention better for older employees than for younger employees. For these analyses, age was split into equal thirds. The top and bottom thirds were designated as the “younger” and “older” populations. The results summary in Table 12 indicate slight support for this hypothesis. The younger employees, shown in Figure 11, resulted in the critical indices, including Goodness-of-Fit (0.85), Adjusted Goodness-of-Fit (0.81), Normed Fit Index (0.79), and the root mean square error of approximation (0.100) show a moderate fit with the data.
Figure 11 Embeddedness Model of Turnover Intention – Young Employees
Figure 12 Embeddedness Model of Turnover Intention - Older Employees
The older employees, shown in Figure 12, also resulted in the critical indices, including Goodness-of-Fit (0.92), Adjusted Goodness-of-Fit (0.81), Normed Fit Index (0.89), and the root mean square error of approximation (0.060) showing a moderate fit with the data.

Table 12  Comparison of Hypotheses and Models – Young vs. Old

<table>
<thead>
<tr>
<th>Model Tested</th>
<th>See Figure</th>
<th>NFI</th>
<th>GFI</th>
<th>AGFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4: Young</td>
<td>11</td>
<td>0.79</td>
<td>0.85</td>
<td>0.81</td>
<td>0.100</td>
</tr>
<tr>
<td>H4: Old</td>
<td>12</td>
<td>0.89</td>
<td>0.92</td>
<td>0.89</td>
<td>0.060</td>
</tr>
</tbody>
</table>
CHAPTER IV
SUMMARY AND DISCUSSION OF FINDINGS

The purpose of this study was multi-faceted. First, the study was to test the validity of the theoretical model of Job Embeddedness brought forth in the Mitchell et al. (2001) article. Another purpose of this study was to compare the predictive power of the Embeddedness model versus the traditional model of turnover which consists of organizational commitment, job satisfaction, and perceived job alternatives. Lastly, the study was to investigate the predictive power of the Embeddedness model on gender and age.

The Job Embeddedness construct was developed in an effort to establish an instrument in which the predictive properties go above and beyond that of existing scales. As Mitchell et al. (2001) purported, the ability of Job Embeddedness to predict turnover was significantly greater than that of the traditional model. In the original article (Mitchell et al., 2001), a thorough validation process of the Job Embeddedness Scale was not conducted.

The Embeddedness construct originates from the organizational attachment literature. Its underlying premise is that certain aspects of an individuals job act as a “web” and restrain employees from voluntarily leaving their organization. As Mitchell et al. (2001) purported, Job Embeddedness is a unique construct that has explained significant incremental variance beyond traditional turnover models using samples of grocery and hospital workers. Theoretically, the construct was an addition to the turnover literature, however,
psychometric testing and determining its transference to general populations was in order.

An interesting aspect of Embeddedness is that this theoretical construct is flexible in recognizing that people can become embedded in organizations in different ways.

The traditional models of voluntary turnover, comprised of job satisfaction, organizational commitment, and the perceived availability of job alternatives, are by far the more pervasive models found in the literature. However, future research on turnover, then, should use traditional turnover-related constructs but also incorporate the dimensions Job Embeddedness. Support for this argument is found in the structural equation models performed in this study. The best fit for the data was with the Embeddedness model, alone.

The current study was conducted within the information technology divisions of a large federal agency for data collection. Of the 3,078 responses received from the 6,718 employees within the federal agency, 2,741 responses were kept after the data cleaning, resulting in an overall response rate of close to 41%. 60.3% of the federal agency workforce is above the age of 46, which means they will be eligible for retirement within 10 years. Males make up nearly 59% of the agency. 43.6% of the federal agency workforce hold a college degree and another 25.6% having some graduate school experience or holding a graduate/terminal degree.

The original Job Embeddedness construct, as presented by Mitchell et al. (2001) consisted of one dimension comprised of organizational fit, organizational
sacrifice, and organizational links. To assess psychometric properties of Embeddedness, both exploratory and confirmatory factor analyses were conducted. The initial sample was randomly split for use on the exploratory analyses. A scale purification process was conducted in which the items were pruned from the original scales because they were not highly associated with their designated dimension, as defined in the Mitchell et al. (2001) article. The exploratory factor analysis showed a five-factor structure, rather than the three-factor structure proposed by Mitchell et al. (2001). Principal axis factoring with varimax rotations was used in the exploratory factor analysis.

After completing the exploratory factor analyses, a confirmatory factor analyses was conducted on the second half of the randomly split data to test the support of the five-factor structure, versus the one-factor and three-factor models. This confirmatory factor analyses of the five-factor model was shown to be the best fit for the data. Aside from the chi-square (which is affected by sample sizes > 200), the various fit indices demonstrated a solid fit for the five-factor model. These high scores for the fit indices lead one to conclude the Job Embeddedness model, as presented by Mitchell et al. (2001), is a construct consisting of five factors or dimensions.

The five-factor structure included Organizational Fit, Organizational Sacrifice, and three Organizational Links dimensions. The dimensions of Organizational Links can be easily identified into three logical dimensions: 1) Tenure, 2) Co-Worker interaction, and 3) Group involvement. Table 10 shows
significant correlations between these three factors, however, the do remain
distinct factors. The correlation between these Links factors is understandable
as the longer an employee spends in an organization, the more interactions
(groups, teams, committees, etc.) the individual will have. As well, it is logical to
assume that the more groups one belongs to, the more interactions with other
coworkers they would have.

Hypothesis 1 stated that Embeddedness would improve the prediction of
turnover intention, adding to the variance accounted for by the traditional
turnover intention model. Structural equation models were run for the traditional
model, the Embeddedness model, and a combined traditional-Embeddedness
model on turnover intention.

The traditional model on turnover was a moderate fit to the data (GFI, .90;
NFI, .90; AGFI, .84). Combining the Embeddedness and traditional models on
turnover intention resulting in a better fit of the data (GFI, .91; NFI, .95; AGFI,
.90). However, the best fit for the data was the Embeddedness model, alone.
Running the Embeddedness model, alone, on turnover intention resulting in a
very good fit with the data (GFI, .96; NFI, .95; AGFI, .95). These data show
support for the hypothesis which states the Embeddedness will improve
predictive power above and beyond that of the traditional model, which includes
organizational commitment, job satisfaction, and perceived job alternatives.

Hypotheses 2a states that the Job Embeddedness dimension of
organizational fit will be negatively correlated with turnover intention. Bivariate
correlations were run between the dimension of organizational fit and turnover intention. Hypothesis 2a was supported ($r = -.30, p<.01$). It stands to reason that the more an individual identifies and fits with not only an organization, but also group of friends, community group, etc. the more they will be inclined to continue association with that group. We find this to be true in this study as well. The psychological taxing a person will endure in a group with dissimilar values can precipitate withdrawal behaviors. However, these withdrawal behaviors do not always lead to attrition, but can be more damaging to organizations through the existence of poorly motivated or poorly performing employees who have little incentive to produce.

Hypothesis 2b states that the Job Embeddedness dimension of organizational sacrifice will be negatively correlated with turnover intention. Bivariate correlations were run between the dimension of organizational sacrifice and turnover intention. Hypothesis 2b was supported ($r = -.08, p<.05$).

Organizational sacrifices are defined as the aspects of the job, if lost, that one would see as a “sacrifice.” The items which remained in the study in this scale mostly dealt with the financial sacrifices which an employee would forego if they left an organization. The reliance on 401ks and other retirement packages provided by organizations can serve as significant deterrents for attrition. As the cost of living increases, and the ever-increasing importance placed on material items increases, so do the standards of living increase. Jobs which provide high
salaries, good retirement packages, and yearly bonuses can serve as a method
of control for organizations to retain their valued employees.

Hypothesis 2c states that the Job Embeddedness construct dimensions of
organizational links will be negatively correlated with turnover intention. As a
result of the psychometric work done on the Embeddedness construct, three
dimensions of organizational links exist. Bivariate correlations were run between
the three organizational links dimensions and turnover intention. Hypothesis 2c
is partially supported. Organizational links 3 (group involvement) is significantly
correlated with turnover intention ($r = -.10$, $p<.01$). However, link 1 ($r = -.01$) and
links 2 ($r = .00$) were not significantly correlated with turnover intention. Again,
hypothesis 2c is only partially supported.

The only Links scale which was found to be significantly correlated with
turnover intention was the scale dealing with interactions of employees with the
number of teams and committees with which one is involved. The bond one
forms while working on such teams and committees is the reason for the
correlation may account for this correlation. We find that the simple interactions
employees have with other co-workers (Links 2) does not result in the same
relationship with turnover intention. Perhaps the intrinsic value of “teams” can
spur employees to remain, while being isolated and working independently from
others in the organization can encourage flight from the job. Links 1, items
dealing with tenure, also showed no significant relationship with turnover
intention. In a day and age of job hopping because of fear of termination due to
economic reasons this result is logical. A number of factors, other than tenure with any organization, will cause employees to seek employment elsewhere.

The last two hypothesis in this study were aimed at discerning the differences of the predictive power of Embeddedness for age and gender. Hypothesis 3 states that the Job Embeddedness construct will predict turnover intention better for males than females. Based on the structural equation models results it was shown that the data were a good fit for the male population (GFI, .95; NFI, .93; AGFI, .93). It was also shown that the female population data were a good fit for the Embeddedness model, as well (GFI, .93; NFI, .90; AGFI, .91). Embeddedness is a better fit for the male population than the females, therefore, hypothesis 3 is supported.

Inherently, females are subject to more facets of life not controlled by the organization. For example, women often chose to become full-time housewives after childbirth. However, this trend of females being the sole care-takers for children is changing. However, the pervasiveness of the traditional American values of the mother staying home and becoming a home-maker is evident. This is a personal decision on the part of the employee, which is not in direct control of many organizations.

A few aspects of work that are in the control of the organization are FMLA and in-house daycares. The in-house daycares allow males and females to remain in their organization by tending to their children while they work. In fact, the availability of this in-house daycare can prove to serve as a retention device
employed by an organization. In addition, the Family Medical Leave Act (FMLA) enables both males and females up to take up to 12 weeks off of work for events such as childbirth. This 12 week time period allows for lifestyle adjustments and can possibly increase employee retention as well. That being said, the reasons males stay or leave an organization may be more attributed the organization itself, and not events of their personal lives. Again, the trend of women staying home is changing, which would lead one to believe this finding should be addressing again in the future.

Hypothesis 4 states that the Job Embeddedness construct will predict turnover intention better for older employees than younger employees. Based on the results, it was shown that the data were a moderate fit for the younger employee population (GFI, .85; NFI, .79; AGFI, .81). It was also shown that the older employee population data were a moderate to good fit for the Embeddedness model, as well (GFI, .92; NFI, .89; AGFI, .89). Embeddedness is a better fit for the older population than the younger employees, therefore, hypothesis 4 is supported.

Leaving an organization is like starting over. Employees may possibly lose valuable money in a 401k, retirement package, or any other program set up by their employers. As individuals approach retirement age, the prospects of starting over become more and more of a hindrance to seek employment in a new organization. Typically, as age increases, individuals “settle down” and the thought of up-rooting to potentially a new city, making new acquaintances, buying
a new home, etc. can be daunting. In this instance, the cost-benefit ratio can play an integral part in an employee remaining with an organization. The individual must ask themselves if it is worth the increase in pay, better hours, more stable work environment, etc. to possibly relocate to someplace foreign and begin anew.

In terms of implications for practitioners, even the theoretical underpinnings of this work give managers in all varieties of enterprises some new and interesting ways to think about retaining employees. It suggests that focus on job satisfaction as a means to retain employees is too limited. By more thoroughly understanding why employees choose to remain with an organization, more effective retention policies are potentially developed.

Since the hypotheses regarding the correlations of the dimensions of Job Embeddedness with turnover intention are partially supported, there are significant implications for both research and practice. In terms of research, finding support for this new construct provides additional evidence for the generalizability of this expanded turnover model. Therefore significant implications for both research and practice can be taken from this study. However, there are limitations within this study.

Limitations

This study investigates the Embeddedness construct as a predictor of voluntary turnover but like any study, it has inherent limitations. An obvious limitation to this study was the exclusion of all the items found within the original
Job Embeddedness Scale (Mitchell et al., 2001). This omission was due to the bargaining unions’ influence on the research team’s survey development. The union requested the absence of all off-the-job questions due to privacy issues. This, however, may prove to have minimal effect, as organizations can truly influence only those aspects of business in which they have direct control. The inclusion of all the Embeddedness items may have resulted in different factor loadings.

Another possible limitation is the use of turnover intention as the dependent variable instead of actual turnover. That being said, it is a common practice in literature for several reasons. First, the use of actual turnover numbers requires access to sensitive, personal records. These records are often not available to researchers. Second, longitudinal studies are required to link turnover intention with actual turnover. In the time span allotted in a study such as this, a number of variables can come into play, possibly affecting the initial intention. In addition, this type of study takes several years to conduct. Lastly, turnover intention is a variable of high interest to organizations, as it can serve as a precursor of actions to come. Organizations can take efforts to prevent or reduce the occurrence of turnover by knowing of intentions. In addition, meta-analyses have found that turnover intention is a direct antecedent to actual turnover (Hom and Griffeth, 1995; Griffeth et al., 2000). However, the correlation between the two is not as high as one would prefer.
The respondents of this study were from a federal government agency, as opposed to the private sector. Therefore, before results can be generalized across multiple populations, caution must be exercised. However, considering the enormity of the federal government, this study is valuable to a certain section of the working population.

Scaling the link items also proved to be problematic as there was no indication of how the original authors completed this step in their study. This omission on the part of Mitchell et al. (2001) could also have contributed to the exclusion of the link sub-dimension in the final cleaned scales used within this study due to scaling issues.

Future Research

A more thorough examination of the Job Embeddedness scale is needed in order to assess the potential contribution of Job Embeddedness to the voluntary turnover literature. As evidenced by this study, the majority of the sub-dimensions of Job Embeddedness do, in fact, correlate with turnover intention at a significant level. In addition, the identification of this construct is important because it improves the prediction of turnover intention. As was shown in this study, future turnover research should include facets of the Embeddedness model. This study is an initial step in introducing Embeddedness and demonstrating its relevance to research and practice.

The concept of embedding workers into the fabric of the organization is consistent with much of the strategies employed by organizations currently
(Agarwal & Ferratt, 2001). There is a need to focus on not only developing long-term relationships, but also maintaining those new and existing relationships as well. The sense of community and opportunities for advancement are among the topics discussed by Agarwal and Ferratt (2002) that are incorporated into the Embeddedness construct.

With the global economy as it is, it may be important to investigate the implications of the different types of interactions employees will encounter in the future. For example, many organizations are conducting virtual meetings, via phone, computer, etc. Do these types of interactions hold the same “bonding” as those that are created in person?

Conclusion

Embeddedness is a construct that has explained significant variance going above and beyond that of traditional measures of turnover intention. The research described in this study shows that Embeddedness improves our understanding of turnover intentions. Embeddedness is unique, in that it is a theoretical construct that is flexible in recognizing how individuals can become “entangled” in organizations in different ways. It is becoming increasingly important for organizations to recognize employees as a true long-term resource. Considering Embeddedness to reduce voluntary turnover can help organizations retain those valuable employees that make the organization a high performing organization.
VA IT Workforce Organizational Assessment Scales

1. Turnover Intention

* It is likely that I will be working for this organization this time next year.
I will probably look for a job at another organization in the next year.
It is likely that I will take steps during the next year to secure a job at a
different organization.
* I will be working for this organization five years from now.

2. Job Embeddedness - Organizational Fit

My values are compatible with this organization.
I like the members of my work group.
My co-workers are similar to me.
I can reach my professional goals working for this organization.
My job utilizes my skills and talents well.
I feel like I am a good match for this organization.
* I do not fit with this organization’s culture.
I like the authority and responsibility I have at this organization.
I feel good about my professional growth and development.

3. Job Embeddedness - Organizational Sacrifices

The prospects for continuing employment with this company are excellent
* I would not sacrifice a lot if I left this job.
The benefits are good on this job.
The retirement benefits provided by this organization are excellent.
The health-care benefits provided by this organization are excellent.

I feel that people at work respect me a great deal.

I am well compensated for my level of performance.

I have a lot of freedom on this job to decide how to pursue my goals.

The perks on this job are outstanding.

My promotional opportunities are excellent.

4. **Job Embeddedness – Organizational Links**

** How long have you been in your current position?

** How long have you been with VA?

** How many years of federal service do you have?

** How many co-workers do you interact with regularly?

** How many co-workers are highly dependent upon you?

** How many teams are you on? (where all team members are in the same organizational unit and report to the same manager).

** How many work committees are you on? (where team members are from different organizational units).

5. **Job Satisfaction**

All in all I am satisfied with my job.

In general, I don’t like my job.

* In general, I do not like working here.

6. **Organizational Commitment**
I am willing to put in more than the expected effort to help the organization be successful.

I talk up the organization as a great place to work.

I would accept almost any job to stay with the organization.

I find that my personal values are similar to the organization’s values.

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

This organization inspires one’s best performance.

I’m extremely glad that I chose this organization over others to work for.

I really care about the fate of this organization.

This is the best of all possible organizations to work for.

7. **Job Alternatives**

There is a good probability that I could find an acceptable alternative to my job outside of VA.

If I searched for an alternative job, within a year I could find an acceptable job.

* Indicates negatively scored items.

** Indicates item requiring re-scaling for analytical purposes.
APPENDIX B

SAMPLE DEMOGRAPHICS
## Sample Demographics in Percentages

<table>
<thead>
<tr>
<th></th>
<th>Federal Agency Division 1</th>
<th>Federal Agency Division 2</th>
<th>Federal Agency Division 3</th>
<th>Federal Agency Division 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>41.2</td>
<td>38.2</td>
<td>32.0</td>
<td>49.4</td>
</tr>
<tr>
<td>Male</td>
<td>58.8</td>
<td>61.8</td>
<td>68.0</td>
<td>50.6</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 30</td>
<td>2.7</td>
<td>3.6</td>
<td>4.3</td>
<td>4.9</td>
</tr>
<tr>
<td>31-40</td>
<td>23.5</td>
<td>21.7</td>
<td>19.0</td>
<td>17.3</td>
</tr>
<tr>
<td>41-50</td>
<td>42.6</td>
<td>40.9</td>
<td>39.2</td>
<td>42.8</td>
</tr>
<tr>
<td>51-60</td>
<td>29.0</td>
<td>31.1</td>
<td>34.5</td>
<td>31.2</td>
</tr>
<tr>
<td>61 +</td>
<td>2.2</td>
<td>2.7</td>
<td>3.0</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>Highest Level of Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some High School</td>
<td>0.0</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>High School</td>
<td>6.4</td>
<td>6.7</td>
<td>7.4</td>
<td>6.4</td>
</tr>
<tr>
<td>Some College</td>
<td>25.5</td>
<td>25.3</td>
<td>23.6</td>
<td>30.1</td>
</tr>
<tr>
<td>A.A.</td>
<td>19.2</td>
<td>18.7</td>
<td>13.9</td>
<td>16.5</td>
</tr>
<tr>
<td>B.A/B.S.</td>
<td>25.8</td>
<td>25.3</td>
<td>33.4</td>
<td>24.4</td>
</tr>
<tr>
<td>Some Graduate School</td>
<td>8.6</td>
<td>6.1</td>
<td>12.2</td>
<td>9.0</td>
</tr>
<tr>
<td>MBA/MS /MA</td>
<td>12.7</td>
<td>15.3</td>
<td>9.1</td>
<td>11.3</td>
</tr>
<tr>
<td>Ph.D./M.D./J.D.</td>
<td>1.8</td>
<td>2.4</td>
<td>0.0</td>
<td>1.9</td>
</tr>
</tbody>
</table>
APPENDIX C

IRB LETTERS
Suggested format for use as an email from each supervisor to the IT workers they supervise:

SUBJECT: ACTION ITEM: VA’s IT Workforce Study

VA is working with a research team from the University of North Texas led by Professors Leon Kappelman, Victor Prybutok, and Sherry Ryan. Together we’ve designed a study to help VA improve delivery of services to our nation’s veterans by becoming a better and more productive place for IT workers. VA recognizes the value of regularly assessing things in order to improve them and we are deploying this on-line survey for all IT supervisors and workers to participate in. Participation is voluntary. Please take enough of your official work time (i.e., paid time on the clock) to participate in this survey and complete it by the close of business on XXXX, XX 2002. We expect it will take approximately 30 minutes. Your password for participation is your VA email address and the URL is http://ISRCVA.unt.edu/xxxxxxxx. Only the UNT team will have access to your individual responses. The survey questions have been approved for use by all the relevant unions as well as the university’s Committee for the Protection of Human Subjects,

Thank you for your participation!
Suggested format for the Email from VA CIOs to all IT workers

SUBJECT: IMPORTANT ACTION ITEM: IT Workforce Study

Dear fellow VA employees:

As part of our efforts to improve the Department we are working with a research team from the University of North Texas (UNT) to conduct a study about our IT workforce. As part of this effort we ask that all of VA’s IT employees (workers and supervisors) complete an on-line survey in order to help us better address your needs and the needs of the America’s veterans.

Your candid input is important. There are no right or wrong responses. The UNT research team will take every effort to protect the anonymity of all individual survey responses, and will report only aggregate data to VA. The survey runs on the university's computers and only the UNT research team will analyze the data. The survey asks your opinions about your employment, as well as about other organizational and demographic characteristics. We ask that you please dedicate approximately 30 minutes of your official paid work time to complete this survey. The UNT research team will contact you with additional details about your participation.

It is important that you understand that your participation in this study is voluntary, not required, and that your refusal to participate will not adversely affect you in any way. However, by deciding not to participate in the survey you forgo your opportunity to share your ideas and feelings with the VA. In addition, you may withdraw from this study at any time and unless you complete the survey in its entirety your information will not be used and will subsequently be erased from the master database. However, once you have completed the survey and clicked the final submit button your contribution cannot be taken back.

This study is intended to result in positive benefits to all of us by advancing our knowledge about VA’s IT workforce. If you have any questions, please call the ISRC Helpline, at (940) 565-3128 or by email isrc@unt.edu.

Thank you for your time and assistance in this important matter.

Sincerely,

Dr. John Gauss, CIO VA
Gary Steinberg, CIO VHA
Adair Martinez, CIO VBA
Joe Nosari, CIO NCA

This project has been approved by the University of North Texas Committee for the Protection of Human Subjects, (940) 565-3940. Please retain a copy of this letter for your records.

UNT Contacts:

Professor Leon A Kappelman
Director, IS Research Center
(940) 565-3128

Professor Victor R. Prybutok
Director, Center for Quality and Productivity
(940) 565-3110

Professor Sherry D. Ryan
Business computer Information Systems
(940) 565-3106
Sent as email to all IT workers from ISRC@UNT.EDU:

SUBJECT: ACTION ITEM: VA’s IT Workforce Study

As part of VA’s efforts to improve the overall effectiveness and efficiency of the IT workforce and the manner in which the Veterans are served, they are working with a research team from the University of North Texas (UNT) to conduct a study about VA’s IT workforce. As a member of that workforce, your candid answers are important to help VA improve your work environment.

This on-line survey is being conducted by UNT’s Information Systems Research Center (ISRC) and Center for Quality and Productivity (CQP). The survey runs on the university’s computers and only the UNT research team will see and analyze the data. The only connection between the survey results and the participant will be the email address given during registration. However, this email address is not retained within the database and is not available for review or for analytical purposes, therefore, linking specific survey results with individuals is impossible. The UNT team will take every effort to protect the anonymity of any individual survey responses, and we will report only aggregate summaries. The URL and your personal password for participation in the survey are provided below.

The survey asks your opinions about your employment, as well as about other organizational and demographic characteristics. There are no right or wrong responses. As explained in the messages to you from VA management, you are allowed to use official paid on the clock work time. Please allow approximately 30 minutes of your time to participate in this survey and complete it by the close of business on XXXX, XX 2002. If you have any questions, please call the ISRC Help Desk at (940) 565-3128 or by email to isrc@unt.edu.

Your participation in this study is voluntary, not required, and your refusal to participate will not adversely affect you in any way. However, by deciding not to participate in the survey you forgo your opportunity to share your ideas and feelings with the VA. By understanding the current skill-sets of the IT employee population and their psychological attitudes, motivations, and desires, the issues and transitioning to revised IT job categories will be smoother and better reflect the wishes of the employees. It is anticipated that these data will also be utilized to improve operational performance, allow better planning for technical skills allocation, provide more accurate estimates as to the types of training employees will need, and enable the Department to better prepare for a digital government.

While filling out this survey, you may withdraw from this study at any time. Unless the final submit button is selected, the data which has been provided prior to will not be used in the analysis and will subsequently be erased from the master database. Although, once you click on this final submit button your contribution cannot be taken back.

Your efforts and those of your colleagues will be used to help VA better develop and manage its IT workforce issues, such as training, retention, and satisfaction of IT
employees, thus enabling VA to become a better place to work. Thank you for your time and assistance.

Your personal password: Your VA email address.
URL to survey website: http://ISRCVA.unt.edu/xxxxxxxx

Best wishes,

Professor Leon A. Kappelman, Ph.D., Director, ISRC
(940) 565-3128

Professor Victor R. Prybutok Ph.D., Director, CQP
(940) 565-3110

Professor Sherry D. Ryan, Ph.D.
(940) 565-3106

This project has been approved by the University of North Texas Committee for the Protection of Human Subjects, (940) 565-3940. Please retain a copy of this letter for your records.
TO: All IT workers in the Department of Veterans Affairs  
SUBJECT: ACTION ITEM: VA’s IT Workforce Study

As part of VA’s efforts to improve the overall effectiveness and efficiency of the IT workforce and the manner in which the Veterans are served, they are working with a research team from the University of North Texas (UNT) to conduct a study about VA’s IT workforce. As a member of that workforce, your candid answers are important to help VA improve your work environment.

This on-line survey is being conducted by UNT’s Information Systems Research Center (ISRC) and Center for Quality and Productivity (CQP). The survey runs on the university’s computers and only the UNT research team will see and analyze the data. The only connection between the survey results and the participant will be the email address given during registration. However, this email address is not retained within the database and is not available for review or for analytical purposes. Therefore, linking specific survey results with individuals is impossible. The UNT team will take every effort to protect the anonymity of any individual survey responses, and we will report only aggregate summaries. The URL and your personal password for participation in the survey are provided below.

The survey asks your opinions about your employment, as well as about other organizational and demographic characteristics. There are no right or wrong responses. As explained in the messages to you from VA management, you are allowed to use official paid on the clock work time. Please allow approximately 30 minutes of your time to participate in this survey and complete it by the close of business on XXXX, XX 2002. If you have any questions, please call the ISRC Help Desk at (940) 565-3128 or by email to isrc@unt.edu.

Your participation in this study is voluntary, not required, and your refusal to participate will not adversely affect you in any way. By understanding the current skill-sets of the IT employee population and their psychological attitudes, motivations, and desires, the issues and transitioning to revised IT job categories will be smoother and better reflect the wishes of the employees. It is anticipated that these data will also be utilized to improve operational performance, allow better planning for technical skills allocation, provide more accurate estimates as to the types of training employees will need, and enable the Department to better prepare for a digital government.

While filling out this survey, you may withdraw from this study at any time. Unless the final submit button is selected, the data which has been provided prior to will not be used in the analysis and will subsequently be erased from the master database. Although, once you click on this final submit button your contribution cannot be taken back.

Your efforts and those of your colleagues will be used to help VA better develop and manage its IT workforce issues, such as training, retention, and satisfaction of IT employees, thus enabling VA to become a better place to work. Thank you for your time and assistance.

Your personal password: Your VA email address.  
URL to survey website: http://ISRCVA.unt.edu//WF_login.asp

Best wishes,

Professor Leon A. Kappelman, Ph.D., Director, ISRC (940) 565-3128  
Professor Victor R. Prybutok Ph.D., Director, CQP (940) 565-3110  
Professor Sherry D. Ryan, Ph.D. (940) 565-3106
This project has been approved by the University of North Texas Committee for the Protection of Human Subjects, (940) 565-3940. Please retain a copy of this letter for your records.
REFERENCES


