



**ANALYSIS OF THE THEORETICAL RELATIONSHIPS BETWEEN
WORK EXHAUSTION, JOB SATISFACTION, AND TURNOVER
INTENTION OF AIR FORCE INFORMATION SYSTEMS MANAGERS**

THESIS

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THESIS

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FORCE INFORMATION SYSTEMS MANAGERS**

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A. Dan Ray

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Abstract

The use of information technology has increased exponentially over the last two decades (Cohen and Burton, 2001). Accordingly, the ability of organizations to retain their information systems staff has been a critical factor in the effort to achieve strategic goals (Moore, 2002). When IS professionals leave an organization, not only is the number of them available for assignment to projects depleted, the professionals themselves often take specialized skills, tacit knowledge, and understanding of specific business operations and information systems with them (Agarwal and Ferratt, 2002). Chief Executives have become increasingly interested in issues related to the recruitment, development, and retention of IS Managers in their organizations (Moore and Burke, 2002). These circumstances have spurred researchers to study the reasons that IS Managers leave their organizations (Mobley et al. 1979; Igarria et al. 1993; Lambert et al. 2001; Moore 2000; Moore and Burke, 2002). The Armed Forces are currently fully engaged in an information technology (IT) labor crisis that they must resolve (Wilcox, 2001). With billions of dollars being spent on the development and acquisition of equipment to support the transformed force of the 21st century, it is imperative that effort also be focused on developing an IT workforce to match the growth of the technology (Shelton, 1999). There is a shortage of skilled information system workers in the United States that will persist well in to the future (Oshagbemi, 2000). It appears there are many factors contributing to the IT worker shortfall that range from implications of an aging workforce to negative perceptions of military service, but with so many of the Joint

Vision 2020 and reorganization concepts hinging on the use of IT to enhance operational capabilities, identifying the problems in a military context must be accomplished.

ANALYSIS OF THE RELATIONSHIPS BETWEEN WORK EXHAUSTION, JOB SATISFACTION, AND TURNOVER INTENTION OF AIR FORCE INFORMATION SYSTEM MANAGERS

I. Introduction

Overview

The use of information technology has increased exponentially over the last two decades (Cohen and Burton, 2001). Accordingly, the ability of organizations to retain their information systems staff has been a critical factor in the effort to achieve strategic goals (Moore, 2002). When IS professionals leave an organization, not only is the number of them available for assignment to projects depleted, the professionals themselves often take specialized skills, tacit knowledge, and understanding of specific business operations and information systems with them (Agarwal and Ferratt, 2002). Chief Executives have become increasingly interested in issues related to the recruitment, development, and retention of IS Managers in their organizations (Moore and Burke, 2002). These circumstances have spurred researchers to study the reasons that IS Managers leave their organizations (Mobley et al. 1979; Igbaria et al. 1993; Lambert et al. 2001; Moore 2000; Moore and Burke, 2002). The Armed Forces are currently fully engaged in an information technology (IT) labor crisis that they must resolve (Wilcox, 2001). With billions of dollars being spent on the development and acquisition of equipment to support the transformed force of the 21st century, it is imperative that effort also be focused on developing an IT workforce to match the growth of the technology (Shelton, 1999). There is a shortage of skilled information system workers in the United

States that will persist well in to the future (Oshagbemi, 2000). It appears there are many factors contributing to the IT worker shortfall that range from implications of an aging workforce to negative perceptions of military service, but with so many of the Joint Vision 2020 and reorganization concepts hinging on the use of IT to enhance operational capabilities, identifying the problems in a military context must be accomplished.

The federal government invested over \$40 billion in 2001 towards information technology related infrastructure and automated systems, yet it continues to inadequately resource arguably the most vital component, people (Cohen and Burton, 2001). The federal government is not alone in its struggle to retain qualified information systems professionals. In the private sector, worker turnover has been of interest for both managers and researchers across a wide array of disciplines. In the past two decades however, interest in turnover has increased, as the pressure for the financial performance among American organizations has intensified (PSI, 2001).

This research will take the existing theories of work exhaustion (Moore, 2000), job satisfaction and turnover intention (Mobley et al., 1979), and apply them to Air Force Information System (IS) Managers. The specific focus of this research will be to investigate the relationship between work exhaustion, job satisfaction, and turnover intention of Air Force Information System (IS) Managers. For the purpose of this study, IS Managers are comprised of company grade officers (lieutenants and captains) in the Communication and Information career field (33S).

Background

Company grade officers in the Communication and Information career field are leaving the AF at a higher rate than any other mission support career field (AFPC, 2001). AF Occupational Measurement Squadron surveyed C & I career field in April 2001 but has not analyzed data to investigate relationship between work exhaustion, job satisfaction and turnover intention. Many information system managers leave the military to take higher-paying jobs in the private sector (AFPC, 2001; PSI, 2001). Technological advancements will increase the private sector employment of computer-related workers; as a result, the demand for managers to direct these workers also will increase (BLS, 2002). Industry seeks talent and is willing to pay for it during strong economic periods. Military members constitute a loyal, self-disciplined work force, superbly trained and educated to run a high-tech military that is the envy of the world. The military must compete with industry to retain the personnel it needs, yet it does not have the power to negotiate salaries in similar fashion as the private sector (Jumper, 2002). In a study conducted by the Air Force Personnel Center (1989) officers were asked about their career intentions. A decade later (1999), 73% of those that indicated they would separate before retirement, left.

Officer retention is measured using Cumulative Continuation Rates (CCRs). A CCR represents the percentage of officers entering their 4th year of service that will complete 11 years of service given existing retention rates. For example, a 55% CCR for Air Force Information System (IS) managers means that for every 100 officers entering the 4th year of commissioned service, 55 would complete the 11th year, if current rates persist (AFPC, 2001). IS managers low cumulative continuation rates, which are

averaging 40%, could be costly to the Air Force both directly and indirectly. Identifying the variables that contribute to the sagging retention (CCR) of AF IS managers is critical, as it may enable Air Force leaders to develop programs and incentives that motivate IS managers to stay, therefore reducing turnover (AFPC, 2001). Study after study has come to very similar conclusions on the critical issue of turnover in the private sector (Mobley et al., 1979; Price, 1977; Porter and Steers, 1977; Fishbein, 1975; Moore, 2000, Spector, 1997). Research suggests that reducing IS manager turnover will require a radical change in personnel management, a compensation package that reflects the professional status of the IS employees, a plan to keep employee skills current, and a change in how information technology is valued (Mueller and Price, 1990; Igbaria and Siegel, 1992). While the Air Force continues recruiting large numbers of people with the understanding that not all will remain on active duty, it has established goals for officer Cumulative Continuation Rates, which have not been met for much of the past decade (AFPC, 2001).

Advances in computer technology provide a great opportunity for improving operational effectiveness. However, we can only take advantage of this opportunity if we have a skilled workforce that can manage and implement high technology products

--Fred Thompson, U.S. Senator

Over the past decade, the Air Force has collected feedback on why its members, stay or separate, providing valuable insight into how pieces of the retention puzzle fit together (AFPC, 2001). As stated earlier, the focus of this study will be to investigate the relationship between work exhaustion, job satisfaction, and turnover intention of Air Force Information System (IS) Managers. Mobley, Hillingsworth, Hand, and Meglino

(1979) developed a model for job satisfaction; this study will use it as a basis to examine the job satisfaction and turnover intention of Air Force Information System (IS) managers. Mobley et al. (1979) suggest that individual factors, organizational factors, and economic/labor market factors impact an employees overall job satisfaction. Moreover, they suggest that if employees lack overall job satisfaction, their turnover intention and turnover behavior are negatively impacted. Therefore, consistent with their research, one would expect that an employee would be less likely to leave if they are satisfied with their job versus one who is not. Mobley et al.'s research on job satisfaction and turnover intention is further discussed in Chapter 2. Furthermore, this study will modify their model to include the construct of work exhaustion. This study will operationalize the construct of work exhaustion in the military environment.

The work exhaustion construct comes from Moore's (2000) study on work exhaustion and turnover intention of information technology workers. Her theory posits that technology professionals experiencing higher levels of work exhaustion reported lower levels of job satisfaction and higher intentions to leave their organization. Of the variables in the model, perceived workload was the strongest contributor to exhaustion in IS employees. Furthermore, exhausted IS professionals identified work schedule, inadequate staffing, and resources as primary causes of work overload and exhaustion. Moore's study also suggests that work exhaustion impacts job satisfaction, which in turn influences employee turnover intention (Moore 2000).

Research Focus

Using the models discussed in the previous section, the research focus is to investigate the relationship between work exhaustion, job satisfaction, and turnover intention of AF IS Managers. Although literature supports that turnover can be strongly predicted by turnover intention, it is beyond the scope of this research.

Archival survey data collected by the Air Force Occupational Measurement Squadron (AFOMS) in April 2001 will be factor analyzed, and a bi-variant correlation will be performed to assist in this study. The results could help identify why, regardless of the initiatives and programs implemented to combat high turnover rates, it remains an issue. Finding information systems managers is one thing, keeping them is another. The latter is something the Air Force is rigorously working (Jumper, 2002). The results of this study may provide the basis for new policy to more effectively deal with turnover. The specific research questions that will be addressed to examine the relationship between work exhaustion, job satisfaction, and turnover intention are:

1. Based on the literature, which AFOMS Air Force IS manager Job Inventory Survey (JIS) items are appropriate for assessing work exhaustion?
2. Which AFOMS Air Force IS manager JIS items are indicative of work exhaustion?
3. What is the relationship between work exhaustion and job satisfaction?
4. What is the relationship between job satisfaction and turnover intention of Air Force IS managers?

Summary

This chapter discussed the Air Force's struggle to retain qualified IS managers. Two models with different approaches were introduced as an example of the various studies conducted to explain employee turnover intention. The following chapter will review literature on turnover intention, job satisfaction, and work exhaustion. Chapter 3 will present the methodology for analyzing the archival survey data and conducting the research; included will be characteristics of the sampled population, the data collection techniques utilized, and how the data will be analyzed. Chapter four will provide the results of the analyzed data from the Air Force Occupational Measurement Squadron Career Field Survey 2001, and chapter five will present the findings, implications for the Air Force, suggest further research, and limitations of the study.

II. Literature Review

Overview

This chapter reports on the literature concerning job satisfaction, work exhaustion and turnover intention. The models used to examine the relationship between, work exhaustion and job satisfaction, are also discussed. Following an in depth review of the research literature, a theoretical framework of turnover for Communications and Information Officers will be proposed. The utility of the proposed model will be geared towards career field functional managers and the Occupational Measurement Squadron. The bottom line is that retaining productive IT workers results in lower costs (PSI, 2001).

Introduction

There is a shortage of skilled Information Technology (IT) workers in North America that will persist well into the future (BLS, 2002). The accelerating need for IT personnel in business, industry, and government has transformed today's IT market into a seller's market (Oshagbemi, 2000). In fact, 47 percent of human resources executives polled by the American Management Association (2001) confirmed that their organizations are currently experiencing a shortage of skilled IT workers, including management. Approximately 55 percent forecast the shortage will carry over into the next decade. Microsoft reports that its Microsoft Solution Providers channel is facing a labor shortage of 17,000 technical jobs in North America and 40,000 jobs worldwide. The Information Technology Association of America (ITAA) predicts that the shortages at 190,000 unfilled IT jobs. That figure does not take into account government and

nonprofit organizations, which would likely increase the total. Nearly a third of ITAA members reported that their recruiting efforts are geared towards full-time employees and over a third say they are concerned that the skill shortage will become a barrier to growth (ITAA, 2002). The U.S. Department of Commerce (DoC, 1997)) estimates that the average annual growth rate for computer system analysts and computer engineers will top 100 percent by 2006. According to the ITAA, that means 1.3 million new IT workers will be needed to fill job openings and replace workers leaving the field over the next seven years. Finding and retaining talent for an IT organization or function will clearly be a challenge requiring creativity.

Employee turnover is corporate America's number one problem (Surmacz, 2002). Further, it is a problem that's permeated itself through the Armed Forces since the end of the Gulf War (AFPC, 2001). A formidable solution results in more profitable companies, productive employees, and satisfied customers (Anderson and Meyer, 1994). Losing employees is also expensive. Studies have found that the cost of replacing lost talent within an organization varies between 70 to 200 percent of that employee's salary. There are also advertising and recruitment expenses, training and orientation of new employees, and decreased productivity until the new hire is brought up to speed (Hellman, 1997). Additionally, there is the loss of customers who were loyal to the departing employee. Recruiting and retaining the best employees represents a major organizational investment in turnover reduction. Once an organization has recruited talented personnel, the return on investment requires closing the back door to prevent them from leaving (Oshagbemi, 2000). The direct costs of employee turnover are typically grouped into three main categories: separation costs (exit interviews, administration, functions related to

terminations, separation pay, and unemployment tax), replacement costs (communicating job vacancies, pre-employment administrative functions, interviews, and exams), and training costs (formal classroom training and on-the-job instruction) (Slaughter and Ang, 1996). The indirect costs associated with employee turnover are more complicated to assess and include the loss of efficiency of employees before they actually leave the organization, the impact on their coworkers' productivity, and the loss of productivity while a new employee achieves full mastery of the job (Blankertz and Robinson, 1997).

True turnover costs are more complex than simply figuring out the average cost of employee replacement. For example, the costs of losing a good performer are greater than the costs of losing an average performer. The true cost of losing a key seasoned employee is hard to estimate. There is the investment in development of the employee, the value of the knowledge and experience gained, and the lost productivity that must also be considered to arrive at a true cost figure. The cost has been estimated by some businesses to be approximately \$15,000 to \$25,000 per employee while others estimate that it costs up to two and a half times the employee's salary (PSI, 2001).

Using a multiplier of one times the employee's salary is a conservative estimate of turnover cost, yet it presents a potentially expensive issue for the Air Force. Table 1 shows the estimated turnover cost of Communications and Information Officers separating from the Air Force (DFAS, 2002). The table and respective formulas were found on the Predictive Systems Incorporated web site and have been applied to the case of Air Force IS Managers. In addition to the direct turnover costs associated with retention shortfalls, there are also the indirect costs. Previous studies conducted by the U.S. Department of Commerce (1997) suggest that customer satisfaction is adversely

impacted by an organization's inability to retain qualified personnel (PSI, 2001). Some companies even speculate that employee turnover has a direct impact on customer turnover, though that theory is beyond the scope of this research. Overall, the cost of employee turnover is difficult to quantify with an exact dollar amount (Tziner et al., 1996). Yet, given the difference between the Air Force's retention goal of 70% and the actual numbers in Table 3, it appears retention is a costly issue for the Air Force.

Table 1: Estimated Turnover Costs for Air Force Information Systems Managers

<u>Pay Grade</u>	<u>Base Salary</u>	<u>BAH*</u>	<u>BAS</u>	<u>Total</u>	<u>Multiplier</u>	<u>Turnover Cost**</u>
0-1	\$26,220	\$506.10	\$166.37	\$26,892.47	1.0	\$26,892.47
0-2	\$33,012	\$580.65	\$166.37	\$33,759.10	1.0	\$33,759.10
0-3	\$38,040	\$702.90	\$166.37	\$38,809.30	1.0	\$38,809.30
BAH = Basic Allowance for Housing BAS = Basic Allowance for Subsistence * BAH calculated using average of with dependent and without dependent rate for each rank ** Turnover cost per person						

Numerous studies have been published outlining issues that have contributed to the current, long running IT professional shortage, which includes IS managers, within the private sector and the federal government (Wilcox, 2001; Moore, 2000; Hellman, 1997; Igbaria, Greenhaus, and Parasuraman, 1991; Bozeman, and Bretschneider, 1986; Rainey, 1979; Mobley, Horner, and Hollingsworth, 1978). Based on published turnover rates, I suggest the response from the Department of Defense has not adequately addressed the retention problem. Information Systems Manager retention remains an

important aspect of personnel force management. The Air Force is closely monitoring non-rated operations and mission support officer retention, which includes Communications, Civil Engineering, Security Forces, Personnel, and Services Officers (AFPC, 2001). Table 2 shows the Cumulative Continuation Rates (CCR) for pilots, navigators, air battle managers, non-rated operations, and mission support officers from fiscal year (FY) 1992 to FY 2001. As mentioned earlier CCRs are how officer retention is measured. Mission Support Officer Retention, which encompasses Lt Colonels and below not possessing an aero rating, and excludes non-rated operations and non-line officers (medical officers, lawyers, chaplains) has remained at a constant 42-46%.

Table 2: Cumulative Continuation Rates (CCR) for AF Officers

	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01
Pilot	34%	62%	82%	87%	77%	71%	46%	41%	45%	49%
Navigator	54%	28%	84%	86%	75%	73%	62%	62%	69%	72%
Air Battle Manager	45%	17%	84%	44%	46%	56%	36%	45%	51%	47%
Non-rated Operations	43%	20%	70%	42%	65%	58%	60%	57%	51%	48%
Mission Support	39%	20%	66%	39%	46%	44%	42%	45%	43%	44%

Table 3 shows the retention rates for Mission Support and Communications Officers, which have also remained low, compared to the AF goal of 70% (AFPC, 2002). The preceding figures illustrate the retention shortfall in both the general Air Force officer population and the Communications and Information career field. In the Mission Support career fields as a whole, retention rates have not been met in the last ten years. For the Information Systems Managers (33S), retention rates have not been met in the

last seven years (AFPC, 2002). This study will suggest a theoretical framework for the relationships between work exhaustion, job satisfaction, and turnover intention. Which, if supported, may provide valuable insight to the real issues impacting Air Force IS Manager's consistently high turnover rates.

Table 3: Cumulative Continuation Rates for Support Officers

CORE ID	<i>FY95</i>	<i>FY96</i>	<i>FY97</i>	<i>FY98</i>	<i>FY99</i>	<i>FY00</i>	<i>FY01</i>
MISSION SUPPORT (AGGREGATE)	39.0%	46.1%	43.8%	42.1%	45.2%	43.3%	44.0%
(33S) COMMUNICATION AND INFORMATION	31.5%	39.0%	42.2%	32.9%	36.1%	43.1%	42.7%

Mobley Et Al. Turnover Model

The second turnover model used for this study is one of the most detailed in job satisfaction research, it was conceptualized by Mobley, Griffeth, Hand, and Meglino (1979). The model incorporates elements from earlier turnover studies (March and Samon, 1958; Price, 1977; and Mobley, 1982). The expanded Mobley et al. model is presented in the Appendix A, but a simplified version is illustrated in Figure 1. This particular model suggests that there are four key determinants of intentions to quit and subsequently turnover: job satisfaction – dissatisfaction, expected utility of alternative internal work roles, expected utility of external work roles, and non-work values and contingencies. Mobley et al. sought to graphically illustrate the multiple organizational, environmental, and individual variables associated with the turnover process.

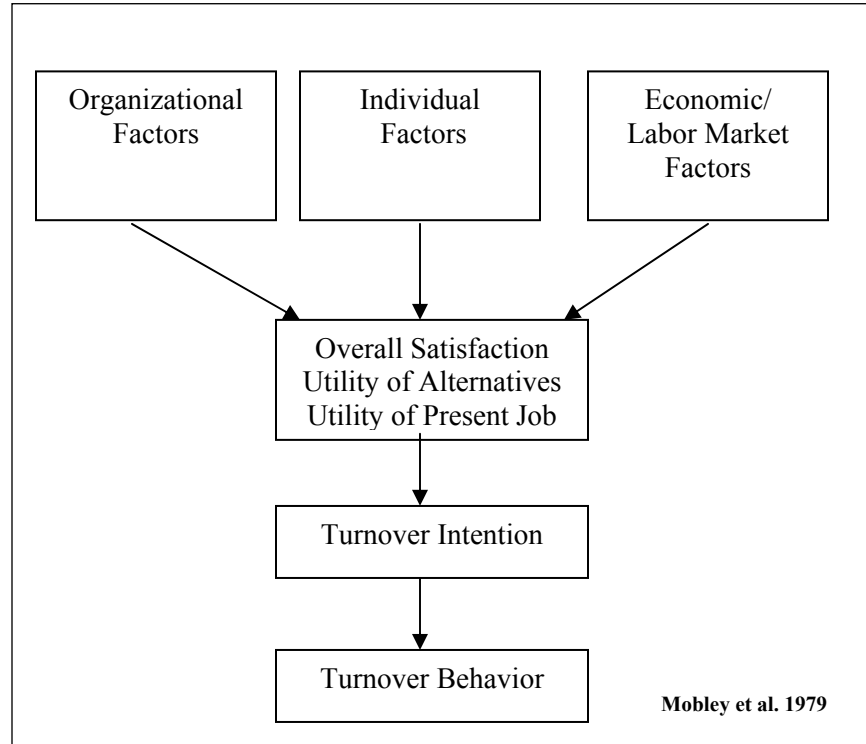


Figure 1: Mobley et al.'s Turnover Model (simplified)

Employee Turnover

Turnover rates are one of the major factors that affect the supply of labor. From a managerial perspective, it is important to monitor turnover rates and be proactive in taking action to keep the costs of turnover from becoming excessive.

Accurate forecasting and strategic planning of an organization's human resources requirements are crucial in keeping turnover rates at a desirable level (Mohr, 1971). A company's demand for IT workers is composed of two parts, jobs created by business growth and expansion, and jobs created by employee turnover (Weiss, 1983). The former is a problem most companies wish they had, while the latter may keep Chief Executive

Officers awake at night. Chief Technology Officers (CTOs) are often quoted as saying that the most valuable organizational assets walk out the door every night. Therefore, the trick is to ensure they walk back in the door the next morning (PSI, 2001).

The general definition of employee turnover used in this paper is “the termination of membership in an organization by an individual who received monetary compensation from the organization” (Mobley et al. 1982). Several aspects of this definition require noting. First, the focus is on cessation or separation from an organization and not on the related but distinct issues of accession, transfer, or other internal movement within the organization. Second, the focus is on employees, those who receive monetary compensation from the organization as a condition of membership. Although other aspects of turnover are interesting and important issues, they are beyond the scope of this paper. This general definition of turnover is applicable to any type of organization—manufacturing, service, government, and any type of employee-organization relationship arrangement, including part-time or full-time and hourly or salary arrangements. The controlling part of this definition is that the individuals receive monetary compensation for their membership in the organization (Price 1977).

Employee turnover is important issue for organizations, individuals, and society. From the organizational perspective, employee turnover can represent significant costs in terms of lost recruitment, training, socialization investments, disruption and replacement costs, and a variety of indirect costs. Equally, employee turnover can have positive organizational benefits, for example, displacement of poor performers, creation of promotion opportunities, and infusion of new people with new ideas (Mobley et al. 1982).

From the individual perspective, turnover can have potentially positive and/or negative implications. For example, the decision to quit a job can be positively associated with the pursuit of an individual's career objectives or with the transition away from a stressful environment. Conversely, turnover can have negative consequences for the individual. For example, the individual could lose non-vested pension benefits; it may disrupt the family's social support system, and can be subject to the "grass is greener on the other side" syndrome, only to experience later disappointment. Additionally, turnover can have positive and/or negative consequence for the individuals remaining with the organization (Mobley et al. 1982).

Finally, from the societal perspective, turnover again can be seen to have potentially both positive and negative consequences. Turnover is associated with mobility and migration to new industries and organizations necessary for economic development (Spector, 1997). On the contrary, excessive turnover could serve to depress productivity growth and orderly development. Given the significance of turnover from these three perspectives, it is important for an organization to be able to effectively analyze, understand, and manage employee turnover (Mobley et al. 1982).

Worker turnover has been of interest for both managers and researchers across a wide array of disciplines. Over the past two decades, interest has intensified, as the pressure for the financial performance among American organizations has increased. In response to employee turnover, particularly voluntary turnover (Mobley, Horner & Hollingsworth 1978; Mobley, Griffeth, hand, and Meglino, 1979) proposed a theoretical causal process to explain this phenomenon. Their process centers around four core antecedents of employee turnover. First, are demographic characteristics that influence a

person's decision on whether to remain with or leave a job. Second, job satisfaction influences a cognitive withdrawal process stressing turnover intention. Third, work environment factors significantly influence employee job satisfaction, which in turn affects turnover intention.

The body of theory on which turnover literature is based, is rooted primarily in the disciplines of psychology, sociology, and economics. Psychological explanations for turnover posit that individual perceptions and attitudes about work conditions lead to behavioral outcomes. Contributing psychological theories include stress theories (Wolpen et al., 1991; Wright and Cropanzano, 1998), personality and dispositional theories such as Locus of Control (Spector and O'Connell, 1994), learning theory (Wasserman and Miller 1997), and organizational turnover theory (Hom et al. 1995). Sociological theories posit that work-related factors are more predictive of turnover than are individual factors (Miller et al., 1994). Key sociological theories that are used to explain turnover include social comparison theory (Geurts et al. 1998), social exchange theory (Miller et al., 1996), and social ecological theory. Economic theoretical explanations of turnover are based on the premise that employees respond with rational actions to various economic and organizational conditions. The turnover literature draws on human capital, utility maximization, and dual labor market models of economic processes (Miller 1996). Although each of the three domains—psychology, sociology, and economics—has strong proponents in the turnover literature, it is widely recognized that theoretical aspects from all three are necessary to explain the process of turnover fully (Hellman, 1997).

Turnover Intention

The definitions of turnover and turnover intention vary across studies. Turnover intention is generally defined as seriously considering leaving one's current job (Guimaraes et al., 1992). Some studies ask whether participants are currently thinking of quitting, and others ask whether they had thought of quitting during a designated time-period in the past (e.g., past 3 months) or if they had planned to quit within a designated time-period (Thatcher et al., 2002). In the Air Force, it is discussed in the context of reenlistment for enlisted members, and cumulative continuation rates for officers. The Air Force has conducted research into retention using career intent as a predictor of actual turnover (Hamilton and Datko, 2000). While turnover intention does not measure actual turnover, research suggests that an individual's intentions to quit or stay tends to be a good predictor of turnover behavior (Locke, 1976; Fishbein and Ajzen, 1975; Mobley et al., 1978). Empirically, employees' behavioral intentions to quit-stay measures appear to be among the best individual level predictors of turnover (Mobley, 1982). Steel and Ovalle (1984) compared the relationships of job satisfaction, organizational commitment, and turnover intentions with actual turnover. They concluded that turnover intent is a significant variable in determining turnover behavior. Studies conducted primarily in the United States indicate that intent to leave an organization has gained much empirical and theoretical support as an important predictor of actual turnover (Kraut, 1975; Mobley, Horner and Hollingsworth, 1978; Steel and Ovalie, 1984; Prestholdt, Lane, and Mathews, 1987; Tett and Meyer, 1993).

Job Satisfaction

The American Heritage Dictionary defines satisfaction as “the fulfillment or gratification of a desire, need, or appetite.” Overall job satisfaction is generally defined as an affective response by an employee concerning their particular job and results from the employee’s comparison of actual outcomes with those that are perceived, wanted, needed, or expected to be fair and just (Spencer, 1996). Researchers have defined job satisfaction as “the overall degree to which the employee is satisfied and happy with their job” (Hackman and Oldham 1975) and “the emotional reactions of individuals to their job and its experiences”. Job satisfaction has been extensively studied, as both a dependent and independent variable. In 1976, Locke estimated the number of articles and dissertations dealing with job satisfaction to be over 3,300. In 1996, Spector estimated the number of studies that have incorporated job satisfaction in some manner to be over 12,000 (Lambert, 2001).

The effect of job satisfaction on turnover is only part of the equation. It is of equal importance to explore, confirm, and comprehend the key antecedents of job satisfaction. Identifying the factors that influence job satisfaction, provide management with necessary, meaningful information to make intelligent decisions regarding interventions aimed at increasing job satisfaction (Stone et al., 1977; Spector, 1997). Besides, rather than treating job satisfaction as an exclusive variable, it is pivotal to review both the causes and effects of job satisfaction. Furthermore, previous studies have shown that it is necessary to develop comprehensive models for complex human behavior that take into account both the direct and indirect outcomes (Lee and Mowday, 1987).

Research suggests there are two basic categories of factors that influence job satisfaction; demographic characteristics and work environment factors. Concurrently, job satisfaction negatively affects turnover intent and turnover intent directly influences voluntary turnover. Demographic measures include but are not limited to age, gender, education, and tenure. Work environment measures include but are not limited to role conflict, task variety, financial rewards, co-worker relations, and autonomy (Mobley, 1982).

Multitudes of conceptual models for the turnover process have been developed over the past 50 years. While these models have assorted origins from a wide array of disciplines, many researchers have theorized that job satisfaction is a key antecedent of worker turnover (Mobley et al., 1979; Wakefield et al., 1988; Williams and Hazer, 1986). Some studies (Judge and Hulin, 1993) contend that overall job satisfaction measures are the most informative data a manager or researcher can have predicting employee behavior. Existing research proposes that high levels of job dissatisfaction lead to employee withdrawal, particularly in terms of voluntary turnover. While research has shown a consistent relationship between job satisfaction and voluntary worker turnover, the explained variation has typically been small (Locke and Judge, 1998). Mobley and colleagues theorized that the relationship between job satisfaction and turnover is moderated by intentions. Most researchers now accept the premise that intention to stay or leave a job with a particular organization is the final cognitive step in the decision making process of voluntary turnover (Steele and Ovalle, 1984). As a result, turnover intention has been integrated in most employee turnover models developed in the past 20 years. Because job satisfaction is such a compelling variable, it can be conceptualized as

the discrepancy between what an individual values and what the situation provides (Locke, 1976). Thus, defined, satisfaction includes both individual differences in values and individual perceptions of organizational variables. According to Locke's research, one behavioral reaction to dissatisfaction is to withdraw, while the reaction to satisfaction however, is to approach.

Many of the previous studies show that there is a consistent negative relationship between job satisfaction and turnover (Brayfield and Crockett, 1955; Vroom, 1964; Porter and Steers, 1973; Price, 1977; Mobley et al. 1979; Muchinski and Tuttle, 1979; Moore, 2000). Their reviews show clearly that the lower job satisfaction is, the greater the probability of turnover is. Although job satisfaction proves to be a strong variable, others must be considered to better predict the factors that influence turnover (March and Simon, 1980). Furthermore, a recent study of job satisfaction among municipal government employees (Ellickson and Logsdon, 2002), revealed that environmental factors such as promotional opportunities, pay and benefits satisfaction, performance appraisal satisfaction, equipment and resources, training, workload, supervisory relationships, and most important of all, departmental esprit de corps were significantly, and positively, related to overall job satisfaction. In contrast, demographic variables were relatively poor predictors of job satisfaction.

Individual Demographic Factors

Reviews of turnover literature have shown a consistent negative relationship between age and turnover. This implies that younger employees have displayed a higher probability of leaving (Mobley et al. 1979; Price 1977; Muchinski and Tuttle 1979) It has

been suggested (Bedeian et al. 1988) that prestige and confidence are likely to increase with age and that older employees, therefore, are likely to report higher levels of job satisfaction. Because younger employees are not likely to have fully established their worth to the organization, they generally do not hold positions of authority. In age, conceptualizations of career stage (Griffeth et al. 1992) imply that age, or more generally work life experiences, tend to shape occupational aspirations and concerns. It follows, then, that younger employees are more likely to be mobile and to have lower psychological investment in the organization. Middle-aged employees tend to engage in behaviors that encourage stabilization. Last, older employees more commonly engage in maintenance behaviors. Studies suggest, the older a person becomes, the less likely he or she is to give up the benefits and idiosyncratic credits associated with tenure, seniority, and/or status among his or her peers to enter the job market and compete with younger, and possibly better trained and qualified, job candidates (Porter and Steers 1973). The age-turnover relationship may be based on a number of influences. Younger employees may have more entry-level job opportunities and few family responsibilities, thus making job mobility that much easier. They may also have unrealistic expectations regarding working which are not fulfilled in their early employment experiences (Wanous, 1989).

Tenure has been identified as a covariant of age (Bedeian et al. 1988), therefore, its impact on the relationship between job satisfaction and intent to leave should be relatively similar to the effects of age. Conceptually, as tenure increases within an organization, so does the employee's potential for both formal benefits such as promotions and informal benefits such as status among the younger, less experienced coworkers. Thus, employees with more tenure should be less likely than those with less

tenure to leave the organization to enter a competitive job market where they may have to reestablish their value in a new organization. Previous research has established that length of service is one of the best single predictors of turnover (Mangione et al., 1975). The Kass et al., (2001) found that in any given cohort of hires, two-thirds to three-fourths of the quits would occur by the end of the first three years of employment. Of these, more than half will occur before the end of the first year alone. The point of emphasis here is that turnover is relatively high in the early years of employment. Interaction with age and inadequate early socialization (Horner et al. 1979; Wanous 1989) are among the probable reasons for this relationship. In 2002, companies believe that the average acceptable time to retain their IT workers is 25 months, or just slightly over two years. They retain 84 percent of their IT workers for this length of time or longer. Additionally, companies said the acceptable tenure was 33 months on average, although they retained 78 percent of the IT workforce for that length of time or longer. In 2001, IT companies were only able to retain 74 percent of their employees, while non-IT companies retained 82 percent. This year however, there is no significant difference between non-IT and IT companies in percent retained. Hiring managers believe that IT workers in all job categories have the same primary retention incentive, money (ITAA, 2002).

There is no simple pattern when examining the literature on the relationship between gender and turnover (Mobley, et al. 1979; Price 1977). Of the existing studies relating an individual's gender to turnover, Marsh and Mannari (1977) observed that female Japanese manufacturing workers had higher turnover than males. They suggest that gender most likely interacts with other variables as does occupation and family responsibility.

Since many turnover studies are based on individuals with similar educations, a relationship between turnover and education is difficult to establish. Furthermore, the meaningfulness of education as a variable is questionable given the wide disparity in the quality of education (Mobley et al.). Additionally, the lack of variance in education in studies such as Hellriegel and White (1983) precludes adequate evaluation of the relationship between an individual's education and their turnover intention.

Work Environment Factors

The work environment is complex and is comprised of many aspects (Hackman and Oldman, 1975; Spector, 1997). The five measures in Lambert's model (2001), representing different dimensions of his respondent's perception of their work/job environment are role conflict, task variety, financial rewards, relations with co-workers, and autonomy/participation. In a recent study by the Information Technology Association of America (ITAA), respondents rated a good overall compensation plan more often than any other benefit. Flexibility, which included hours worked, dress code, and work environment, was second most cited. Formal on-the-job training along with frequent raises and reviews were also ranked high by managers. Each of the four mentioned retention-getters ranked virtually the same for non-IT and IT companies. One of the major differences between the IT and non-IT firms is providing incentives for certifications, which is cited more than twice as often with IT companies. Table 4 illustrates the results of the ITAA's retention study.

Table 4: ITAA Retention Study Results

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Economic-Labor Market

The technologies that dominate the production of goods and services, especially in advanced industrialized countries, have forever changed the dynamics of the demand for and the return to labor (Compeau et al., 1999). Employment in technology intensive occupations such as computer programming and network technology has increased at double the rate of U.S. non-farm employment overall since the mid-1990s (U.S. Department of Commerce, 1997). Thousands of jobs in offices, factories, and retail organizations require technological infrastructures unnecessary a decade ago. According

to Rondinelli et al., (2001), the basis of urban economic development is now a technology and knowledge based system of production and services. Consequently, they suggest that those without the skills to participate in this system are confined to secondary, futureless roles in urban economies.

There is evidence suggesting a strong negative combined relationship between unemployment level and turnover rates (U.S. Dept of Commerce, 1997). However, unemployment is unevenly distributed across geographic regions, occupations or industries. From the management perspective, this relationship should be used to compare the organization's turnover with appropriate labor markets. Inflation may also influence turnover but that relationship is beyond the scope of this research. The ongoing change in the composition of the labor force will have a significant impact on management in general (Drucker, 1988). The overall economy sets the stage for alternative employment opportunities. In a tight economy, generally there are less alternative opportunities and employees are less willing to leave their current jobs even if they are dissatisfied (PSI, 2001).

Moore's Turnover Model

The second turnover model used for this study comes from a recent study by Jo Ellen Moore (2000). She researched work exhaustion as a possible mediating factor of turnover intention. The notion of work exhaustion from the management and psychology research literature is examined in the perspective of technology professionals. Moore collected data from 270 IT managers in a variety of industries across the United States. Through structural equation modeling, work exhaustion was shown to partially mediate

the effects of workplace factors on turnover intention. In addition to being a mediating factor on turnover intention, the results also revealed that technology professionals experiencing higher levels of exhaustion reported a higher intention to leave their job. Furthermore, of the variables in Moore's model (Figure 2) expected to impact work exhaustion, work overload was the most significant contributor to exhaustion in IT employees. Also, over worked IT managers identified staff and resource shortages as a primary cause of work overload. Burnout, or work exhaustion is identified as a strong factor that existing research has repetitively shown to be correlated to work attitudes. Particularly, in the area of job satisfaction, organizational commitment, and turnover intention. The research literature and the popular press suggest that technology professionals are particularly vulnerable to work exhaustion (Kalimo and Toppinen, 1995; McGee, 1996).

The organizational utilization of information systems and technology continues to grow as does the need for technology professionals (Huarng, 2001). Slow to respond has been growth in the supply of information technology (IT) talent (Department of Commerce 1997; Information Technology Association of America, 1999). According to them, the gap in the supply and demand pool of IT labor force compounds staffing problems. Consequently, technology professionals not satisfied with current positions are likely to find alternative employment opportunities abundant. For this reason, the management of IT managers, which contribute to the retention of valued technology workers, is an area of significant concern (Igbaria et al., 1994). In the research literature, work exhaustion was initially encompassed by the construct of tedium, which is defined as a state of physical, emotional, and mental exhaustion, and mental exhaustion invoked

by long-term involvement in demanding situations (Pines et al.1981). It is suggested that tedium is the result of having too many negative and not enough positive features in your work environment. With features being pressures, conflicts and demands pooled with too few rewards, acknowledgments, and successes (Kanner et al. 1978).

In Figure 2, as a potentially significant path to turnover among Information Systems (IS) personnel, work exhaustion in the technology worker environment is examined. Particularly, Moore surveyed technology professionals to address two research objectives: 1) to confirm that turnover intention is significantly higher in technology professionals experiencing exhaustion and 2) to gain insights to the primary cause of exhaustion of technology professionals.

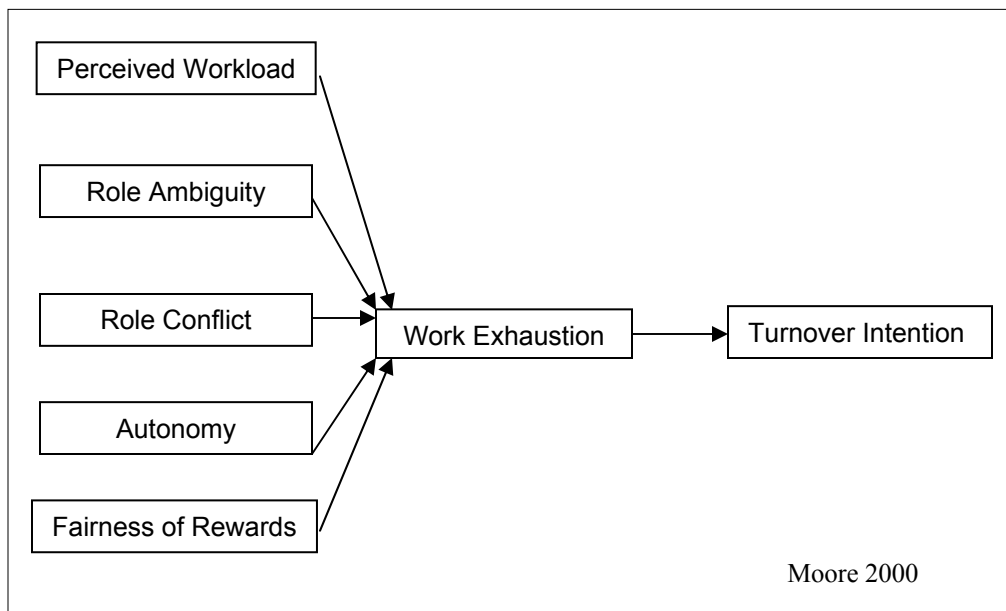


Figure 2: Moore's Turnover Model

Work Exhaustion /Burnout

Maslach and Jackson (1981) developed a three-component model, which provides the most commonly used operational definition of job burnout. They define it as a psychological syndrome of emotional exhaustion, depersonalization (callous or negative behavior towards others) and diminished personal accomplishment that occurs among individuals who work in human service. With the exception of some early research by Pines et al. (1981), exhaustion studies have used Maslach and Jackson concept and consequently focused on exhaustion in human service work (Moore 2001). Efforts to generalize burnout to corporate and industrial environments were stimulated by Cordes and Dougherty (1993). A proposed theory of burnout facilitates such efforts (Schaufeli et al., 1995). Schaufeli et al.'s model intends to apply itself to a wide range of professions, versus just human services. Their primary component is exhaustion, and it is defined as the depletion of mental resources. Moore's study focuses on work exhaustion in technology professionals and, therefore, uses the Schaufeli et al. concept and measure of exhaustion. To place emphasis on the workplace aspect of the Schaufeli et al.'s exhaustion construct, Moore's research uses the construct labeled "work exhaustion". Effective managers have innovative ways of relieving burnout that surpass encompassing fun in to the organization. Many industry publications, including Infoworld (2000), have reported on the burnout that many information systems (IS) professionals experience. According to them, burnout is as much a part of information technology (IT) as long office hours, endless stressful deadlines, and continuous juggling that results from having too much work and not enough time and resources to accomplish it.

Perceived Workload

Many IS organizations passively accept that they can do very little to reduce the burnout nature of the work because they can not control the demand for IT in the organization (Sethi, Barrier and King, 1999). To the contrary, some studies shift the responsibility for diminishing burnout solely on senior/executive leadership of IS (Gomolski, 2001). According to Gomolski, heavy workloads will always be a part of IT, but the workload need not be backbreaking. Research suggests that an organization's "best people" may be the most vulnerable to work exhaustion (Roxburgh, 1996). Therefore, IS managers can take precautions to minimize the occurrence of work exhaustion. Organizations that take a serious interest in worker burnout or exhaustion will ensure their managers have adequate time to deal with the issue of employee burnout. Bottom line, organizations need to encourage, enable and empower their IS executives to prevent key IS managers from burning out and leaving the company (Moore, 2000). A unique characteristic of a military career that this study will suggest impacts work exhaustion is the length of temporary duty (TDY) assignments. In a recent study conducted by Westman and Etzion (2002), the impact of business trips was shown to increase an employees' level of stress and burnout.

Role Variables

Role conflict and role ambiguity have been found to be important antecedents of job satisfaction, and turnover (Burke and Greenglass, 1995). Van Sell et al. (1979) define role conflict and role ambiguity. Role ambiguity refers to the lack of clear and precise information regarding what is expected in the respective role. Their research, further

suggests that role conflict occurs when an individual receives conflicting job performance information or is expected to do too much. Van Sell et al., go on to report that role conflict and role ambiguity have been found to increase job dissatisfaction and turnover. When IS personnel increase the number and types of individuals with whom they work, they span across organizational and/or departmental boundaries. The orientations and expectations of individuals from the various departments may vary from those of the IS professional. The outcome of crossing these boundaries could result in role conflict and role ambiguity (Kahn et al., 1974).

There are several organizational behavior studies that suggest IS personnel may be particularly sensitive to role conflict and role ambiguity (Morris and Snyder, 1979; Rizzo et al., 1980). Kahn et al. found that people with a high need for cognition (a construct similar to cognitive structure) displayed a positive relationship between role conflict and job related tension. This is indicative of IS personnel being prone to the adverse effects of role ambiguity and role conflict. Morris and Snyder report that satisfaction and organizational commitment are strong negative correlates of inter-sender role conflict for individuals with high autonomy related needs. Abdel-Halim (1980) suggests that jobs in mediating (service related) technologies are more vulnerable to role conflict and ambiguity. Baroudi (1985) reports that role conflict and role ambiguity are significant antecedents of job satisfaction and commitment, as well as intentions to quit.

Autonomy

Autonomy has been operationalized as the power to control the method and scheduling by which a person completes his work as well as controlling the criteria upon

which the work is evaluated (Breugh, 1989). Management of autonomy is a critical skill in managing professionals (Raelin, 1989). Implicit within the increased emphasis on the concept of both autonomous work groups and empowerment in industry today is the acceptance that increased job autonomy leads to increased productivity (Janz, 1997). However, extensive research defining the relationship between perceived job autonomy and employee performance yields conflicting results. While most studies find perceived job autonomy to be positively related to performance (Weber, 1990; Yammarino and Naughton, 1988), both inverse (Farh & Scott, 1983) as well as insignificant relationships (Orpen, 1984) have been found. These counterintuitive findings may indicate the presence of moderating variables, such as need for autonomy, influencing the relationship (Ivancevich et al., 1983).

Organizational theorists argue that organizational efficiency can be improved by enhancing employees' professional autonomy. That is, to allow individuals greater decision-making power, greater control of their work schedule, and more freedom to think and act (Williams et al., 1992). Their argument is based on studies indicating that organizations in which decision making is kept within the boundaries of senior-echelons are less effective than organizations in which decision making is decentralized (Friedman, 1999). Additionally, in a study by Almer and Kaplan (2002) it is suggested that employees who switched to a flexible work arrangement, showed significant improvement in job satisfaction, as well as some decline in burnout and stressors. Consequently, in recent years, both public and business organizations have taken steps to increase professional autonomy among their staff through decentralization of organizational processes (Huber, Sutcliffe, Miller, and Glick, 1990). Moore (2000)

reports that autonomy, measured with four other antecedents (perceived workload, role ambiguity, role conflict, and fairness of rewards) explained 56 percent of the variance in work exhaustion. As an independent variable, autonomy is a better predictor of turnover intention. Moore's study (2000) showed no significant correlation between autonomy and work exhaustion.

Fairness of Rewards

Fairness issues are abundant in the organizational and social literature. Several general and specific (e.g. Greenberg et al., 1971; Jackson et al., 1986; Pines et al., 1981) theories are devoted entirely to the theory of fairness. Despite the centrality of the fairness construct in organizational theory, the relationship of pay fairness to health and behavioral outcomes, like many areas of compensation research, is barely touched upon (Lawler, 1985). There is some evidence that pay attitudes are related to other job attitudes e.g. commitment (Cohen & Gattiker, 1994), citizenship (Lee et al., 2001), quit intentions (Miceli, Jung, 1991), and perceived organizational support (Miceli & Mulvey, 2000), but evidence of the relationship of pay attitudes to more distal behavioral and well-being outcomes is, at best, sparse. George and Brief (1989) argue that the relationship between pay fairness and employee outcomes (both behavioral and health outcomes) is probably affected by a host of factors. Pay fairness may relate to these outcomes only in certain situational contexts. Pay is a central feature in the work lives of many individuals (Shaw and Gupta, 2001) and, obviously, most individuals would rather receive more than less pay. Still, people differ in their need for money, i.e. money plays a much more central role in the lives of some people than others (Friedman, 1999). Many factors

account for variations in centrality, some focusing more on personality and background characteristics, and others more on economic or family circumstances (Mobley, 1982). For some people, money is central because they value the status and material goods that money can bring. For others, money is important simply because they need the money to support a large family (Shaw and Gupta, 2001). Although many such reasons can be identified, research suggests one particularly important factor, financial need (Kahn, 1974; Kahn et al., 1990). Financial need or economic dependence can be viewed as the extent to which an employee must rely on financial rewards to support his/her life. People who are married, people who have many dependants, or people without alternative sources of income, tend to be more financially dependent than those who are single, without dependants, or with alternative income sources (e.g. Brett and Cron, 1995; George and Brief, 1989). While money may not be the primary reason why IS workers shift jobs, people expect to be paid what the market will bear. Moreover, in the future, the market could become a more literal arbiter of worker value (Sjoberg and Sverke, 2000).

Better compensation is usually one of the first reasons people think of for leaving a job. However, often time's compensation is cited as a reasoning exit interviews when other causes are present but people are reluctant to discuss the other causes. Nonetheless, in competitive labor markets, compensation is certainly a significant factor (PSI, 2001). Special bonuses are often used to make quick adjustments to market pay scales. Tying bonus, stock plans, and pay levels to longevity, referred to as the "golden handcuffs, is also a common response to competitive labor markets. Additionally, pensions based on tenure are a lucrative method of monetary rewards (Sethi and King, 1999). Rewards do

not have to be monetary to have impact. Positive feedback, formal recognition programs, changing job titles, and special project assignments are also ways to improve reward/recognition programs (PSI, 2001). Furthermore, consistent with previous research conducted in both the public and private sectors, job satisfaction of municipal government employees is significantly influenced by perceptions of employee satisfaction with promotional opportunities, pay, and fringe benefits (Ellickson and Logsdon, 2002).

Summary

Turnover theories have repeatedly used job satisfaction and turnover intention as variables to predict actual turnover. While the variable antecedents may vary from researcher to researcher, the premise is the same; job satisfaction and turnover intention are good predictors of turnover (Mobley et al., 1979; Mobley, 1978; Waters et al., 1976; Griffeth et al., 2000; Igarria et al., 1991). Moore (2000) discovered that one predominantly powerful factor, supported by previous research, and significantly correlated to job attitudes (job satisfaction and turnover intention) is work exhaustion. Although work exhaustion can occur in a variety of workplace environments, research literature and the popular press suggest that technology professionals are particularly vulnerable (Kalimo and Toppinen, 1995; McGee, 1996). Technology is so widespread and vitally important throughout organizations that Information Systems (IS) staff and managers can feel overwhelmed by organizational demands (Moore, 2000). This study will use 11 items from the Air Force Occupational Measurement Squadron's survey to examine the relationship between work exhaustion, job satisfaction, and turnover

intention of Air Force IS Managers. The employee turnover model, based on the research of Mobley et al. (1979) and presented in Figure 1, is one of two models used as the basis for this study. The other model is based on research conducted by Moore (2000), which suggests a relationship between work exhaustion, job satisfaction and turnover intention. The proposed research model for this study is presented in Chapter 3. The factors that impact the turnover intention of Air Force IS Managers may provide insight to more significant problems and potential solutions driving the sagging cumulative continuation rates for Air Force IS managers (Communications and Information Officers) (AFPC, 2002). The following chapter will outline the research methodology used in this study. Chapter 4 will detail the analysis of the data, and Chapter 5 will discuss the research findings, any limitations, as well as recommendations for further research in to this area.

III. Methodology

Overview

The previous chapters discussed the sagging retention rates (Cumulative Continuation Rates) of Air Force Information Systems (IS) Managers, the current state of the information technology market and background information on the concepts of turnover intention, job satisfaction, and work exhaustion, along with their suggested impact on actual turnover. The proposed theory is that Air Force IS Managers are experiencing significant levels of work exhaustion, which in turn leads to a decrease in job satisfaction and a greater intention to leave. This chapter will outline the methodology to investigate the relationship between work exhaustion, job satisfaction and turnover intention. It includes a description of the population under study, data collection methods, survey instrument development, and the statistical techniques that will be used to analyze the data.

Relevant Population

The population for the study consists of all officers holding the rank of colonel (O-6) and below in the Communications and Information (33SX) career field, located via the Air Force Personnel Center (AFPC) and surveyed through the Air Force Occupational Measurement Squadron (AFOMS). These personnel are the Air Force's equivalent of Information Systems Managers. For the purpose of this study, only active-duty company grade officers (1,355 captains and lieutenants), will be investigated. General officers are

excluded from the survey population because upon attaining the rank of general they also change Air Force Specialty Codes.

Survey Development

The Air Force Occupational Measurement Squadron (AFOMS) at Randolph Air Force Base, Texas, developed the survey instrument for this study. They developed the occupational analysis (Job Inventory Survey) for two reasons. First, to update the Communication and Information Officer (33S) professional development guide. Secondly, to aid in the development of a career-long learning plan for the Air Forces' information technology managers (AFOMS/OMY, 2001).

The 33S occupational analysis survey goals were:

- Describe the 33S task and job structure
- Determine typical 33S officer career progression
- Measure current job satisfaction indicators
- Address special interest items from senior leaders
- Validate current Air Force Communications Officer Training (AFCOT) curricula
- Translate Occupational Analysis data into information for AF personnel decision makers
- Provide the best possible occupational information to functional managers and trainers

The survey was developed using a Job Inventory Survey (JIS) model with a list of tentative tasks obtained from research. The JIS was refined and validated by conducting 130 subject-matter expert (SME) interviews over the course of 15 bases and 28 organizations. Furthermore, the JIS included tasks for all 33SXs, including the “A’

shreds. The final survey grouped 1,048 tasks under 20 duty areas. The Job Inventory also included 28 special interest questions covering the following topics:

- 33SX skills and knowledge utilization
- Working environment, writing code, and stove-piping
- Prior communications and information experience
- Adequacy/content of technical training
- Continuing education and self-initiated training
- Mentoring
- Competitive outsourcing & Privatization
- Separation factors and incentive pay

Survey Administration

Survey was administered by the Occupational Measurement Squadron to the 33S career field between Mar-Apr 2001, to all active duty, guard, and reserve members between the ranks of 2Lt and colonel. The number of Air Force personnel eligible to participate in the survey was 5,123, of which 4,027 were active duty. Of the active duty force, this research will focus on the 1,355 company grade officers, which account for approximately 35 percent of the career field. The final version of the survey consisted of biographical information, two questions to designate which base and major command (MAJCOM) respondents were assigned to, and 49 questions to measure job satisfaction indicators and task/job structure. The task utilization questions were compared by the Occupational Measurement Squadron in terms of percentage of members performing task, and average percentage of time spent. Raw responses were converted to account for 100 percent of work time. The relative time spent completing the survey was rated on a nine-point scale.

Table 5 contains the items supported by the literature and the items from the JIS this research suggests are indicative of work exhaustion of Air Force Information System Managers.

Table 5: Work Exhaustion Factors and Related JIS Items

WE Factor/Reference	AFOMS Job Inventory Item
Work Overload: Jackson et al. 1986 & 1987 Lieter, 1991 Moore, 2000 Pines et al. 1981 Sethi et al. 1999	- Job Responsibilities - Job Expectations too Great - Additional Duties - Work Schedule - Length of Duty Day
Lack/Fairness of Rewards: Jackson et al. 1986 Moore, 2000 Pines et al. 1981	- Pay and Allowances - Bonus or Specialty Pay - Retirement Benefits - Recognition of One's Efforts
Work Travel: Bertaglioni, 2000 Westman & Etzion, 2002	- Frequency of Temporary Duty Assignment (TDY) - Length of Temporary Duty Assignment (TDY)

The proposed research model is presented in Figure 3. The 11 items from the JIS, supported by the literature to be indicative of work exhaustion, are presented along with the questions used to measure Job Satisfaction and Turnover Intention.

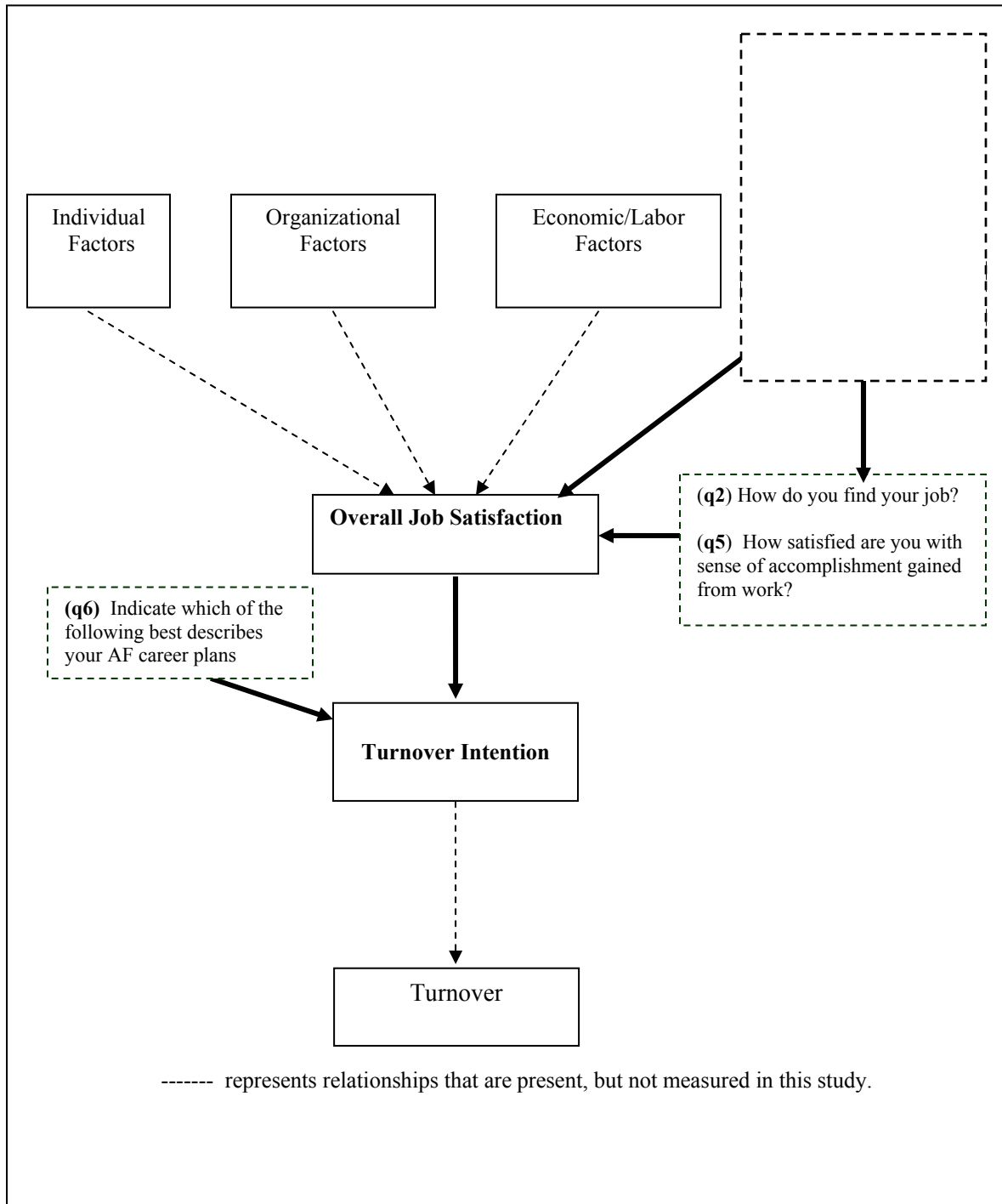


Figure 3: Proposed Turnover Intention Research Model

Work Exhaustion

This study will utilize archival data from the AFOMS 2001 Communication and Information Career Field Survey. The survey items from the AFOMS 2001 Communication and Information Career Field Survey did not specifically address work exhaustion and have not been validated in previous research. However, I propose the survey items this study uses to examine work exhaustion may still provide empirical support for the proposed research model. The data underlying these factors and the proposed construct of work exhaustion will be examined through factor analysis. The factor analysis will be used to determine if all 11 items load on a single factor, work exhaustion. The purpose of factor analysis is to discover simple patterns in the pattern of relationships among the variables. In particular, it seeks to discover if the observed variables can be explained largely or entirely in terms of a much smaller number of underlying variables called *factors* (Darlington, 2000). The list of separation factors provided by Question 7 (Appendix C), “Indicate the factors that have influenced your decision to separate from the Air Force before retirement, choose all that apply”, contains 11 items that I propose are similar to factors research suggests (Moore, 2000; Pines et al. 1993; Jackson et al. 1986; Pines et al. 1981; Maslach, 2001; Lieter 1991; Bertagioni, 2000; Westman et al., 2002) are indicative of work exhaustion. The 11 items from Question 7 are: additional duties, job expectations, job responsibilities, length of temporary duty assignments (TDY), frequency of TDY, length of duty day, work schedule, pay and allowances, specialty pay, retirement benefits, and recognition of ones efforts. Moore’s model of work exhaustion (2000) suggested that perceived workload, role ambiguity, role conflict, autonomy, and fairness of rewards were all viable

antecedents of work exhaustion. Research suggests a negative relationship between work exhaustion and job satisfaction (Moore, 2000; Maslach, 2001; Igbaria et al., 1994; Schaufeli et al., 1995). Consequently, this study includes the construct of work exhaustion in the expanded version (Figure 4) of Mobley's turnover model, to examine the relationship between work exhaustion, job satisfaction, and turnover intention. Next, the items from the JIS used to measure job satisfaction will be discussed.

Job Satisfaction

As discussed in Chapter 2, overall job satisfaction is the degree to which the employee is satisfied and happy with their job (Hackman and Oldham, 1975). The two questions from the AFOMS survey that will be used to assess the level of job satisfaction of Air Force Information System Managers are: (both items measured on 7-point scale)
Question 2 - "How do you find your job?" (Extremely Dull to Extremely Interesting)
Question 5 - "How satisfied are you with the sense of accomplishment you gain from your work"? (Extremely Dissatisfied to Extremely Satisfied). These questions are empirically supported in their ability to assess job satisfaction (Shaw and Gupta, 2002; Spector, 1997; Mobley, 1982). The results of the questions are combined using the summative rule to represent the construct of job satisfaction in the proposed model in Figure 4 (McClave et al., 2001). Mobley et al.'s turnover theory included the impact of Individual, Organizational, and Economic/Labor Market Factors. My study acknowledges the influence these factors have on job satisfaction, but will not be examined for the purpose of this research.

Turnover Intention

Research suggests (Mobley, 1982; Moore, 2000; Lee and Mowday, 1987; Hom et al., 1991) that turnover intention is the most significant predictor of actual turnover. Additionally, the relationship between job satisfaction and turnover intention has been empirically supported (Mobley et al., 1979; Spector, 1997; Hom et al. 2001). Therefore my study will use the same turnover intention measure as Datko and Hamilton (2000) used in their 2000 Report on Career Decisions in the Air Force. They used a single item to measure their career intention. Recently, Wanous, Reichers, and Hudy (1997) published a paper demonstrating that single-item measures correlated quite highly with multiple-item (or scale) measures. Survey respondents were asked by Question 6 to “Indicate which of the following **best** describes your Air Force career plans”. Their responses were measured on a five-point Likert scale ranging from “Definitely separate before retirement” to “Definitely stay for retirement”. In addition to the five options provided, a “No Response” option was provided for those personnel who chose to not respond to the survey question. Survey respondents who selected the “Undecided”, “Probably stay for retirement”, or “Definitely stay for retirement” option for their career intention, were prompted to Question 7 which asked respondents to “Indicate the factors that have influenced your decision to separate from the Air Force before retirement”. Respondents who selected “Undecided”, “Probably stay for retirement” or “Definitely stay for retirement” were prompted to Question 9. Which, asked respondents to “Indicate the factors that have influenced your decision to stay in the Air Force for retirement”.

Referring to the job inventory (JIS) questionnaire provided in Appendix C, notice that survey respondents that selected the “Undecided” option for question 6, regarding

their career intentions, were presented with both the separation and stay factors (questions 7 & 8). Of the 33 factors, respondents were given access to (Appendix C), 26 of them were identical in classification. Consequently, since each of the factors were identical in name and weight, it is assumed that if the stay and separation factors are combined in to a single response variable, the range can be retained accurately by reverse coding the separation factors from positive coefficients to negative coefficients and leaving the stay factors as positive coefficients. Accordingly, for each of the 26 identical factors, the range can be conceptualized effectively as ranging from -5 to 5, with a 0 response indicating the particular factor was not selected and did not influence the respondent's intention to stay or separate from the Air Force. A score of -5 indicates the factor had a very large negative influence in their career decision. Hence, a score of 5 indicates the factor had a very large positive influence in their career decision.

Summary

This chapter described the research design and methodology used to investigate the relationship between work exhaustion, job satisfaction, and turnover intention of Air Force Information Systems Managers. Since the only questions in the survey validated by the AFOMS were used to develop the Job Inventory (JIS), the analysis of the data will be merely a suggested framework for the relationship. It is merely a starting point for future research in this area. The following chapter provides the analysis of the data collected by the Air Force Occupational Measurement Squadron's Communication and Information Career Field Survey in Mar-Apr 01. Chapter 5 will discuss the results of the

analysis, limitations of the study, implications for the Air Force, and suggestions for further research.

IV. Data Analysis

Overview

This chapter examines the results of the analysis conducted on the data from the Job Inventory Survey (JIS) created and disseminated by the Air Force Occupational Measurement Squadron (AFOMS). The statistical methods used include exploratory factor analyses and scale reliability assessment for the theorized construct of work exhaustion. Additionally, a bi-variant correlation test is used to examine the relationships between work exhaustion and job satisfaction, and job satisfaction and turnover intention as discussed in Chapter 2. The research questions in Chapter 1 and listed below are examined using the results of the statistical analyses.

1. Based on the literature, which AFOMS Air Force IS manager Job Inventory Survey (JIS) items are appropriate for assessing work exhaustion?
2. Which AFOMS Air Force IS manager JIS items are indicative of work exhaustion?
3. What is the relationship between work exhaustion and job satisfaction?
4. What is the relationship between job satisfaction and turnover intention of Air Force IS managers?

Survey Results/Descriptive Statistics

The total number of usable responses for this study was 1,358. The Air Force Occupational Measurement Squadron filtered the unusable responses before providing the data for this research. Therefore, the 1,358 usable responses represent approximately 70 percent of the entire population of active-duty company grade officers in the Communication and Information career field (33S) (AFOMS, 2002). Prior to beginning

the analysis, this research filtered the sample of usable cases to those respondents who had a Total Active Federal Military Service (TAFMS) time less than or equal to 120 months. Consequently, this study will focus on a sample that consists of n=1295 active duty Air Force Information System Managers (Communication & Information Officers) with less than ten years of TAFMS. The TAFMS mean is 3 years and 8 months. The survey respondent sample gender distribution is 84% male and 16% female.

Research Questions 1 & 2 Analyses

As stated in Chapter 2, this research is examining the relationships between work exhaustion, job satisfaction, and turnover intention of AF Information System (IS) Managers. Research questions 1 and 2 are addressed through the literature review performed for this study. Furthermore, Table 6 is comprised of the 11 items from Job Inventory Survey's (JIS) combined list of factors this research proposes are indicative of work exhaustion. The research literature discussed in Chapter 2, suggests that these factors represent work exhaustion in private sector employees. Therefore, I suggest they may also indicate work exhaustion of Air Force IS managers, and that relationships may exist between work exhaustion and job satisfaction, and job satisfaction to turnover intention. The means and standard deviations for the 11 items representing the hypothesized construct of work exhaustion are presented in the Table 6 below. The mean is simply the mathematical average of the responses for a given item. The standard deviation is the statistic that tells you how tightly all the various examples are clustered around the mean in a set of data. When the examples are tightly grouped together, the standard deviation is small. When the examples are spread apart, that indicates you have

a relatively large standard deviation. For example, one standard deviation away from the mean accounts for somewhere around 68 percent of the responses in a group. Two standard deviations away from the mean, account for roughly 95 percent of the responses in a group. And three standard deviations away from the mean, account for about 99 percent of the responses in a given group (Rosenthal, 1990).

Table 6: Work Exhaustion Variable Descriptive Statistics

	Mean	Std. Deviation	Analysis N
ADD_DUT (additional duties)	-.14	1.209	1295
RET_BENE (retirement benefits)	1.70	2.635	1295
FREQ_TDY (frequency of TDYs)	.12	1.646	1295
JOB_EXP (job expectations)	.45	1.495	1295
JOB_RESP (job responsibilities)	1.36	2.150	1295
SPEC_PAY (specilty pay)	-.78	1.598	1295
PAY_ALLOW (pay and allowances)	.52	2.806	1295
WORK_SCH (work schedule)	.37	1.734	1295
REC_EFF (recognition of one's efforts)	.47	2.093	1295
LENG_DAY (length of duty day)	.06	1.425	1295
LENG_TDY (length of TDYs)	.08	1.182	1295

The correlation matrix in Table 7 consists of correlation coefficients. The coefficients are numbers between 1.0 and -1.0. If there is perfect positive linear relationship between work exhaustion items, the correlation will be 1.0. If there is a perfect negative linear relationship between work exhaustion items, the correlation coefficient is -1.0. A correlation coefficient of zero means that there is no linear

relationship between the items (SPSS, 2002). Fundamentally, the correlation coefficients specify to what extent the variables behave alike or vary together. The correlations provided in Table 7 are significant at the 0.01 level ** or 0.05 level * (2-tailed) unless otherwise specified.

Table 7: Work Exhaustion Variable Correlation Matrix

	ADD_DUT	LENG_DAY	WORK_SCH	REC_EFFO	PAY_ALLOW	SPEC_PAY	RET_BENE	JOB_EXP	JOB_RESP	LENG_TDY	FREQ_TDY
ADD_DUT	1										
LENG_DAY	.168**	1									
WORK_SCH	.173**	.546**	1								
REC_EFFO	.185**	.201**	.290**	1							
PAY_ALLOW	.139**	.238**	.293**	.288**	1						
SPEC_PAY	.183**	.188**	.150**	.136**	.259**	1					
RET_BENE	.124**	.153**	.227**	.280**	.397**	.132**	1				
JOB_EXP	.219**	.234**	.215**	.281**	.198**	.044*	.185**	1			
JOB_RESP	.146**	.103**	.113**	.269**	.235**	.072**	.212**	.480**	1		
LENG_TDY	.141**	.334**	.175**	.106**	.190**	.068*	.098**	.150**	.093**	1	
FREQ_TDY	.200**	.233**	.175**	.160**	.238**	.093**	.132**	.183**	.126**	.568**	1

Research Question 3 Analysis

The first step in examining the relationship between work exhaustion and job satisfaction consisted of performing an exploratory factor analysis followed by a scale reliability assessment to measure construct validity. A factor analysis was performed on the 11 Job Inventory Survey (JIS) items; additional duties, frequency of TDYs, length of TDYs, job expectations, job responsibilities, specialty pay, retirement benefits, pay and allowances, recognition of one's efforts, length of duty day, and work schedule to determine the construct validity of the survey items. Factor analysis uses the correlation

matrix in Table 6 to try to determine which sets of items cluster together. However, before this analysis was conducted, the data were examined to assess suitability for factor analysis. The Bartlett's test of sphericity (Table 8), revealed the data was suitable for factor analysis with a Chi-Square = 2631.45, $p < .01$. The Kaiser Meyer-Olkin measure of sampling adequacy was .730, which exceeds the stated level for suitability of .70 (Hair, 1995). These tests of assumption reveal that the data is suitable for exploratory factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy tests whether the partial correlations among variables are small, measures closer to 1 represent less of a correlation between the variables being tested. Bartlett's test of sphericity tests whether the correlation matrix is an identity matrix, which would indicate that the factor model is inappropriate (Hair, 1995).

Table 8: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.730
Bartlett's Test of Sphericity	Approx. Chi-Square	2631.450
	df	55
	Sig.	.000

For the 11 items used to measure the proposed variable of work exhaustion one factor was expected, but the factor analysis revealed four latent factors with Eigenvalues greater than 1.0 (Table 9). Eigenvalues less than 1.0 usually account for less variance. According to Kachigan (1991), the rule of thumb is to retain factors with an Eigenvalue greater than 1.0. The first four components/factors in Table 9 account for 60.471 percent of the variance explained by all 11 work exhaustion items. By default, factors with

Eigenvalues greater than 1 (when analyzing a correlation matrix) or the average item variance (when analyzing a covariance matrix) are extracted (SPSS, 2002).

Table 9: Eigenvalues for Work Exhaustion Variable

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.089	28.082	28.082
2	1.367	12.424	40.506
3	1.181	10.740	51.247
4	1.015	9.224	60.471
5	.962	8.745	69.215
6	.791	7.190	76.405
7	.703	6.389	82.794
8	.566	5.148	87.942
9	.492	4.471	92.412
10	.458	4.168	96.580
11	.376	3.420	100.000

A Varimax Rotation was performed to minimize the number of variables that have high loadings on each factor and simplify the interpretation of the factors. The Varimax-Rotated factor loadings are presented in Table 10 below. The item labeled ADD_DUT which measures the level of influence additional duties has on a respondent's career decision, showed a loading of .249 for Factor 1, .239 for Factor 2, and .244 for Factor 3. Additionally, the item labeled REC_EFFO, which measures the level of influence recognition of one's efforts, has on a respondent's career decision, showed a loading of .461 for Factor 1 and .380 for Factor 2, and .242 for Factor 4. Additional duties and recognition of one's efforts showed a significant cross loading between factors and will be removed from any further analyses. The results of the factor analysis in

Table 10 suggest that the 11 items used, illicit responses directed at four latent constructs rather than the one global work exhaustion construct proposed in Chapter 3. In interpreting the items which loaded on each factor, the .30 level is a generally accepted minimum factor loading because it indicates that approximately 10% of the variance for a corresponding variable has been explained by a factor (Tinsley & Tinsley, 1987). The bold items indicate the significant factor loadings for each component that was extracted during the factor analysis. The items labeled JOB_RESP and JOB_EXP loaded on Component 1, which from this point forward is referred to as Workload . The items labeled PAY_ALLOW, SPEC_PAY, and RET_BENE loaded on Component 2, which from this point forward, will be referred to as Fairness of Compensation. The items labeled LENG_TDY and FREQ_TDY loaded on Component 3 which from this point forward will be referred to as Work Related Travel. The items labeled WORK_SCH and LENG_DAY loaded on component 4, which will now be referred to as Job Duration.

Table 10: Varimax Rotated Component Matrix

	Component			
	1	2	3	4
JOB_RESP	.813	.125	.052	-.058
JOB_EXP	.806	-.015	.123	.185
REC_EFFO	.461	.380	.003	.242
ADD_DUT	.249	.239	.244	.126
PAY_ALLOW	.188	.711	.172	.130
SPEC_PAY	-.159	.668	.047	.116
RET_BENE	.264	.652	.013	.039
LENG_TDY	.035	.026	.862	.170
FREQ_TDY	.106	.131	.861	.049
WORK_SCH	.128	.201	.034	.845
LENG_DAY	.075	.092	.238	.836

The next step in examining the proposed relationship between work exhaustion and job satisfaction consists of performing a scale reliability assessment of the 9 remaining Job Inventory items. Cronbach's Alpha is performed to examine how well a set of items (or variables) measures a single one-dimensional latent construct. When data have a multidimensional structure, Cronbach's alpha will usually be low. Technically speaking, Cronbach's Alpha is not a statistical test; it is a coefficient of reliability (or consistency). Alpha coefficients range in value from 0 to 1 and may be used to describe the reliability of factors extracted from dichotomous (that is, questions with two possible answers) and/or multi-point formatted questionnaires or scales (i.e., rating scale: 1 = poor, 5 = excellent). The higher the score, the more reliable the generated scale is. According to Nunnally (1978), 0.7 is an acceptable reliability coefficient, but lower thresholds are sometimes used. A reliability analysis of all 9 items reported a Cronbach's Alpha of .69. When each proposed construct was tested individually for reliability, Workload, which consists of job responsibilities and job expectations, reported a Cronbach's Alpha of .62. Job Duration, which consists of work schedule and length of duty day, reported a Cronbach's Alpha of .70. Additionally, Fairness of Compensation, which consists of specialty pay, pay and allowances, and retirement benefits, reported a Cronbach's Alpha of .52. Moreover, Fairness of Compensation is defined as the individual's perception that their compensation is inadequate or unfair. Finally, Work Related Travel, which is comprised of Length of TDYs and Frequency of TDYs, reported a Cronbach's Alpha of .70. The lower than acceptable scores may be explained by the low number of variables or items in each group being assessed (Nunnally, 1978).

The subsequent step in the analysis consisted of examining the relationship between Job Satisfaction and the four latent variables reported by the factor analysis. The correlation matrix in Table 11 indicates that there are no significant relationships between Job Satisfaction, Fairness of Compensation, Work Related Travel, Workload, and Job Duration.

Table 11: Job Satisfaction Correlation Matrix

		JOB_SAT	FAIR_CMP	WRK_TRVL	WORKLOAD	JOB_DURA
JOB_SAT	Pearson Correlation	1	.051	-.004	.064	.036
	Sig. (2-tailed)	.	.069	.872	.022	.192
	N	1295	1295	1295	1295	1295

Research Question 4 Analysis

The relationship between job satisfaction and turnover intention has been shown to have a strong negative relationship, e.g., when job satisfaction is high, turnover intention is low (Spector, 1997; Mobley et al., 1979; Griffeth et al. 2000; Moore, 2000)). The correlation matrix, Table 12, shows that a significant negative relationship exists between job satisfaction and turnover intention. Relationship is significant at .01 (2-tailed) **. This suggests that as the job satisfaction of Air Force Information System Managers increases, their turnover intention decreases. Furthermore, a reliability assessment of the two questions measuring Job Satisfaction reported a Cronbach's Alpha of .88.

Table 12: Job Satisfaction and Turnover Intention Correlation Matrix

		TURNINT	JOB_SAT
TURNINT	Pearson Correlation	1	-.299(**)
	Sig. (2-tailed)	.	.000
	N	1295	1295

Supplementary Analysis

Although not part of the initial research focus, an additional bi-variant correlation was conducted to examine the relationship between turnover intention and the four factors extracted during the factor analysis. The results in Table 13 suggest a significant positive relationship between Job Duration, Work Related Travel, Fairness of Compensation and turnover intention. The relationship between Workload and Turnover Intention was not significant. Therefore, it is not further examined. This implies that as Air Force Information System managers experience increased levels of Job Duration, Work Related Travel, or Fairness of Compensation their turnover intention increases accordingly. The correlations in Table 13 are significant at .01 (2-tailed **). The results of the bi-variant correlation suggest linear relationships between Turnover Intention, Job Duration, Work Related Travel, and Fairness of Compensation; hence, a regression analysis was performed. Workload did not have a significant relationship with Turnover Intention and was not included in further analysis.

Table 13: Turnover Intention Correlation Matrix

	TURNINT	JOB_DURA	WRK_TRVL	FAIR_CMP	WORKLOAD
TURNINT Pearson Correlation	1	.107(**)	.106(**)	.258(**)	.013
Sig. (2-tailed)	.	.000	.000	.000	.653
N	1295	1295	1295	1295	1295

Based on the results of the bi-variant correlation, a multiple-linear regression was conducted to examine the predictability of turnover intention by Job Satisfaction, Work Related Travel, Fairness of Compensation and Job Duration. The predictor for Turnover Intention entered in to SPSS for Model 1 was Job Satisfaction. The predictors for Turnover Intention entered for Model 2 include Job Satisfaction, Job Duration, Fairness of Compensation, and Work Related Travel. The Model Summary in Table 14 suggests that approximately 8 percent of the variance (R^2) in turnover intention can be explained solely by job satisfaction (Model 1). By including the factors of Job Duration, Fairness of Compensation, and Work Related Travel, the explained variance (R^2) increases to 18 percent.

Table 14: Regression Analysis of Turnover Intention

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.283	.080	.080	1.310	.080	111.67	1	1293	.000
2	.425	.180	.180	1.262	.100	41.55	4	1289	.000

Summary

This chapter presented the analysis of the data collected by the Air Force Occupational Measurement Squadron. The first step in the analysis process was to conduct an exploratory factor analysis on the survey items believed to be indicative of work exhaustion. The factor analysis was performed to determine if the 11 survey items, which this research proposes are indicative of work exhaustion, loaded on one factor. Consequently, the four factors extracted: Workload, Job Duration, Fairness of Compensation, and Work Related Travel, were examined for reliability by determining the coefficient alpha. Additionally, bi-variant correlation matrices were developed to examine the relationships between Workload, Job Duration, Fairness of Compensation, Work Related Travel, Job Satisfaction, and Turnover Intention. Finally, a multiple-linear regression was performed to examine the predictability of turnover intention. Chapter 5 presents the research findings, implications for the Air Force, implications for future research efforts, and limitations.

V. Conclusions and Recommendations

Overview

The focus of this study was to investigate the relationships between work exhaustion, job satisfaction, and turnover intention of Air Force Information System (IS) Managers. The literature supports that higher levels of work exhaustion are associated with decreased job satisfaction. Furthermore, lower levels of job satisfaction, as generally recognized in the literature, are consistently and negatively associated with turnover intention. Archived survey data of AF IS managers in the 33S career field from a recent AFOMS-sponsored Job Inventory Survey were used for the research and included 1355 usable responses, of which 1295 were analyzed to examine the following research questions:

1. Based on the literature, which AFOMS Air Force IS manager Job Inventory Survey (JIS) items are appropriate for assessing work exhaustion?
2. Which AFOMS Air Force IS manager JIS items are indicative of work exhaustion?
3. What is the relationship between work exhaustion and job satisfaction?
4. What is the relationship between job satisfaction and turnover intention of Air Force IS managers?

Discussion

Research Question 1 asks “Based on the literature, which AFOMS Air Force IS manager Job Inventory Survey (JIS) items are appropriate for assessing work exhaustion? These items are: Additional Duties, Length of Duty Day, Work Schedule, Recognition of One’s

Efforts, Pay and Allowances, Specialty Pay, Retirement Benefits, Job Expectations, Job Responsibilities, Length of TDYs, and Frequency of TDYs. The research findings suggest that the 11 items initially proposed as representing the construct of work exhaustion, appear to represent four latent variables; Workload, Job Duration, Fairness of Compensation, and Work Related Travel, all of which literature suggests may be indicative of work exhaustion and job satisfaction. In fact, the 2001 AFOMS Career Field Survey listed pay or allowances, lack of specialty or incentive pay, and lack of opportunity to perform the work you are trained to perform, in the list of top ten reasons AF IS Managers separate before retirement. Furthermore, 35 percent of survey respondents selected these factors as having a “very large influence” in their decision to separate from the Air Force. While addressing Research Question 1, the data analysis provides some evidence that AF IS Managers have underlying work exhaustion and or job satisfaction factors similar to civilian IS managers.

Research Question 2 asks “Which factors indicate work exhaustion of Air Force IS managers?” Of the 11 items that were analyzed, nine loaded on the four underlying variables extracted by SPSS. Given the specific items and the way they loaded on the four variables, it is not certain that all of them are representative of work exhaustion. Although Workload, Job Duration, Work Related Travel, and Fairness of Compensation are supported in the literature regarding work exhaustion, they can also be regarded as antecedents of job satisfaction. Therefore, this research suggests that a measurement tool specifically designed to measure work exhaustion is required to determine if AF IS managers suffer from work exhaustion.

Research Question 3 asks “What is the relationship between work exhaustion and job satisfaction?” Job satisfaction and work exhaustion research suggest a negative relationship between these variables (Moore, 2000; Friedman, 1999; Pines, 1993; Maslach et al., 2001). A simple bi-variant correlation between each of the four new variables (Workload, Job Duration, Work Related Travel, Fairness of Compensation) and Job Satisfaction, revealed that the relationships between them were not significant. This may be another consequence of not using a specific measurement item.

Research Question 4 asks “What is the relationship between Job Satisfaction and Turnover Intention?” A bi-variant correlation using Job Satisfaction and Turnover Intention revealed a negative relationship between them, much like the literature reports in regards to their civilian counterparts. Although the questions measuring job satisfaction and turnover intention are empirically supported, a measurement tool with multiple items addressing each variable might be more meaningful and reveal more significant results.

Supplementary Findings

Further analysis of the data provided by the AFOMS revealed a significant positive relationship between three of the four factors reported by the factor analysis (Job Duration, Work Related Travel, Fairness of Compensation). Moreover, a regression analysis of turnover intention by job satisfaction, job duration, work related travel, and fairness of compensation reported that 18 percent of the variance in turnover intention could be explained. The model presented in Figure 4 is based on the results of this study’s analysis. Therefore, it is merely a suggestion for further research in the area of

work exhaustion, job satisfaction, and turnover intention of Air Force Information System managers.

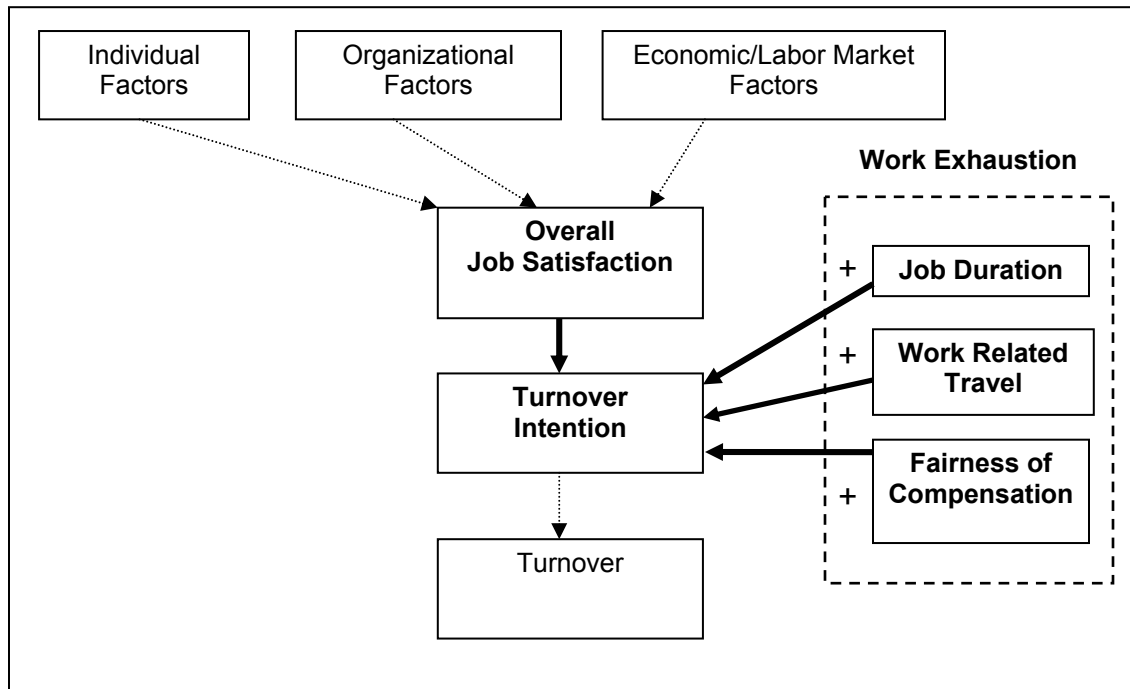


Figure 4: Suggested Research Model

Implications for the Air Force

A finding that should be taken from this research is that Air Force IS Managers appear to be different than other civilian IS managers studied thus far. This may suggest that the retention programs implemented in the civilian sector do not necessarily affect AF IS Managers. For example, flexible work schedules, which some organizations use to reduce work stress, are not an option AF organizations could universally implement.

Therefore, the AF should not blindly implement recruiting and retention programs specifically designed for civilian IS managers unless they fully understand their potential impact on the Communications and Information community, or the entire AF population. In spite of this, it does appear that current retention efforts focusing on pay, specialty pay, retirement, and other quality of life issues may be on the right track. Additionally, the finding that job satisfaction and turnover intention are negatively related may identify a potential area for AF leaders to implement initiatives that could lower turnover intention of AF IS managers by improving their job satisfaction. Furthermore, this research suggests that Job Satisfaction, Fairness of Compensation, Work Related Travel, and Job Duration all contribute to the turnover intention of Air Force Information System managers. With the increased operations tempo, the impact of these factors on turnover intention may become an even more important issue.

Implications for Researchers

Results from this study add to the existing body of knowledge focusing on the relationship between job satisfaction and turnover intention within the armed forces. Specifically, this research uses the Mobley et al. (1979) turnover intention model and integrates work exhaustion as theorized by Moore (2000). The results of using the archival data as provided by the AFOMS for this study introduces the AFOMS's Job Inventory Survey (JIS) into the domain for further study. During the course of this study, it became evident that the JIS was designed purposefully to assess conditions within particular career fields such as duty area and job utilization, it was not designed to address issues relating to separation and retention, except incidentally; however, results

from the JIS are apparently used routinely by senior AF officials to base decisions regarding recruiting and retention techniques and initiatives funding based on perceived factorial influences as presented by the JIS (AFOMS/OMY, 2002a; HQ USAF, 2002).

Limitations

As with nearly all studies, certain factors emerge that introduce uncertainty and limit the reliability of the results. Perhaps the most significant limiting factor in this case is the use of secondary data, which was collected through one observation and did not specifically address the issue of work exhaustion. Second, the survey was mandatory, and data collection included the reporting of identifying information, which was removed prior to dissemination for this research. Cook and Campbell (1979) suggest that the potential bias problems with non-anonymous surveys is that respondents may report what they perceive the researchers want to see, or only that information that positively reflects on their own knowledge, beliefs, abilities, or opinions. These limitations of secondary data affect the validity and reliability of the data. Additionally, the data are self-report, which may subject the results to error based on the inability of a person to accurately recall past events or behaviors, although respondents are best suited to relate information concerning themselves to others (Schacter, 1999).

Another limitation is the data administration methodology which potentially introduces methods effects bias (Dooley, 2001:91). The JIS survey administration methodology varied from base to base because survey control monitors were given discretion as to how to administer the survey to their base's population of interest (AFOMS/OMY, 2002a). It is feasible that survey respondents may have reacted and

answered differently based on their respective base's survey process, time allotted for completion of the survey, unit leadership involvement, peers' influences, self-perceptions of JI survey intent, etc. Furthermore, the list of 31 predetermined separation/retirement factors were presented to respondents without explanation of what particular terms represented; therefore, terms may have been interpreted differently survey takers. For example, the term "pay and allowances" is not specific and could have a unique meaning to each survey respondent based on his or her perception of what "pay and allowances" are comprised of.

Another possible limitation is the lack of reliability and validity information for the archival data set. Because there is no data available on the construct validity of measures used within the JI survey instrument, it is possible that it suffers from method effects (Dooley, 2001; Fiske, 1987). Finally, the results of this study are not applicable outside of the AF IS manager population, yet may hold relative value against studies of other AF populations, particularly if the study is based on JI survey data.

Future Research

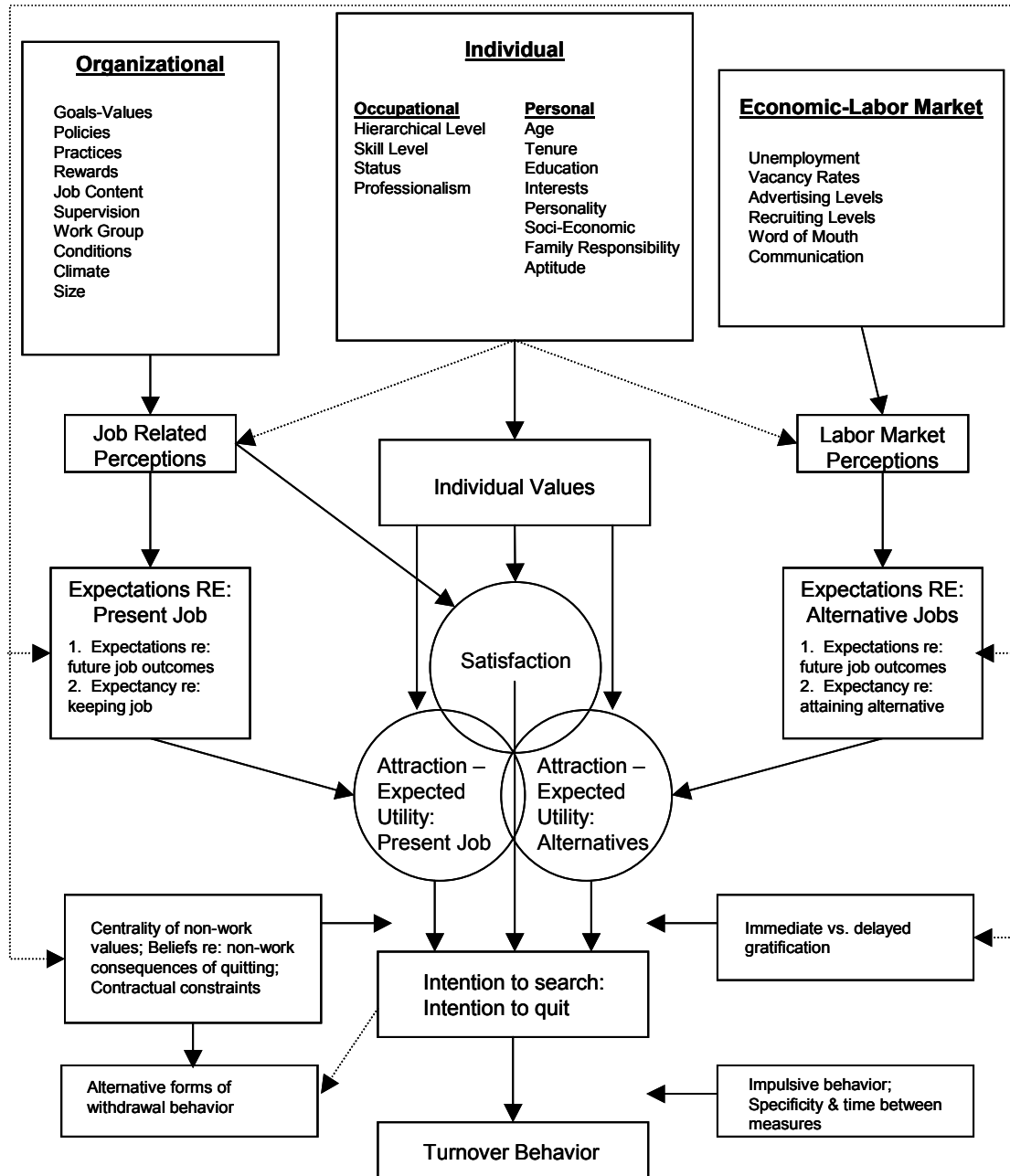
In choosing possible avenues to follow-up the results of this study, a likely place to continue would be to start with developing and administering a survey that more precisely measures the levels of work exhaustion, job satisfaction and turnover intention of AF IS Managers. Additionally, this was a correlational study so it is impossible to determine if the distribution of separation factors would change over time or if those who expressed a high turnover intention will actually separate. Longitudinal studies that track specific groups of individuals may be useful (Rogasa, 1995) to determine career

intentions over time. Furthermore, a longitudinal study could be valuable in determining if turnover intention equals actual turnover behavior. The fact that 54 percent of AF IS managers with less than 8 years TAFMS plan to separate before retirement (AFOMS, 2001) suggests that there is still further research needed in this area.

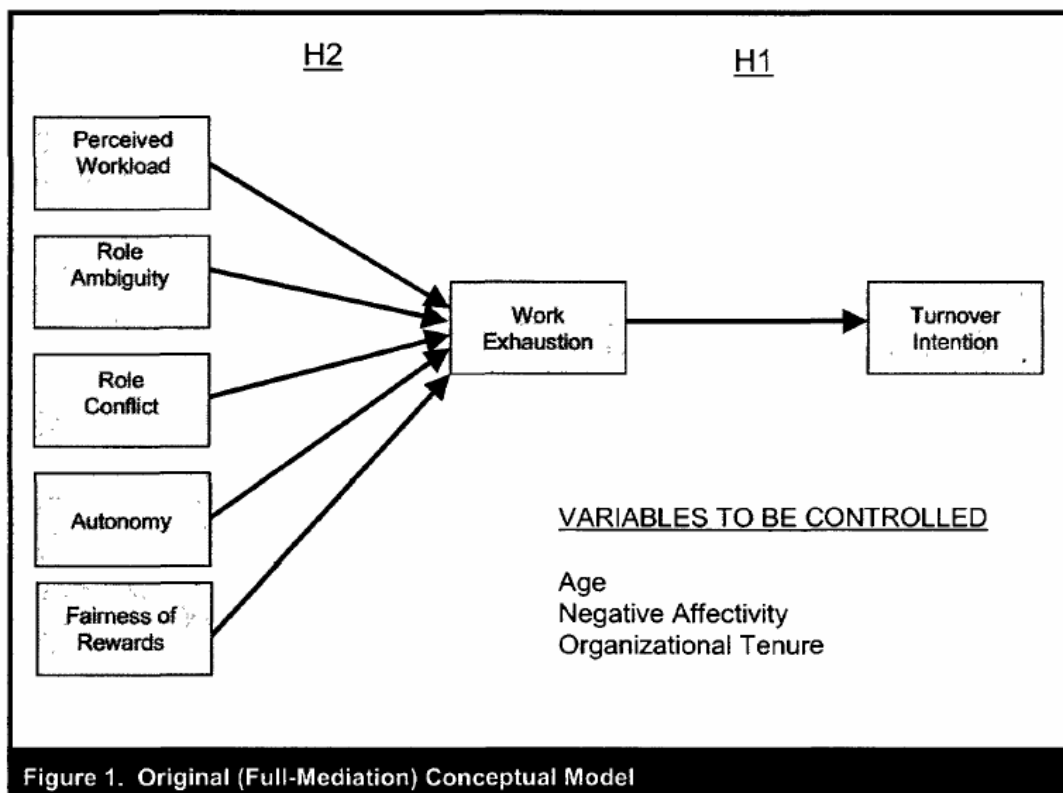
Conclusion

Results from this study imply that AF IS Managers are different from civilian IS managers in what they consider important in a career. Particularly, that Air Force IS managers exhibit underlying work exhaustion characteristics that do not affect their job satisfaction. After analyzing the data, limited support was found for each of the stated research questions. Additionally, results from this study suggest that work exhaustion alone may not be an adequate predictor of job satisfaction or turnover intention for Air Force IS managers. Thus, further research into organizational and individual factors is needed to determine why AF IS managers are separating at a rate higher than the general Air Force population.

Appendix A: Mobley et al's Employee Turnover Model



Appendix B: Moore's Work Exhaustion and Turnover Model (2000)



Appendix C: AFOMS Questionnaire Items Used for Research

2. How do you find your job? **Choose only one.**

Extremely Dull
Very Dull
Fairly Dull
So-So
Fairly Interesting
Very Interesting
Extremely Interesting

5. How satisfied are you with the sense of accomplishment you gain from your work? **Choose only one.**

Extremely Dissatisfied
Very Dissatisfied
Slightly Dissatisfied
Neither Satisfied Nor Dissatisfied
Slightly Satisfied
Very Satisfied
Extremely Satisfied

6. Indicate which one of the following **best** describes your Air Force career plans. **Choose only one.**

Definitely separate before retirement
Probably separate before retirement
Undecided
Probably stay for retirement
Definitely stay for retirement

7. Indicate the factor(s) that have influenced your decision to separate from the Air Force before retirement.

Choose all that apply.

Additional duties
Availability of assignments
Availability of civilian jobs
Availability of dental or medical care
Competitive sourcing and privatization
Conflict with spouse's career or job
Decreased retirement benefits
Educational opportunities
Family separation
Frequency of PCS moves
Frequency of TDYs
Incompatibility with family responsibilities
Job expectations too great
Job responsibilities
Lack of adequate training
Lack of career progression
Lack of command opportunities
Lack of control over future assignments
Lack of esprit de corps
Lack of opportunity to perform work you are trained to perform
Lack of specialty or incentive pay
Length of duty days
Length of TDYs
Location of assignments
Number of remote assignments required
Pay or allowances
Promotion opportunities
Quality of Air Force leadership
Quality of coworkers
Quality of dental or medical care
Quality of housing
Quality of immediate supervisor
Recognition of one's efforts
Relocation costs
Work schedule
Other

8. If career field-specific incentive or bonus pay were available to Communications and Information officers, how much annual incentive pay would convince you to stay in the Air Force?

Added incentive pay alone would **not** convince me to stay in the Air Force

Less than \$3,000
\$3,000 to \$5,999
\$6,000 to \$8,999
\$9,000 to \$11,999
\$12,000 to \$14,999
\$15,000 to \$17,999
\$18,000 to \$20,999
More than \$21,000

9. Indicate the factor(s) that have influenced your decision to stay in the Air Force for retirement. **Choose all that apply.**

Ability to perform a variety to different work
Ability to perform meaningful work
Additional duties
Availability of assignments
Availability of dental care
Career progression
Command opportunities/level of responsibility
Compatibility with spouse's career or job
Competitive sourcing and privatization
Culture of the military
Desire to serve your country
Educational opportunities
Esprit de corps
Feeling valued by the Air Force
Frequency of PCS moves
Frequency of TDYs
Job expectations
Job responsibilities
Lack of family separation
Length of duty days
Length of TDYs
Location of assignments
Number of remote assignments required
Opportunity to perform work you are trained to perform
Pay or allowances
Promotion opportunities
Quality of Air Force leadership
Quality of coworkers
Quality of dental or medical care
Quality of housing
Quality of immediate supervisor
Recognition of one's efforts
Retirement benefits
Work schedule
Other

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Vita

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14. ABSTRACT This research will take the existing theories of work exhaustion (Moore, 2000), job satisfaction and turnover intention (Mobley et al., 1979), and apply them to Air Force Information System (IS) Managers. The specific focus of this research will be to investigate the relationship between work exhaustion, job satisfaction, and turnover intention of Air Force Information System (IS) Managers. For the purpose of this study, IS Managers are comprised of company grade officers (lieutenants and captains) in the Communication and Information career field (33S).					
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