3-2004

Effects of Duty Schedule Variance and Overtime on the Job Satisfaction and Turnover Intentions of USAF F-16 Crew Chiefs

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EFFECTS OF DUTY SCHEDULE VARIANCE AND OVERTIME ON THE JOB SATISFACTION AND TURNOVER INTENTIONS OF USAF F-16 CREW CHIEFS

THESIS

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AFIT/GLM/ENS/04-17

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AFIT/GLM/ENS/04-17

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THESIS

Presented to the Faculty

Department of Operational Science

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Logistics Management

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March 2004

AFIT/GLM/ENS/04-17

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Abstract

This thesis empirically assessed how duty schedule variance and overtime affect the job satisfaction and turnover intentions of USAF F-16 crew chiefs. A survey was completed by 346 active duty USAF F-16 crew chiefs regarding their perceptions of duty schedule variance, overtime, job satisfaction and intent to leave the Air Force. Theory suggests that turnover behavior is a multistage process that involves organizational, individual, and attitudinal components. Using multivariate correlation and regression analyses, plausible evidence was found to support the idea that duty schedule variance and overtime plays a role in USAF F-16 crew chief turnover intentions via job satisfaction. Additional evidence supported the theory that these path relationships changed in strength for demographic sub-categories based on age, but not for education, length of service, marital status or number of dependents.

Acknowledgements

I would like to express my sincere appreciation to my faculty advisor, Lt Col Stephen Swartz, for his enthusiasm and guidance throughout the course of this thesis effort. I would also like to acknowledge the efforts of several other faculty members: Major John Bell for providing direction, encouragement and support, Major Danny Holt for sharing his expertise in measurement theory, and Mr. Terrence Sampson for his outstanding support in creating and maintaining the World Wide Web survey site.

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EFFECTS OF DUTY SCHEDULE VARIANCE AND OVERTIME ON THE JOB SATISFACTION AND TURNOVER INTENTIONS OF USAF F-16 CREW CHIEFS

I. Introduction

Background

The Air Force is extremely concerned with flight safety. Clearly, there are several factors that influence this. One of the most important factors is the maintenance performed on our aircraft. The Air Force directive for aircraft and equipment maintenance management is Air Force Instruction (AFI) 21-101. It provides the minimum essential guidance and procedures for safely and effectively maintaining, servicing, and repairing aircraft and support equipment at the base level (Department of the Air Force, 2002:1). This instruction states that during normal operations, aerospace equipment maintenance personnel are to be scheduled for duty based on a 40-hour workweek and that they are not to be scheduled for more than 12 hours of continuous duty (group commanders may approve duty hours in excess of 12 hours up to a maximum of 16 hours).

While AFI 21-101 defines a scheduled 40-hour work week as part of its minimum essential guidance and procedures for safely and effectively maintaining aircraft and support equipment at the base level, the reality of many Air Force Aircraft Maintenance Squadron (AMS) duty schedules is quite different. Flying schedules are built to support real world missions and to ensure assigned aircrew members can complete required

proficiency training. This large scope of mission and pilot training requirements can result in a different flying schedule for each day of the week. Aircraft Maintenance Squadrons must schedule their personnel to ensure adequate support for all scheduled and unscheduled pre- and post-flight maintenance actions to include the launch and recovery of each scheduled flight. Air Combat Command Instruction 21-101, Pacific Air Force Instruction 21-101, and United States Air Forces in Europe Instruction 21-101 all direct fighter maintenance units to operate on a two shift schedule; a dayshift and swing-shift. These instructions also allow for fighter maintenance units to operate a minimally manned mid-shift that is restricted to performing aircraft servicing and minor maintenance procedures (i.e. service tires, struts, liquid oxygen converters, perform pre-flight inspections and other minor maintenance).

In order to comply with the mandated two shift schedule and provide adequate mission support for the continually changing flying schedule, many Aircraft Maintenance Squadrons are forced to have maintenance personnel work nonstandard duty schedules. For example, dayshift workers may be required to report for duty at 0730 hrs on Monday, 0630 hrs Tuesday, 0930 hrs Wednesday, 0930 hrs Thursday, and 0700 hrs on Friday (see Appendix A to view a copy an actual AMS duty schedule). The duty schedule generally changes each week to support flying operations and sometimes changes drastically to support night flying operations. In addition to the shifting Monday-Friday duty schedule, maintenance personnel are also repeatedly required to work overtime and weekend shifts in order to produce a sufficient number of Fully-Mission-Capable (FMC) aircraft to support the flying schedule.

Problem Statement

Generally, work schedules are designed to meet organizational needs and constraints, and the better the match between work schedules and these needs and constraints, the more effective the organization. The duty schedule can enhance performance through the coordination of work among employees and the meeting of customer and client needs (Dunham, Pierce, and Castaneda, 1987). Nevertheless, when designing a work schedule, if great care is not taken to balance the needs of the organization with the needs of the individual workers, the organization can suffer. A work schedule should attempt to meet employee needs for off the job activities such as conducting personal business and interacting with friends and family. The degree to which the work schedule interferes with off-job activities is related to worker satisfaction with the schedule itself, which could exert influence on more general reactions to the work schedule such as overall job satisfaction, job involvement, motivation, experienced stress, interpersonal relationship conflicts, and turnover (Dunham et al., 1987).

The mission of the United States Air Force is to defend the United States through the control and exploitation of air and space. The nature of this mission dictates that the needs of the organization must come first and often limits the ability of commanders and supervisors to consider the needs of their workers when constructing duty schedules. In addition, the reduction-in-force initiatives of the 1990's have reduced the number of enlisted Air Force members from 495,245 troops in 1987 to approximately 296,130 troops in 2002 (HQ Air Force Personnel Center, 2004). The Air Force is currently the smallest it's been since it's inception in 1947, but it is supporting more operations on more fronts than anytime in history (Murray, 2003). A combination of the reduced

manpower levels and increased operations tempos have placed increased workloads on aircraft maintainers (Collette, 1999:5). As a result, aircraft maintainers are often forced to work nonstandard shifts and frequent overtime to provide the FMC aircraft required to support their unit's mission. A nonstandard shift is defined here as a duty schedule which requires employees to work different hours each week or each day. Currently it is unknown how this type of duty schedule affects the job satisfaction and turnover intentions of USAF F-16 Crew Chiefs.

Research Question and Hypotheses

This thesis applies a modified version of Spector's (1997) "Model of Employee Turnover as a Function of Job Satisfaction and Unemployment Rates" (Figure 1) to a random selection of USAF F-16 Crew Chiefs in order to answer the question: "***Do nonstandard shift schedules (schedule variance) and overtime negatively impact the job satisfaction and turnover intentions of USAF F-16 Crew Chiefs?***" This theoretical model can be interpreted to propose organizational factors such as pay, promotion opportunity, fringe benefits, contingent rewards, operating conditions, nature of the work, communication, management, and coworkers combine with individual factors such as length of service, age, education, and marital status to determine an individual's level of job satisfaction (Bluedorn, 1982: 138). If the level of job satisfaction is sufficiently low, the individual will develop a high propensity to leave their job.

To answer the research question, this study focuses on the following four hypotheses:

Hypothesis 1: ***As schedule variance increases, job satisfaction decreases***.

Hypothesis 2: ***As overtime increases, job satisfaction decreases***.

Hypothesis 3: ***As job satisfaction decreases, turnover intention increases.***

Hypothesis 4: ***Job satisfaction is influenced by the individual factors of age, pay grade, level of education, and marital status.***

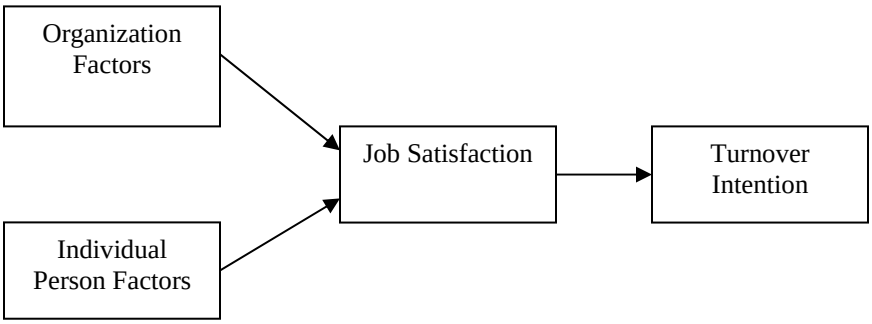


Figure 1. Model of Turnover Intention as a Function of Job Satisfaction

Overview of Methodology

A survey was designed to measure and assess the job satisfaction, shift satisfaction, overtime and schedule variance of randomly selected USAF F-16 Crew Chiefs. The data collected from returned surveys was then applied to and used to test the theoretical turnover intention model (Figure 1). This was accomplished using multivariate correlation and multiple regression analysis techniques. The research design, sample, population, instrument, data collection, and analysis methodology is presented in detail in Chapter III.

Summary

This research attempts to answer the research question with the guide of four hypotheses. In chapter two, a review of the relevant literature will be presented. In

chapter three, the method by which data was gathered and analyzed will be summarized. In chapter four the data analysis is reported. The fifth and final chapter discusses the implications of the data analysis in answering the research question and presents additional findings.

II. Literature Review

The purpose of this research is to assess the impact of nonstandard shifts and overtime on the job satisfaction and turnover intention of USAF F-16 Crew Chiefs. Studies have established that both organizational and individual factors influence employee job satisfaction and that job satisfaction correlates with job performance, absenteeism, tardiness, depersonalization, physical health, psychological well-being, and turnover intent (Spector, 1997). Each of these individual worker attributes can have varying degrees of direct and/or indirect impacts on organizational effectiveness and therefore it is important to understand how different factors influence these attributes. A review of the literature reveals numerous studies that looked at shiftwork or extended hours as antecedents to various outcomes. Some of the outcomes studied were health, social activities, and interpersonal relationships. The following sections seek to summarize the findings of several such studies with the final section attempting to interpret how such outcomes relate to job satisfaction and turnover intentions.

The Circadian Rhythm

Shiftwork and extended duty hours can have an adverse effect on the health of shiftworkers. A review of the related literature reveals substantial evidence to support this claim. It appears that employees working shift schedules tend to have higher incidences of health problems than non-shiftworkers. Many of the health problems experienced by shiftworkers are believed to result from the disruption of a workers circadian rhythm (Luna, 1996). A circadian rhythm is essentially a human beings internal daily biological clock. The circadian rhythm is what regulates hormone

secretion, sleep-wake cycles, and other physiological processes. Human beings are diurnal creatures and the circadian system strives to keep us asleep at night and awake during the day (Monk, 1986). The circadian system can be reset or adjusted to become realigned with a change in routine, but this readjustment is not instantaneous. For a shiftworker, resynchronization of the circadian system takes approximately one day for each one hour shift change (Luna, 1986). Therefore, it would take approximately eight days for a circadian system to adapt to an eight hour shift change. During this period of adjustment a person's new work/rest cycle is no longer synchronized with the external environment, or with themselves. This is called internal dissociation and can induce loss of appetite, changed bowel habits, impaired performance, malaise, and poor sleep (Aschoff, Hoffman, Pohl, and Wever, 1975). Repeated internal dissociation over a long period of time may lead to chronic health problems and could explain why much of the research indicates that overall health appears to be least damaged when workers are assigned to permanent shift schedules (Luna, 1996).

Effects of Shiftwork and Extended Duty Hours on Health

Shiftwork and extended hour studies have been conducted on a wide range of professions in a number of different countries. These studies have included factory workers in Germany, bus drivers in Australia, mill workers in Belgian, nurses in England, and police officers in the United States. Across this variety of professions, geographic locations, and cultures these studies have time and again produced evidence suggesting that nonstandard duty schedules can result in negative health consequences for

employees. A brief overview of several such studies is presented in the following paragraphs.

German Factory Workers. Frese and Norbert (1986) conducted a questionnaire study of 3,446 blue-collar male workers from chemical, paper, and ceramic operations in the Federal Republic of Germany. In this study shiftworkers were compared with workers who had never worked shifts, workers who had previously worked shifts but ceased because their physician had told them to, and workers who left shiftwork for reasons other than health. The sample population consisted of 1295 shiftworkers with 8-hour shifts, 1198 shiftworkers with 12-hour shifts, 693 workers who had never worked shifts, 108 former shiftworkers who left because of health reasons on a physician's advice, and 152 former shiftworkers who left for reasons other than health. The questionnaire measured environmental stress, psychological stress, psychosomatic complaints, irritation strain, and health complaints. Analysis of the questionnaire responses revealed that shiftworkers showed statistically significant higher levels of psychological stress at work and more health problems (e.g. fatigue, sleep disorders, stomach disease, bowel disease, and heart disease) than non-shiftworkers.

Belgian Wire Mill Workers. Meers and Verhaegen (1978) studied 104 Belgian wire mill employees working on a semi-continuous four-shift system. The shift cycle consisted of four Monday-Saturday work weeks with Sundays always off. Employees worked one week of morning shifts (0800-1600 hrs), followed by one week of afternoon shifts (1600-2400 hrs), then one week of night shifts (0000-0800 hrs), and then would have one work week off. The subjective health of these employees was measured three

times. Once several weeks before they started working the four-shift system, a second time after they had been working the four-shift system for six month, and a third time after they had been working the four-shift system for four years. Results from this study show that after six months of shift work, the workers had an increase in complaints of fatigue, apathy, gastro-intestinal disorders, palpitations and nervousness and that the decrease in subjective health that occurred in the first six months had not disappeared after four years, but in fact had become more pronounced. After four years 31 of the original 104 subjects had left the plant all together, 25% of this group stated they left the plant because of concerns for their subjective well being and/or disruptions of social relations. For this group the number of subjective health complaints did not differ from the health complaints reported at the six month point. The subjective health of employees who left the plant had stabilized, while the subjective health of employees still on shiftwork had continued to deteriorate.

Swedish Steel Workers. Akerstedt and Torsvall (1978) evaluated the long term effects of shift work on the well-being of steel workers in central Sweden. The focus of their study was 400 blue collar employees, all working at the same factory and assigned to four different types of shift schedules: (1) Dayshift, Monday-Friday from 0700-1600hrs (2) Two shift work, Monday-Friday. Morning shift was from 0445-1300 hrs, the afternoon shift was from 1300-2115 hrs; shifts alternated each week (3) Three shift work, same as two shift work with the addition of a night shift from 2115-0445 hrs (4) Four shift work, same as three shift work except four shift workers changed shifts every 2 or 3 days instead of every 7 days. Economic reasons were forcing the company to cut-down shift work and reassign approximately half of the three-shift and four-shift workers.

Some of the four-shift workers were reassigned to three-shift, two-shift and day work, and some of the three-shift workers were reassigned to two-shift work and day work. The remainder of workers did not change shift schedules. A few months prior to the implementation of the shift reassignments a questionnaire designed to measure general well-being, shift dependent well-being, sleep length, attitude, sickness absence, and inter-individual differences was administered to 97 percent of the factory employees, this same questionnaire was re-administered to the same employees within the first year of their shift reassignments. The results from this study found that employees who switched from shift work to steady day work reported greatly increased social well being, a shortening of sleep-length during free days, reduced sickness absence rates and considerably improved attitudes towards their work schedules.

Australian Coach Drivers. Peter Raggatt (1991) studied the work conditions, coping behaviors and stress among 93 Australian long-distance coach drivers. His research focused on how the environmental factors of driving long distance coach related to maladaptive coping behaviors and stress outcomes. Environmental factors he studied included the number of years experience as a coach driver, average number of hours spent at the wheel per shift, percent of driving done at night, passenger complaints, and the quality of coach maintenance. Maladaptive coping behaviors studied were: speeding, taking drugs, frequent alcohol use, hours of sleep and reduced quality of sleep. Stress outcomes measured and studied were: doctor visits, accidents, health problems, stress symptoms, and job dissatisfaction. A correlation analysis between the environmental factors and the measures of maladaptive coping behaviors revealed that the average number of hours spent at the wheel per shift was the single best predictor of maladaptive

coping behaviors. Hours spent at the wheel were significantly correlated with all of the maladaptive coping behaviors except for frequency of speeding. The average number of hours spent at the wheel had a positive correlation with drug and alcohol use (r = .35 and .28 respectively) and a negative correlation with hours of sleep (r = -.23) and quality of sleep (r = -.40). Furthermore, a correlation analysis between the measures of maladaptive behaviors and the stress outcome variables showed many other significant correlations. Drug use, alcohol consumption, hours of sleep and quality of sleep all had significant correlations with job satisfaction (r = -.51, -.31, .36, and .57 respectively). Raggatt concluded that the foregoing correlation analyses imply that long work hours can lead to maladaptive coping strategies and behaviors which in-turn lead to increased stress consequences such as reduced hours of regular sleep, decreased sleep quality, increased health problems, increased doctor visits and decreased job satisfaction.

American Control Room Operators. Rosa and Bonnet (1993) performed worksite studies of performance and alertness on 8 hour and 12 hour rotating shifts at a large natural gas utility. For this study, a group of control room operators (all male with ages ranging from 25-59 and an average age of 37) working an 8 hour/3-shift rotation schedule had their individual levels of performance and fatigue assessed at various times throughout the workday and workweek. Their levels of fatigue and performance were assessed with a battery of standard performance tests and self-report scales. After several months of this testing, the workers were then transitioned to a 12 hour/2-shift rotation schedule and given 7 months to adapt. After completion of the 7 month adaptation period, the workers were once again subjected to the same battery of standard performance tests and self-report scales at various times throughout the workday and

workweek. The results of the test battery and self report scores from the 8 hour schedule were then compared with the results from the 12 hour schedule. The comparison revealed that the workers had decreased test battery performance and increased subjective fatigue on 12 hour shifts as compared to the 8 hour shifts. After 3-5 years on the 12 hour shift schedule workers were tested again and the results showed that declines in alertness with time on-shift and reductions in total sleep time were still apparent. When the workers were on 12 hour shifts they had more frequent simple reaction time misses and more grammatical reasoning errors than when they were on 8 hour shifts. These results have shown declines in alertness after increasing shift length by 50%. The declines in alertness observed in this study were most apparent at night and emphasizes a need to schedule critical and hazardous activities early in the shift whenever possible.

Austrian Oil Refinery. Koller, Kundi and Cervinka (1978) conducted field studies of shiftworkers at an Austrian oil refinery. A questionnaire containing items about personal, family, and social life, and health, working conditions, and sleep was administered to 270 workers in an oil refinery. In addition to the questionnaire a physician also conducted a private interview with each of the respondents to better assess the current health of each respondent. Of the 270 respondents, 171 were permanent shiftworkers, 57 were permanent day workers and 32 had changed from shiftwork to day work. The results of this study showed that a significantly greater proportion of the shiftworkers reported more trouble sleeping, dissatisfaction with their work schedules, and reported a greater perceived connection between their health problems and their work. The state of health of shiftworkers was significantly worse than the state of health of day workers; shiftworkers appeared to have more gastrointestinal and cardiac disorders

than the day workers; and a much greater proportion of shiftworkers stated that they had needed medical services and drugs.

British Nurses. Barton and Folkard (1991) conducted a study of non-industrial male and female psychiatric nurses who were working a shift schedule. Day- and night-shift nurses were compared on a range of questionnaire measures. The questionnaire measured shift satisfaction, work-life conflict, self-reported stress, and the value each individual attached to different days of the week for time off work. The nurses in this study had freely chosen to work either as a permanent day-shift or permanent night-shift nurse. The day-shift nurses worked a three shift system which included morning (0725-1330 hrs), afternoon (1315-1940 hrs) and full day (0725-1940 hrs) shifts. A typical schedule rotation for day-shift nurses would be a full day on Monday, followed by a morning shift on Tuesday, then an afternoon shift on Wednesday, then a morning shift on Thursday, then a day off, followed by a full day on Saturday. Night-shift nurses worked a single shift system. Their shift was from 1925-0740 hours, and they would work two or three nights in succession then have the equivalent number of nights off. Results of this study indicated that the permanent day-shift nurses working a three-shift rotating schedule had significantly more domestic type problems than the night-shift nurses who were working a single-shift rotating schedule. However the night-shift nurses reported significantly higher levels of stress than the day-shift nurses.

Conclusion. The preceding paragraphs presented a brief overview of several different shiftwork and extended duty hour studies that have examined the impact of extended duty hours and shiftwork on employee health. The literature reviewed in these paragraphs is just a sample of the thousands of shiftwork and overtime studies that have

been published over the last forty years and have been presented here to illustrate the association between shiftwork and negative health consequences. The studies presented cover a wide variety of professions, work environments, and duty schedules across several different countries and the results of each of theses studies supports the idea that shiftwork and extended duty hours can have negative health consequences for workers.

Effects of Shiftwork and Overtime on Job Satisfaction and Turnover Intentions

Job satisfaction has been defined as "a positive emotional state produced from a person's experience associated with his or her job" (Locke, 1969: 310). From this definition one might postulate that positive experiences associated with their job will increase job satisfaction, while negative experiences associated with their job will decrease job satisfaction. The literature reviewed in this chapter has clearly demonstrated that shiftwork and extended hours can be associated with negative consequences on worker health, safety, and interpersonal relations. Thus, it is expected that employees who work nonstandard shifts and overtime are at risk to experience these negative consequences, which would in-turn decrease their level of job satisfaction. It follows that a decrease in an individual's level of job satisfaction should increase their propensity to leave the organization (turnover intention). This statement is supported by numerous studies, which over the years have attempted to explain employee turnover behavior. Several such studies are presented in the following paragraphs:

Bluedorn (1982) developed a theoretical turnover model that suggested there are sixteen different organizational and individual factors (promotion opportunities, centralization, formalization, communication, equity, pay, routinization, integration,

environmental opportunities, role conflict, and length of service, age, education and marital status) which influence employee job satisfaction. The model also predicted that job satisfaction would influence organizational commitment; that organizational commitment influenced job search behavior; and that job search behavior influenced turnover intentions. In an attempt to validate this theoretical model a questionnaire was administered to employees in the operations division of a large insurance company. The majority of respondents were women (94 percent). The questionnaire was designed to measure: instrumental communication, member integration, routinization, centralization, equity, environmental opportunity, formalization, foregone environmental opportunities, role conflict, job satisfaction, turnover intentions, organizational commitment, job search, marital status, age, length of service, pay and education. Multivariate correlation, regression and path analyses were conducted to determine how well the data collected fit the theorized turnover model. Analysis of the data collected for this study revealed that: instrumental information, equity, and age directly influenced job satisfaction; and that job satisfaction was negatively correlated with turnover intentions. In this study the job satisfaction variable was able to account for approximately 30 percent of the variance in the turnover intention variable. It was also found that the most important determinants of actual turnover were: environmental opportunities, turnover intention, routinization, and age.

Ghiselli, La Lopa, & Bai (2001) studied the relationships between job satisfaction, life satisfaction and turnover intent of 459 food-service managers from 24 different food service companies. Approximately two-thirds of the respondents were men, held positions ranging from second assistant manger to general manger, earned salaries

ranging from $20,000/yr to $65,000/yr, and had an average age of 32.6 years. Data for this study was collected with a mail survey designed to measure job satisfaction, life satisfaction, role conflict and turnover intentions. These subscales yielded reliabilities ranging from .80 for role conflict to .87 for satisfaction. From the analysis of the data collected, the authors inferred support for the following statements: an increase in job satisfaction is positively correlated with increased salary; job satisfaction does not vary significantly among the various managerial categories or by gender, marital status, ethnicity, education, or length of industry experience; interrole conflict decreases as salary and length of employment increased; and that intent to turnover decreases as job satisfaction, life satisfaction, and age increases.

Igbaria and Guimaraes (1993) explored the antecedents and consequences of job satisfaction for information center employees. For this study, ninety-two employees from twenty-eight companies known to have significant information center activities were asked to complete a survey questionnaire. Seventy-six of the ninety-two employees completed the questionnaire for an 82.6 percent response rate. Forty-seven percent of the respondents were men, fifty-three percent were women, their ages ranged from 21 to 46 years old, their average length of service in their current organization was 5.18 years, and the highest level of education attained for the majority of respondents was a bachelor's degree (69.7 percent). The questionnaire was designed to measure role ambiguity, role conflict, job satisfaction, organizational commitment, and turnover intention. Multiple regression analysis was used to assess: the main effects of each of the role stressors on job satisfaction; the effects of job satisfaction on organizational commitment; the effects of individual factors (age, gender, tenure, and education) on organizational commitment;

the effects of job satisfaction on turnover intentions; and the effects of organizational commitment on turnover intentions. The results of these analyses suggest that: both role ambiguity and role conflict are negatively correlated with job satisfaction; both job satisfaction and organizational commitment are negatively correlated with turnover intention; role stressors and job satisfaction account for approximately 27 percent of the variance in the organizational commitment variable; and that age and gender are both significantly correlated with job satisfaction. The results of this study supported the authors' expectation that overall job satisfaction is an important predictor of information center employee organizational commitment and intent to leave the organization.

Cote and Morgan (2002) performed a longitudinal analysis of the association between emotion, regulation, job satisfaction, and intentions to quit. They hypothesized that: (1) The suppression of unpleasant emotions decreases job satisfaction; (2) the suppression of unpleasant emotions increases intentions to quit; (3) the amplification of pleasant emotions increases job satisfaction; (4) the amplification of pleasant emotions decreases intentions to quit; (5) the effect of the amplification of pleasant emotions on intentions to quit is mediated by job satisfaction; (6) and the effect of the suppression of unpleasant emotions on intentions to quit is mediated by job satisfaction. A questionnaire designed to measure emotion regulation, job satisfaction, turnover intentions, and control variables was administered to 103 working college students on two separate occasions; the first administration was accomplished in a large laboratory setting by a research assistant who was unaware of the research hypotheses and the second administration was completed four weeks later at the same location. The mean age of the 103 participants was 19.1 years, 78 were female and 33 were male, and 71 percent identified themselves

as Caucasian. The participants held a variety of jobs in the service industry and worked an average of 11.94 hours a week. The results of this study supported the researcher's hypotheses that: the suppression of unpleasant emotions decreases job satisfaction; the amplification of pleasant emotions increases job satisfaction; the suppression of unpleasant emotions increases intentions to quit; the amplification of pleasant emotions decreases intentions to quit; and job satisfaction mediates the effect of the suppression of unpleasant emotions on intentions to quit. The data did not support the researcher's hypothesis that job satisfaction mediates the relation between the amplification of pleasant emotions and intentions to quit. This longitudinal analysis revealed that emotion regulation influences both job satisfaction and intentions to quit and there was evidence of a path from 'amplification of pleasant emotions' to 'intentions to quit' through 'job satisfaction.' The results also support the statement that the suppression of unpleasant emotions increases job satisfaction and that the amplification of pleasant emotions increases job satisfaction.

Lum, Kervin, Clark, Reid and Sirola (1998) performed a study that attempted to explain the relationships between job satisfaction, pay satisfaction, organizational commitment and turnover intentions of registered nurses. The authors hypothesized that job satisfaction effects turnover intentions via organizational commitment, and that pay satisfaction directly affects both job satisfaction and turnover intent. To test these hypotheses a questionnaire designed to measure job satisfaction, pay satisfaction, organizational commitment, and turnover intentions was administered to 466 registered nurses at a large urban hospital. The pay satisfaction subscale yielded a Cronbach alpha of .69, the job satisfaction subscale yielded a Cronbach alpha of .75, and the

organizational commitment subscale yielded a Cronbach alpha of .83. The majority of respondents were female (97 percent) with a mean age of 32.4 years. More than half reported being married or cohabiting. Approximately 72 percent did not have children and the most commonly reported range of annual nursing income was $30,000 to $39,000. The majority of the sample worked full time (77 percent) and their mean experience was 7.8 years. Approximately half of the nurses who participated were assigned to general care and approximately half were assigned to critical care units. Correlation and path analytic analyses of the data revealed that: pay satisfaction and organizational commitment influence job satisfaction; job satisfaction in-turn influences turnover intentions; gender, income, and marital status have little or no impact on job satisfaction, organizational commitment, or turnover intentions; and that pay satisfaction has both a direct and indirect effect upon nurses' turnover intentions.

Udo, Guimaraes, and Igbaria (1997) investigated the antecedents of turnover intention for manufacturing plant managers in the south-eastern United States. The purpose of this research was to address the following six research questions: (1) What is the impact of role stressors on the turnover intentions of plant managers?; (2) What is the impact of task characteristics on their turnover intentions?; (3) Do work-related attitudes (such as job involvement, job satisfaction, and organizational commitment) mediate the effects of role stressors and task characteristics on their turnover intentions; (4) What is the impact of work-related attitudes on turnover intentions?; (5) Do job satisfaction and organizational commitment mediate the effect of job involvement on turnover intentions?; and (6) Does organizational commitment mediate the effects of job satisfaction on turnover intentions? To answer these research questions, a survey

designed to measure role ambiguity, role conflict, task characteristics, job involvement, job satisfaction, organizational commitment, and intent to stay was mailed to a random sample of 1,000 manufacturing plant managers in the south-eastern USA. Completed surveys were received from 216 plant managers for a 21 percent response rate. Correlation analysis of the collected data revealed that task characteristics are positively correlated with: job involvement (r = .019); job satisfaction (r = .20); organizational commitment (r = .19); and intent to stay (r = .14). Role ambiguity was found to be negatively correlated with task characteristics (r = -.31) and job satisfaction (r = -.22). Intention to stay was found to be positively correlated with job involvement (r = .22), job satisfaction (r = .32), and organizational commitment (r = .42). From the correlation analysis multiple regression models were hypothesized and run. The results of the multiple regression analyses revealed that: role ambiguity showed a significant negative effect on job satisfaction; role conflict had a significant effect on job satisfaction; job involvement had positive effects on organizational commitment and intention to stay; job satisfaction in-turn had significant positive effects on organizational commitment and intention to stay; organizational tenure positively affected intention to stay; and gender, age, and education had no significant effects on any of the dependent variables.

Conclusion. The studies presented in the preceding paragraphs examined the relationships between individual factors, organizational factors, job satisfaction, organizational commitment, and turnover intentions of employees. The employees considered in these studies included a wide range of demographic categories and professions across several different industries and included both full-time and part-time employees. Across this wide range of professions, work environments and demographic

categories a consistent and recurring theme of these studies has been a linkage between job satisfaction and turnover. The results of these studies have been somewhat consistent in suggesting that employee turnover is a multistage process beginning with organizational factors that influence job satisfaction, that job satisfaction in-turn influences turnover intentions, and that turnover intentions then leads to actual turnover. This logic appears to hold true for many different professions and work environments, and it does not appear to differ significantly between demographic subcategories.

Summary

The literature presented covers a wide range of shiftwork, extended duty hour, and employee turnover studies. The studies presented cover a wide variety of professions, work environments, and worker demographic subcategories. The results of these studies support the idea that shiftwork and extended duty hours put workers at risk to experience negative consequences, these negative consequences may influence job satisfaction which may influence turnover intentions.

III. Methodology

Objective

The primary objective of this study was to empirically assess the effects of nonstandard duty schedules and overtime on job satisfaction and turn-over intentions of United States Air Force (USAF) F-16 Crew Chiefs. This research will attempt to identify relationships between duty schedules, job satisfaction, and turn-over intentions of Air Force members. This project gives the participants an opportunity to share their feelings and thoughts regarding their current duty schedules and the impact these duty schedules have on their overall job satisfaction and turn-over intentions. Thus, the data collected should have a very high payoff for organizational leaders by giving them a clear understanding of the impact nonstandard duty schedules and overtime have on the job satisfaction and turn-over intentions of its members.

Research Design

The Research Theory. This study was observational in nature and consisted of a cross-sectional survey of USAF F-16 Crew Chiefs to determine the construct relationships involved in the research question. The data gathered with the survey instrument represents the situation as it existed during the October 1, 2003 - December 29, 2003 timeframe. The research design did not involve changing or modifying the situation under investigation. This type of descriptive research cannot detect cause-and-effect relationships (Leedy and Ormrod, 2001:191). It is for this reason that this study relies upon a modified version of the Model of Employee Turnover as a Function of Job Satisfaction and Unemployment Rates (Figure 1) to determine the nature of the

relationships among the constructs. This model was developed by Paul E. Spector (1997:64) to illustrate the relationship between organizational and individual factors on job satisfaction and the causal effects of job satisfaction on turnover. This theory implies that the correlation between organizational factors, individual factors and job satisfaction; and between job satisfaction and turnover is in fact causal in nature; it suggests that organizational constraints and individual factors can lead to job dissatisfaction which does in fact lead to turnover. Spector (1997) states that the reason for his inference of these cause-and-effect relationships is based on the results of numerous longitudinal design studies which have been applied to this model (e.g., Bluedorn, 1982; Mobley, Griffeth, Hand, & Meglino, 1979; Crampton and Wagner, 1994; Blau, 1993; and Shore, Newton, & Thornton, 1990). As applied to this thesis, this theory establishes that one would expect the independent variables of overtime, schedule variance, age, education, length of service, and marital status to influence the mediating variable of job satisfaction which will in-turn influence the dependent variable of turnover intentions.

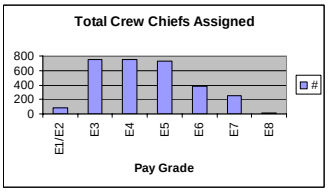
Population and Sample

Surveys were administered to USAF F-16 Crew Chiefs stationed at Hill Air Force Base (AFB), Utah; Luke AFB, Arizona; Shaw AFB, South Carolina; Eielson AFB, Alaska; Aviano AB, Italy; Kunsan AB, South Korea; and Spangdahlem AB, Germany. There are approximately 2,954 F-16 crew chiefs assigned at these six locations (AFPC Demographics Report, 2003). Of the 2,954 crew chiefs assigned 346 took part in this study (N = 346), for an 11.71% participation rate (this low response rate is discussed in detail within the "confounds to inference" section later in this chapter). A comparison

between the sample population and the total population reveals that the demographic compositions of the two groups are virtually identical on the dimensions of pay grade, length of service, gender, marital status, and level of education. This is a good indication the sample population is representative of the total population on these dimensions. Figure 2 summarizes the distribution of crew chiefs by pay grade for the total population and the sample population. Similar charts depicting age, gender, marital status, length of service, and level of education distributions can be found in Appendix B.

Total Crew Chiefs Assigned		
Grade	**#**	**%**
E1/E2	84	2.84%
E3	757	25.63%
E4	751	25.42%
E5	726	24.58%
E6	381	12.90%
E7	246	8.33%
E8	9	0.30%
	2954	100.00%

Survey Participants		
Grade	**#**	**%**
E1/E2	10	2.89%
E3	89	25.72%
E4	97	28.03%
E5	91	26.30%
E6	34	9.83%
E7	22	6.36%
E8	3	0.87%
	346	100.00%



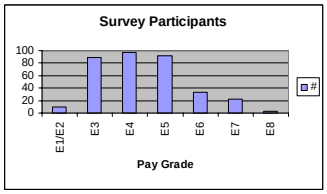


Figure 2. Distribution by Pay Grade for the Total Population and the Sample Population

Instrumentation – Measures, Reliabilities, and Validity

The instrument used to measure the levels of schedule variance, overtime, job satisfaction, and turnover intentions of workers was a fifty-two question survey designed to assess each individuals satisfaction with pay, promotion, supervision, benefits,

contingent rewards, operating procedures, coworkers, nature of work, communication, shift satisfaction, overall job satisfaction, turnover intentions and self reported levels of overtime and work schedule stability. The survey was composed of the following four components:

Schedule Variance. This section was designed to measure the individual's perceived level of work schedule stability during the 30 day period immediately preceding their completion of the survey. This subscale consisted of the following four items (the first two items in the list were reverse coded):

- *I am required to report for duty at approximately the same time each day*
- *My duty schedule does not vary significantly from week to week*
- *I am required to report for duty at significantly different times each day*
- *My duty schedule varies significantly from week to week.*

Individuals responded on a six-point scale ranging from *Disagree with very much* (1) to *Agree with very much* (6). A score for this subscale was computed by averaging each individual's responses to the four items listed above. A respondent could have a score ranging from 1 to 6; a score of 1 indicates a low level of duty schedule variance while a score of 6 indicates a high level of duty schedule variance. The alpha coefficient for this subscale was .92 with N=304. These items were written for this study and have not been subjected to any previous reliability or validity tests.

Overtime. This section was designed to measure the individual's level of overtime worked during the 30 day period immediately preceding their completion of this survey. This subscale consisted of the following four items (the first item in the list was reverse coded):

- *In the last 30 days I was **not** required to work overtime (more than 40 hours in a 7 day period)*
- *In the last 30 days I was frequently required to work overtime (more than 40 hours in a 7 day period)*
- *In the last 30 days it was common for me to be on duty for more than 50 hours in a 7 day period*
- *In the last 30 days it was common for me to be on duty for more than 60 hours in a 7 day period.*

Individuals responded on a 6-point scale ranging from *Disagree with very much* (1) to *Agree with very much* (6). Scores for this subscale were computed by averaging the responses to its four items. A respondent could have a score ranging from 1 to 6; a score of 1 indicates a low level of overtime while a score of 6 indicates a high level of overtime. The alpha coefficient for this subscale was .80 with N=308. These items were written for this study and have not been subjected to any previous reliability or validity tests.

Job Satisfaction. Spector's (1997) thirty-six question Job Satisfaction Survey (JSS) was used to measure each respondent's satisfaction with pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature of work, communication, and overall job satisfaction. Each of the nine facet subscales contained four items, and an overall job satisfaction score was computed by combining all of the items (Spector, 1997:8). Individuals responded to each item on a six-point scale ranging from *Disagree with very much* (1) to *Agree with very much* (6). The JSS can yield ten scores. Scores for each of the nine facet subscales were computed by averaging

the responses to its four items and the overall job satisfaction score was computed by averaging the responses to all thirty-six items. Therefore a respondent can have a score from 1 to 6 for each subscale, a score of 1 indicates dissatisfaction and a score of 6 indicates satisfaction.

The alpha coefficients for overall job satisfaction and each job satisfaction subscale were as follows: *pay* .69 (N=310), *promotion* .64 (N=307), *supervision* .81 (N=309), *fringe benefits* .63 (N=303), *contingent rewards* .82 (N=303), *operating conditions* .44 (N=309), *coworkers* .61 (N=310), *nature of work* .72 (N=308), *communication* .71 (N=309), and *overall job satisfaction* .87 (N=282). Note the operating conditions subscale yielded an exceptionally low alpha coefficient (.4440, N=308) and split-half reliability coefficient (.4436, N=308). Low alpha and split-half reliability coefficients indicate that the scores for the operating conditions subscale are unstable. Due to this fact, all items associated with the operating conditions subscale were removed from the raw data set prior to performing any additional analysis.

In previous studies, the JSS has shown internal consistency or coefficient alphas that ranged from .60 for the coworker subscale to .91 for the total scale. A study that compared five subscales of the JSS with corresponding subscales for Smith et al.'s (1969) Job Descriptive Index produced correlations ranging from .61 for the coworkers subscale to .80 for the supervision subscale, this study provides a good indication of JSS validity (Spector, 1997:11).

Shift Satisfaction. This section was designed to measure each individual's level of contentment with their duty schedule. This subscale consisted of the following four items (the first two items in the list were reverse coded):

- *Duty schedules are made with little regard for the welfare of squadron members*
- *I spend too much time at* work
- *I enjoy working my current schedule*
- *My current duty schedule leaves me with sufficient time to spend with my family and/or friends.*

Individuals responded on a six-point scale ranging from *Disagree with very much* (1) to *Agree with very much* (6). Scores for this subscale were computed by averaging the responses to its four items. Therefore a respondent could have a score ranging from 1 to 6; a score of 1 indicates discontentment with their duty schedule while a score of 6 indicates contentment with their duty schedule. The alpha coefficient for this subscale was .73 with N=306. These items were written for this study and have not been subjected to any previous reliability or validity tests.

Turnover Intentions. This section was designed to measure each individual's intention to leave the Air Force or their career field. Intention to turnover was measured with four items, three items from the Michigan Organizational Assessment Questionnaire (MOAQ) (Camman, Fichman, Jenkins, and Klesh, 1983) and one additional item written by the author. The four items were:

- *I often think about leaving the Air Force*
- *I enjoy being part of the Air Force and plan to reenlist* (this item was reverse coded)
- *It is likely that I will actively look for a new job in the next four years*
- *If I had the chance I would cross train into a different AFSC.*

Individuals responded on a 6-point scale ranging from *Disagree with very much* (1) to *Agree with very much* (6). Scores for this subscale were computed by averaging the responses to its four items. Therefore a respondent could have a score ranging from 1 to 6; a score of 1 indicates a low propensity to turnover while a score of 6 indicates a high propensity to turnover. The alpha coefficient for this subscale was .78 with N = 308. In a previous study, the author of the MOAQ turnover intention items reported an internal consistency reliability of .71.

Table 1 summarizes the internal consistency coefficient alphas and split-half reliabilities for all of the subscales. The job satisfaction, schedule variance, overtime, and turnover variables (to include items associated with each variable) measured by the survey instrument are defined in Appendix B and a complete copy of the survey can be found in Appendix C.

Table 1. Cronbach and Split-Half Reliabilities

Subscale Reliability									
Pay		Promotion		Supervision		Fringe Benefits		Contingent Rewards	
N = 310		N = 307		N = 309		N = 303		N = 303	
Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half
0.6942	**0.7438**	**0.6474**	**0.6429**	**0.8143**	**0.8262**	**0.6303**	**0.6810**	**0.8177**	**0.8136**
Operating Conditions		Coworkers		Nature of Work		Communication		Shift Satisfaction	
N = 309		N = 310		N = 308		N = 309		N = 306	
Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half
0.4440	**0.4436**	**0.6088**	**0.7240**	**0.7163**	**0.7576**	**0.7087**	**0.6996**	**0.7256**	**0.6987**
Schedule Variance		Overtime		Turnover Intentions		Overall Job Satisfaction			
N = 304		N = 308		N = 308		N=282			
Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half	Alpha	Split-Half		
0.9180	**0.8899**	**0.8013**	**0.6836**	**0.7799**	**0.7329**	**0.8698**	**0.8910**		

Factor Analysis. To assess the validity of the chosen measures, a general factor analysis of the measure items was conducted. Operating condition measures were not included due to their low alpha and split-half reliability scores. A principal factor

analysis using the varimax rotation method with Kaiser Normalization was conducted. Table 2 illustrates the factor loading of each of the items. In general, the items loaded on factors as expected (refer to Appendix D to view survey item numbers and questions). Contingent Rewards and Communication items all loaded against the same factor, but exhibited acceptable split-half and Cronbach alpha reliability measurements to be retained as separate subscales. The factor breakout along with acceptable reliability statistic values indicates measures that are valid.

Table 2. Factor Analysis Loading

Variables	Item/Survey Question #	FACTOR								
		1	2	3	4	5	6	7	8	9
Contingent Rewards	5	0.381								
	18	0.432								
	31	0.484								
	44	0.481								
Communication	9	0.64								
	22	0.766								
	34	0.67								
	48	0.456								
Promotion	2		0.314							
	15		0.734							
	28		0.57							
	45		0.638							
Supervision	3			0.745						
	16			0.753						
	29			0.795						
	42			0.805						
Turnover Intention	12				-0.744					
	25				-0.745					
	38				-0.735					
	51				-0.434					
Shift Satisfaction	13					0.694				
	26					0.632				
	39					0.63				
	52					0.724				
Nature of Work	8						0.38			
	21						0.739			
	35						0.773			
	47						0.702			
Pay	1							0.619		
	14							0.634		
	27							0.7		
	40							0.593		
Fringe Benefits	4								0.509	
	17								0.68	
	30								0.722	
	41								0.574	
Co-workers	7									0.724
	20									0.255
	33									0.756
	46									0.326

Data Collection

For this study participants were surveyed once during the October-December 2003 time frame. The survey was posted on the World Wide Web and all data was collected electronically. This was easily accomplished due to the fact that (with very few exceptions) all USAF F-16 crew chiefs are assigned official USAF e-mail addresses and

each and every crew chief has access to the World Wide Web at their work centers. All survey responses were solicited with individual, targeted email messages. This method is believed to result in sampling control as data is produced from a known sample of individuals (Stanton, 1998: 711). In 1995, Mehta and Sivadas performed a study of survey response rates employing this technique. The results of their study suggest this technique yields response rates which are comparable to response rates achieved with more traditional paper mail methods (Stanton, 1998: 711).

The web based survey included a number of extras so that the questionnaire was convenient. For instance, keyboard strokes are minimal (i.e., with the exception of final comments, all open-ended items are accompanied with "pull down menus" listing available options). Also, organizational members that did not feel comfortable completing an on-line version of the questionnaire were offered the option to print a traditional paper version of the questionnaire so that they could complete it and return it directly to the researcher through the official government mail system at no cost to the member. It is interesting to note that although the option to print and return a paper version of the survey existed, not a single paper version of the survey was returned.

The geographic separation and large population of crew chiefs assigned prevented the researcher from having access to all of the names in the population so a multistage sampling design was utilized. A point-of-contact (POC) was established at each of the six locations. Each POC distributed the survey to all F-16 crew chiefs at their respective locations via their organizations official e-mail system. Strategies proven to bolster the response rate of mailed surveys were used in an attempt to maximize response rates (Creswell, 1994: 122). One week prior to the survey becoming available the POCs

contacted all crew chiefs at their respective geographic locations. Contact was accomplished with an electronic message sent to each person's official USAF e-mail account. This initial electronic message stated the purpose of the research, asked for each individual's participation, and informed them the survey would be available in approximately one week. One week after the initial messages were sent, POCs sent a second electronic message to each individual's official USAF e-mail account. This time the message invited the recipient of the email to participate in the survey, included a brief summary of the research objective, and provided an electronic link to the web based survey. In addition, attached to the message was an electronic copy of the survey in the form of a Microsoft Word document, this gave recipients the option to print, complete and return a paper based version of the survey if they so desired. Approximately four weeks after the survey became available, POCs at each location sent a third and final message to each individual's personal e-mail account. This final message once again provided a brief summary of the research objective, an electronic link to the web based survey, and requested the individual's participation if they had not already completed the survey.

Analysis

Multivariate correlation analysis was performed to identify the level of association between variables. Correlations with p-values less than or equal to .05 were considered significant. After significant correlations were identified multiple regression analysis was performed to determine the nature of the relationships and the relative importance of the predictor variables in their contribution to the variation of the criterion

variables. A causal model for predicting USAF F-16 crew chief turnover intentions was developed using individual factors, schedule variance and overtime as antecedents, job satisfaction as a mediator and turnover intentions as an outcome. A graphic depiction of this conceptual model is shown in Figure 3.

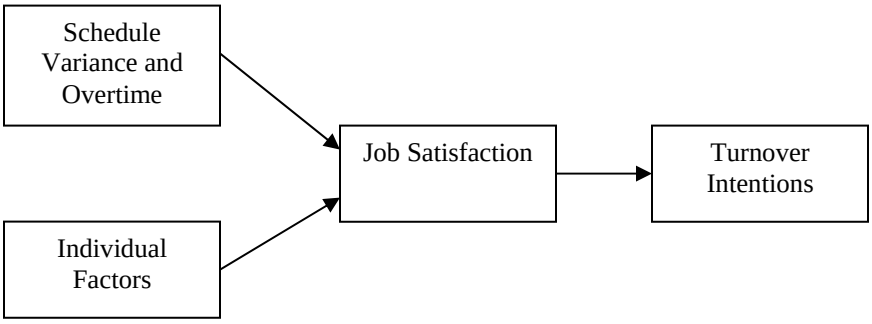


Figure 3. Conceptual Model

Confounds to Inference

Response Rates. Despite the use of strategies proven to bolster the response rate of mailed surveys this study yielded a remarkably low response rate of 11.71%. According to Leedy (2001: 222) this presents a potential problem because the more non-respondents there are, the greater the likelihood that response bias exists. Given that the subjects of this study are all active members of the United States Air Force, it was necessary to ensure all survey administration and data collection be accomplished in strict compliance with the Code of Federal Regulations, title 32, part 219, section 101, paragraph (b) (2); Air Force Instruction (AFI) 36-201, Air Force Personnel Survey Program; AFI 37-132, Air Force Privacy Act Program; and AFI 40-402, Exemption from

Human Experimentation Requirements. As a result, it was necessary to employ survey procedures that would not allow the information obtained to be linked to the subjects, either directly or through the use of identifiers. This required anonymity of the subjects combined with the electronic administration of surveys prevented the tracking of contacts, non-contacts, respondents and non-respondents. Without the means to differentiate between the different groups it is difficult to determine if the non-responses can be attributed to non-contacts. Which raises the question: Are those that did not respond to the survey different from those that did respond to the survey? Due to these issues it cannot be determined if the data is biased as a result of non-response errors. However, as discussed earlier in this chapter the demographic composition of the response population is extremely similar to the demographic composition of the total population (on the dimensions of pay grade, gender, marital status and level of education). This is a good indication that the response population is representative of the total population on these dimensions.

Self Reports. The amount of overtime and schedule-variance experienced by each respondent was measured with self reports. This research assumes that the self-reported overtime and schedule-variance data are accurate. No time cards or other historical records were obtained to verify the data reported by the respondents.

Data Collection. The survey was published on the World Wide Web and no specialized controls were used to limit access to only USAF F-16 Crew Chiefs. This means any individual with a personal computer and internet access could have potentially responded to the survey. If this occurred the data received from the web based survey may not be an accurate representation of the population being studied (Stanton,

1998:711). However, the survey asked the subject to report their military rank, squadron assignment, and Air Force Specialty Code. It is improbable that individuals not associated with the population being studied would have the knowledge to respond with valid answers to these questions. There were no surveys with invalid responses to these questions. In addition the web site address was made available only to USAF F-16 Crew Chiefs and it is unlikely anybody without the specific web site address could find and access the survey.

Electronic vs. Paper Based Surveys. Data collection for this research was accomplished through the use of a web based survey. A review of the literature on web based surveys presents differing views. On the one hand, some research suggests that electronic survey techniques return different results than traditional paper based surveys (Mead & Drasgow, 1993) and that a challenge associated with electronic survey techniques is their ability to obtain or construct an unbiased sampling frame that allows probability sampling (Simsek & Viega, 2000: 96). However, on the other hand some research has shown the administration medium does not affect the way subjects respond to surveys (King & Miles, 1995), the response rate is higher for web based surveys than mail surveys, and there are no differences in the nature of the data gathered by web-based and mail surveys (Griffis, Goldsby, & Cooper, 2003: 246; Stanton, 1998: 720).

IV. Results and Analysis

This section is presented in three parts. First, descriptive statistics for the study variables are reported. Second, correlation analyses performed among individual factors (age, gender, level of education, marital status, number of dependents, skill level, time in service, and number of years assigned to current squadron), JSS (excluding operating conditions subscale which was removed due to low reliability), shift satisfaction, overtime, turnover intention, and schedule variance variables are presented. Finally, regression analyses which summarize the patterns of correlation in the data are presented.

Descriptive Statistics

Descriptive statistics for the study variables are presented in Table 3. This table presents sample sizes, means, standard deviations and ranges for all JSS, schedule variance, shift satisfaction, overtime and turnover intention study variables. Sample sizes varied slightly due to missing values. Each respondent can have a score ranging from 1 to 6 for each subscale. For the communication, coworker, contingent rewards, fringe benefits, nature of work, pay, promotion, shift satisfaction, and supervision subscales a score of 1 indicates dissatisfaction and a score of 6 indicates satisfaction. On the schedule variance subscale a score of 1 indicates a low level of duty schedule variance while a score of 6 indicates a high level of duty schedule variance. For the overtime subscale a score of 1 indicates a low level of overtime and a score of 6 indicates a high level of overtime. The turnover intention subscale score can be interpreted as follows; a score of 1 indicates the individual has a low propensity to leave the organization or their

career field while a score of 6 indicates the individual has a high propensity to leave the organization or their career field. Frequency tables for each variable measured can be found in Appendix G.

Table 3. Descriptive Statistics

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Communication	329	5.00	1.00	6.00	3.3204	1.1051
Co-worker	329	5.00	1.00	6.00	3.7571	.9006
Contingent Rewards	331	5.00	1.00	6.00	2.9290	1.1583
Fringe Benefits	331	4.75	1.00	5.75	3.1793	1.0191
Job Satisfaction	331	3.84	1.47	5.31	3.5004	.6390
Nature of Work	329	5.00	1.00	6.00	4.2497	1.0770
Overtime	329	5.00	1.00	6.00	4.5998	1.2535
Pay	331	5.00	1.00	6.00	2.8630	1.0480
Promotion	331	5.00	1.00	6.00	3.5974	.9236
Schedule Variance	329	5.00	1.00	6.00	3.9238	1.6385
Shift Satisfaction	326	5.00	1.00	6.00	2.6759	1.1314
Supervision	331	4.75	1.25	6.00	4.8756	.9833
Turnover Intention	329	5.00	1.00	6.00	4.3131	1.3270
Valid N (listwise)	326					

Correlation Analyses: Antecedents and Outcome Variables

The conceptual model presented in Figure 3 predicted that individual factors, duty schedule variance and increased overtime will influence job satisfactions, which will in-turn influence intentions to either stay with or leave their organization or career field. Table 4 presents the Pearson product moment correlation coefficients between individual factors (age, level of education, marital status, and time in service), job satisfaction, schedule variance, overtime, and turnover intentions. This table was constructed to

examine the effects of overtime and schedule variance on outcomes such as job satisfaction and turnover intentions.

Table 4. Pearson Product Moment Correlation Coefficients

Correlations

		Age	Level of Education	Marital Status	Time in Service	Job Satisfaction	Schedule Variance	Overtime	Turnover Intention
Age	Pearson Correlation	1.000	*						
	Sig. (2-tailed)	.							
	N	199							
Level of Education	Pearson Correlation	.170*	1.000						
	Sig. (2-tailed)	.017	.						
	N	198	337						
Marital Status	Pearson Correlation	.305**	.149**	1.000					
	Sig. (2-tailed)	.000	.006	.					
	N	196	335	336					
Time in Service	Pearson Correlation	.882**	.144*	.344**	1.000				
	Sig. (2-tailed)	.000	.043	.000	.				
	N	199	198	196	199				
Job Satisfaction	Pearson Correlation	.157*	-.027	-.074	.107	1.000			
	Sig. (2-tailed)	.029	.625	.181	.140	.			
	N	193	330	329	193	331			
Schedule Variance	Pearson Correlation	-.162*	.027	-.040	-.181*	-.344**	1.000		
	Sig. (2-tailed)	.025	.629	.473	.012	.000	.		
	N	192	328	327	192	329	329		
Overtime	Pearson Correlation	-.150*	.019	-.063	-.143*	-.433**	.460**	1.000	
	Sig. (2-tailed)	.038	.736	.253	.047	.000	.000	.	
	N	192	328	327	192	329	329	329	
Turnover Intention	Pearson Correlation	-.190**	.031	-.080	-.160*	-.570**	.190**	.209**	1.000
	Sig. (2-tailed)	.008	.571	.147	.026	.000	.001	.000	.
	N	192	328	327	192	329	329	329	329

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

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

As predicted overtime and schedule variance had statistically significant negative relationships with overall job satisfaction (r = -.433 and r = -.460 respectively) and statistically significant positive relationships with turnover intentions (r = .209 and r = .190 respectively). Job satisfaction also has a statistically significant negative relationship with propensity to turnover (r = -.570). Thus, increases in overtime and increases in schedule variance are associated with a decrease in overall job satisfaction.

In addition, a decrease in overall job satisfaction is associated with an increase in propensity to turnover.

According to Kachigan (1991:138) "the square of the correlation coefficient, r^2, indicates the proportion of variance in one of the variables that is accounted for, explained, or predictable from the variance of scores of the other variable". Therefore .187 (-.433 squared) or 18.7 percent of the variance on the job satisfaction variable is associated with the variance of the scores on the overtime variable; .212 or 21.2 percent of the variance on the job satisfaction variable is associated with the variance of the scores on the schedule variance variable; and .325 or 32.5 percent of the variance on the turnover variable is associated with the variance of the scores on the job satisfaction variable.

It is also important to note that the only statistically significant correlations among individual factors and overall job satisfaction or turnover intentions were between: age and job satisfaction (r = .157); age and turnover intentions (r = -.190); and between time-in-service and turnover intentions (r = -.160). This finding is consistent with previous studies that found age has strong empirical correlations with turnover (Ghilselli, La Lopa, and Bai, 2001: 29).

The foregoing correlation analyses cannot assess the joint effects of two or more variables and cannot discern to what extent the correlation between two variables is due to the effects of other confounding variables. The correlation analysis does however support the theoretical model presented in Figure 3 and suggests unsure causal models for predicting F-16 Crew Chief turnover intentions. One such model should include overtime and schedule variance as an antecedent with job satisfaction as an outcome, a

second model should include individual factors as an antecedent with job satisfaction as an outcome, while a third model should include job satisfaction as an antecedent with a propensity to leave the organization or career field as an outcome. The correlations between age, time-in-service, overtime, schedule variance, job satisfaction and turnover intentions provide some support for this interpretation.

Developing Causal Models

The correlation analysis revealed which variables have statistically significant relationships. To further explore the nature of these relationships and assess the degree of relative importance of various predictor variables in their contributions to criterion variables a series of multiple regression analyses were performed. Each regression model in this section was analyzed in accordance with McClave, Benson, and Sincich's (2001: 535) four step process for analyzing multiple regression models. The steps in this process are:

Step 1. Hypothesize the deterministic component of the model and determine the independent variables to be included in the model. This component relates the mean, E(y), to the independent variables $x_1, x_2, \ldots, x_k$.

Step 2. Fit the hypothesized model to the sample data.

Step 3. Check that the following assumptions on ε are satisfied:

- The mean of the probability distribution of ε, is 0.
- The variance of the probability distribution of ε is constant for all settings of the independent variable x.
- The probability distribution of ε is approximately normal.
- The values of ε associated with any two observed values of y are independent

Step 4. Statistically evaluate the usefulness of the model.

Regression Model # 1.

Regression Model 1 regressed the job satisfaction variable on the schedule variance and overtime variables. This model is represented by equation 1.

$$y = \beta_0 + \beta_{1x1} + \beta_{1x2} + \varepsilon \qquad (1)$$

where

y = the *response variable of job satisfaction*
β_0 = the *y-intercept of the line*
β_1 is the *slope of the line*
x_1 is the *predictor variable overtime*
x_2 is the *predictor variable schedule variance*
ε is the *random error component*

The model represented by equation 1 was fit to the data using the statistical software package SPSS 8.0 for windows. A summary of the SPSS output for this model is displayed in Table 5, and the full SPSS output for this model can be found in Appendix E.

Table 5. Regression Model # 1 Summary - Dependent Variable is Job Satisfaction

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.433[a]	.187	.185	.5767
2	.462[b]	.214	.209	.5681

a. Predictors: (Constant), Overtime

b. Predictors: (Constant), Overtime, Schedule Variance

Examination of the SPSS output (Appendix E) reveals that the standardized predicted and standardized residual means are equal to 0, the residual standard deviation

is approximately equal to the standard error of the estimate, the probability distribution of ε is approximately normal, and he values of ε associated with any two observed values of y are independent. The β coefficients for the hypothesized model are:

β_0 = 4.595
β_1 = -.178
β_2 = -.0027144

The adjusted multiple coefficient of determination (R^2) for this model is .209, this number reveals that the overtime and schedule variance variables together accounted for 20.9 percent of the variance in the job satisfaction sample data. Model 1 is summarized in Table 5.

A hypothesis test involving all β parameters in the model follows:

H_0: $\beta_1 = \beta_2 = 0$
H_a: At least one of the coefficients is non zero

Using the observed significance level of the F statistic from the ANOVA table of the SPSS output (Appendix E), it is determined that the null hypothesis is rejected for any α greater than .000. A rejection of the null hypothesis in the global F-test leads to the conclusion that this model is "statistically useful".

Regression Model # 2.

Regression Model 2 regressed the job satisfaction variable on the individual factors of age, gender, level of education, marital status, number of dependents, and time in service. This model is represented by equation 2.

$$y = \beta_0 + \beta_{1x1} + \beta_{2x2} + \beta_{3x3} + \beta_{4x4} + \varepsilon \quad (2)$$

where

y is the *response variable of job satisfaction*
β_0 is the *y-intercept of the line*
β_1 is the *slope of the line*
$\beta_{2...i}$ determines the contribution of x_i
x_1 is the *predictor variable level of education*
x_2 is the *predictor variable marital status*
x_3 is the *predictor variable time in service*
x_4 is the *predictor variable age*
ε is the *random error component*

The model represented by equation 2 was fit to the data using the statistical software package SPSS 8.0 for windows. A summary of the SPSS output for this model is displayed in Table 6, and the full SPSS output for this model can be found in Appendix F.

Table 6. Regression Model # 2 Summary - Dependent Variable is Job Satisfaction

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.246[a]	.061	.041	.6422

a. Predictors: (Constant), Age, Level of Education, Marital Status, Time in Service

b. Dependent Variable: Job Satisfaction

Examination of the SPSS output (Appendix F) reveals that the standardized predicted and standardized residual means are equal to 0, the residual standard deviation is *not* approximately equal to the standard error of the estimate, the probability distribution of ε is approximately normal, and the values of ε associated with any two observed values of y appear to be independent. The β coefficients for the hypothesized model are:

$\beta_0 =$ 3.544

β_1 = -.001462
β_2 = -.181
β_3 = -.004019
β_4 = .165

The adjusted multiple coefficient of determination (R^2) for this model is .041, this number reveals that the independent variables together accounted for only 4.1 percent of the variance in the job satisfaction sample data. Model 2 is summarized in Table 6.

A hypothesis test involving all β parameters in the model follows:

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$
H_a: At least one of the coefficients is non zero

Using the observed significance level of the F statistic from the ANOVA table of the SPSS output (Appendix F), it is determined that the null hypothesis is rejected for any α greater than .02. A rejection of the null hypothesis in the global F-test leads to the conclusion that this model is "statistically useful".

It is extremely important to note that examination of the observed significance levels of the t statistics from the coefficients table of the SPSS output suggests that "age" and "marital status" are the only statistically significant predictors in this model. In addition the collinearity statistics show that "time in service" and "age" both have variance inflation factors greater than 4. This indicates a high degree of collinearity. As such only one of those two factors should be included in the model. It is for this reason that this model is determined to be ineffective. To determine which predictors should be retained in the model a stepwise regression of job satisfaction on the individual factors was performed and is presented as Regression Model #2a.

Regression Model # 2a.

A stepwise regression of Model 2 excluded all individual factors except age and marital status. This model is represented by equation 2a.

$$y = \beta_0 + \beta_{1x1} + \beta_{2x2} + \varepsilon \qquad (2a)$$

where

y is the *response variable of job satisfaction*
β_0 is the *y-intercept of the line*
β_1 determines the contribution of x_i
x_1 is the *predictor variable age*
x2 is the *predictor variable marital status*
ε is the *random error component*

Model 2a was fit to the data using the statistical software package SPSS 8.0 for windows. A summary of the SPSS output for this model is displayed in Table 7, and the full SPSS output for this model can be found in Appendix G.

Table 7. Regression Model #2a Summary - Dependent Variable is Job Satisfaction

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.154[a]	.024	.019	.6495
2	.242[b]	.059	.049	.6394

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Marital Status

c. Dependent Variable: Job Satisfaction

Examination of the SPSS output (Appendix G) reveals that the standardized predicted and standardized residual means are approximately equal to 0, the residual standard deviation is approximately equal to the standard error of the estimate, the probability distribution of ε is approximately normal, and the values of ε associated with

any two observed values of y appear to be independent. The β coefficients for the hypothesized model are:

β_0 = 3.519
β_1 = .122
β_2 = -.191

The adjusted multiple coefficient of determination (R^2) for this model is .049, this number reveals that this single independent variable accounts for 4.9 percent of the variance in the job satisfaction sample data. Model 2a is summarized in Table 7. A hypothesis test involving all β parameters in the model follows:

H_0: $\beta_1 = \beta_2 = 0$
H_a: The coefficient is not equal to zero.

Using the observed significance level of the F statistic from the ANOVA table of the SPSS output (Appendix G), it is determined that the null hypothesis is rejected for any α greater than .003. A rejection of the null hypothesis in the global F-test leads to the conclusion that this model is "statistically useful".

Regression Model # 3.

Regression Model 3 regressed the turnover intention variable on the job satisfaction variable. This model is represented by equation 3.

$$y = \beta_0 + \beta_{1x1} + \varepsilon \qquad (3)$$

where

y is the *response variable of job satisfaction*
β_0 is the *y-intercept of the line*
β_1 determines the contribution of x_i
x_1 is the *predictor variable job satisfaction*

ε is the *random error component*

The model hypothesized above was fit to the data using the statistical software package SPSS 8.0 for windows. A summary of the SPSS output for this model is displayed in Table 8, and the full SPSS output for this model can be found in Appendix H.

Table 8. Regression Model # 3 Summary - Dependent Variable is Turnover Intention

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.570[a]	.325	.323	1.0915

a. Predictors: (Constant), Job Satisfaction

Examination of the SPSS output (Appendix H) reveals that two of the assumptions are stringently satisfied, while the other two assumptions are not stringently satisfied. Fortunately the departure from the assumptions is not so great that it makes the regression model ineffectual. This is because least squares regression analysis is sufficiently robust to produce reliable statistical tests, confidence intervals, and prediction intervals even when there are some departures from the model assumptions (McClave et. al, 2001: 634).

For Model # 3, the standardized predicted and standardized residual means are equal to 0 and the probability distribution of ε is approximately normal. The residual standard deviation (.76) is *approximately* equal to the standard error of the estimate (1.09) and the values of ε associated with any two observed values of y appear to have a minimal degree of covariance. The β coefficients for the hypothesized model are:

β_0 = 8.457
β_1 = -1.185

The adjusted multiple coefficient of determination (R^2) for this model is .323, this number reveals that the independent variable accounts for 32.3 percent of the variance in the turn over intention sample data. Model 3 is summarized in Table 8. A hypothesis test involving all β parameters in the model follows:

H_0: $\beta_1 = 0$
H_a: The coefficient is non zero

Using the observed significance level of the F statistic from the ANOVA table of the SPSS output (Appendix H), it is determined that the null hypothesis is rejected for any α greater than .000. A rejection of the null hypothesis in the global F-test leads to the conclusion that this model is "statistically useful".

Summary

The correlation and multiple regression analyses mathematically revealed the association and nature of the relationships between individual factors, duty schedule variance, overtime, job satisfaction, and turnover intentions of USAF F-16 Crew Chiefs. This insight allowed the researcher to fit the data on the theoretical model presented in Figure 3. This is depicted in Figure 4 and reveals that duty schedule variance and overtime variables combined account for approximately 20.9 percent of the variance in the job satisfaction variable; all individual factors except "age" and "marital status" were excluded from the stepwise regression of Model 2a, these two variables account for approximately 4.9 percent of the variance in the job satisfaction variable; and the job satisfaction variable accounts for approximately 32.3 percent of the variance in the turnover intention variable.

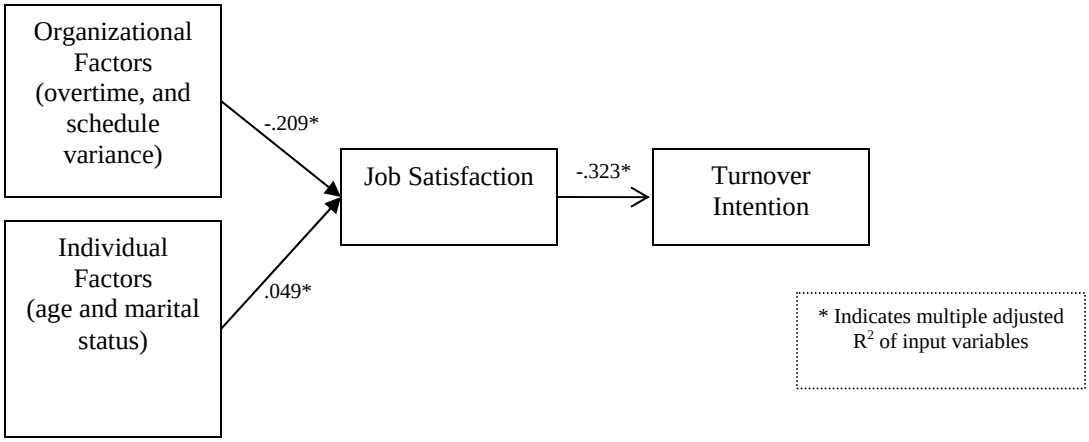


Figure 4. Turnover Intention Model Path Analysis

V. Conclusions and Recommendations

Research Question

This study was fundamentally based on the question of whether or not overtime and duty schedule variance is an influencing factor on the turnover intentions of USAF F-16 Crew Chiefs. The motivation for this question came from the researchers' eight years of USAF aircraft maintenance experience in which he has personally observed unpredictable duty schedules that changed dramatically from week to week or in some cases from day to day and resulted in extensive and consistent amounts of overtime for assigned employees. Ideally the study would have been of experimental design where a control group could be placed on steady and predictable 40 hour shifts and an experimental group could be subjected to varying levels of overtime and schedule variance. This type of experimental design would allow the researcher to physically control and compare the two groups which would increase confidence in the determination of causality. In the place of such an experimental design this study was observational in nature and relied on a survey in which respondents self reported the amount of overtime and schedule variance experienced in the 30 days immediately preceding their participation in the study. This subjective data was then used to judge the objective measure of influence on the relationships between overtime, schedule variance, job satisfaction and turnover intention variables. Review of related literature uncovered several theories and supporting studies that viewed turnover as a result of employee job dissatisfaction (Ghiselli, La Lopa, & Bai, 2001; Spector, 1997; and Mobley, Griffeth, Hand, & Meglino, 1979). From these theories and studies a hypothesis of how overtime

and duty schedule variance might relate to turnover intentions through the intermediary construct of job satisfaction was developed and depicted in Figure 3. The results found in this study are consistent those found in the literature.

Implications for the USAF

The information and data analysis presented in this study provide support for the belief that overtime and duty schedule variances impact the turnover intentions of USAF F-16 crew chiefs. The Pearson product moment correlation coefficients (Table 4) showed statistically significant relationships between overtime, schedule variance, and job satisfaction. It also showed a significant relationship between job satisfaction and turnover intentions. Regression models 1, 2a and 3 revealed that duty schedule variance and overtime variables combined accounted for approximately 20.9 percent of the variance in the job satisfaction variable; stepwise regression of individual factors (age, level of education, marital status, and time in service) excluded all individual factors except age and marital status, these two individual factor accounted for approximately 4.9 percent of variance in the job satisfaction variable; the job satisfaction variable in-turn accounted for approximately 32.3 percent of the variance in the turnover intention variable.

The analysis presented here suggests that overtime and duty schedule variance have a significant impact on job satisfaction which directly and significantly impacts the turnover intentions of USAF F-16 Crew Chiefs. This finding compares well to that found in previous studies (Tett, & Meyer, 1993; Bluedorn, 1982). This implies that the primary influences on turnover intentions for USAF F-16 Crew Chiefs are similar to those for the

civilian population. Air Force leaders that understand these relationships can take action to minimize the negative impacts a duty schedule has on job satisfaction and the turnover intentions of Airmen.

Suggestions for Future Research

The predictive turnover intention model proposed in this study revealed that approximately 20 percent of the variance in job satisfaction can be accounted for with overtime and duty schedule variance and that approximately 32 percent of the variance in turnover intentions can be accounted for with job satisfaction. This means the predictive model leaves 80 percent of variance in the job satisfaction variable and 68 percent of the variance in the turnover intentions variables unaccounted for. The retention of highly trained and qualified personnel is a concern for the USAF, but in order to increase retention, we must understand what drives the turnover intentions of our personnel. The regression models presented yielded coefficients of determination equal to .2, .049, and .32. These low coefficients of determination indicate the predictive model is not accounting for many other confounding variables. Future research should focus on trying to identify these confounding variables and incorporate them into the turnover intention model presented in this thesis.

Additional Findings

Further analysis of the survey data revealed an interesting and practical finding: When turnover intention was regressed on all facets of job satisfaction (Table 9), rather than on the overall job satisfaction variable. It was discovered that four constructs

(nature of work, contingent rewards, pay and communication) of job satisfaction alone explained 36.1 percent (multiple regression adjusted R^2 of .361) of the variance found in the turnover intention variable, with nature of work and contingent rewards accounting for 32.6 percent (multiple regression adjusted R^2 of .326) of the 36.1 percent explained variance. The nature of work and contingent reward subscales were composed of the following items:

Nature of Work Subscale Questions

1. I sometimes feel my job is meaningless
2. I like doing the things I do at work
3. I feel a sense of pride in doing my job
4. My job is enjoyable

Contingent Reward Subscale Questions

1. When I do a good job, I receive the recognition for it that I should receive
2. I do not feel that the work I do is appreciated
3. There are few rewards for those who work here
4. I don't feel my efforts are rewarded the way they should be

This information can be interpreted to suggest that for USAF F-16 Crew Chiefs the largest components of job satisfaction that influence turnover intentions are the nature of work and contingent rewards. This means enjoying the type of work itself, feeling it has meaning, having a sense of pride, being recognized and feeling appreciated for the work accomplished will have the single largest impact on job satisfaction, which as demonstrated in this study has a significant impact on turnover intentions.

For commanders and supervisors this information is of practical significance. It reinforces the need to have good recognition and education programs in place. Recognition of hard work and jobs well done can be accomplished with words, certificates, awards or decorations. A simple thank you can go a long way. In addition to

recognition, extra effort should be made to educate and ensure workers understand the significance of their contribution to the overall Air Force mission. Make sure employees

Table 9. Regression Model Summary - Dependent Variable is Turnover Intention

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.509[a]	.259	.256	1.1442
2	.574[b]	.330	.326	1.0896
3	.598[c]	.358	.352	1.0682
4	.607[d]	.369	.361	1.0609

a. Predictors: (Constant), Nature of Work

b. Predictors: (Constant), Nature of Work, Contingent Rewards

c. Predictors: (Constant), Nature of Work, Contingent Rewards, Pay

d. Predictors: (Constant), Nature of Work, Contingent Rewards, Pay, Communication

know that the tasks they accomplish, no matter how routine or mundane, serve a greater purpose. Let troops know that the mission could not be accomplished without their contributions. Make every effort to give meaning to their work and to instill a sense of pride in the unit. Leaders at all levels can significantly increase job satisfaction and decrease turnover intentions by simply recognizing troops for their hard work and educating them on how they fit into the big picture!

APPENDICES

APPENDIX A: Authentic USAF F-16 Crew Chief Duty Schedule

2 June 2003 – 4 July 2003

XXX AMXS XX AMU Bravo Section Crew Dawgs 2 June - 6 June, 2003						
Day/ Date		Mon 2	Tue 3	Wed 4	Thu 5	Fri 6
Day Shift Duty Hours		0530	0530	0530	0530	0530
Name (4/10/2) 16	Assigned	4/8/2	3/8/2	3/8/2	4/7/2	4/7/2
TSgt XXX	89-2066		Dental 1230	GE 0830		CTO
SSgt XXX	90-0742		GE 0830			
SSgt XXX	90-0714	EOR#1	EOR#1	EOR#1	EOR#1	EOR#1
SSgt XXX	88-0482		Maint O 0800	Chem 0800		
SSgt XXX	90-0736	Phase	Phase	Phase	Phase	Phase
SSgt XXX	90-0742		FIT CK 1330	MRI 1245		
SrA XXX	89-2074		GE 0830			
SrA XXX	89-2066			GE 0830		
SrA XXX	90-0714		TMO 0830	PHA 1400		
SrA XXX	90-0734				EOR#1	EOR#1
SrA XXX	89-2172	ALS	ALS	ALS	ALS	ALS
SrA XXX	90-0724	De-Arm	De-Arm	De-Arm	De-Arm	De-Arm
SrA XXX	90-0718	EOR#1	EOR#1	EOR#1	DEFY 0800	DEFY 0800
A1C XXX	89-2078					
A1C XXX	88-0482					
A1C XXX	90-0736				CTO Hosp 0800	
Swings						
Name (4/7/4) 15	Assigned	3/5/3	4/5/3	4/4/3	4/4/3	4/5/3
Swing Shift Duty Hours		1500	1500	1500	1500	1500
TSgt XXX	90-0718	CTO	GE 1630			
SSgt XXX	89-2172			GE 1630		
SSgt XXX	90-0734					Wash 1200
SSgt XXX	89-2074					
SSgt XXX	89-2066		GE 1630			
SSgt XXX	90-0724			GE 1630		
SrA XXX	89-2078				CTO	
SrA XXX	89-2066	Phase	Phase	Phase	Phase	Phase
SrA XXX	90-0742					
SrA XXX	90-0742					
A1C XXX	90-0736	Leave	Leave	Leave	Leave	Leave
A1C XXX	90-0718			CTO		
A1C XXX	90-0714					
A1C XXX	90-0734	Leave	Leave	Leave	Leave	Leave
AMN XXX	89-2172					
A1C XXX	89-2074			FS 1130		
Mids						
Name (2/1/2) 5	Assigned	2/1/2	2/0/2	2/0/2	1/0/2	1/1/2
Mid Shift Duty Hours		2200	2200	2200	2200	2200
TSgt XXX	90-0724				Maint O 0800	CTO
SSgt XXX	89-2078					
SrA XXX	88-0482		Maint O 0800	Right S 0800	INTRO 0820	
A1C XXX	89-2172					
A1C XXX	89-2078	Hosp 0930		Hosp 0930		Hosp 0930

XXX AMXS XX AMU Bravo Section Crew Dawgs 9 June - 13 June, 2003						
Day/ Date		Mon 9	Tue 10	Wed 11	Thu 12	Fri 13
Day Shift Duty Hours		1030	1030	1030	1030	1030
Name (4/10/2) 16	Assigned					
TSgt XXX	89-2066			TNG 0900	Maint O 0800	
SSgt XXX	90-0742	EOR	EOR	EOR	EOR	CTO
SSgt XXX	90-0714					EOR
SSgt XXX	88-0482		Hosp 1430	Chem War 0800		
SSgt XXX	90-0736					
SSgt XXX	90-0742			PHA 1030		Hosp 1130
SSgt XXX	89-2066					
SrA XXX	89-2074	Leave	Leave	Leave	Leave	Leave
SrA XXX	90-0714	EOR	EOR	EOR	EOR	EOR
SrA XXX	90-0734					
SrA XXX	89-2172	ALS	ALS	ALS	ALS	ALS
SrA XXX	90-0724					
SrA XXX	90-0718					
A1C XXX	90-0734					
A1C XXX	89-2078				CTO	
A1C XXX	88-0482		CTO			
A1C XXX	88-0482	FTAC	FTAC	FTAC	FTAC	FTAC
A1C XXX	90-0736					
Swings						
Name (4/7/4) 15	Assigned					
Swing Shift Duty Hours		1830	1830	1830	1830	
TSgt XXX	90-0718					
SSgt XXX	89-2172					
SSgt XXX	90-0734	CTO			ERGO 1500	
SSgt XXX	89-2074					
SSgt XXX	90-0724					
SSgt XXX	88-0482					
SrA XXX	89-2078					
SrA XXX	89-2066			Leave	Leave	Leave
SrA XXX	90-0742					
SrA XXX	90-0736	Leave	Leave	Leave	Leave	Leave
A1C XXX	90-0718					
A1C XXX	90-0714		CTO			
A1C XXX	89-2172					
A1C XXX	89-2074			Hosp 1130		
Mids						
Name (2/1/2) 5	Assigned					
Mid Shift Duty Hours		Mem Day	2300	2300	2300	2300
TSgt XXX	90-0724					
SSgt XXX	89-2078					CTO
SrA XXX	89-2066					
A1C XXX	89-2172		Dent 1530	CTO		
A1C XXX	89-2078			Hosp 0930		Hosp 0930

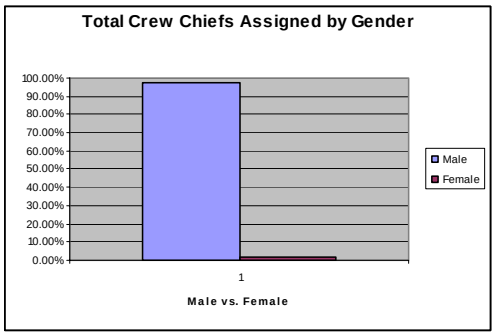
XXX AMXS XX AMU Bravo Section Crew Dawgs 23 June - 27 June, 2003						
Day/ Date		Mon 23	Tue 24	Wed 25	Thu 26	Fri 27
Day Shift Duty Hours		0630	Field Day	Air Show	0630	0630
Name (4/11/3) 18	Assigned	2/7/3			3/5/3	2/7/3
TSgt XXX	89-2066	Fam Ride	Field Day	Air Show		
TSgt XXX	88-0482	Hosp 1000	Field Day	Air Show		CTO
SSgt XXX	90-0742		Field Day	0730 WD		
SSgt XXX	90-0714	Leave	Leave	Leave	Leave	Leave
SSgt XXX	90-0736		Field Day	Air Show		
SSgt XXX	90-0742		Field Day	0730 WD		
SSgt XXX	89-2066	CTO	Field Day	TDY	TDY	TDY
SrA XXX	89-2074	Leave	Leave	Leave	Leave	Leave
SrA XXX	90-0734		1000 WD	Air Show		
SrA XXX	89-2172	ALS	ALS	ALS	ALS	ALS Grad
SrA XXX	90-0724	MPF 1400	Field Day	0730-1200		
SrA XXX	90-0718		Field Day	FAM	CTO	
SrA XXX	90-0714	INTRO	INTRO	INTRO	INTRO	INTRO
A1C XXX	90-0734		1000 WD	Air Show		
A1C XXX	89-2078		Field Day	Air Show		
A1C XXX	88-0482		Field Day	Air Show		
A1C XXX	88-0482		Field Day	Air Show		
A1C XXX	90-0736		Field Day	Air Show		
Swings						
Name (4/7/3) 14	Assigned	4/6/3			4/1/2	4/3/3
Swing Shift Duty Hours		1500	Field Day	Air Show	1500	1400
TSgt XXX	90-0718	Dent 1545	Field Day	Air Show		
SSgt XXX	89-2172	Hosp 1330	Field Day	Air Show		
SSgt XXX	90-0734		1000 WD	Air Show		
SSgt XXX	89-2074		Field Day	Air Show	PHA 0945	
SSgt XXX	90-0724		Field Day	Air Show	FTD	FTD
SSgt XXX	88-0482		Field Day	1700-2100		
SrA XXX	89-2078		Field Day	TDY	TDY	TDY
SrA XXX	89-2066	Leave	Leave	Leave	Leave	Leave
SrA XXX	90-0742		Field Day	1700 WD	FTD	PHA 0800
SrA XXX	90-0736		Field Day	Air Show	FTD	FTD
A1C XXX	90-0718		Field Day	Air Show	FTD	
A1C XXX	90-0714		Field Day	Air Show		
A1C XXX	89-2172		Field Day	Air Show		
A1C XXX	89-2074		Field Day	Air Show	FTD	
Mids						
Name (2/1/2) 5	Assigned	2/1/2			2/1/2	2/1/2
Mid Shift Duty Hours		2300	Field Day	Air Show	2300	2300
TSgt XXX	90-0724		Field Day	Air Show		
SSgt XXX	89-2078		Field Day	Air Show		
SrA XXX	89-2066		Field Day	Air Show		
A1C XXX	89-2172		Field Day	Air Show		
A1C XXX	89-2078		Field Day	Air Show		

XXX AMXS XX AMU Bravo Section Crew Dawgs 30 June - 4 July, 2003						
Day/ Date		Mon 27	Tue 28	Wed 29	Thu 30	Fri 31
Day Shift Duty Hours		0730	0630	0930	0930	0700
Name (4/7/3) 14	Assigned	3/4/3	3/3/3	2/4/0	3/5/0	3/5/0
(T)Sgt XXX	90-0742	PHA 1030		Dental 1330		
SSgt XXX	90-0724			HOT PITS 0800		
SSgt XXX	90-0734	EOR ARM	EOR ARM	EOR	EOR ARM	EOR ARM
SSgt XXX	89-2066					
SrA XXX	89-2078		CPR	CPR	CPR	CPR
SrA XXX	90-0742		M-16 0800	Dental 1600		
SrA XXX	90-0736					
A1C XXX	89-2172			HOT PITS 0800		
A1C XXX	90-0714		Wash			
A1C XXX (Profile)	88-0482	HOSP 1000	HOSP 1000		Hosp 1000	
Swings						
Name (3/5/3) 11	Assigned	2/4/3	2/3/3	2/3/3	2/4/3	2/4/3
Swing Shift Duty Hours		1530	1430	1730	1730	TBD
SSgt XXX	89-2172				Ergo 1400	
SSgt XXX	90-0714		Wash			
SSgt XXX	88-0482	Leave	Leave	Leave		
SrA XXX	89-2074				Ergo 1500	
SrA XXX	89-2066					
SrA XXX	90-0718			M-16 0800		
A1C XXX	90-0742					
A1C XXX	90-0736					
Mids (Swing Hours This week)						
Name (3/4/0) 7	Assigned	2/2/0	2/2/0	2/2/0	2/2/0	2/2/0
Mid Shift Duty Hours		0100	2400	0200	0200	TBD
SSgt XXX	89-2078					
SSgt XXX	90-0736					
SrA XXX	90-0724			HOT PITS 0800		
SrA XXX	90-0714	Leave	Leave	Leave	Leave	Leave
SrA XXX	90-0734					

APPENDIX B: Comparison of the Demographic Compositions of the Sample Population and the Total Population

Total Crew Chiefs Assigned		
Gender	#	%
Male	2888	97.77%
Female	66	2.23%
	2954	

Survey Participants		
Gender	#	%
Male	331	97.07%
Female	9	2.64%
Missing	1	0.29%
	341	



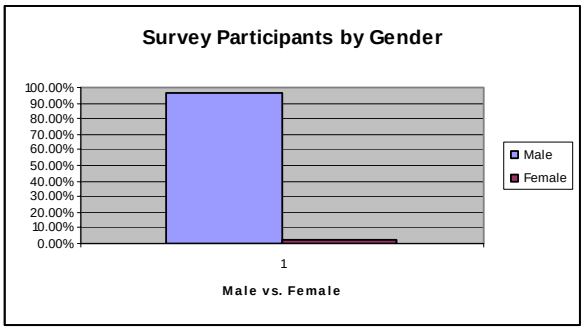
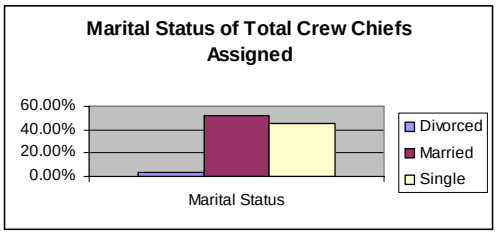


Figure 5. Number and Percent of Male and Female USAF F-16 Crew Chiefs

Total Crew Chiefs Assigned		
Marital Status	#	%
Divorced	96	3.25%
Married	1528	51.73%
Single	1330	45.02%
	2954	

Survey Participants		
Marital Status	#	%
Divorced	14	4.17%
Married	166	49.40%
Single	156	46.43%
	336	



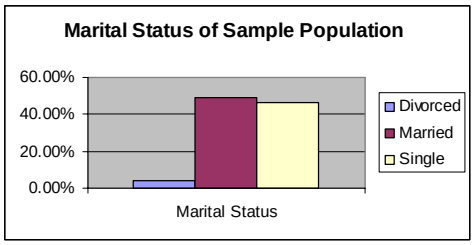
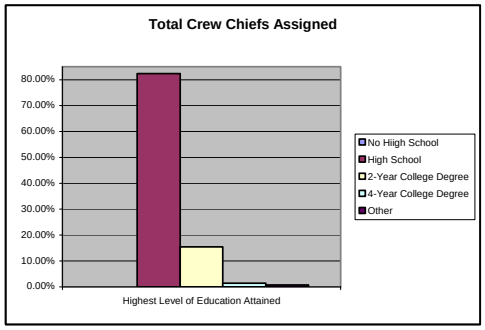


Figure 6: Marital Status

Total Crew Chiefs Assigned		
Level of Education (Highest)	#	%
Did not complete High School	0	0.00%
High School	2434	82.40%
2-Year College Degree	457	15.47%
4-Year College Degree	41	1.39%
Other	22	0.74%
Total	2954	100.00%

Survey Participants		
Level of Education (Highest)	#	%
Did not complete High School	0	0.00%
High School	251	74.70%
2-Year College Degree	58	17.26%
4-Year College Degree	10	2.98%
Other	17	5.06%
Total	336	100.00%



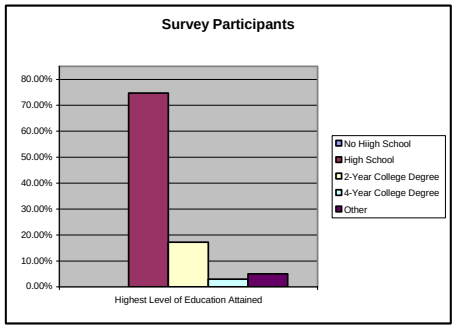


Figure 7: Highest Level of Education Achieved

.

APPENDIX C: Measurement Variables and Items

Variable & items from each scale

Job Satisfaction Scales

Pay. Measures the members satisfaction with pay and pay raises

1. I feel I am being paid a fair amount for the work I do.
2. Raises are too few and far between.
3. I feel unappreciated by the organization when I think about what they pay me.
4. I feel satisfied with my chances for salary increases.

Promotion. Measures the members' satisfaction with promotion opportunities.

1. There is really too little chance for promotion on my job.
2. Those who do well on the job stand a fair chance of being promoted.
3. People get ahead as fast here as they do in other places.
4. I am satisfied with my chances for promotion.

Supervision. Measures the members' satisfaction with their immediate supervisor.

1. My supervisor is quite competent in doing his/her job.
2. My supervisor is unfair to me.
3. My supervisor shows too little interest in the feelings of subordinates.
4. I like my supervisor.

Fringe benefits. Measures the members' satisfaction with fringe benefits.

1. I am not satisfied with the benefits I receive.
2. The benefits we receive are as good as most other organizations offer.
3. The benefit package we have is equitable.
4. There are benefits we do not have which we should have.

Contingent Rewards. Measures the members' satisfaction with rewards (not necessarily monetary) given for good performance.

1. When I do a good job, I receive the recognition for it that I should receive.
2. I do not feel that the work I do is appreciated.
3. There are few rewards for those who work here.
4. I don't feel my efforts are rewarded the way they should be.

Operating Conditions. Measures the members' satisfaction with rules and procedures.

1. Many of our rules and procedures make doing a good job difficult.
2. My efforts to do a good job are seldom blocked by red tape.

Variable & items from each scale

3. I have too much to do at work.
4. I have too much paperwork.

Coworkers. Measures the members' satisfaction with coworkers.

1. I like the people I work with.
2. I find I have to work harder at my job because of the incompetence of people I work with.
3. I enjoy my coworkers.
4. There is too much bickering and fighting at work.

Nature of Work. Measures the members' satisfaction with the type of work done.

1. I sometimes feel my job is meaningless.
2. I like doing the things I do at work.
3. I feel a sense of pride in doing my job.
4. My job is enjoyable.

Communication. Measures the members' satisfaction with communication within the organization.

1. Communications seem good within this organization.
2. The goals of this organization are not clear to me.
3. I often feel that I do not know what is going on with the squadron.
4. Work assignments are not fully explained.

Schedule Variance. Measures the members' perceived work schedule stability.

1. I am required to report for duty at approximately the same time each day.
2. I am required to report for duty at significantly different times each day.
3. My duty schedule varies significantly from week to week.
4. My duty schedule does not vary significantly from week to week.

Overtime. Measures the members' perception of the amount of overtime worked in the last 30 days.

1. In the last 30 days I was frequently required to work overtime (more than 40 hours in a 7 day period).
2. In the last 30 days I was ***not*** required to work overtime (more than 40 hours in a 7 day period).
3. In the last 30 days, it was common for me to be on duty ***for more than*** 50 hours in a 7 day period.
4. In the last 30 days it was common for me to be on duty ***for more than*** 60 hours in a 7 day period.

Turnover Intentions. Measures the individuals' intention to leave the Air Force or their career field.

1. I often think about leaving the Air Force.
2. I enjoy being part of the Air Force and plan to reenlist.

Variable & items from each scale

3. It is likely that I will actively look for a new job in the next four years.
4. If I had the chance, I would cross train into a different Air Force Specialty Code (AFSC).

Shift Satisfaction. Satisfaction with the current duty schedule.

1. Duty schedules are made with little regard for the welfare of squadron members.
2. I enjoy working my current schedule.
3. I spend too much time at work.
4. My current duty schedule leaves me with sufficient leisure time.

APPENDIX D: The Survey

Job Satisfaction Survey

Purpose: Our research team is investigating the impact varying shift schedules and overtime has on job satisfaction and quality of life of Air Force members. Our goal is to more fully understand your feelings about your duty schedule and give researchers information that will help them develop and lobby for the implementation of duty schedules that promote healthy lifestyles while still providing adequate mission support. In addition, the data will be used as part of a research study that will investigate the correlation between varying duty schedules, overtime and job satisfaction.

Participation: We would greatly appreciate your completing this survey. Your participation is COMPLETELY VOLUNTARY. However, your input is important for us to understand the impact duty schedule and overtime have on your quality of life. You may withdraw from this study at any time without penalty, and any data that have been collected about you, as long as those data are identifiable, can be withdrawn by contacting the primary investigator. Your decision to participate or withdraw will not jeopardize your relationship with your organization, the Air Force Institute of Technology, the Air Force, or the Department of Defense.

Confidentiality: ALL ANSWERS ARE STRICTLY CONFIDENTIAL. No one other than the primary investigators (assigned at the Air Force Institute of Technology which is an organization independent of your organization) will ever see your questionnaire. Findings will be reported at group levels only. We ask for some demographic and unit information in order to interpret results more accurately, and in order to link responses for an entire unit. Reports summarizing trends in large groups may be published.

If you are taking the web based survey, be assured that certain precautions have been built into the database to ensure that your confidentiality is protected. First, the questionnaire and database are not stored on your organization's server; instead, the questionnaire and database will be stored on the Air Force Institute of Technology's secure server. This makes it impossible for your leaders to circumvent the research team and try to access any identifiable data without their knowledge. Second, you will only have access to your responses. Finally, the database is protected by a password that is known only by the primary investigator, making it impossible for others to access your data. Still, if you don't feel comfortable completing the on-line version of the questionnaire you can print a paper version of the questionnaire, complete it, and return it directly to the research team at the address listed below.

Contact information: If you have any questions or comments about the survey contact First Lieutenant Shellhamer at the number, mailing address, or e-mail address listed below.

First Lieutenant Michael Shellhamer
AFIT/ENS BLDG 642
2950 P Street
Wright-Patterson AFB OH 45433-7765
Email: Michael.Shellhamer@afit.edu
Phone: DSN 785-6565, ext. 4285, commercial (937) 785-6565, ext. 4285

AIR FORCE RESEARCH LABORATORY SPONSORED
SHIFTWORK AND OVERTIME RESEARCH STUDY

JOB SATISFACTION SURVEY

for

F-16 CREW CHIEFS
(AFSC 2A3X3)

INFORMATION ABOUT THIS STUDY

Thank you for participating in this research project. Your participation in this survey is strictly VOLUNTARY. Your work experience will make an important contribution to the goals of this research project.

Confidentiality of your responses: This information is being collected for research purposes only. The write up and analysis of the F-16 Crew Chief Job Satisfaction Surveys will be based on cumulative unit and base survey responses. No one in your unit, base, or MAJCOM will EVER be allowed to see your individual responses. You are welcome to discuss this questionnaire with anyone you choose, but please wait until they have had a chance to participate.

PRIVACY ACT STATEMENT

In accordance with AFI 37-132, paragraph 3.2, the information below is provided as required by the Privacy Act of 1974.
Authority: 10 U.S.C. 8012, Secretary of the Air Force; powers and duties; delegation by; implemented by AFI 36-2601, USAF Survey Program.
Purpose: To evaluate the influence of shift work and overtime on the job satisfaction of Air Force members.
Routine Use: To increase understanding of factors affecting retention. No analyses of individual responses will be conducted. Reports summarizing trends in large groups of people may be published.
Disclosure: Participation is VOLUNTARY. No adverse action will be taken against any member who does not participate in this survey or who does not complete any part of this survey.

BACKGROUND INFORMATION

This information will be used to develop a profile of the participants in this study. Your responses will be kept completely confidential. These items are very important for statistical purposes.

INSTRUCTIONS

1. Please write your name, rank, and office symbol in the spaces provided below. All responses will be kept confidential; the information requested on this page will be used for tracking purposes only.

2. Read the INFORMATION ABOUT THIS RESEARCH STUDY and PRIVACY ACT information.

The success of this project depends on the accuracy of the information you provide. Please do your best to be honest. Your responses will be kept confidential.

Rank: _____ Squadron: _____

Shift (circle one): __Days__ Swings__ Mids__ Rotating__

BACKGROUND INFORMATION

1. What is your sex?
(a) Male
(b) Female

2. How old are you? _____

3. Highest education level completed?
(a) Did not complete High School
(b) High School Diploma or GED
(c) 2-Year College Degree
(d) 4-Year College Degree
(e) Other

4. How long have you worked for the Air Force?
_____years_____months

5. What is your present pay grade? _____

6. How long have you worked in this squadron?
____years_____months

7. What is your current skill level?
(a) 1
(b) 3
(c) 5
(d) 7
(e) 9

8. What is your AFSC? _____

9. What is your marital status?
(a) Single
(b) Married
(c) Legally Separated
(d) Divorced

10. How many dependents do you have currently residing with you? _____

NOTE: ANSWERS TO DUTY SCHEDULE AND OVERTIME QUESTIONS SHOULD REFLECT YOUR EXPERIENCE OVER THE LAST 30 DAYS.

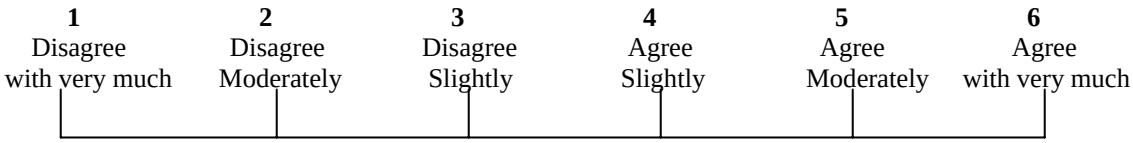
Job Satisfaction Survey

The items listed below were designed to assess your satisfaction with pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature of work, communication, and shift satisfaction.

Using the scale below, please circle the one number for each question that comes closest to reflecting your opinion about it. As you read through the list, you will note that some of the statements are similar. However, no two of them are exactly alike or have exactly the same meaning. You should simply respond to them as they come and not feel any special need to check back to make sure answers agree. Please be sure to respond to all items. Be as honest as possible.

1	**2**	**3**	**4**	**5**	**6**
Disagree with very much	Disagree Moderately	Disagree Slightly	Agree Slightly	Agree Moderately	Agree with very much

1	I feel I am being paid a fair amount for the work I do.
2	There is really too little chance for promotion on my job.
3	My supervisor is quite competent in doing his/her job.
4	I am not satisfied with the benefits I receive.
5	When I do a good job, I receive the recognition for it that I should receive.
6	Many of our rules and procedures make doing a good job difficult.
7	I like the people I work with.
8	I sometimes feel my job is meaningless.
9	Communications seem good within this organization.
10	I am required to report for duty at approximately the same time each day.
11	In the last 30 days I was frequently required to work overtime (more than 40 hours in a 7 day period).
12	I often think about leaving the Air Force.
13	Duty schedules are made with little regard for the welfare of squadron members.
14	Raises are too few and far between.
15	Those who do well on the job stand a fair chance of being promoted.
16	My supervisor is unfair to me.
17	The benefits we receive are as good as most other organizations offer.
18	I do not feel that the work I do is appreciated.
19	My efforts to do a good job are seldom blocked by red tape.
20	I find I have to work harder at my job because of the incompetence of people I work with.
21	I like doing the things I do at work.
22	The goals of this organization are not clear to me.
23	I am required to report for duty at significantly different times each day.
24	In the last 30 days I was ***not*** required to work overtime (more than 40 hours in a 7 day period).
25	I enjoy being part of the Air Force and plan to reenlist.
26	I enjoy working my current schedule
27	I feel unappreciated by the organization when I think about what they pay me.
28	People get ahead as fast here as they do in other places.
29	My supervisor shows too little interest in the feelings of subordinates.
30	The benefit package we have is equitable.
31	There are few rewards for those who work here.



32	I have too much to do at work.
33	I enjoy my coworkers.
34	I often feel that I do not know what is going on with the organization.
35	I feel a sense of pride in doing my job.
36	My duty schedule varies significantly from week to week.
37	In the last 30 days it was common for me to be on duty ***for more than*** 50 hours in a 7 day period
38	It is likely that I will actively look for a new job in the next four years.
39	I spend too much time at work.
40	I feel satisfied with my chances for salary increases.
41	There are benefits we do not have which we should have.
42	I like my supervisor.
43	I have too much paperwork.
44	I don't feel my efforts are rewarded the way they should be.
45	I am satisfied with my chances for promotion.
46	There is too much bickering and fighting at work.
47	My job is enjoyable.
48	Work assignments are not fully explained.
49	My duty schedule does not vary significantly from week to week.
50	In the last 30 days it was common for me to be on duty ***for more than*** 60 hours in a 7 day period.
51	If I had the chance I would cross train into a different AFSC
52	My current duty schedule leaves me with sufficient time to spend with family and/or friends.

Thank you very much for completing this important survey. Again, be assured your responses will be held in strict confidentiality and are for research purposes.

APPENDIX E: Detailed Results of Regression Model # 1

Regression:

Dependent Variable is Job Satisfaction

Independent Variables are Overtime and Schedule Variance

Table 10. Model # 1 - Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
Job Satisfaction	3.4968	.6388	329
Overtime	4.5998	1.2535	329
Schedule Variance	3.9238	1.6385	329

Table 11. Model #1 - Regression Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.462[a]	.214	.209	.5681

a. Predictors: (Constant), Schedule Variance, Overtime

b. Dependent Variable: Job Satisfaction

Table 12. Model #1 - ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.632	2	14.316	44.354	.000[a]
	Residual	105.223	326	.323		
	Total	133.855	328			

a. Predictors: (Constant), Schedule Variance, Overtime

b. Dependent Variable: Job Satisfaction

Table 13. Model # 1 - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.595	.122		37.694	.000		
	Overtime	-.178	.028	-.349	-6.307	.000	.789	1.268
	Schedule Variance	-7.144E-02	.022	-.183	-3.314	.001	.789	1.268

a. Dependent Variable: Job Satisfaction

Table 14. Model # 1 - Collinearity Diagnostics

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Overtime	Schedule Variance
1	1	2.883	1.000	.01	.01	.01
	2	8.291E-02	5.897	.21	.05	.92
	3	3.368E-02	9.252	.78	.94	.07

a. Dependent Variable: Job Satisfaction

Table 15. Model # 1 - Residual Statistics

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.0996	4.3454	3.4968	.2955	329
Residual	-1.6274	1.5068	8.720E-16	.5664	329
Std. Predicted Value	-1.344	2.872	.000	1.000	329
Std. Residual	-2.865	2.652	.000	.997	329

a. Dependent Variable: Job Satisfaction

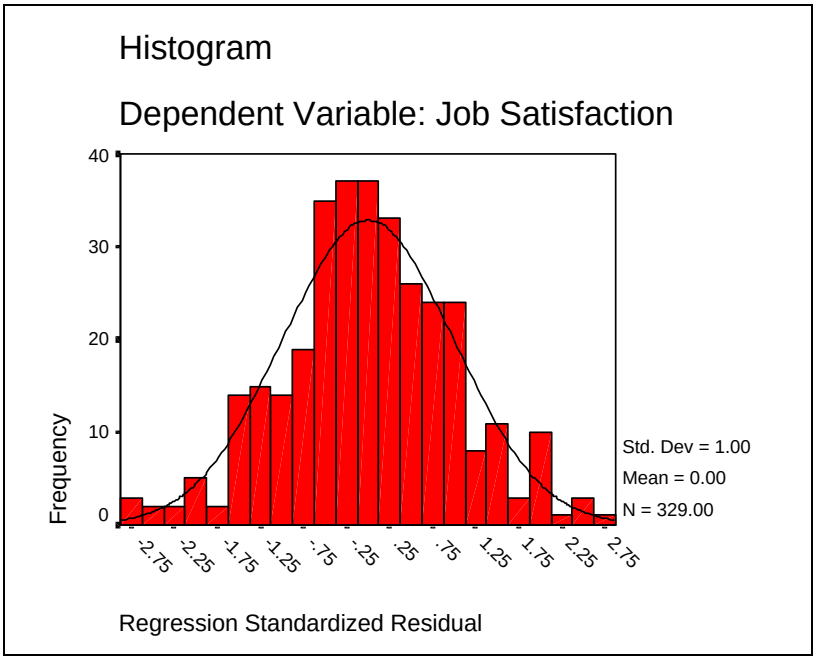


Figure 8. Model # 1 - Standardized Residual Histogram with Normal Probability Plot

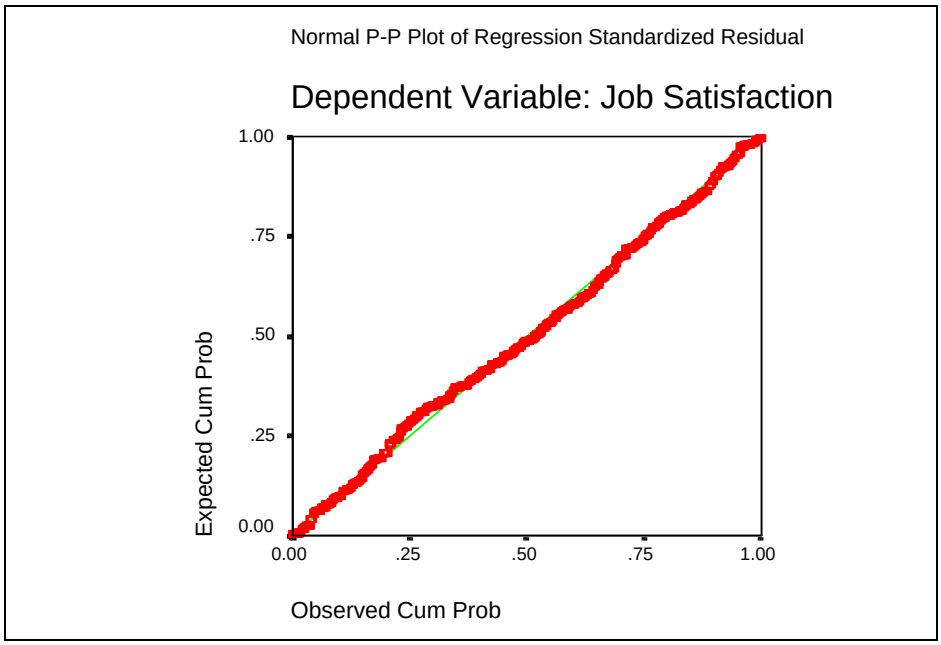


Figure 9. Model # 1 - Normal P-P Plot

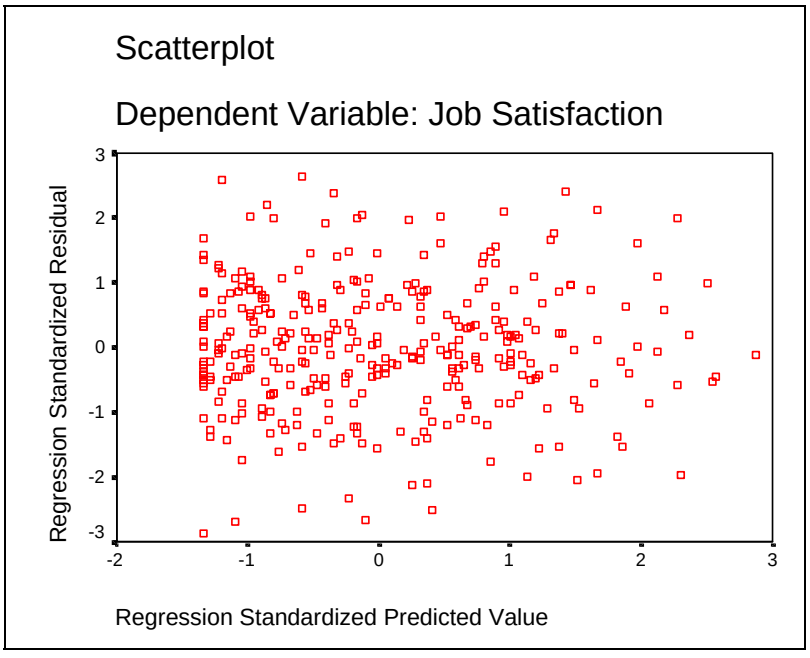


Figure 10. Model # 1 - Scatterplot depicting standardized predicted values against stanadardized residual values

APPENDIX F: Detailed Results of Regression Model # 2

Regression:

Dependent Variable is Job Satisfaction

Independent Variables are age, level of education, time in service, and marital status.

Table 16. Model # 2 - Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
Job Satisfaction	3.4261	.6556	191
Level of Education	2.4084	.8148	191
Marital Status	1.6387	.6808	191
Time in Service	2.0419	1.4284	191
Age	1.8010	1.1797	191

Table 17. Model # 2 - Regression Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.246[a]	.061	.041	.6422

a. Predictors: (Constant), Age, Level of Education, Marital Status, Time in Service

b. Dependent Variable: Job Satisfaction

Table 18. Model # 2 - Regression ANOVA Summary

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.958	4	1.239	3.005	.020[a]
	Residual	76.710	186	.412		
	Total	81.667	190			

a. Predictors: (Constant), Age, Level of Education, Marital Status, Time in Service

b. Dependent Variable: Job Satisfaction

Table 19. Model # 2 - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.544	.171		20.670	.000		
	Level of Education	-1.462E-02	.059	-.018	-.250	.803	.954	1.048
	Marital Status	-.181	.074	-.188	-2.446	.015	.851	1.175
	Time in Service	-4.019E-02	.069	-.088	-.580	.563	.221	4.516
	Age	.165	.083	.296	1.978	.049	.225	4.439

a. Dependent Variable: Job Satisfaction

Table 20. Model # 2 - Collinearity Diagnostics

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Level of Education	Marital Status	Time in Service	Age
1	1	4.476	1.000	.00	.00	.01	.00	.00
	2	.337	3.644	.03	.05	.03	.07	.05
	3	.101	6.642	.02	.27	.84	.00	.01
	4	4.854E-02	9.603	.92	.67	.12	.01	.01
	5	3.722E-02	10.965	.02	.00	.02	.92	.93

a. Dependent Variable: Job Satisfaction

Table 21. Model # 2 - Residual Statistics

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.8589	3.8946	3.4261	.1615	191
Residual	-1.9711	1.6068	-3.3714E-16	.6354	191
Std. Predicted Value	-3.511	2.901	.000	1.000	191
Std. Residual	-3.069	2.502	.000	.989	191

a. Dependent Variable: Job Satisfaction

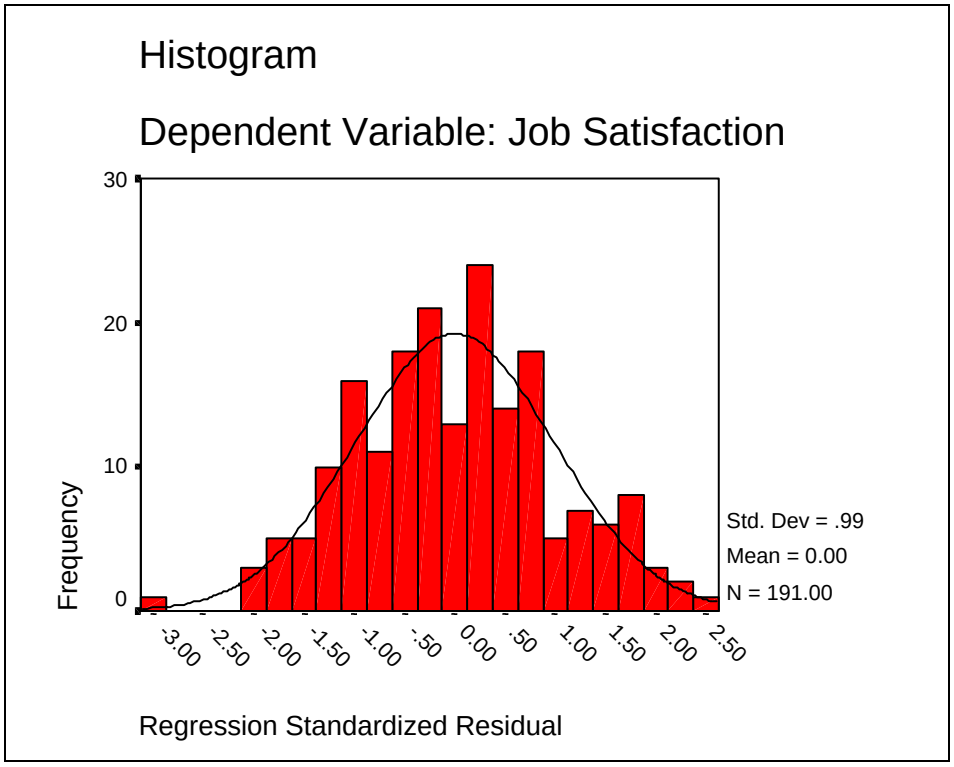


Figure 11. Model # 2 - Standardized Residual Histogram with Normal Probability Plot

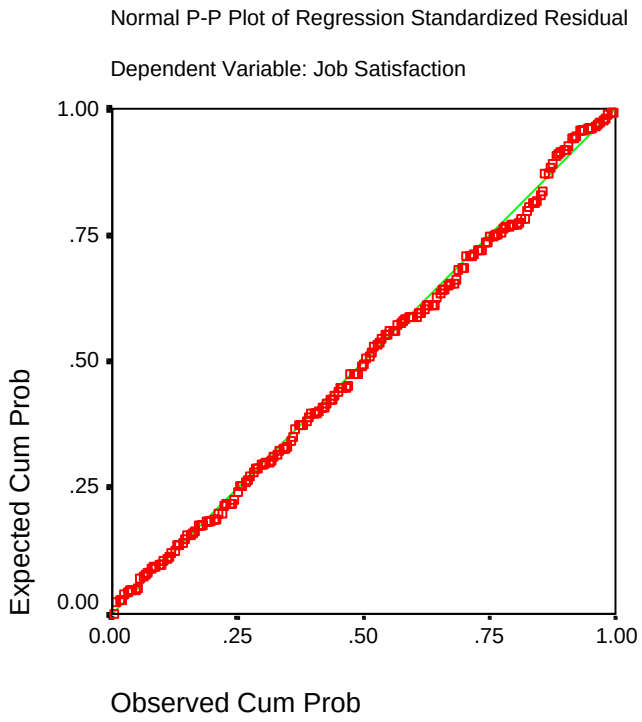


Figure 12. Model # 2 - Normal P-P Plot

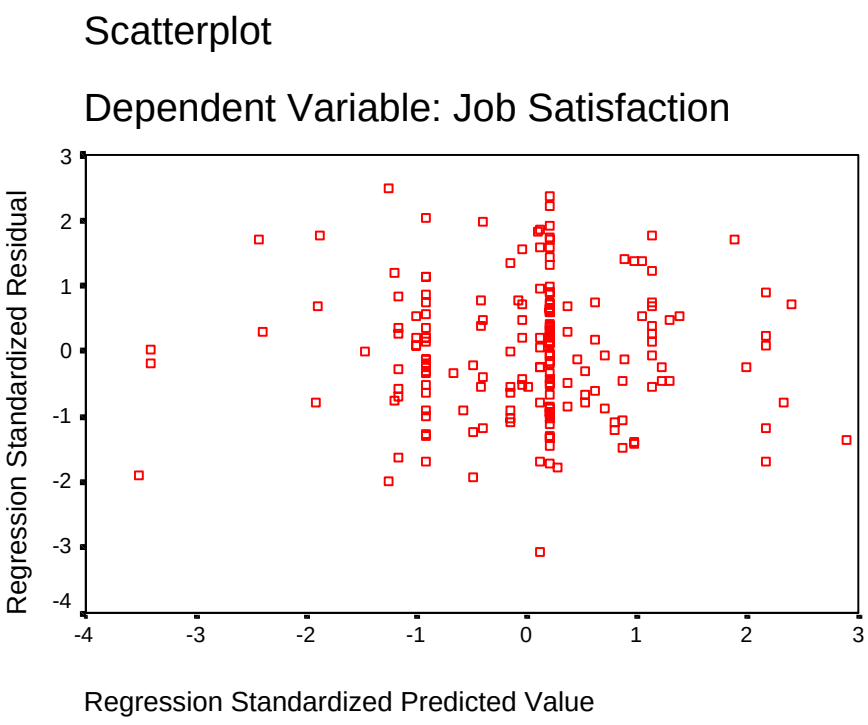


Figure 13. Model # 2 - Scatterplot depicting standardized predicted values against stanadardized residual values

APPENDIX G: Detailed Results of Regression Model # 2a

Stepwise Regression:

Dependent Variable is job satisfaction

Independent Variables retained are age and marital status

Table 22. Model # 2a - Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
Job Satisfaction	3.4261	.6556	191
Level of Education	2.4084	.8148	191
Marital Status	1.6387	.6808	191
Time in Service	2.0419	1.4284	191
Age	1.8010	1.1797	191

Table 23. Model # 2a - Regression Summary

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.154[a]	.024	.019	.6495
2	.242[b]	.059	.049	.6394

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Marital Status

c. Dependent Variable: Job Satisfaction

Table 24. Model # 2a – Regression ANOVA Summary

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.945	1	1.945	4.611	.033[a]
	Residual	79.722	189	.422		
	Total	81.667	190			
2	Regression	4.795	2	2.398	5.864	.003[b]
	Residual	76.872	188	.409		
	Total	81.667	190			

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Marital Status

c. Dependent Variable: Job Satisfaction

Table 25. Model # 2a - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.272	.086		38.076	.000		
	Age	8.576E-02	.040	.154	2.147	.033	1.000	1.000
2	(Constant)	3.519	.126		27.897	.000		
	Age	.122	.042	.220	2.929	.004	.891	1.122
	Marital Status	-.191	.072	-.198	-2.640	.009	.891	1.122

a. Dependent Variable: Job Satisfaction

Table 26. Model # 2a - Collinearity Diagnostics

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Variance Proportions Age	Variance Proportions Marital Status
1	1	1.837	1.000	.08	.08	
	2	.163	3.359	.92	.92	
2	1	2.736	1.000	.02	.03	.02
	2	.188	3.818	.13	.97	.10
	3	7.609E-02	5.997	.86	.00	.88

a. Dependent Variable: Job Satisfaction

Table 27. Model # 2a - Residual Statistics

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.8784	3.8160	3.4261	.1589	191
Residual	-1.9778	1.5691	1.930E-16	.6361	191
Std. Predicted Value	-3.447	2.454	.000	1.000	191
Std. Residual	-3.093	2.454	.000	.995	191

a. Dependent Variable: Job Satisfaction

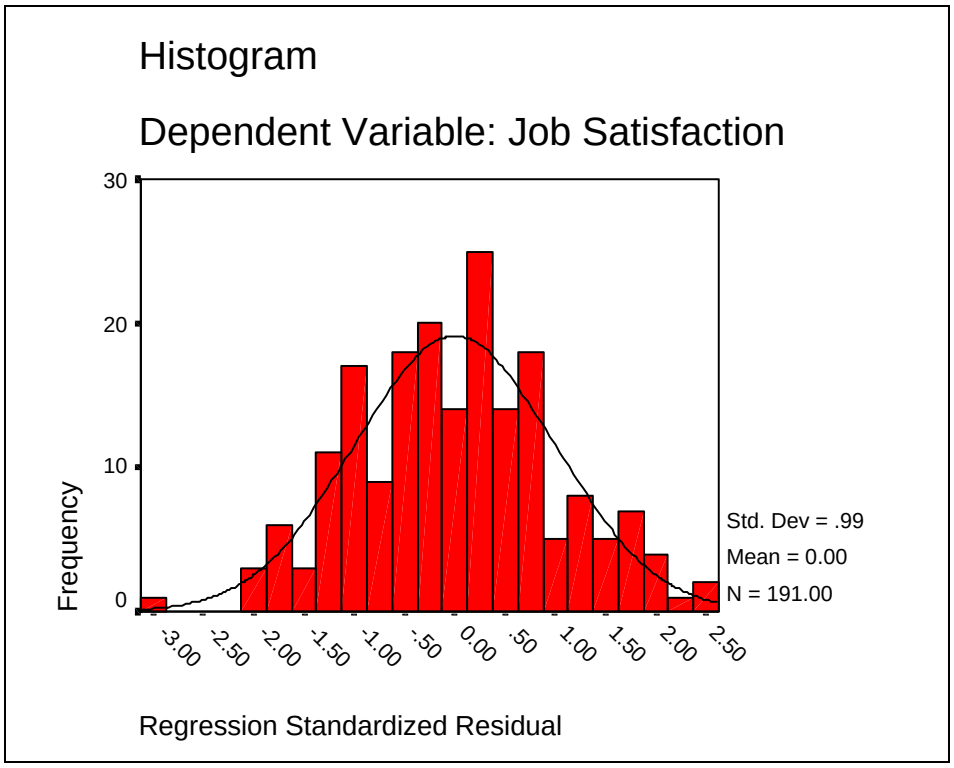


Figure 14. Model # 2a - Standardized Residual Histogram with Normal Probability Plot

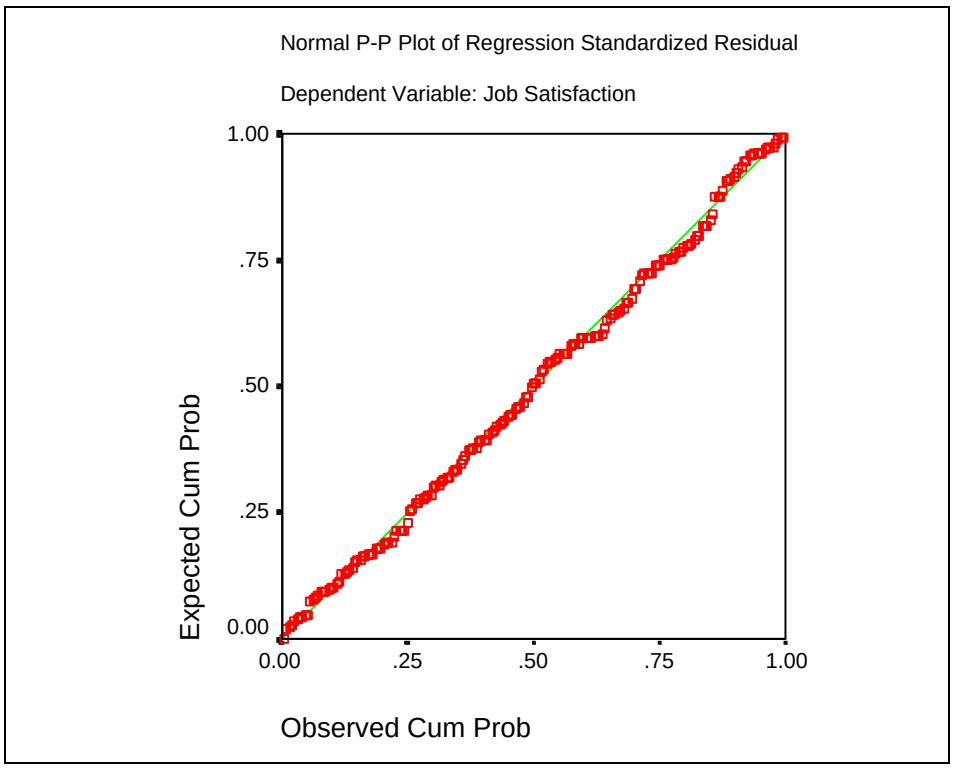


Figure 15. Model # 2a - Normal P-P Plot

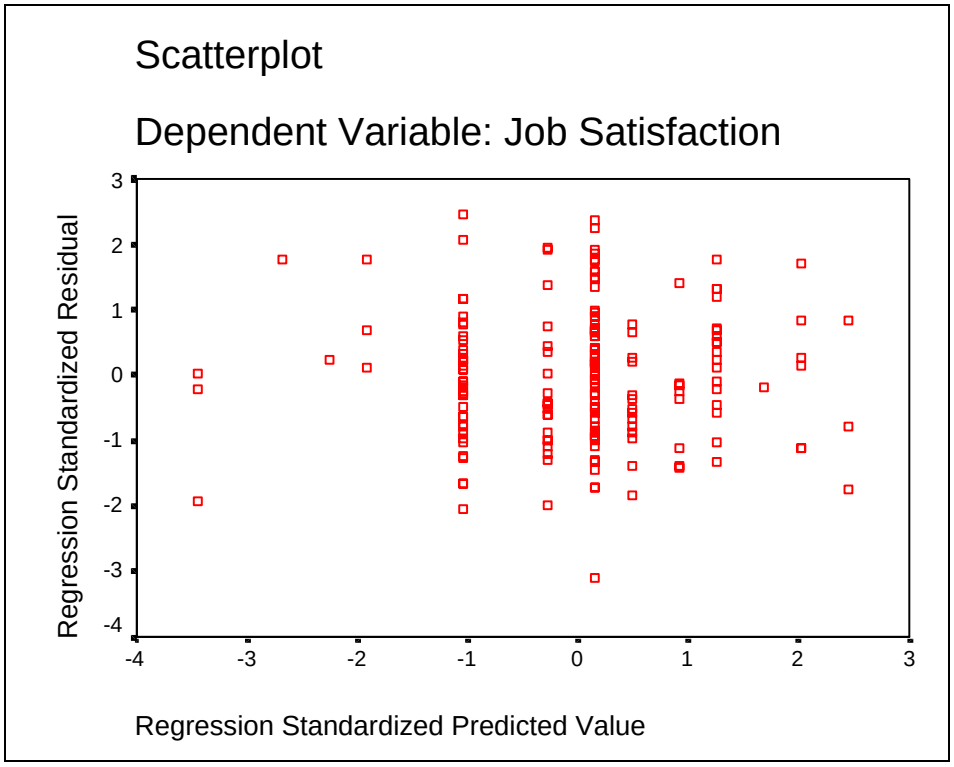


Figure 16. Model # 2a - Scatterplot depicting standardized predicted values against stanadardized residual values

APPENDIX H: Detailed Results of Regression Model # 3

Regression:

Dependent Variable is turnover intention
Independent Variable is job satisfaction

Table 28. Model # 3 - Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	N
Turnover Intention	4.3131	1.3270	329
Job Satisfaction	3.4968	.6388	329

Table 29. Model # 3 - Regression Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.570[a]	.325	.323	1.0915

a. Predictors: (Constant), Job Satisfaction

b. Dependent Variable: Turnover Intention

Table 30. Model # 3 – Regression ANOVA Summary

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187.972	1	187.972	157.774	.000[a]
	Residual	389.588	327	1.191		
	Total	577.559	328			

a. Predictors: (Constant), Job Satisfaction

b. Dependent Variable: Turnover Intention

Table 31. Model # 3 - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	8.457	.335		25.219	.000		
	Job Satisfaction	-1.185	.094	-.570	-12.561	.000	1.000	1.000

a. Dependent Variable: Turnover Intention

Table 32. Model # 3 - Collinearity Diagnostics

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Job Satisfaction
1	1	1.984	1.000	.01	.01
	2	1.623E-02	11.055	.99	.99

a. Dependent Variable: Turnover Intention

Table 33. Model # 3 - Residual Statistics

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.1671	6.7122	4.3131	.7570	329
Residual	-3.0653	2.8428	1.388E-15	1.0898	329
Std. Predicted Value	-2.835	3.169	.000	1.000	329
Std. Residual	-2.808	2.604	.000	.998	329

a. Dependent Variable: Turnover Intention

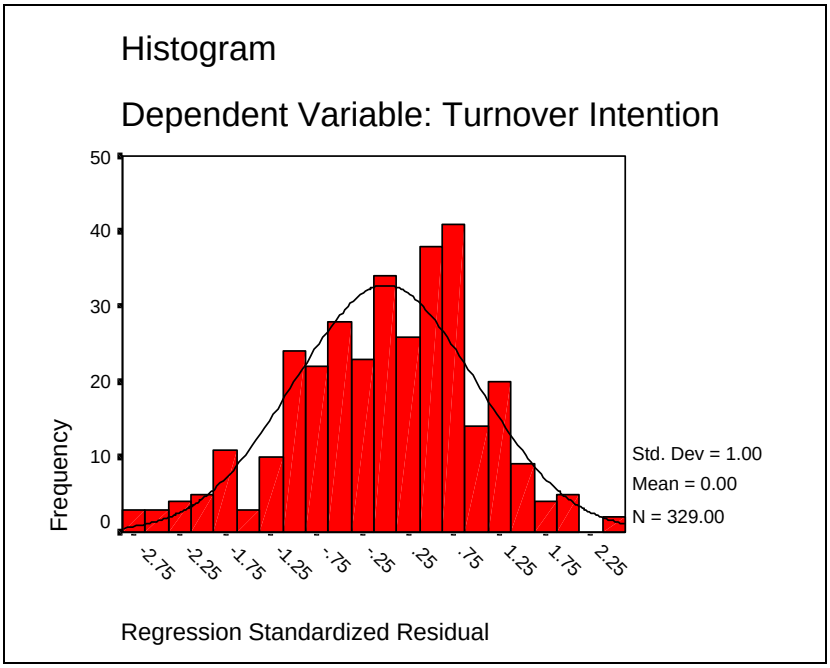


Figure 17. Model # 3 - Standardized Residual Histogram with Normal Probability Plot

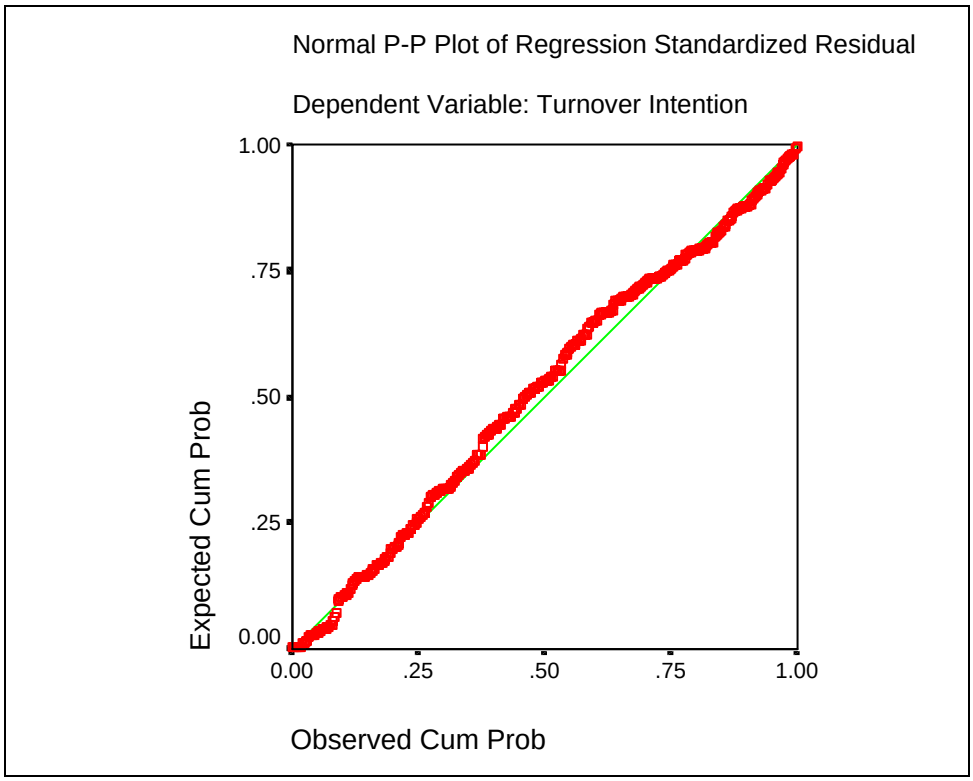


Figure 18. Model # 3 - Normal P-P Plot

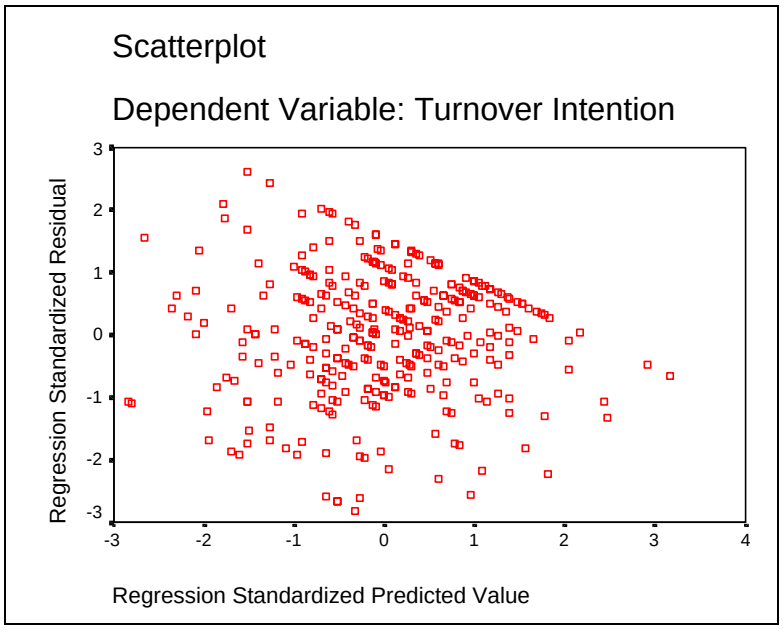


Figure 19. Model # 3 - Scatterplot depicting standardized predicted values against stanadardized residual values

APPENDIX I: Frequency Counts for Research Variables

Rank

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A1C	89	25.5	25.5	25.5
	AB	2	.6	.6	26.1
	AMN	7	2.0	2.0	28.1
	MSgt	23	6.6	6.6	34.7
	Other	2	.6	.6	35.2
	SMSgt	3	.9	.9	36.1
	SrA	97	27.8	27.8	63.9
	SSgt	92	26.4	26.4	90.3
	TSgt	34	9.7	9.7	100.0
	Total	349	100.0	100.0	

Assigned Shift

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	153	43.8	43.8	43.8
	2.00	133	38.1	38.1	81.9
	3.00	19	5.4	5.4	87.4
	4.00	44	12.6	12.6	100.0
	Total	349	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	330	94.6	97.9	97.9
	2.00	7	2.0	2.1	100.0
	Total	337	96.6	100.0	
Missing	System	12	3.4		
Total		349	100.0		

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	121	34.7	60.8	60.8
	2.00	30	8.6	15.1	75.9
	3.00	19	5.4	9.5	85.4
	4.00	22	6.3	11.1	96.5
	5.00	7	2.0	3.5	100.0
	Total	199	57.0	100.0	
Missing	System	150	43.0		
Total		349	100.0		

Level of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00	251	71.9	74.5	74.5
	3.00	58	16.6	17.2	91.7
	4.00	10	2.9	3.0	94.7
	5.00	18	5.2	5.3	100.0
	Total	337	96.6	100.0	
Missing	System	12	3.4		
Total		349	100.0		

Time in Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	106	30.4	53.3	53.3
	2.00	40	11.5	20.1	73.4
	3.00	18	5.2	9.0	82.4
	4.00	12	3.4	6.0	88.4
	5.00	19	5.4	9.5	98.0
	6.00	4	1.1	2.0	100.0
	Total	199	57.0	100.0	
Missing	System	150	43.0		
Total		349	100.0		

Years in Squadron

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	195	55.9	98.0	98.0
	2.00	4	1.1	2.0	100.0
	Total	199	57.0	100.0	
Missing	System	150	43.0		
Total		349	100.0		

Skill Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	.3	.3	.3
	3.00	67	19.2	20.2	20.5
	5.00	140	40.1	42.3	62.8
	7.00	118	33.8	35.6	98.5
	9.00	5	1.4	1.5	100.0
	Total	331	94.8	100.0	
Missing	System	18	5.2		
Total		349	100.0		

Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	156	44.7	46.4	46.4
	2.00	164	47.0	48.8	95.2
	3.00	2	.6	.6	95.8
	4.00	14	4.0	4.2	100.0
	Total	336	96.3	100.0	
Missing	System	13	3.7		
Total		349	100.0		

# of Dependants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	32	9.2	36.4	36.4
	2.00	27	7.7	30.7	67.0
	3.00	23	6.6	26.1	93.2
	4.00	5	1.4	5.7	98.9
	5.00	1	.3	1.1	100.0
	Total	88	25.2	100.0	
Missing	System	261	74.8		
Total		349	100.0		

Pay

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	22	6.3	6.6	6.6
	1.25	12	3.4	3.6	10.3
	1.33	1	.3	.3	10.6
	1.50	12	3.4	3.6	14.2
	1.75	16	4.6	4.8	19.0
	2.00	21	6.0	6.3	25.4
	2.25	30	8.6	9.1	34.4
	2.33	2	.6	.6	35.0
	2.50	20	5.7	6.0	41.1
	2.75	24	6.9	7.3	48.3
	3.00	34	9.7	10.3	58.6
	3.25	20	5.7	6.0	64.7
	3.50	33	9.5	10.0	74.6
	3.67	1	.3	.3	74.9
	3.75	26	7.4	7.9	82.8
	4.00	19	5.4	5.7	88.5
	4.25	16	4.6	4.8	93.4
	4.33	1	.3	.3	93.7
	4.50	10	2.9	3.0	96.7
	4.67	1	.3	.3	97.0
	4.75	3	.9	.9	97.9
	5.00	4	1.1	1.2	99.1
	5.25	1	.3	.3	99.4
	6.00	2	.6	.6	100.0
	Total	331	94.8	100.0	
Missing	System	18	5.2		
Total		349	100.0		

Promotion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	4	1.1	1.2	1.2
	1.25	2	.6	.6	1.8
	1.50	2	.6	.6	2.4
	1.67	1	.3	.3	2.7
	1.75	4	1.1	1.2	3.9
	2.00	8	2.3	2.4	6.3
	2.25	9	2.6	2.7	9.1
	2.50	17	4.9	5.1	14.2
	2.75	22	6.3	6.6	20.8
	3.00	29	8.3	8.8	29.6
	3.25	31	8.9	9.4	39.0
	3.33	2	.6	.6	39.6
	3.50	31	8.9	9.4	48.9
	3.67	1	.3	.3	49.2
	3.75	33	9.5	10.0	59.2
	4.00	42	12.0	12.7	71.9
	4.25	24	6.9	7.3	79.2
	4.33	2	.6	.6	79.8
	4.50	21	6.0	6.3	86.1
	4.75	20	5.7	6.0	92.1
	5.00	13	3.7	3.9	96.1
	5.25	9	2.6	2.7	98.8
	5.33	1	.3	.3	99.1
	5.50	1	.3	.3	99.4
	5.75	1	.3	.3	99.7
	6.00	1	.3	.3	100.0
	Total	331	94.8	100.0	
Missing	System	18	5.2		
Total		349	100.0		

Supervision

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.25	1	.3	.3	.3
	1.50	1	.3	.3	.6
	2.00	3	.9	.9	1.5
	2.25	2	.6	.6	2.1
	2.33	1	.3	.3	2.4
	2.50	1	.3	.3	2.7
	2.75	4	1.1	1.2	3.9
	3.00	6	1.7	1.8	5.7
	3.25	10	2.9	3.0	8.8
	3.50	10	2.9	3.0	11.8
	3.75	20	5.7	6.0	17.8
	4.00	13	3.7	3.9	21.8
	4.25	12	3.4	3.6	25.4
	4.33	2	.6	.6	26.0
	4.50	27	7.7	8.2	34.1
	4.75	28	8.0	8.5	42.6
	5.00	28	8.0	8.5	51.1
	5.25	31	8.9	9.4	60.4
	5.33	1	.3	.3	60.7
	5.50	40	11.5	12.1	72.8
	5.67	3	.9	.9	73.7
	5.75	36	10.3	10.9	84.6
	6.00	51	14.6	15.4	100.0
	Total	331	94.8	100.0	
Missing	System	18	5.2		
Total		349	100.0		

Fringe Benefits

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	11	3.2	3.3	3.3
	1.25	6	1.7	1.8	5.1
	1.50	12	3.4	3.6	8.8
	1.75	7	2.0	2.1	10.9
	2.00	16	4.6	4.8	15.7
	2.25	19	5.4	5.7	21.5
	2.33	1	.3	.3	21.8
	2.50	22	6.3	6.6	28.4
	2.67	2	.6	.6	29.0
	2.75	23	6.6	6.9	36.0
	3.00	34	9.7	10.3	46.2
	3.25	37	10.6	11.2	57.4
	3.33	2	.6	.6	58.0
	3.50	25	7.2	7.6	65.6
	3.67	2	.6	.6	66.2
	3.75	29	8.3	8.8	74.9
	4.00	23	6.6	6.9	81.9
	4.25	18	5.2	5.4	87.3
	4.33	1	.3	.3	87.6
	4.50	14	4.0	4.2	91.8
	4.75	13	3.7	3.9	95.8
	5.00	6	1.7	1.8	97.6
	5.25	5	1.4	1.5	99.1
	5.33	1	.3	.3	99.4
	5.50	1	.3	.3	99.7
	5.75	1	.3	.3	100.0
	Total	331	94.8	100.0	
Missing	System	18	5.2		
Total		349	100.0		

Contingent Rewards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	24	6.9	7.3	7.3
	1.25	11	3.2	3.3	10.6
	1.50	17	4.9	5.1	15.7
	1.67	1	.3	.3	16.0
	1.75	11	3.2	3.3	19.3
	2.00	18	5.2	5.4	24.8
	2.25	26	7.4	7.9	32.6
	2.50	35	10.0	10.6	43.2
	2.75	21	6.0	6.3	49.5
	3.00	28	8.0	8.5	58.0
	3.25	25	7.2	7.6	65.6
	3.33	2	.6	.6	66.2
	3.50	19	5.4	5.7	71.9
	3.75	24	6.9	7.3	79.2
	4.00	18	5.2	5.4	84.6
	4.25	6	1.7	1.8	86.4
	4.33	1	.3	.3	86.7
	4.50	14	4.0	4.2	90.9
	4.67	1	.3	.3	91.2
	4.75	12	3.4	3.6	94.9
	5.00	7	2.0	2.1	97.0
	5.25	3	.9	.9	97.9
	5.50	3	.9	.9	98.8
	5.67	1	.3	.3	99.1
	5.75	1	.3	.3	99.4
	6.00	2	.6	.6	100.0
	Total	331	94.8	100.0	
Missing	System	18	5.2		
Total		349	100.0		

Co-worker

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	.3	.3	.3
	1.50	3	.9	.9	1.2
	1.75	4	1.1	1.2	2.4
	2.00	4	1.1	1.2	3.6
	2.25	10	2.9	3.0	6.7
	2.50	10	2.9	3.0	9.7
	2.75	12	3.4	3.6	13.4
	3.00	29	8.3	8.8	22.2
	3.25	38	10.9	11.6	33.7
	3.50	43	12.3	13.1	46.8
	3.67	1	.3	.3	47.1
	3.75	27	7.7	8.2	55.3
	4.00	42	12.0	12.8	68.1
	4.25	23	6.6	7.0	75.1
	4.50	28	8.0	8.5	83.6
	4.67	1	.3	.3	83.9
	4.75	18	5.2	5.5	89.4
	5.00	12	3.4	3.6	93.0
	5.25	7	2.0	2.1	95.1
	5.33	1	.3	.3	95.4
	5.50	8	2.3	2.4	97.9
	5.67	1	.3	.3	98.2
	5.75	2	.6	.6	98.8
	6.00	4	1.1	1.2	100.0
	Total	329	94.3	100.0	
Missing	System	20	5.7		
Total		349	100.0		

Nature of Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	2	.6	.6	.6
	1.25	1	.3	.3	.9
	1.50	1	.3	.3	1.2
	1.75	1	.3	.3	1.5
	2.00	10	2.9	3.0	4.6
	2.25	7	2.0	2.1	6.7
	2.50	8	2.3	2.4	9.1
	2.75	9	2.6	2.7	11.9
	3.00	13	3.7	4.0	15.8
	3.25	12	3.4	3.6	19.5
	3.50	23	6.6	7.0	26.4
	3.67	1	.3	.3	26.7
	3.75	22	6.3	6.7	33.4
	4.00	29	8.3	8.8	42.2
	4.25	29	8.3	8.8	51.1
	4.50	26	7.4	7.9	59.0
	4.75	22	6.3	6.7	65.7
	5.00	43	12.3	13.1	78.7
	5.25	18	5.2	5.5	84.2
	5.50	23	6.6	7.0	91.2
	5.75	17	4.9	5.2	96.4
	6.00	12	3.4	3.6	100.0
	Total	329	94.3	100.0	
Missing	System	20	5.7		
Total		349	100.0		

Communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	9	2.6	2.7	2.7
	1.25	5	1.4	1.5	4.3
	1.50	11	3.2	3.3	7.6
	1.75	12	3.4	3.6	11.2
	2.00	11	3.2	3.3	14.6
	2.25	18	5.2	5.5	20.1
	2.50	18	5.2	5.5	25.5
	2.75	31	8.9	9.4	35.0
	3.00	27	7.7	8.2	43.2
	3.25	29	8.3	8.8	52.0
	3.33	1	.3	.3	52.3
	3.50	28	8.0	8.5	60.8
	3.67	2	.6	.6	61.4
	3.75	24	6.9	7.3	68.7
	4.00	24	6.9	7.3	76.0
	4.25	19	5.4	5.8	81.8
	4.50	20	5.7	6.1	87.8
	4.75	9	2.6	2.7	90.6
	5.00	11	3.2	3.3	93.9
	5.25	9	2.6	2.7	96.7
	5.50	9	2.6	2.7	99.4
	5.75	1	.3	.3	99.7
	6.00	1	.3	.3	100.0
	Total	329	94.3	100.0	
Missing	System	20	5.7		
Total		349	100.0		

Shift Satisfaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	30	8.6	9.2	9.2
	1.25	18	5.2	5.5	14.7
	1.33	1	.3	.3	15.0
	1.50	19	5.4	5.8	20.9
	1.75	16	4.6	4.9	25.8
	2.00	30	8.6	9.2	35.0
	2.25	32	9.2	9.8	44.8
	2.33	1	.3	.3	45.1
	2.50	26	7.4	8.0	53.1
	2.75	17	4.9	5.2	58.3
	3.00	29	8.3	8.9	67.2
	3.25	16	4.6	4.9	72.1
	3.50	23	6.6	7.1	79.1
	3.67	1	.3	.3	79.4
	3.75	6	1.7	1.8	81.3
	4.00	22	6.3	6.7	88.0
	4.25	15	4.3	4.6	92.6
	4.50	2	.6	.6	93.3
	4.75	9	2.6	2.8	96.0
	5.00	11	3.2	3.4	99.4
	5.75	1	.3	.3	99.7
	6.00	1	.3	.3	100.0
	Total	326	93.4	100.0	
Missing	System	23	6.6		
Total		349	100.0		

Job Satisfaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.47	1	.3	.3	.3
	1.64	1	.3	.3	.6
	1.92	1	.3	.3	.9
	1.94	1	.3	.3	1.2
	2.11	1	.3	.3	1.5
	2.19	2	.6	.6	2.1
	2.33	1	.3	.3	2.4
	2.34	1	.3	.3	2.7
	2.36	2	.6	.6	3.3
	2.39	1	.3	.3	3.6
	2.42	1	.3	.3	3.9
	2.44	1	.3	.3	4.2
	2.47	1	.3	.3	4.5
	2.50	1	.3	.3	4.8
	2.53	2	.6	.6	5.4
	2.56	2	.6	.6	6.0
	2.61	6	1.7	1.8	7.9
	2.63	1	.3	.3	8.2
	2.64	1	.3	.3	8.5
	2.67	1	.3	.3	8.8
	2.69	5	1.4	1.5	10.3
	2.75	8	2.3	2.4	12.7
	2.78	1	.3	.3	13.0
	2.79	1	.3	.3	13.3
	2.81	2	.6	.6	13.9
	2.82	1	.3	.3	14.2
	2.83	3	.9	.9	15.1
	2.86	7	2.0	2.1	17.2
	2.89	3	.9	.9	18.1
	2.91	1	.3	.3	18.4
	2.92	2	.6	.6	19.0
	2.94	4	1.1	1.2	20.2
	2.97	1	.3	.3	20.5
	2.97	5	1.4	1.5	22.1
	3.00	3	.9	.9	23.0
	3.03	5	1.4	1.5	24.5
	3.06	4	1.1	1.2	25.7
	3.08	4	1.1	1.2	26.9
	3.11	6	1.7	1.8	28.7
	3.12	1	.3	.3	29.0
	3.14	4	1.1	1.2	30.2
	3.15	1	.3	.3	30.5
	3.17	3	.9	.9	31.4
	3.19	5	1.4	1.5	32.9
	3.20	1	.3	.3	33.2
	3.22	2	.6	.6	33.8
	3.25	3	.9	.9	34.7
	3.28	5	1.4	1.5	36.3
	3.31	4	1.1	1.2	37.5
	3.31	1	.3	.3	37.8

	3.31	2	.6	.6	38.4
	3.32	1	.3	.3	38.7
	3.33	6	1.7	1.8	40.5
	3.34	1	.3	.3	40.8
	3.36	2	.6	.6	41.4
	3.39	5	1.4	1.5	42.9
	3.42	7	2.0	2.1	45.0
	3.42	1	.3	.3	45.3
	3.44	4	1.1	1.2	46.5
	3.47	5	1.4	1.5	48.0
	3.49	2	.6	.6	48.6
	3.50	5	1.4	1.5	50.2
	3.53	4	1.1	1.2	51.4
	3.54	1	.3	.3	51.7
	3.56	7	2.0	2.1	53.8
	3.57	2	.6	.6	54.4
	3.58	7	2.0	2.1	56.5
	3.59	1	.3	.3	56.8
	3.61	7	2.0	2.1	58.9
	3.64	5	1.4	1.5	60.4
	3.67	7	2.0	2.1	62.5
	3.68	1	.3	.3	62.8
	3.69	2	.6	.6	63.4
	3.71	3	.9	.9	64.4
	3.72	4	1.1	1.2	65.6
	3.74	1	.3	.3	65.9
	3.75	3	.9	.9	66.8
	3.77	1	.3	.3	67.1
	3.78	4	1.1	1.2	68.3
	3.80	2	.6	.6	68.9
	3.83	8	2.3	2.4	71.3
	3.86	6	1.7	1.8	73.1
	3.88	1	.3	.3	73.4
	3.89	1	.3	.3	73.7
	3.89	4	1.1	1.2	74.9
	3.91	3	.9	.9	75.8
	3.92	5	1.4	1.5	77.3
	3.94	1	.3	.3	77.6
	3.94	6	1.7	1.8	79.5
	4.00	5	1.4	1.5	81.0
	4.03	5	1.4	1.5	82.5
	4.06	4	1.1	1.2	83.7
	4.08	4	1.1	1.2	84.9
	4.09	1	.3	.3	85.2
	4.11	3	.9	.9	86.1
	4.14	1	.3	.3	86.4
	4.17	1	.3	.3	86.7
	4.19	1	.3	.3	87.0
	4.25	1	.3	.3	87.3
	4.26	1	.3	.3	87.6
	4.28	2	.6	.6	88.2
	4.31	3	.9	.9	89.1
	4.31	1	.3	.3	89.4
	4.35	1	.3	.3	89.7

	4.39	2	.6	.6	90.3
	4.40	1	.3	.3	90.6
	4.42	2	.6	.6	91.2
	4.46	1	.3	.3	91.5
	4.47	6	1.7	1.8	93.4
	4.50	2	.6	.6	94.0
	4.53	1	.3	.3	94.3
	4.56	1	.3	.3	94.6
	4.58	2	.6	.6	95.2
	4.61	1	.3	.3	95.5
	4.63	1	.3	.3	95.8
	4.64	1	.3	.3	96.1
	4.68	1	.3	.3	96.4
	4.74	1	.3	.3	96.7
	4.75	1	.3	.3	97.0
	4.78	1	.3	.3	97.3
	4.81	1	.3	.3	97.6
	4.83	1	.3	.3	97.9
	4.83	1	.3	.3	98.2
	4.89	1	.3	.3	98.5
	4.97	1	.3	.3	98.8
	5.00	1	.3	.3	99.1
	5.19	1	.3	.3	99.4
	5.29	1	.3	.3	99.7
	5.31	1	.3	.3	100.0
	Total	331	94.8	100.0	
Missing	System	18	5.2		
Total		349	100.0		

Turnover Intention

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	9	2.6	2.7	2.7
	1.25	2	.6	.6	3.3
	1.50	5	1.4	1.5	4.9
	1.75	3	.9	.9	5.8
	2.00	6	1.7	1.8	7.6
	2.25	7	2.0	2.1	9.7
	2.50	4	1.1	1.2	10.9
	2.75	8	2.3	2.4	13.4
	3.00	18	5.2	5.5	18.8
	3.25	16	4.6	4.9	23.7
	3.50	23	6.6	7.0	30.7
	3.75	10	2.9	3.0	33.7
	4.00	22	6.3	6.7	40.4
	4.25	24	6.9	7.3	47.7
	4.33	1	.3	.3	48.0
	4.50	17	4.9	5.2	53.2
	4.67	1	.3	.3	53.5
	4.75	29	8.3	8.8	62.3
	5.00	16	4.6	4.9	67.2
	5.25	18	5.2	5.5	72.6
	5.50	24	6.9	7.3	79.9
	5.75	19	5.4	5.8	85.7
	6.00	47	13.5	14.3	100.0
	Total	329	94.3	100.0	
Missing	System	20	5.7		
Total		349	100.0		

Overtime

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	3	.9	.9	.9
	1.25	4	1.1	1.2	2.1
	1.50	1	.3	.3	2.4
	1.75	2	.6	.6	3.0
	2.00	4	1.1	1.2	4.3
	2.25	7	2.0	2.1	6.4
	2.50	5	1.4	1.5	7.9
	2.75	4	1.1	1.2	9.1
	3.00	13	3.7	4.0	13.1
	3.25	17	4.9	5.2	18.2
	3.50	17	4.9	5.2	23.4
	3.75	19	5.4	5.8	29.2
	4.00	17	4.9	5.2	34.3
	4.25	14	4.0	4.3	38.6
	4.33	1	.3	.3	38.9
	4.50	12	3.4	3.6	42.6
	4.75	24	6.9	7.3	49.8
	5.00	26	7.4	7.9	57.8
	5.25	24	6.9	7.3	65.0
	5.50	22	6.3	6.7	71.7
	5.75	27	7.7	8.2	79.9
	6.00	66	18.9	20.1	100.0
	Total	329	94.3	100.0	
Missing	System	20	5.7		
Total		349	100.0		

Schedule Variance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	20	5.7	6.1	6.1
	1.25	11	3.2	3.3	9.4
	1.50	11	3.2	3.3	12.8
	1.75	13	3.7	4.0	16.7
	2.00	10	2.9	3.0	19.8
	2.25	11	3.2	3.3	23.1
	2.50	11	3.2	3.3	26.4
	2.67	2	.6	.6	27.1
	2.75	10	2.9	3.0	30.1
	3.00	12	3.4	3.6	33.7
	3.25	9	2.6	2.7	36.5
	3.33	1	.3	.3	36.8
	3.50	11	3.2	3.3	40.1
	3.67	1	.3	.3	40.4
	3.75	12	3.4	3.6	44.1
	4.00	9	2.6	2.7	46.8
	4.25	16	4.6	4.9	51.7
	4.50	24	6.9	7.3	59.0
	4.67	2	.6	.6	59.6
	4.75	14	4.0	4.3	63.8
	5.00	18	5.2	5.5	69.3
	5.25	17	4.9	5.2	74.5
	5.50	17	4.9	5.2	79.6
	5.75	22	6.3	6.7	86.3
	6.00	45	12.9	13.7	100.0
	Total	329	94.3	100.0	
Missing	System	20	5.7		
Total		349	100.0		

Bibliography

Akerstedt, T. and Torsvall, L. (1978). Experimental Changes in Shift Schedules—Their Effects on Well-Being. Ergonomics, 21 (10), 849-856.

Aschoff, J., Hoffman, K., Pohl, H., and Wever, R. (1975). Re-entrainment of Circadian Rhythms After Phase Shifts of the Zeitgeber. Chronobiologia, 2, 23-78.

Barton, J., Folkard, S. (1991). The response of day and night nurses to their work schedules. Journal of Occupational Psychology, 64, 204-218.

Blau, G. (1993). Further exploring the relationship between job search and voluntary individual turnover. Personnel Psychology, 46, 313-330.

Bluedorn, A. C. (1982). A Unified Model of Turnover from Organizations. Human Relations, 35 (2), 135-153.

Cammann, C., Fichman, M., Jenkins, G. D., Klesh, J. R. (1983). Assessing the Attitudes and Perceptions of Organizational Members. In Seashore, S. E., Lawler, E. E., Mirvis, P. H., and Cammann, C. Assessing Organizational Change. (pp. 71-138). New York: Wiley-Interscience.

Campbell, C. Effects of Shiftwork on Air Force Aircraft Maintenance Personnel. MS thesis, AFIT/GTM/LAL/98S-2. Graduate School of Logistics and Acquisition Management, Air Force Institute of Technology (AU), Wright-Patterson Air Force Base OH, September 1998.

Cook, J. D., S. J. Hepworth, T. D. Wall, and Warr, P. B. (1981). The Experience of Work: A Compendium and Review of 249 Measures and Their Use. London: Academic Press.

Collette, D. Comparison of the effects of eight-hour and twelve-hour shifts on Air Force Aircraft Maintenance Production Levels. MS thesis, AFIT/GLM/LAL/99S-4. Graduate School of Logistics and Acquisition Management, Air Force Institute of Technology (AU), Wright-Patterson Air Force Base OH, September 1999.

Cote, S, Morgan, L. M. (2002). A longitudinal analysis of the association between emotion regulation, job satisfaction, and intentions to quit. Journal of Organizational Behavior, 23, (8), 947-959.

Crampton, S. M., and Wagner, J. A., III. (1994). Percept-percept inflation in microorganizational research: An investigation of prevalence and effect. Journal of Applied Psychology, 79, 67-76.

Creswell, J. W. (1994). Research Design: Qualitative & Quantitative Approaches. Thousand Oaks, CA: Sage Publications, Inc.

Department of the Air Force.. Aerospace Equipment Maintenance Management. AFI 21-101. Washington: HQ USAF, 1 October 2002.

Dunham, R. B.(1977). Shiftwork: A Review and Theoretical Analysis. Academy of Management Review, 624-634.

Dunham, R. B., Pierce, J. L., & Castaneda, M. B. (1987). Alternative Work Schedules: Two Field Quasi-Experiments. Personnel Psychology, 40, 215-242.

Folkard, S., Monk, T. H., and Lobban, M. C. (1979). Towards a Predictive Test of Adjustment to Shift Work. Ergonomics, 22, (1), 79-91.

Frese, M., and Semmer, N. (1986). Shiftwork, stress and psychosomatic complaints: a comparison between workers in different shiftwork schedules, non-shiftworkers, and former shiftworkers, Ergonomics, 29, (1), 99-114.

Ghiselli, R. F., La Lopa, J. M., and Bai, B. (2001). Job Satisfaction, Life Satisfaction, and Turnover Intent. Cornell Hotel and Restaurant Administration Quarterly, 42, 2, 28-37.

Griffis, S. E., Goldsby, T. J., and Cooper M. (2003). Web-based and mail surveys: A comparison of response, data, and cost. Journal of Business Logistics, 24, (2), 237-258.

HQ Air Force Personnel Center. IDEAS Report. 4 February 2004 http://www.afpc.randolph.af.mil/vbin/broker8.exe

Igbaria, M., Guimaraes, T. (1993). Antecedents and consequences of job satisfaction among information center employees. Journal of Management Information Systems, 9, (4), 145-175.

Kachigan, S. K. (1991). Multivariate Statistical Analysis. (2nd ed). New York, NY: Radius Press.

Kelly, R. and Schneider, M. (1982). The twelve-hour shift revisited: recent trends in the electric industry. Journal of Human Ergology, 11, 369-384.

King, W. C., Miles, E. W. (1995). A quasi-experimental assessment of the effect of computerizing noncognitive paper-and-pencil measurements: A test of measurements equivalence. Journal of Applied Psychology, 80, 643-651.

Koller, M., Kundi, M., Cervinka, R. (1978). Field Studies of Shift Work at an Austrian Oil Refinery: Health and Psychosocial Wellbeing of Workers who Drop out of Shiftwork, Ergonomics, 21, (10), 835-847.

Leedy, P. D, Ormrod, J. E.(2001). Practical Research: Planning and Design (7th ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.

Lillie, L., Kervin, J., Clark, K., Reid, F., and Sirola, W. (1998). Explaining nursing turnover intent: job satisfaction, pay satisfaction, or organizational commitment? Journal of Organizational Behavior, 19, 305-320.

Locke, E. A. (1969). What is Job Satifaction?, Organizational Behavior and Human Performance, 4, (4), 309-336

Luna, T. D. (1996). Shiftwork: Basic Concern for Commanders, Supervisors and Flight Surgeons USAF School of Aerospace Medicine, Brooks Air Force Base, TX. (DTIC No. AL/CF-TR-1996-0073)

McClave, J. T., Benson, P. G., Sincich, T. (2001). Statistics for Business and Economics (8th ed.). Upper Saddle River, NJ: Prentice-Hall Inc.

Mead A. D, Drasgow, F. (1993). Equivalence of computerized and paper-and-pencil cognitive ability tests: A meta-analysis. Psychological Bulletin, 114, 449-458.

Meers, A., Maasen, A. and Verhaegen, P. (1978). Subjective Health After Six Months and After Four Years of Shift Work. Ergonomics, 21 (10), 857-859.

Mills, M. E., Arnold, B., and Wood, C. M. (1983). Core 12: A controlled study of the impact of 12h scheduling. Nursing Research, 32, 356-361.

Mobley, W. H. (1979). Intermediate linkages in the relationship between job satisfaction and employee turnover. Journal of Applied Psychology, 62, 237-240.

Monk, T. H. (1986). Advantages and Disadvantages of Rapidly Rotating Shift Schedules- - A Circadian View Point, Human Factors, 28 (5), 553-557.

Mott, P. E., Mann, F. C., McLoughlin, Q., and Warwick, D. P. (1965). Shiftwork. Ann Arbor: University of Michigan Press.

Murray, G. R., Chief Master Sergeant of the Air Force. "Quality of Life in the Military." Verbal Presentation to the United States House of Representatives, Committee on Appropriations and Subcommittee on Military Construction. Washington D.C. 5 March 2003.

Obruba, P. Predictability, Work-Family Conflict, and Intent to Stay: An Air Force Case Study. MS thesis, AFIT/GEE/ENV/01M-13. Graduate School of Engineering and Management, Air Force Institute of Technology (AU), Wright-Patterson Air Force Base OH, March 2001.

Overland, D. Comparison of Effects of Change From 8 to 12 Hour Shifts on Air Force Maintenance Workers. MS thesis, AFIT/GTM/LAL/97S-8. Graduate School of Logistics and Acquisition Management, Air Force Institute of Technology (AU), Wright-Patterson Air Force Base OH, September 1997 (AD-A329844).

Price, J. L., and Mueller, C. W. (1981). A causal model of turnover for nurses. Academy of Management Journal, 24, (3), 543-565.

Raggatt, P. T. (1991). Work stress among long-distance coach drivers: A survey and correlational study. Journal of Organizational Behavior, 12, 565-579.

Rosa, R. R., and Bonnet, M. H. (1993). Performance and alertness on 8h and 12h rotating shifts at a natural gas utility. Ergonomics, 36, (10), 1177-1193.

Scott, K. A Comparison of 8-Hour vs. 12-Hour Shifts on Performance, Health and Safety in a USAF Aircraft Maintenance Squadron. MS thesis, AFIT/GLM/LAL/98S-11. Graduate School of Logistics and Acquisition Management, Air Force Institute of Technology (AU), Wright-Patterson Air Force Base OH, September 1998.

Seashore, S. E., Lawler, E. E., Mirvis, P. H., and Cammann, C. (1983). Assessing Organizational Change. New York, NY: Wiley-Interscience.

Shore, L. M., Newton, L. A., and Thornton, G. C., III. (1990). Job and organizational attitudes in relation to employee behavioral intentions. Journal of Organizational Behavior, 57, 57-67.

Simsek, Z., and Veiga, J. F. (2000). The Electronic Survey Technique: An Integration and Assessment. Organizational research Methods, 3, (1), 92-114.

Smith, P. C., Kendall, L. M., and Hulin, C. L. (1969). Measurement of satisfaction in work and retirement. Chicago: Rand McNally.

Spector, P. E. (1997). Job Satisfaction – Application, Assessment, Causes, and Consequences. Thousand Oaks, CA: Sage Publications.

Staines, G. L., and Pleck, J. H. (1984). Nonstandard work schedules and family life. Journal of Applied Psychology, 69, 515-523.

Stanton, J. M. (1998). An Empirical Assessment of Data Collection Using the Internet. Personnel Psychology, 51, 709-725.

Tett, R. P., and Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: path analysis based on meta-analytic findings. Personnel Psychology, 46, 259-293.

Udo, G. J., Guimaraes, T., Igbaria, M. (1997). An investigation of the antecedents of turnover intentions for manufacturing plant managers. International Journal of Operations & Production Management, 17, (9), 912-925.

Vita

First Lieutenant Michael J. Shellhamer graduated from Longmont High School in Longmont, Colorado on May 30, 1992. Enlisting in the Air Force in December of 1993 he was an Honor Graduate from the Aircraft Electrical Environmental Systems Technical School, Sheppard AFB, TX. As an Aircraft Electrical-Environmental Systems Specialist he worked on the U-2R/S at Beale AFB, California and the F-15C/D, F-16C/D, and A/OA-10 at Spangdahlem AB, Germany. After 5 years of enlisted service Michael applied for and was accepted into the AFROTC Professional Officer Course Early Release Program. He attended Embry Riddle Aeronautical University in Prescott, Arizona where he graduated with a Bachelor of Science degree in Professional Aeronautics in April 2000. Upon graduation Michael was commissioned as a 2nd Lieutenant and returned to active duty as an Aircraft Maintenance Officer on June 10, 2000.

His next assignment was at Davis-Monthan AFB, Arizona where he served fifteen months as the Sortie Support Flight Commander for the 357th Fighter Squadron and eight months as the Propulsion Flight Commander for the 355th Component Repair Squadron. In August 2002 he entered the Graduate School of Engineering and Management, Air Force Institute of Technology. Upon graduation, he will be assigned to Aeronautical Systems Command, Wright-Patterson AFB, OH.

REPORT DOCUMENTATION PAGE	Form Approved OMB No. 074-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From – To)*
05-04-2004	**Master's Thesis**	Jun 2003 – Mar 2004

4. TITLE AND SUBTITLE
EFFECTS OF DUTY SCHEDULE VARIANCE AND OVERTIME ON THE JOB SATISFACTION AND TURNOVER INTENTIONS OF USAF F-16 CREW CHIEFS

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Michael J. Shellhamer, 1st Lt, USAF

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)
Air Force Institute of Technology
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8. PERFORMING ORGANIZATION REPORT NUMBER

AFIT/GLM/ENS/04-17

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
AFRL/HESR
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2698 G Street
Wright-Patterson AFB, OH 45433-7604

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

This thesis empirically assessed how duty schedule variance and overtime affect the job satisfaction and turnover intentions of USAF F-16 crew chiefs. A survey was completed by 346 active duty USAF F-16 crew chiefs regarding their perceptions of duty schedule variance, overtime, job satisfaction and intent to leave the Air Force. Theory suggests that turnover behavior is a multistage process that involves organizational, individual, and attitudinal components. Using multivariate correlation and regression analyses, plausible evidence was found to support the idea that duty schedule variance and overtime plays a role in USAF F-16 crew chief turnover intentions via job satisfaction. Additional evidence supported the theory that these path relationships changed in strength for demographic sub-categories based on age, but not for education, length of service, marital status or number of dependents.

15. SUBJECT TERMS
Job satisfaction, shift work, overtime, employee turnover, aircraft maintenance

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			**Stephen M. Swartz,** USAF (ENS)
U	**U**	**U**	**UU**	125	**19b. TELEPHONE NUMBER** *(Include area code)* (937) 255-3636 ext 4575, e-mail: stephen.swartz@afit.edu

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39-18