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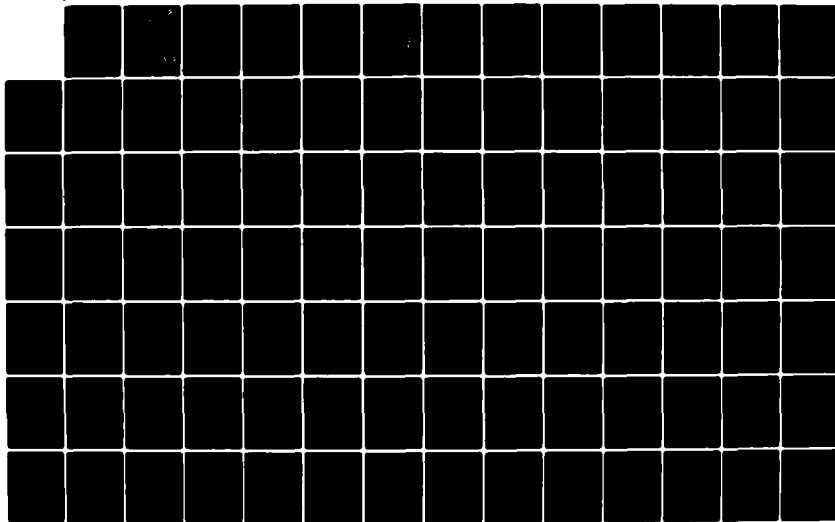
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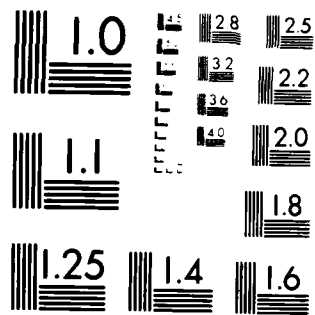
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AN ANALYSIS OF ALTERNATE WORK
SCHEDULES IN SELECTED AIR FORCE
CIVIL ENGINEERING SQUADRONS

William R. Burcher, 1st Lt, USAF
Larry L. Lawrence, 1st Lt, USAF

LSSR 50-82

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Alternate Work Schedules, including the compressed workweek and flexitime, have been successfully implemented in private business. These schedules have resulted in increased productivity, job satisfaction, and decreased absenteeism. Through an employee attitude questionnaire, these benefits as well as possible detriments such as increased fatigue and job difficulty were examined among Civil Engineering organizations that implemented alternate work schedules. Additional analysis focused on determining if differences existed between the perceptions of supervisory and nonsupervisory personnel, and if differences existed between compressed and flexible work schedules. Questionnaire results indicated that alternate work schedules are beneficial to both the employee and the organization. For both types of work schedules, supervisors and non-supervisors expressed high levels of satisfaction and acceptance; however, non-supervisors showed slightly higher levels of acceptance than supervisors. Compressed schedules received more favorable responses from employees than flexible schedules but major differences did not exist.

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AN ANALYSIS OF ALTERNATE WORK SCHEDULES IN
SELECTED AIR FORCE CIVIL ENGINEERING SQUADRONS

A Thesis

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Engineering Management

By

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September 1982

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and

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has been accepted by the undersigned on behalf of the
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fulfillment of the requirements for the degree of

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COMMITTEE CHAIRMAN

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CHAPTER I

INTRODUCTION

Over the past forty years, the standard American work schedule has been a five-day, forty-hour week with fixed arrival and departure times. This work schedule forces each employee to maintain a regimented time schedule, and typically, workers are given no latitude to schedule personal business during their work hours. For some workers, the standard work schedule can be a great inconvenience. This inconvenience may eventually lead to dissatisfied workers. Many employers have recognized a need for alternate work schedules (AWSs) and have taken steps to implement them in their organizations.

Several types of alternate work schedules are in use today, but most can be classified into two categories: the compressed work schedule and flexitime. The compressed work schedule refers to any schedule that requires less than five workdays to complete forty hours of work or less than ten workdays to complete eighty hours of work. The most common compressed schedule is the four-day, forty-hour week (43:2). Under this schedule, the employee works ten hours each day and four days each week. The five-four-nine is another type of compressed work schedule. Employees on this schedule work five days the first week then switch to four days the next week.

The flexitime schedule maintains the five-day, forty-hour week, but employees may vary arrival and departure times around a specified core time. Core time is a designated period of time each day that all employees must be present for work. Nine a.m. to three p.m., for example, is a common core time used by many organizations.

The Federal Government, encouraged by the results of alternate work schedule experiments within private business concerns, enacted the Federal Employees Flexible and Compressed Work Schedules Act of 1978 (Public Law 95-390). This act allowed Federal Agencies to implement AWSs on an experimental basis. The Office of Personnel Management (OPM) was given the responsibility of evaluating the effectiveness of these experiments and reporting their findings to the United States Congress. The OPM's primary research objectives were to examine the effects of alternate work schedules on the following six concerns: (1) efficiency of Government operations, (2) mass transit and traffic congestion, (3) energy consumption, (4) public service, (5) employment opportunities, and (6) employee quality of life (43:1-7).

As part of the OPM's research, the Air Force (AF) first implemented AWSs in selected work units during fiscal year 1980. Included in the AF alternate work schedule experiment were four Civil engineering (CE) squadrons that implemented AWSs throughout their organizations.

Statement of the Problem

Management in the private sector has gleaned much information from past research on the effects of alternate work schedules. However, two significant problems can be found with this research. First, the research has focused on organizations with relatively homogeneous tasks such as manufacturing, services, or administration. Since many organizations, including AF Civil Engineering squadrons, have multiple functions, this previous research has only limited applications. Secondly, most of the alternate work schedule research has been devoted to revealing the perceptions of nonsupervisory personnel. Although supervisors make up only a small fraction of any organization's workforce, their perceptions should be compared to those of their subordinates in order to accurately assess the impact of alternate work schedules on a particular organization.

Background

The concept of flexitime was imported from West Germany where it first appeared in 1967. A German aerospace company was the first organization to experiment with flexible works hours. They implemented flexitime to relieve some of the severe traffic congestions that resulted from having only one road accessing their plant.

The implementation of flexitime not only eliminated the traffic problems, but it also reduced absenteeism, overtime, and employee turnover (50:4,5). Other advantages that have been linked to flexitime include increases in productivity (19:510), morale (19:510), and job satisfaction (52:211). Additionally, it has been suggested that flexitime can reduce worker fatigue and increase the number of hours available for customer contact (52:206,215). Today, several million workers are using flexitime schedules in the U.S. (50:11).

The compressed workweek originated in the U.S. in the late 1960s. In 1974, approximately 650,000 full-time American workers were using a four-day schedule (24:30) and by 1979, almost 1.5 million workers had adopted the four-day schedule (58:92). The compressed workweek has been shown to increase productivity, decrease absenteeism, improve morale, decrease turnover, and increase recruiting potential (7:17). In addition, the compressed workweek provides for extra employee leisure time (26:29) and has the potential for reducing utility costs if plants or offices close for one more day each week (39:61).

As in most programs, alternate work schedules also have disadvantages. With flexitime, scheduling problems sometimes result, and it may become necessary for increased managerial planning in order to carry out routine organizational tasks (40:19). Organizations may experience a

decline in internal communications (19:510) as well as external communications with other organizations (52:199). Research has revealed that most organizations using flexitime encounter problems with recording attendance. Flexitime is difficult to monitor and some employees take advantage of this situation (40:19). Time clocks may help alleviate the monitoring problem, but many employees resent having to use them (1:49). Another flexitime problem that plagues some organizations is a lack of employee supervision (13:155). Under the flexitime program, some employees may choose to work the hours of six a.m. to three p.m. while others may choose to work from nine a.m. to six p.m. Since a supervisor cannot be expected to work the entire twelve-hour period, it is inevitable that some employees will have periods in which they are not supervised. Without supervision, certain employees may become non-productive.

The compressed workweek may also create supervision problems. Organizations working four-day schedules often maintain a five-day operation by having half of their employees working Monday through Thursday and the other half working Tuesday through Friday. This establishes one day (Monday or Friday) in which the work unit is unsupervised. Other disadvantages sometimes associated with the compressed workweek include increased moonlighting (46:75), reduced customer contact (41:44), increased

worker fatigue (14:661), and the unavailability of key personnel (46:32).

Alternate work schedules have been unsuccessful in some organizations but have been successful in others. The specific types of organizations in which AWSs will be effective have not been clearly established. However, some trends are now appearing. Flexitime has been successful more often in organizations involving research and development or administrative activities (10:20). Flexitime has been reported as being unsuccessful in organizations employing assembly-lines, shift-work, machine-paced work, and in jobs that require continuous coverage or extensive communication (40:6). The compressed work schedules have typically been successful in manufacturing operations. Generally, the compressed schedules are more likely to work in organizations that do not rely heavily on a weekly five-day operation (41:48). Service organizations normally require a five-day operation, so if compressed schedules are used, the schedules must be staggered to ensure Monday through Friday coverage. Staggering the compressed schedules creates the supervisory problems that were discussed earlier. It is important to note, however, that there is a large amount of variability in the results of alternate work schedule experiments. One manufacturing organization reported their four-day schedule increased productivity and decreased absenteeism (30:53), while another manufacturing

organization reported that their four-day program resulted in no significant changes in productivity, morale, or absenteeism (57:23). Although the type of organization may be the same, many variables remain that can affect the results of AWS programs.

Justification

The numerous advantages associated with alternate work schedules make them very attractive to Air Force Civil Engineering (CE) organizations. Civil Engineering squadron commanders must find out if AWSs will produce increased productivity, increased morale, increased job satisfaction, reduced absenteeism, and reduced turnover within their units. The variability of past AWS effects on heterogeneous organizations make it impossible to accurately judge the success or failure of alternate work schedules in CE squadrons. The only way to eliminate this lack of knowledge is to thoroughly evaluate the CE alternate schedule experiments. Unfortunately, the Office of Personnel Management study is very broad in scope and covers a wide variety of federal jobs. Although data from the CE experimental programs will be used by the Office Personnel Management, it is not the OPM's intention to perform the detailed evaluation necessary to determine the effectiveness of AWSs in CE organizations (43:1-7).

Civil Engineering organizations throughout the Air Force have basically the same organizational structure. Information obtained from an in-depth study of the CE alternate work schedule experiments can be beneficial to all CE squadron commanders contemplating the implementation of alternate work schedules.

Implementation sets enormous challenges for organizations, and before adopting the system, U.S. managers need to be convinced of its worth for their own organizations [9:20].

Without sound information, the chances of a good decision drop dramatically, and poor decisions ultimately prove to be very costly. However, the usefulness of a thorough CE study will not be limited to just CE squadron commanders. The results will be an aid to all managers involved in the implementation of AWS programs within multi-functional organizations.

Research Objective

The objective of this research is to examine supervisors' and non-supervisors' perceptions toward alternate work schedules within selected AF Civil Engineering squadrons for the purpose of advancing the knowledge of alternate work schedule effects within a multi-functional organization. Furthermore, this research is designed to enable all CE squadron commanders to accurately assess the

potential of using alternate work schedules in their organizations.

Research Questions

This research evaluates six questions about the experimental alternate work schedule programs conducted at three AF Civil Engineering squadrons:

1. Did employee productivity increase after AWSs were put into effect
2. Did employee job satisfaction increase after AWSs were put into effect
3. Did employee job difficulty increase after AWSs were put into effect
4. Were AWSs well accepted by employees
5. Did employee fatigue increase after AWSs were put into effect
6. Did absenteeism decrease after AWSs were put into effect?

Scope

This study examined the perceptions of approximately 250 Air Force military personnel on the experimental AWS program conducted in their CE organizations. The data were obtained from a 57 question structured questionnaire and one personal interview. The interview and questionnaire primarily covered the areas addressed by the research questions. Data analysis was accomplished through the use of descriptive statistics, factor analysis, and analysis of variance.

Overview of Remaining Chapters

The second chapter presents a literature review of both flexitime and the four-day workweek. The third chapter explains the development and organization of the questionnaire as well as the data analysis plan and research limitations. The fourth chapter covers the data analysis results, and the fifth chapter presents the conclusions and recommendations.

CHAPTER II

LITERATURE REVIEW

Overview

Throughout this century, an active and progressive labor movement has existed in the United States. This labor movement has done much to improve working conditions and benefits for the working populace. Major victories include the five-day workweek, overtime pay, and the eight-hour workday. Similarly, many advances have been made by management in the areas of productivity, efficiency, and labor relations. Continued improvement is necessary, however, to promote the growth and development of our society. Management must look for new ways of maximizing output from both an economic and a social standpoint.

Riva Poor, one of the early proponents of the four-day workweek, suggests that four-day scheduling may improve organizational development.

Since rising productivity has been the key to the emergence of our civilization with its many benefits (disputed and otherwise), it is critical that we locate, explore, and utilize innovations such as 4-day that can bolster the productivity which has been basic in improving the quality of our life so far, and that will be basic to any further improvement [46:xvi].

Likewise, proponents of flexitime claim that this innovative work schedule may cause employee attitudinal changes that are beneficial to employers.

For workers, the fundamental feature of flexible working hours is a new freedom of choice and autonomy. This flexibility enhances the quality and dignity of

working life by offering them more control over their working time and the ability to accomodate personal and family life needs as well as work needs [40:5].

This literature review is limited to the available research on legal restrictions, behavioral attitudes, and key employee work factors as they relate to alternate work schedules. These key factors include productivity, absenteeism, morale, job satisfaction, and worker fatigue. The key factors, overtime and retention, are purposely excluded from this study and review because of the short period of time Civil Engineering organizations have experimented with alternate work schedules. Each of the areas listed above will constitute a separate section in this review of the available research on AWSs.

Discussion

Legal Restrictions

The implementation of alternate work schedules is restricted in numerous areas by labor laws. The Walsh-Healey Act (1936) and the Fair Labor Standards Act (1938) apply to government contracts exceeding \$10,000 and to agencies engaged in interstate commerce (52:83). The key effects of these laws were the requirements for time-and-a-half hourly pay rates for any hours worked in excess of 8 hours a day or 40 hours a week (52:83). These laws were enacted to strengthen the prohibition of child labor abuse and to also aid the unemployment situation of the

1930s (52:84). The overtime requirements were added to encourage employers to hire additional employees instead of paying overtime premiums (52:84). These laws severely limit the implementation of alternate work schedules.

Organizations that are governed by the Walsh-Healey Act and the Fair Labor Standards Act may be very reluctant to try AWSs for fear of violating the labor laws. Some organizations have successfully implemented compressed work schedules by reducing employee hourly wage rates to a level where total pay including time-and-a-half rates is equivalent to the regular pay for a five-day, forty-hour workweek. Flexible work schedules that allow only 8 hours a day, 40 hours a week, are not affected by these laws; however, flexible schedules that allow employees to debit and credit work hours on a daily or weekly basis are restricted by these laws (40:51).

In the last few years, legislators have realized that changes to the Walsh-Healey and the Fair Standards Acts may be warranted because workforce characteristics have sufficiently changed since the 1930s, and because these laws restrict the use of innovative work schedules such as flexitime and the compressed workweek (52:84). Prompted by these realizations and public support, federal legislation has been proposed to increase the use of alternate work schedules. On 31 December 1979, the Federal Employees Flexible and Compressed Work Schedules Act of

1978 (Pub L. 95-390) became effective. This act established a two-and-one-half year experimental program that allowed federal agencies to adopt alternate work schedules. This program, monitored by the Office of Personnel Management, was extended in July 1982 for another three-year period. Organizations included in this study were given a ninety-day period to assess their results from alternate work schedules and to terminate or continue these schedules. The results of this program are to be used to guide future legislation and restrictions of AWSs.

Productivity

Productivity is perhaps one of the most important issues relating to alternate work schedules. Unfortunately, productivity is also a very vague term that is interpreted in numerous ways from economic indicators such as output, efficiency, and effectiveness, and can be especially difficult to measure in nonprofit organizations (3:35). The percentage of organizations that report increased productivity is very high. A 1972 American Management Association study of 143 companies on a four-day workweek revealed that 66% of these companies reported increased productivity while 31% reported no change, and 3% reported a decrease in productivity (57:5). Two more recent American Management Association studies revealed that of the 148 four-day workweek companies studied, 39% reported increased productivity, and of the 196 flexitime

companies studied, 48% reported increased productivity (41:46; 40:18).

Productivity increases for companies converting to the four-day workweek are common because of set-up and shut-down periods. Conversion from a five-day to a four-day workweek automatically causes a 20% reduction in set-up and shut-down periods. These time gains can then be converted to productive time (7:17). A study of the 50 man production force at Aggregates Equipment Company reported that productivity increased after conversion to a four-day workweek because of start-up and shut-down periods (34:63). "Flexitime can also affect individual productivity by taking advantage of the employee's biological time clock, for instance, by permitting a worker who is most productive early in the day to arrive early in the morning [32:57]."

Some researchers have concluded that the type and size of an organization using an alternate work schedule will have an impact on productivity. A 1978 American Management Association study concluded that four-day organizations involved in manufacturing and production were more likely to report increases in productivity than organizations in finance, insurance, and other services because of start-up and shut-down periods (41:48). The same study also revealed that smaller firms have generally had more success with the four-day workweek than have larger firms (41:44). These same conclusions are not shared by

researchers of flexitime organizations. Another 1978 American Management Association study revealed that, "In general, flexitime experiences are not much different for organizations in one industry, work technology, or group size than another [40:7]." Other available research supports these premises of type and size of organization.

In Riva Poor's 4 Days, 40 Hours, summaries of numerous organizations that have tried the four-day workweek indicate similar results. Manufacturing, retail, and service organizations were included in these summaries, but increases in productivity were only noted from the manufacturing organizations (46:41-62). The available research does indicate that the percent of non-manufacturing organizations reporting productivity increases is small. Non-manufacturing divisions of corporations such as Hewlett-Packard and Control Data Corporation have reported small increases in productivity after compressed and flexible work schedules were implemented (60:16; 50:13).

Although many organizations have experienced increased productivity after implementation of alternate work schedules, increased productivity has not resulted for all organizations. A Texas Levi Strauss plant implemented a four-day workweek experiment for nine months and found that productivity had not changed (30:53). Similarly, Hon Industries, a metal working company, experienced no change in productivity after a three-month trial period (57:23).

A major retail chain tried the four-day workweek in hopes of improving the efficiency of its data processing terminal use. This increase did not occur so the organization went back to a five-day schedule (55:7). Calvasina and Boxx measured the effect of the four-day workweek on worker productivity in two wearing apparel manufacturing plants. Productivity was defined as the level of output divided by the time required to produce the output (4:605). The researchers concluded that the change to a four-day workweek did not significantly affect worker productivity and the reason was probably because, "start-up and shut-down periods were insignificant factors [4:605]."

A common experience of organizations implementing alternate work schedules is a difference in the supervisory and non-supervisory perceptions of the impact on productivity. After three years on a flexible schedule, 53% of the management at Control Data Corporation reported that productivity had increased (52:160). On the other hand, 65% of the employees felt that productivity had increased (52:162). Similarly, from questionnaire responses of employees and supervisors of a large pharmaceutical company working flexible schedules, Golembiewski and Hilles found that 93% of the employees reported that productivity had increased. In sharp contrast to employee responses, only 32% of the supervisors felt that employee productivity had increased (18:68). Questionnaire responses from employees

and supervisors of the U.S. Geological Survey revealed that 37% of the employees working flexible schedules felt that productivity had increased, 61% reported no change, and 2% felt productivity decreased (37:72). On the other hand, only 27% of the supervisors reported that productivity increased, 68% reported no change, and 5% felt that productivity decreased (37:72). Golembiewski and Proehl reported that a study conducted by Walker, Fletcher, and McLeod revealed that 25% of the employees working flexible schedules felt that productivity had increased; however, managers of this same firm reported that flexitime had no significant effect on productivity (20:849,851). Objective evaluations of 17 public agencies using flexitime revealed that productivity increased in 82% of these organizations (48:202). These evaluations revealed that employees perceived a greater improvement in productivity than supervisors. The researchers concluded that these perceptions may indicate that supervisors have a less favorable attitude towards flexitime than the non-supervisors (48:203).

Generally, supervisors are more conservative in their perceptions than non-supervisors, but there does not appear to be a pattern among supervisory personnel as to their perceptions of the impact of AWSs on productivity. The percentage of supervisors reporting increased productivity has been found to be consistent with the non-

supervisory perceptions of the impact on productivity. A study of a six-month trial flexitime program in the 500 man design-drafting department of the Pacific Gas and Electric Company revealed this consistency. Reporting on their personal productivity, 79% of the employees reported that productivity increased while 72% of the first-level supervisors reported that the productivity of their work groups increased (52:147).

Several other indicators of productivity could be work coverage, customer contact, and service to other departments. These indicators could easily be used as measures of productivity for service organizations where public contact is inherent. Research, using surrogates as measures of productivity for service organizations, has shown mixed results in productivity after implementation of alternate work schedules. A 1978 American Management Association study of 196 flexitime users revealed that 30% of the organizations felt that work coverage was better under flexitime, 32% felt there was no change, and 38% felt that work coverage was worse using flexitime (40:18). The same study revealed that 22% of the organizations felt that relationships with customers had improved, while 70% felt there were no changes, and 8% felt that customer relationships were worse (40:18). An American Management Association study of companies on the four-day workweek revealed that customer contact was the most common problem area for the

implementation of the four-day workweek (41:44). Thus, a reduction in productivity could result for four-day customer service organizations, especially when productivity is measured by the previously mentioned indicators.

Absenteeism

Organizations implementing alternate work schedules have a high probability of decreasing absenteeism because workers have more opportunity to conduct their personal business during off-duty time (46:226). Even though a day's absence increases from 20% to 25% of the workweek after converting from the five-day to the four-day workweek, most companies still reported that absenteeism was reduced (46:226). A 1978 American Management Association study of flexitime users reported that 73% of the 196 organizations studied experienced decreased absenteeism (40:18).

Most organizations that implement alternate work schedules experience a small reduction in absenteeism, although large reductions have resulted. After three months on an experimental flexitime program, Gulf-Oil in Toronto, Canada, reported that absenteeism was down 20% from the same period the previous year (52:73). In their 1973 study of a large pharmaceutical company, Nord and Costigan found that after the effects of seasonal factors and changes in the number of employees were controlled, the four-day workweek accounted for a 10% reduction in absenteeism (42:65).

Although decreases in absenteeism associated with the implementation of alternate work schedules are not generally overwhelming, several companies have reported impressive results. Scovill Manufacturing's General Hose and Coupling subsidiary reported that absenteeism was cut in half after implementation of a four-day workweek schedule (30:53). Similarly, an abrasive products manufacturer also reported that absenteeism was reduced by 50% after only one year on the four-day workweek (46:43). Numerous organizations implementing flexible schedules have also experienced considerable reductions in absenteeism. The Ottbrunn research and development plant, a German aerospace company, experienced a substantial drop in sick leave calls after a flexitime program began in 1967 (10:18). A U.S. claims processing company reported a significant drop in absenteeism because employees felt they had more time for personal business after the implementation of flexitime (56:63).

The effects of alternate work schedules on absenteeism are not always reported as optimistic. Hon Industries, after implementing a four-day workweek for a three-month period, reported no change in absenteeism (57:23). Likewise, absenteeism at a Texas Levi Strauss plant was reported as unchanged for a nine-month four-day scheduling experiment (30:54). Riva Poor reports that Lawrence Manufacturing Company, a manufacturer of

industrial knit fabrics, tried a four-day schedule to help the absenteeism rate but failed to reach its established goal (46:49-50). After three years on a flexitime schedule, 73% of the managers at Control Data responded that absenteeism had remained the same (52:160). Despite the examples to the contrary, the majority of companies trying these schedules report some decrease in absenteeism, probably because workers have more time to conduct their personal business.

Morale

Like other factors, the effects of alternate work schedules on worker morale have been both positive and negative; however, morale is probably the area where companies trying AWSs report the most gains. An American Management Association study of 148 companies on the four-day workweek found that 90% reported improved morale (41:46). Similarly, an American Management Association study of 196 companies on a flexible work schedule found that 97% reported improved morale (40:17).

Although both types of alternate work schedules generally produce some increase in morale, flexible work schedules appear to improve employee morale somewhat more than four-day schedules. A six-month trial flexitime program at Firestone's Canadian Headquarters revealed that 71% of the employees felt that morale had increased (52:78). After three years on flexible schedules at Control Data Corpor-

ation, 22% of the employees responded that morale had greatly improved and 56% responded that morale had moderately improved (52:160). Likewise, three separate flexitime trial programs at the Kentucky Department of Personnel revealed that 70% of the division directors felt that morale had increased (5:247). A 1974 survey of Hewlett-Packard Corporation's U.S. divisions revealed that 96% of the employees felt that morale had increased and a 1975 survey of their Colorado Springs division revealed that 93% felt morale had increased (60:18). Of notable interest is a flexible work hour experiment conducted on the Pacific Gas and Electric Company's design and drafting departments. This experiment revealed that 75% of the surveyed employees felt that morale had increased after implementation of flexible work schedules and 95% of the surveyed supervisors felt that morale had increased (6:119; 20:848,850).

Even though flexitime users report greater morale improvements, organizations implementing four-day work schedules also achieve substantial increases. Employees of the Group Actuarial Consulting Bureau of the Equitable Life Assurance Society noted increased morale on the job when a four-day workweek was implemented (57:23). The nine-month four-day workweek experiment at a Texas Levi Strauss plant resulted in morale being the only organizational improvement resulting from the four-day work schedule (30:54). Hon Industries was one of the few organizations which re-

ported that a three-month four-day experiment produced no significant change in morale (57:23).

Researchers suggest that there are several reasons why alternate work schedules achieve high increases in morale. These include a greater sense of responsibility and freedom, better living conditions, and increased leisure time. Employees working a four-day week at Aggregates Equipment were reported to have experienced improved morale because the four-day workweek was viewed as giving them something they wanted (34:63). Management from Gulf-Oil reported that flexible schedules caused increases in employee job responsibility which resulted in increased employee morale (52:75). Martin Gannon has suggested that because organizational change often causes short-term changes in attitudes, morale will decrease after the novelty of the alternate work schedule wears off (16:75-75). His hypothesis is somewhat supported by an experiment conducted by the Port Authority of New York and New Jersey (29:217). This organization conducted its own summer trial period of the four-day workweek and found that before the experiment, 78% of the employees involved viewed the four-day workweek as a morale builder, and after the experiment, only 41% viewed the four-day schedule as a morale builder (29:218). Even if the degree of morale increase is reduced, morale is nevertheless reported as improved by most companies implementing alternate work schedules. In fact, a 1972 American

Management Association study found that 32 of 143 four-day companies surveyed reported morale as the principle advantage of the four-day workweek (57:14).

Job Satisfaction

Most organizations implementing alternate work schedules do experience some increase in employee job satisfaction, but generally, the positive results of AWSs on employee morale are not matched by increases in employee job satisfaction. A 1971 survey of 633 employees working the four-day schedule found that 71% of the respondents agreed with the statement, "I like my work more now [59:21]." A literature review of nine studies that investigated the effects of the four-day workweek on job satisfaction revealed that job satisfaction had increased for five of the nine studies, decreased for two and remained the same for two (47:63). Another literature review by Olson and Brief detected a difference between the job satisfaction of managers and non-managers in numerous studies (44:74). Differences in job satisfaction between supervisors and subordinates working alternate work schedules are common. The difference can probably be accounted for because the implementation of alternate work schedules may cause greater planning, controlling, and scheduling difficulties for supervisors (21:507). Golembiewski, Yeager, and Hilles reviewed the attitudinal self-reporting question-

naires of employees in three research and development organizations and found that positive changes in work attitudes resulted after flexitime programs were implemented (21:502). However, this study also found that greater demands were not placed on supervisors to schedule or control work (21:502).

Several researchers have proposed that job satisfaction is affected by worker attitudes toward alternate work schedules. Hicks and Klimoski suggest that questionnaires measuring employee attitudes that include the word "flexitime" may give biased job satisfaction results because employees may want to keep flexitime schedules (25:334). These researchers examined the impact of flexitime on employees' views toward work satisfaction from two companies in central Ohio for jobs that included clerical, engineering, assembly, and quality control (25:334-335). Each company had employees working both flexible and fixed-hour, five-day work schedules. This study found a lack of significant differences in worker satisfaction between the two work schedules (25:339). Gannon conducted a study of 370 engineering technicians on a four-day schedule and found that as their preference for the four-day workweek increased, worker job satisfaction decreased (16:76). These results appear to indicate a negative correlation between job satisfaction and the four-day workweek; however, those workers most dissatisfied before

the implementation of the four-day schedule are likely to have more preference for the new schedule because they have fewer days in a job they dislike. This study should have included a pretest of worker job satisfaction to find out if job satisfaction increased after implementation of the four-day workweek for the dissatisfied workers.

Hodge and Tellier studied the questionnaire responses of 371 employees of twelve four-day companies and measured the resultant changes in employee job satisfaction (26:27). A typical measured statement in this study was, "As a result of the four-day week, I am more enthusiastic about my work [26:27]." This study concluded that no matter how employees were demographically classed, they were generally more satisfied with their jobs after implementation of a four-day workweek (26:27).

Fatigue

Opponents of the four-day workweek claim increased worker fatigue may cancel any advantages gained by this work schedule. Research in this area, just as with job satisfaction, shows mixed results. A 1978 American Management Association study of companies on the four-day workweek revealed that 53% of the 148 companies studied reported that worker fatigue was greater after implementation of the four-day workweek, while 39% reported no change and 8% reported that worker fatigue was less of a problem (41:46). The Equitable Life Assurance Society of

the United States in New York City reported that of the 175 employees on the four-day workweek, 25% admitted to being more tired than before the four-day schedule was implemented (57:23). Maklan (31:92) studied the worker fatigue of blue collar workers on both four and five-day schedules and found that three times as many four-day workers reported they were very tired at the end of the day. Available research of organizations working flexible schedules does not indicate that the fatigue of workers has changed. Although not substantiated by formal research, Swart suggests that flexitime may actually reduce worker fatigue because the worker has the option of sleeping later if he chooses (52:206).

Numerous studies have also found that fatigue was not a significant problem with a four-day schedule. A 1971 survey of 633 employees of manufacturing and service organizations on the four-day workweek revealed that 67% were not more fatigued working a four-day schedule (59:21). Likewise, the 50 man production force at Aggregates Equipment reported no increased fatigue after implementation of a four-day workweek (34:63). In addition, only 8 of the 143 four-day companies surveyed by the American Management Association reported fatigue as an observable disadvantage (57:14). It appears that increased worker fatigue is not present in all four-day companies. Fatigue is probably related to the type of work involved, but there are no clear

patterns to establish which organizations implementing four-day schedules will experience increased worker fatigue.

Behavioral Attitudes Toward AWSs

Employee attitudes toward alternate work schedules are generally favorable, but some resistance is to be expected with organizational change. Greater acceptance of an AWS is usually found "among employees whose individual and job characteristics are most compatible with it and among those who perceive the rewards (economic and non-economic) as significantly greater than the costs [14:657]." Dunham and Hawk analyzed the questionnaire responses of individuals on five-day workweeks and found that the type of worker that would have a positive attitude toward the four-day workweek would be characterized as being young, and having a low job level, low tenure, and low income (8:652). These researchers also suggested that persons who view the four-day workweek as favorable might view it as an escape from negative aspects of their work (8:653). If this is true, employee acceptance of alternate work schedules may correlate to increased job satisfaction.

Regardless of the reasons why employees have positive attitudes toward alternate work schedules, available research does indicate that a majority of workers prefer AWSs to fixed, five-day work schedules. A survey of a large pharmaceutical company on the four-day workweek

indicated that 81% of the employees were highly favorable of the work schedule (42:62). A survey of employees at Fluorocarbon, one of the first U.S. companies to permanently adopt a four-day workweek, revealed that 68 out of 77 employees liked the four-day schedule (39:63). Millard, Lockwood, and Luthans questioned engineering, clerical, and management personnel of a small firm experimenting with the four-day workweek and found that 87% of these employees preferred the four-day schedule over the five-day schedule (36:33). Similar results were experienced by a small metal fabricating plant in California where 75% of the employees preferred the four-day workweek after a three-month test (59:70).

Organizations implementing flexible work schedules have also experienced positive worker attitudes toward these schedules. Over 97% of the people surveyed at the Hewlett-Packard Corporation's Colorado Springs division indicated the program was successful (60:18). At Firestone's Canadian Headquarters, 97% of the employees liked flexitime and 91% felt that flexitime should be made permanent (52:76-80). Three trial periods at the Kentucky Department of Personnel revealed that of the employees working flexible schedules, 95% were pleased with their schedule. Of the employees not on flexitime, 65% reported that they were pleased with flexitime and 28% were undecided (5:248). The lower percentage of favorableness reported by non-flexitime

workers could indicate the presence of internal or external communication problems created by the flexible schedule (40:31).

Available research indicates some differences between supervisor and employee acceptance of alternate work schedules. These differences are especially prevalent for flexible work schedules. Golembiewski, Yeager, and Hilles suggest that a major concern with flexitime is that it appeals to more non-supervisors than supervisors (21:507).

Three types of initial supervisory reactions to flexible hours have been observed. In some cases, the supervisors fear something will happen when they are not present, so they increase their working hours. In other cases, supervisors try to learn each other's jobs, so they can rely on colleagues during flexible-time periods. Most often, however, supervisors learn the benefits of having employees organize their own work, and are then free to concentrate on long-range planning [9:28].

In a study of a large insurance company, Evans found that 76% of the employees working a flexible schedule were very favorable toward their working hours (11:238). A study conducted by Partridge of the same firm revealed that 70% of the supervisors and managers were very favorable toward flexitime (45:241). In their study of a large pharmaceutical company, Golembiewski and Hilles found that 83% of the non-supervisors working flexible schedules supported the continuance of these schedules while 81% of the supervisors surveyed supported the continuance of flexitime (18:68). Prior to the start of a flexitime experiment at the Pacific Gas and Electric Company, 73% of the super-

visors were in favor of flexitime (6:123). After three weeks on the program, 84% of the supervisors favored flexitime and after one year, 97% of the supervisors were in favor of continuing flexitime (6:123). After studying the questionnaire responses of managers and workers from flexitime organizations, Golembiewski, Yeager, and Hilles concluded that no differences in preference for the flexible work schedule existed (21:507).

Supervisors of employees working a four-day workweek are perhaps not as satisfied with this work schedule as are supervisors of employees working flexible schedules. In a survey of employees and supervisors of an accounting division of a large multinational corporation, Goodale and Aagaard found that 53% of the supervisors felt that the four-day workweek had an adverse effect on their work areas (22:37). In general, supervisors expressed dissatisfaction with the four-day work schedule and a large majority of supervisors reported that they were unable to regularly take advantage of their extra day off (22:37).

Summary

Many studies have been conducted of organizations implementing alternate work schedules, and the results are as varied as the types of organizations studied. The available research is not unanimous on any of the key areas covered; however, general observations can be made. Most

organizations experience some increase in productivity, but the increase is usually slight. Increases in productivity are probably manifested by start-up or shut-down periods or decreases in absenteeism which are common because of the extra time available for employees to conduct personal business. Employee morale commonly increases after implementation of alternate work schedules, but appears to drop off somewhat after the newness of the schedule wears off. Generally, researchers conclude that alternate work schedules lead to greater job satisfaction, although a variety of results have been reported. Finally, increased worker fatigue has been noted in some organizations but not in others, depending on the type of organization involved. Organizations have different experiences with alternate work schedules; there are no universal patterns. Similarly, the impact of alternate work schedules appears to effect supervisors and non-supervisors somewhat differently.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Overview

This chapter is divided into four sections. The first section defines the terms universe and population and also explains the data collection plan. The second section describes the research questionnaire, the third section explains how the data is to be analyzed, and the final section covers the limitations of this study.

Universe, Population, and Data Collection Plan

Universe

The universe is defined as all Officer and Enlisted personnel assigned to all Civil Engineering squadrons within the United States Air Force.

Population

The population included only those military personnel assigned to Chanute, Ellsworth, and Mather Air Force Base Civil Engineering squadrons during May of 1982. The size of this population was approximately 685 personnel.

Data Collection Plan

From the outset of this research, it was determined that both probability and non-probability sampling

would be impractical, because individuals working alternate schedules could not be readily identified prior to the administration of the questionnaire. To overcome this problem, a census was selected as the method of data collection. Questionnaires were mailed in bulk to a designated individual at each base who in turn distributed them to military personnel working in his squadron. All completed questionnaires were returned in unmarked envelopes to each base designee who then forwarded them for analysis.

Research Questionnaire

Development

The questionnaire was designed to accomplish the research objective by answering the research questions presented in the first chapter. Six constructs were linked to the six research questions (one construct per research question) and included the following: 1) productivity, 2) job satisfaction, 3) job difficulty, 4) supervisor/non-supervisor acceptance, 5) fatigue, and 6) absenteeism. The questionnaire included a variety of statements that corresponded to each of the above constructs. Each statement had a series of responses associated with it. By selecting one of the responses, each employee established his perception toward one construct of the alternate work schedule experiment.

Several of the statements and response choices used in the questionnaire were adapted from previous alternate

work schedule questionnaires developed by Swart (52:235-245) and by the Office of Personnel Management (54:1-11). However, the majority of the statements used in this questionnaire were developed specifically for this research and have not been previously used.

The questionnaire was designed to have both face and content validity. A questionnaire has face validity if "it 'appears to measure' whatever it purports to be measuring [51:54]" and has content validity when the "items making up the measure are a representative sample of the domain of items associated with the variable being measured [51:51]." As mentioned above, the constructs were analyzed through a group of statements that directly measured the constructs. As an independent check on the face and content validity, two Air Force Institute of Technology faculty members reviewed the questionnaire and agreed that the statements were reasonable and representative measures of the constructs under consideration.

Organization

The questionnaire consisted of five sections. The first section focused on demographic data. The characteristics age, sex, current base of assignment, rank/grade, work section, supervisor/non-supervisor, and current work schedule were all included in this section. Age and sex were not fundamental to this study; however, acquiring this information expanded the data base to allow future research

to be conducted.

The second portion of the questionnaire established a base line of information about each individual's job or work unit. This section contained one question each about morale, job satisfaction, fatigue, and productivity.

The third section of the questionnaire was directed at supervisors who had subordinates working alternate schedules. Included in this section were questions concerning supervisors' views on subordinates' productivity, fatigue, and absenteeism while subordinates were working the alternate schedules. Also included were questions about each supervisor's job difficulty when the alternate work schedules were in effect.

The fourth section was directed at all employees who were working in their Civil Engineering squadron when the alternate work schedule experiment was in effect. The statements in this section solicited views about the six constructs linked with the research questions.

The final section concentrated on only those employees who worked an alternate schedule. In this section, employees were asked to compare the alternate schedule they worked to the typical five-day, forty-hour schedule. Again, a series of statements was given to solicit responses about the six constructs identified earlier. Individuals were asked to comment on alternate work schedules at the end of the questionnaire. Compiled comment results are presented in Chapter IV.

Analysis Plan

Data Level

Because Likert-type scales were used, the data obtained from the questionnaire was on an ordinal level; however, these scales did approximate an interval level. Kerlinger states that although "most psychological scales are basically ordinal, we can with considerable assurance often assume an equality of interval [28:426]." Because these data were technically ordinal, parametric procedures are not generally applicable. Because the distinction between ordinal and interval level data is often obscure, behavioral scientists argue that parametric procedures are acceptable for ordinal level data. After reviewing evidence both for accepting and rejecting the use of parametric techniques with ordinal data, Gardner concludes:

1. The distinction between ordinal and interval scales is not sharp. Many summated scales yield scores that although not strictly of interval strength, are only mildly distorted versions of an interval scale.
2. Some of the arguments underlying the assertion that parametric procedures require interval strength statistics appear to be of doubtful validity [17:55].

Similarly, Anderson writes,

Regarding practical problems, it was noted that the difference between parametric and rank-order tests were not great insofar as significance level and power were concerned. However, only the versatility of parametric statistics meets the everyday needs of psychological research. It was concluded that parametric procedures are the standard tools of psychological statistics although nonparametric procedures are useful minor techniques.

Under the heading of measurement of theoretical considerations...It was thus concluded that the type of measuring scale used had little relevance to the question of whether to use parametric or nonparametric tests [2:315,316].

Although many researchers agree that parametric procedures are applicable for ordinal data, many also agree that there are certain risks in doing so.

The best procedure would seem to be to treat ordinal measurements as though they were interval measurements, but to be constantly alert to the possibility of GROSS inequality of intervals [28:427].

Based on the above arguments, this research employed parametric statistics where statistically feasible.

Factor Analysis

Factor analysis is a method of analyzing sets of observations from their intercorrelations to identify underlying factors affecting the relationships between these observations (15:1; 12:101). Factor analysis allows the researcher to identify patterns in observations such that the data may be grouped or reduced to a set of factors that account for the observed interrelationships in the data (38:469).

Factor analysis was used in this research to identify variables (questions) that grouped as factors and to test the purity or construct validity of proposed constructs (10:451). In addition, factor analysis was used to identify any underlying relationships that existed between factors. By finding factors which heavily load on

each of the variables (questions) and comparing computed factors to the proposed research constructs (productivity, job satisfaction, fatigue, etc.), purity of these constructs was evaluated and hence the construct validity of the instrument was tested. If research constructs correlate to the computed factors, it can be concluded there is some construct validity (10:131). The rotated factor matrix was used to identify groups of questions that related to the established research constructs. These grouped questions were used for the analysis of variance procedure.

The first step in factor analysis is the preparation of a correlation matrix using Pearson Product Moments that show the relationships between every variable and all other variables (33:311). The Pearson Product Moment coefficient of correlation is a measure of the linear relationship between two variables (33:311). The closer to one the coefficient is, the stronger the relationship between the two variables. A coefficient close to zero indicates little relationship between variables.

"The second step in factor analysis is to construct a new set of variables on the basis of relationships in the correlation matrix [10:450]." These new variables, called factors, are computed by finding the best linear combination of variables that account for the most variance in the data (10:450). The resulting matrix expresses relation-

ships present in the data with factors grouped in columns and variables grouped in rows of the matrix. The net correlation coefficient between each variable and factor is expressed by a number called a loading (12:105). The higher the absolute value of the loading, the greater the relationship between the factor and the variable. Because pure patterns for each construct rarely exist, rotation of the loaded matrix is performed to reduce the amount of unexplained variance for each factor (10:451).

TABLE 1
ROTATED FACTOR MATRIX

QUESTION	FACTORS		COMMUNALITY
	A	B	
1	.4	.6	.52
2	.0	.8	.64
3	.9	.0	.81
4	.7	.2	.53
5	.1	.9	.82
EIGENVALUE	1.47	1.85	3.32
% OF VARIANCE	.29	.37	.66

Adapted from (15:59).

Table 1 shows a simple factor matrix. The questions on the left side of the matrix are questions that would be included in the survey instrument and represent the observed variables. The factors loadings for each question are distributed among two factors; Factor A and

Factor B. Question 1, for example, has a factor loading of .4 on Factor A and .6 on Factor B. The variation in Question 1 that is accounted for by each factor is the square of the respective factor loading. In this case, the variation for Question 1 that is accounted for by Factor A is $(.4)^2 = .16$ or 16 percent. The total variance for any one variable that is explained by all factors is called the communality (10:451). The communality for Question 1 is $(.4)^2 + (.6)^2 = .52$.

Eigenvalues are the sum of the variance or factor loadings for each factor (10:451). The computed eigenvalue for Factor A is 1.47. The percentage of variance accounted for by each factor is computed by dividing the eigenvalue for each factor by the total number of questions listed in the matrix. Factors with eigenvalues of one or greater generally account for a sufficient percentage of variance, so the rule of thumb is to retain all factors with eigenvalues of one or greater (35:6-24).

To accomplish the above mentioned procedures, the SPSS Principal Factoring with iteration (PA2) method was employed for variable reduction. The VARIMAX method of orthogonal rotation was applied to further simplify the columns of the factor matrix (38:485). The number of factors contained in the factor matrix is usually determined by the established minimum eigenvalue (38:493). This research employed a minimum eigenvalue of 1.0 to establish

the factors in the factor matrix.

Reliability

The SPSS subprogram RELIABILITY was used to evaluate the reliability of the grouped factors contained in the factor matrix established from factor analysis.

"Reliability is defined as the variation over an indefinitely large number of independent repeated trials of errors of measurement [27:249]." The concept of reliability deals with the accuracy to which the survey instrument measures the true scores of the population and is tested by such techniques as tests of internal consistency, test-retest, and alternate forms methods (27:248; 23:435). Estimates of reliability are quantified by means of a coefficient of reliability computed from the ratio of true score variance to the observed variance (49:102). This research employed a test of internal consistency using Cronbach's coefficient alpha which estimates the coefficient of reliability (27:256). Alpha will be zero if all the variation in survey results are due to errors of measurement and will be one if there is no error of measurement (27:249).

Descriptive Statistics

To analyze the attitudinal responses relative to each construct, numerous descriptive statistics were employed to various groupings of data. First, data were

categorized into those individuals working compressed workweeks, flexible workweeks, and those individuals who did not work an alternate work schedule. Within each of these categories data were further sub-classified into supervisory and non-supervisory personnel.

To each attitudinal response, a five-point numerical rating scale was applied. This scale provided the means for using various descriptive statistics to analyze constructs at each categorized level. In addition to basic descriptive statistics, frequency distributions for each scaled attitudinal response and each categorized level were computed along with the crosstabulation of rank by the acceptance of AWSs. This information formed the basis for the evaluation of the research questions.

Analysis of Variance

Analysis of variance is a statistical technique that is used to decide if a difference exists among treatment means by examining the variation among the sample means (33:459). Analysis of variance provides an indication of the overall relationship between dependent and independent variables and is useful in interpreting the pattern of independent variable effects (38:401). In applying the statistical technique of analysis of variance, it was assumed that the Central Limit Theorem was applicable to the survey data. The Central Limit Theorem states that generally, for large sample sizes greater than $n=30$,

sampling distributions are approximately normal (33:198). Normal sample distributions are a prerequisite for using parametric testing methods.

The SPSS subprogram ONEWAY was used to accomplish oneway analysis of variance for each grouping of questions relating to each research construct. The population surveyed was categorized into various subpopulations and the ONEWAY procedure was used to determine if differences in means existed between subpopulations. The ONEWAY subroutine was also used to test the homogeneity of variances from the Cochran's C test (27:65). Parametric analysis of variance procedures were rejected for analyses that resulted in unequal variances. For these analyses, the nonparametric alternative (the Mann-Whitney U-test) was employed. The Mann-Whitney U-test does not require normality of distribution or homogeneity of variance, but is still regarded to be nearly as powerful as the parametric oneway analysis of variance (49:175). The Mann-Whitney U-test was used to determine if differences in probability distributions existed between subpopulations.

First, analysis of variance (ONEWAY or Mann-Whitney U-test) was used to determine if mean differences existed in the responses of four-day workers versus those employees working flexible schedules or if differences existed in the probability distributions of these subpopulations. Second, for each work schedule, analysis of variance was used to

determine if mean differences or differences in probability distributions existed between supervisory and nonsupervisory personnel. Throughout all ONEWAY analyses the level of risk or alpha (α) of .05 was used to determine statistical significance.

Supplemental Data

The Civil Engineering squadron at Williams AFB implemented AWSs for a very limited time period. These alternate work schedules were stopped because of internal problems within that organization. The organization provided information as to the reasons AWSs were stopped. The information obtained from Williams AFB is discussed in Chapter IV.

Limitations

Perhaps the most inherent limitation in this research was the absence of a pretest for each of the constructs measured. Because alternate work schedules were implemented prior to this research, pretests were not always possible and subjects had to be questioned on their comparisons of previous work schedules with AWSs. Additionally, no control groups were included in this research because the instrument questions did not measure current attitudinal responses to each construct. Because one of the squadrons surveyed terminated its alternate work schedules more than one year prior to the administration of this

questionnaire, the results achieved in this research may be confounded by history and maturation-type error (10:332-333). Other interactions could result from this research design because one squadron implemented a four-day workweek while the other two squadrons implemented both types of alternate work schedules. This research design concentrated on the effects of AWSs on the established research constructs, but an attempt was made to analyze the interrelationships that might exist among the constructs; however, no attempt was made to determine if a cause-effect relationship existed.

CHAPTER IV

DATA ANALYSIS

Overview

This chapter presents the results obtained from the application of the methodologies described in Chapter III. These results were analyzed to determine significant relationships present in the six research questions.

Questionnaire Response

The questionnaire was initially distributed to approximately 685 military personnel in three Air Force Civil Engineering Squadrons. The total number of individuals having worked an alternate work schedule or having been assigned to sections working alternate work schedules were not known prior to questionnaire distribution so the questionnaire had to be used for this purpose. Question 16, which asked "Were you working in your present squadron when the Alternate Work Schedule Program was in effect," was used to distinguish those individuals having had contact with alternate work schedules. Questionnaires with a response of "No" to Question 16 were excluded from data analysis. In several instances answers were inconsistent with the intent of Question 16. For example, several of the respondents from Ellsworth AFB answered "No" to Question 16. This is inconsistent because a majority of the

organizational sections of the Civil Engineering Squadron at Ellsworth were still working an alternate work schedule when the questionnaire was distributed. All respondents from Ellsworth should have answered "Yes" for Question 16. This inconsistency reduced the number of questionnaires analyzed by approximately 25.

The number of questionnaires analyzed were further reduced because several respondents were civilian and because four questionnaires were judged as false representations of respondents' actual feelings based on numerous inconsistencies among these responses. These questionnaires coupled with the "No" responses to Question 16 reduced the total number of questionnaires analyzed to 241.

Demographic Data

Complete distributions of demographic data are presented in Appendix G. This section contains an overview of selected demographic data by percentages.

Approximately eighty-nine percent of the respondents were male and eleven percent were female. Almost half of the respondents (46.5 percent) were less than twenty-five years old and most of the respondents (83 percent) were less than thirty-four years old. The distribution of responses by base was very uneven. Respondents from Ellsworth AFB accounted for 57.3 percent of the analyzed questionnaires while Chanute and Mather

accounted for 27.2 and 15.5 percent respectively.

This uneven distribution was expected because most of the employees in Civil Engineering at Ellsworth were still working an alternate work schedule when the questionnaire was administered while only a few sections within Civil Engineering at Chanute were working alternate work schedules. In addition, alternate work schedules were terminated in Civil Engineering at Mather more than one year prior to questionnaire administration. Because of the uneven distribution of responses, no attempt was made to analyze data by base.

Approximately 7.5 percent of the respondents were officers and 92.5 percent were enlisted. Although thirty-four percent (n=82) of the respondents reported they were supervisors and sixty-six percent reported that they were not officially classified as supervisors (see Question 9), the number of supervisors is not exactly known because 100 respondents answered the questions intended only for supervisors (see Questions 17-27).

The distribution of individuals reporting having worked alternate work schedules was also very uneven for the two schedules studied. Approximately 76.3 percent of the individuals who worked an alternate work schedule, worked the compressed schedule while 23.7 percent worked flexitime. Again, this uneven distribution was expected

because most of the individuals who worked the four-day workweek were assigned to Ellsworth where flexitime was not implemented. Unlike Ellsworth, the Civil Engineering Squadrons at Chanute and Mather implemented both the four-day workweek and flexitime.

Factor Analysis

Questions 17 through 27, 29 through 32, 34, 37 through 40, and 42 through 55 were analyzed using factor analysis procedures described in Chapter III. The remaining questions were omitted from the factor analysis procedure due to their lack of applicability to the research constructs (i.e. demographic questions).

The initial run of the SPSS factor analysis procedure yielded six factors with eigenvalues greater than one. Because the fifth and sixth factors had eigenvalues only slightly greater than one (1.08 and 1.008), the factor analysis procedure was repeated with the factors limited to five and four. Reducing the factors from six significantly reduced the statistically explained variance in the variables, so six factors were chosen for further analysis. A list of factors, eigenvalues, and corresponding variances accounted for are presented in Table 2.

Table 2

Factor Eigenvalues

<u>Factor</u>	<u>Eigenvalue</u>	<u>Pct of Var</u>	<u>Cum Pct</u>
1	19.43955	55.5	55.5
2	1.81906	5.2	60.7
3	1.47943	4.2	65.0
4	1.26788	3.6	68.6
5	1.07731	3.1	71.7
6	1.00765	2.9	74.5

Next, the varimax rotated factor matrix was analyzed to determine the highest factor loading for each question. A loading of .3 was considered as the minimum acceptable loading for further analysis of any question. The varimax rotated factor matrix is presented in Appendix C. All questions loaded higher than .3 on at least one factor. Several questions loaded highly on separate factors. Question 27 had a loading of .49063 for factor three and a loading of .50210 for factor five. Question 27 was intended to measure the construct productivity so factor three was chosen as the proper loading because a high number of productivity-related questions also loaded under factor three. Question 34, which measured differences in cooperation between work sections, could probably be related to several factors. This relationship was

established because Question 34 loaded highly on three different factors with loadings of .42406 on factor two, .44557 on factor three, and .37386 on factor four. Because "cooperation" was not directly related to any one construct and because the multiple loading occurred, Question 34 was excluded from the analysis of variance procedure. Question 53 had a loading of .58536 for factor one and a loading of .53281 for factor four. Both of these factors had large numbers of loadings with questions measuring job difficulty so the question was assumed to be valid and was placed under factor one where the highest factor loading occurred. Generally, questions loading to more than one factor were placed under the factor with the highest loading.

Interpretation of Factor Analysis Results

The research construct job difficulty was the most difficult construct to analyze. This construct accounted for twelve of the thirty-five questions factor analyzed. The construct job difficulty was developed from questions which were intended to measure aspects of the job that might become more difficult with the adoption alternate work schedules. These aspects included such areas as communications with other workers, contact with other organizations, and communications between supervisors and subordinates. Several questions proposed to measure the construct job difficulty grouped together, but under differ-

ent factors, thereby loading with other proposed constructs. This distribution of factor loadings for the construct job difficulty was assumed to have occurred because this proposed construct was developed from many different questions that might be related to other constructs. In other words, the questions proposed to measure the construct job difficulty were found to encompass a much broader scope than originally intended and therefore, overlap with other constructs resulted. Because of this overlap, the proposed construct job difficulty was considered to be impure, and therefore, to lack construct validity. Further analysis of the construct job difficulty was consistent with that performed with other constructs; however, a high degree of confidence should not be placed in the results from the job difficulty analysis.

Factor 1

Factor one accounted for 55.5 percent of the total variance among all questions. The loadings for factor one are given in Table 3 with the proposed construct identified with each question. Factor one was dominated by questions proposed to measure job difficulty with four loadings. Factor one also contained several of the questions relating to the proposed construct acceptance and all of the questions relating to the proposed construct fatigue. Thus, several different research constructs loaded in this factor. The proposed constructs acceptance and fatigue

appear to be pure because all of the questions intended to measure these constructs loaded together. Job difficulty, as previously mentioned, was considered impure because a majority of questions intended to measure this proposed construct loaded under several factors.

Table 3

<u>Factor 1</u>		
<u>Question Number</u>	<u>Proposed Construct</u>	<u>Loading</u>
18	Acceptance	.71
47	Acceptance	.70
17	Job Difficulty	.69
48	Job Difficulty	.69
46	Job Difficulty	.59
53	Job Difficulty	.58
51	Fatigue	.56
40	Acceptance	.55
39	Productivity	.55
45	Fatigue	.52
36	Job Satisfaction	.52
25	Fatigue	.51

The grouping of these constructs under one factor indicates that several constructs may be related. It is quite possible that employees are judging acceptance of alternate work schedules based on the resulting job difficulty brought about by these schedules. Employees whose

jobs have become more difficult are less likely to accept alternate work schedules. Because the construct fatigue loaded in this factor with the construct job difficulty, worker fatigue could be viewed as directly related to job difficulty. Thus, a chain of interrelationships could be included in factor one. For example, as a result of alternate work schedules, a worker may become more fatigued which could increase his job difficulty. This, in turn, could result in the employee's low acceptance of alternate work schedules. In a like manner, the opposite chain of events could result.

Factor 2

Factor two accounted for 5.2 percent of the variance among questions. The loadings for each question under factor two are given in Table 4. The construct productivity dominated factor two with four loadings. All of these loadings were from questions that measured the respondent's own productivity. Additionally, all the job satisfaction construct questions loaded under factor two. Question 44, which asked employees if they would work an alternate work schedule again, also loaded under factor two. The purity of the constructs productivity and job satisfaction appears to have been established because all of the questions measuring these constructs group together under factor two. It is logical to assume that the willingness to work another alternate work schedule could be

related to job satisfaction, especially if the work schedule caused an increase or decrease in job satisfaction.

Table 4

<u>Factor 2</u>		
<u>Question Number</u>	<u>Proposed Construct</u>	<u>Loading</u>
42	Job Satisfaction	.68
44	Acceptance	.62
55	Job Satisfaction	.61
43	Productivity	.60
50	Productivity	.59
54	Productivity	.55
49	Productivity	.46

Factor 3

Factor three accounted for 4.2 percent of the variance among questions. The loadings for each question under factor three are given in Table 5. The proposed productivity questions dominated factor three with five loadings that measured supervisors' perceptions of their employees' productivity. These supervisor perceptions grouped together but on a different factor than individual perceptions of personal productivity. It is possible that supervisors feel differently about the effects of alternate work schedules on their employees' productivity than employees feel about their own productivity; however, because only supervisors answered the questions loading in this

factor, these factor analysis results cannot be used to determine if differences in personal productivity perceptions existed between supervisors and non-supervisors.

Table 5

Factor 3

<u>Question Number</u>	<u>Proposed Construct</u>	<u>Loading</u>
21	Productivity	.73
19	Productivity	.67
20	Productivity	.66
29	Job Difficulty	.57
22	Productivity	.55
27	Productivity	.49

Factor 4

Factor four accounted for 3.6 percent of the variance among questions. The loadings for each question under factor four are given in Table 6. Factor four was composed of five questions all represented by the proposed construct job difficulty. The intent of these five questions was to measure the individual's perceptions of job difficulty as it related to alternate work schedules. Although the impurity of the construct job difficulty has previously been established, factor four represents a pure grouping of questions measuring job difficulty. Questions loading under factor four were used in further analysis for

the construct job difficulty.

Table 6

Factor 4

<u>Question Number</u>	<u>Proposed Construct</u>	<u>Loading</u>
32	Job Difficulty	.68
31	Job difficulty	.59
37	Job Difficulty	.59
30	Job Difficulty	.59
38	Job Difficulty	.52

Factor 5

Factor five accounted for 3.1 percent of the variance among all questions. The loadings for each question under factor five are given in Table 7. Factor five was composed of two questions intended to measure the construct job difficulty. Both of these questions dealt with supervisors' perceptions of their own job difficulty resulting from employees working alternate work schedules. These supervisor perceptions grouped together, but on a different factor than individual perceptions of personal job difficulty. It is possible that supervisors feel differently about the effects of AWSs on their own job difficulty as compared to non-supervisors; however, these factor analysis results cannot be used to determine if differences exist between these two groups because the ques-

tions contained in this factor were answered only by supervisors.

Table 7

Factor 5

<u>Question Number</u>	<u>Proposed Construct</u>	<u>Loading</u>
23	Job Difficulty	.66
24	Job Difficulty	.54

Factor 6

Factor six accounted for 2.9 percent of the variance among questions. The loadings for each question under factor six are given in Table 8. Factor six was composed of two questions which were intended to measure the construct absenteeism. One question dealt with supervisor's perceptions of absenteeism and the other question dealt with individual perceptions of absenteeism as it related to alternate work schedules. Because these questions grouped together, supervisor and employee perceptions of the construct absenteeism may be similar. The purity of this construct is also established from the purity of this factor.

Table 8

Factor 6

<u>Question Number</u>	<u>Proposed Construct</u>	<u>Loading</u>
52	Absenteeism	.70
26	Absenteeism	.62

Using the results of factor analysis, questions relating to each proposed research construct were chosen from the related factor matrix for the analysis of variance procedure. Questions were chosen based on the purity of factor loadings. Because Questions 17 through 27 were answered only by supervisors, the analysis of variance procedure could not be used with these questions to test the difference in means between supervisors and non-supervisors. Questions 17 through 27 were used for further analysis of the research questions based on their frequency distributions. Table 9 contains the construct questions taken from the factor matrix to be used for analysis of variance.

Table 9

Factor AnalyzedConstruct Questions

<u>Questions</u>	<u>Research Construct</u>
43	
49	Productivity
50	
54	
30	
31	Job Difficulty
32	
37	
38	
*48	
45	Fatigue
51	
40	
44	Acceptance
47	
42	Job Satisfaction
55	
52	Absenteeism

* Question 48 was included in the analysis of variance procedure separately from the other five job difficulty questions.

Reliability

Internal consistency of the construct questions used in the analysis of variance procedure was developed for five of the six research constructs using Cronbach's coefficient alpha. The research construct absenteeism could not be tested for internal consistency because it contained only one variable (after Question 26 was removed).

Interpretation of alpha is highly subjective, but it is generally accepted that the closer alpha is to 1, the better the internal consistency of the factor (construct) being measured. The SPSS subroutine RELIABILITY provides an overall alpha for the construct being tested and also provides a categorical listing of alpha values assuming that individual questions were deleted from analysis. In all cases except one the overall alpha value was higher for the inclusion of every question in the constructs. The overall alpha value for the construct productivity was .81 while the alpha value would have been .85 if question 49 was judged valuable; this question was retained for further analysis of the construct productivity. Because of relatively high alpha values, all research constructs were considered reliable. Table 10 lists the Cronbach's coefficient alpha for each research construct.

Table 10
Reliability Test

<u>Construct</u>	<u>Questions</u>	<u>Alpha If Questions Deleted</u>	<u>Overall Alpha</u>
Productivity	43	.72637	.81204
	49	.85564	
	50	.75164	
	54	.71017	
Job Difficulty	30	.86808	.88460
	31	.84618	
	32	.85072	
	37	.86043	
	38	.87162	
Fatigue	45	-----	.72622
	51	-----	
Acceptance	40	.90305	.91281
	44	.87185	
	47	.84573	
Job Satisfaction	42	-----	.78518
	55	-----	

Research Findings

Each research question was evaluated through an examination of the frequency distributions pertaining to each construct. Additionally, the research questions were subclassified to include comparisons between flexible and compressed schedules as well as between supervisors and non-supervisors. The comparisons were accomplished through either the parametric analysis of variance (ANOVA) test or the nonparametric Mann-Whitney U-test depending on the test's applicability. The frequency distributions of each subpopulation were also included in the comparative analysis. Finally, the responses of supervisors toward their subordinates were included.

In the following discussion, the questionnaire responses of "strongly agree" and "agree" are combined for brevity and are referred to by the use of the word "agree." In a similar fashion, the word "disagree" refers to the cumulative totals of both the "strongly disagree" and "disagree" responses unless otherwise noted.

Research Question 1. Did employee productivity increase after AWSs were put into effect?

Of the 199 employees who worked either a flexible or compressed schedule, the majority (75.4 percent) clearly felt that they were more productive when they worked an alternate work schedule (question 43) than when they were

working a standard five-day, forty-hour schedule. In support of this response, 76.4 percent indicated that it was easier to get their work completed on time under an alternate work schedule (Question 50). The remaining two questions that loaded under the construct of productivity were less supportive. In response to statement 49, "I worked harder when I was working an Alternate Work Schedule," a total of 53.3 percent of the employees agreed with the statement while 30.6 percent disagreed; however, increased productivity does not necessarily result from someone working harder. Finally, when asked whether the quality of their work had increased (Question 54), most employees responded in the affirmative. Again, while an increase in work quality is not a necessary condition for an increase in productivity, improved work quality can improve productivity in some cases. (See Table 11 for the frequency distributions of the above questions.)

Table 11

Total Productivity Frequency Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
43	28.6	46.7	10.1	11.6	3.0
49	14.6	38.7	16.1	27.6	3.0
50	23.6	52.8	10.1	11.1	2.5
54	18.4	37.8	24.0	18.4	1.5

SA-Strongly Agree A-Agree D-Disagree SD-Strongly Disagree

The ANOVA test between flexitime and compressed schedules revealed that the mean responses of the productivity questions were equal for both schedules (See Appendix D). The frequency distributions of the productivity questions for both flexible and compressed schedules substantiate the ANOVA results when considering total agreement or disagreement (See Table 12); however, a comparison of each of the four questions reveals that the compressed schedule workers consistently responded with "strongly agree" more often than the flexitime workers did.

Table 12

Flexitime (Compressed) Productivity Frequency Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
43	15.9 (34.0)	56.8 (42.4)	9.1 (9.7)	13.6 (11.1)	4.5 (2.8)
49	13.6 (15.3)	38.6 (38.9)	20.5 (14.6)	25.0 (28.5)	2.3 (2.8)
50	13.6 (26.4)	63.6 (49.3)	11.4 (97.3)	6.8 (12.5)	4.5 (2.1)
54	14.3 (20.3)	40.5 (37.8)	31.0 (31.0)	14.4 (19.3)	--- (2.1)

The ANOVA test to determine whether a difference existed between supervisors and non-supervisors was found to be inappropriate because of the unequal variances between the two subpopulations (see Appendix D). The non-parametric Mann-Whitney U-test was performed instead, and it revealed that the probability distributions were

equal for both supervisor and non-supervisor responses to the productivity questions (see Appendix E). These results indicate that supervisors and non-supervisors did not have substantially different opinions; however, non-supervisors "strongly agreed" with each question more frequently than supervisors did. Thus, as was expected, non-supervisors displayed a slightly more positive opinion that their own productivity had increased. (See Table 13 for overall supervisor/non-supervisor frequency distributions to questions 43, 49, 50, and 54.)

Table 13

Overall Supervisor (Non-Supervisor)
Productivity Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
43	19.0 (33.1)	52.4 (44.1)	7.9 (11.0)	14.3 (10.3)	6.3 (1.5)
49	14.3 (14.7)	49.2 (33.8)	9.5 (19.1)	27.0 (27.9)	--- (4.4)
50	20.6 (25.0)	54.0 (52.2)	6.3 (11.8)	19.0 (7.4)	--- (3.7)
54	11.1 (21.8)	44.4 (34.6)	22.2 (24.8)	20.6 (17.3)	1.6 (1.5)

The supervisor/non-supervisor subpopulations were further subclassified according to the type of schedule worked. The frequency distributions for these subclassifications are given in Table 14. These results show that

the 51 supervisors who worked compressed schedules responded more often (the relative percentage was higher) with "strongly agree" than the 9 supervisors who worked flexible schedules. A similar relationship was found among non-supervisors. Also of note is the fact that a much higher percentage of supervisors who worked flexible schedules responded in disagreement to Question 43 than did the supervisors who worked compressed schedules; however, this fact may be misleading because of the small number of supervisors who worked the flexible schedules. Although the ANOVA test showed no difference in worker productivity between flexible and compressed schedules, the above facts nevertheless indicate that both supervisors and non-supervisors who worked compressed schedules provided more positive responses about productivity gains than flexitime workers. Another point these distributions convey is that regardless of schedule, non-supervisors responded in agreement more frequently than supervisors (the only exception being Question 49).

One point that cannot be overemphasized is the fact that only nine supervisors worked the flexitime schedule. This may be the primary reason that a large difference existed in the supervisor/non-supervisor distributions for Question 43.

Table 14

Flexitime Supervisor (Non-Supervisor)
Productivity Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
43	11.1 (17.1)	44.4 (60.0)	---- (11.4)	22.2 (11.4)	22.2 ----
49	11.1 (14.3)	55.6 (34.3)	---- (25.7)	33.3 (22.9)	---- (5.7)
50	11.1 (14.3)	55.6 (65.7)	11.1 (11.4)	22.2 (2.9)	---- (5.7)
54	11.1 (15.2)	44.4 (39.4)	22.2 (33.3)	22.2 (12.1)	---- ----

Compressed Supervisor(Non-Supervisor)
Productivity Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
43	19.6 (41.9)	52.9 (36.6)	9.8 (9.7)	13.7 (9.7)	3.9 (2.2)
49	13.7 (16.1)	49.0 (33.3)	11.8 (16.1)	25.5 (30.1)	---- (4.3)
50	21.6 (29.0)	52.9 (47.3)	5.9 (11.8)	19.6 (8.6)	---- (3.2)
54	11.8 (25.0)	43.1 (34.8)	21.6 (19.6)	21.6 (18.5)	2.0 (2.2)

The responses of supervisors toward their subordinates who worked AWSs are given in Table 15 (Questions 19, 20, 22, and 27). Supervisors generally felt their subordinates were more productive (Question 27), but the percentage of non-supervisors who felt their own productivity increased was greater than the percentage of

supervisors who felt that their subordinates' productivity increased. Additionally, only 55.7 percent of the supervisors felt their subordinates completed their work on time more frequently when they worked alternate schedules (Question 20, Table 15). This compares to 77.5 percent of the non-supervisors who felt they completed their work on time more often (Question 50, Table 13). When asked about working harder when the AWSs were in effect, the responses of supervisors toward their subordinates almost equaled the frequency distributions of the responses provided from their subordinates.

Table 15

<u>Supervisors' Opinions of Their Subordinates' Productivity</u>					
<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
19	17.9	28.2	20.5	28.2	5.1
20	15.2	40.5	13.9	26.6	3.8
22	11.4	38.0	16.5	30.4	3.8

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
27	7.7	41.0	43.6	7.7	---
SI-Significantly Increased I-Increased DNC-Did Not Change D-Decreased SD-Significantly Decreased					

In summary, supervisors as well as non-supervisors felt that AWSs led to an increase in their personal produc-

tivity. Nonparametric statistics indicated that supervisors and non-supervisors responded equally to the productivity questions; however, the frequency distributions show that non-supervisors generally gave more positive responses. Further, supervisors agreed that their subordinates were more productive under alternate work schedules but not to the extent that subordinates felt their own productivity increased. Finally, although the mean responses for both flexible and compressed schedules were determined to be equal by ANOVA, the supervisors and non-supervisors who worked compressed schedules gave more positive indication that their productivity increased.

Research Question 2. Did employee job satisfaction increase after AWSs were put into effect?

The overall frequency distributions of the two questions concerning the construct job satisfaction are similar. (See Questions 42 and 55, Table 16.) A total of 62.3 percent of the employees who responded to statement 42 felt that their job was more meaningful when they were working some type of alternate work schedule. This compares to only 16.6 percent who disagreed with this statement. When asked specifically whether their job satisfaction increased or decreased (Question 55), 64 percent indicated that their job satisfaction had increased while only 6.6 percent indicated that it had declined. Of those employees who

indicated an increase in job satisfaction, 28.9 percent responded that their job satisfaction had increased significantly.

Table 16

<u>Total Job Satisfaction Frequency Distributions</u>					
<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
42	21.1	41.2	21.1	13.6	3.0

	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
55	28.9	35.0	29.4	5.6	1.0

The analysis of variance test between the two types of alternate work schedules revealed that the mean responses to both types of schedules were equal (See Appendix D); thus, the ANOVA test indicated there was little difference of opinion between the employees who worked the flexible schedules and those who worked the compressed schedules concerning the job satisfaction construct. This result, however, is not totally supported by the frequency distributions for both types of schedules (Table 17). The level of agreement shown toward Question 42 was slightly higher for the compressed schedule workers than for the flexitime workers; also, a noticeably higher percentage of compressed schedule workers (12 percent higher) responded to Question 55 with "significantly increased." Although the percentage differences discussed

above are not extreme, the fact remains that compressed schedule workers were more positive that their job satisfaction increased than were flexitime workers.

Table 17

Flexitime (Compressed) Job Satisfaction Frequency Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
42	18.2 (22.9)	45.5 (38.9)	15.9 (21.5)	13.6 (14.6)	6.8 (2.1)

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
55	20.9 (32.9)	44.2 (31.5)	32.6 (27.3)	2.3 (7.0)	--- (1.4)

The ANOVA results for supervisors and non-supervisors revealed that the mean responses of the two subpopulations were different (see Appendix D). The frequency distributions of the two subpopulations show that alternate work schedules affected non-supervisors' job satisfaction more than supervisors' job satisfaction. A higher percentage of non-supervisors responded to questions 42 and 55 with "strongly agree" and "significantly increased" respectively (see Table 18). Although both subpopulations felt their job satisfaciton increased as a result of AWSs, non-supervisors felt a greater increase in job satisfaction than supervisors.

Table 18

Overall Supervisor (Non-Supervisor) Job Satisfaction
Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
42	7.9 (27.2)	47.6 (38.2)	19.0 (22.1)	19.0 (11.0)	6.3 (1.5)

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
55	20.6 (32.8)	34.9 (35.1)	36.5 (26.1)	6.3 (5.2)	1.6 (0.7)

The frequency distributions of the supervisors and non-supervisors grouped by schedule type are presented in Table 19. These distributions indicate that the supervisors as well as the non-supervisors felt that their own job satisfaction increased more under the compressed schedules. It is interesting to note that more than half of the supervisors who worked flexible schedules disagreed with statement 42 which read, "While working an Alternate Work Schedule, my job was more meaningful to me." Contradicting this result is the fact that none of the supervisors who worked flexitime responded that their own job satisfaction decreased. Assuming that Questions 42 and 55 do accurately measure the job satisfaction construct, the contradiction may be explained by the fact that only nine supervisors worked flexible schedules, and thus, the sample may not be representative of the entire supervisor subpopulation. However, it may also be that supervisors who

worked flexible schedules felt that their jobs were neither more or less meaningful to them. As a final point, non-supervisors indicated a greater job satisfaction than supervisors for both types of schedules.

Table 19

Flexible Supervisor (Non-Supervisor) Job Satisfaction Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
42	---- (22.9)	44.4 (45.7)	---- (20.0)	22.2 (11.4)	33.3 ----

	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
55	11.1 (23.5)	44.4 (44.1)	44.4 (29.4)	---- (2.9)	---- ----

Compressed Supervisor (Non-Supervisor) Job Satisfaction Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
42	7.8 (31.2)	47.1 (34.4)	23.5 (20.4)	19.6 (11.8)	2.0 (2.2)

	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
55	21.6 (39.1)	31.4 (31.5)	37.3 (21.7)	7.8 (6.5)	2.0 (1.1)

In summary, job satisfaction increased for both supervisors and non-supervisors who worked alternate schedules but the increase did not occur at the same level for each subpopulation. The ANOVA test revealed that there was no difference in the responses of the flexitime and

compressed schedule workers; however, the frequency distributions do show a slight difference. Both supervisors and non-supervisors felt a higher level of increase in job satisfaction when they worked the compressed schedules.

Research Question 3. Did employee job difficulty increase after AWSs were put into effect?

As mentioned previously, the factor analysis procedure did not group together all twelve questions that were originally designed to measure the job difficulty construct. Since factor four contained five of the twelve questions intended to indirectly measure job difficulty, these five questions (Questions 30, 31, 32, 37, and 38) were included in the job difficulty construct analysis. Question 48 was also included in this construct analysis because it solicited direct responses about job difficulty from those employees who worked one of the alternate schedules. Since the factor analysis procedure did not load Question 48 with the other questions which loaded in factor four, the tests for equality of means were performed separately on Question 48. Even though two factors are involved in this analysis, it is felt that only one construct is being measured. This is justified by the assumption that several indirect measures when taken separately (Questions 30, 31, 32, 37, and 38) can give different results when viewed directly (Question 48).

In response to Question 30, which addressed the difficulty of getting help from other employees, 65.6 percent of the respondents felt it was not difficult to get help when the AWSs were in effect. (See Table 20 for the overall responses to Questions 30, 31, 32, 37, and 38.) The majority of the respondents also disagreed with statement 31 which read, "supervisors and subordinates worked different hours and this caused additional problems." When the preceeding statement was later rephrased in statement 37, most of the respondents agreed that additional problems were not generated. Thus, it appears as though supervisor-subordinate interaction was not a problem under alternate work schedules. Additionally, 63.9 percent of the employees felt that communications were not more difficult when the AWSs were in effect; however, only 35.1 percent agreed that communications were better after AWSs were implemented (see Questions 32 and 38 respectively). Of the 199 employees who responded to statement 48, a resounding 81.4 percent felt that their job was not more difficult when they were working an alternate schedule.

Table 20

Total Job Difficulty Frequency Distributions (Percent)

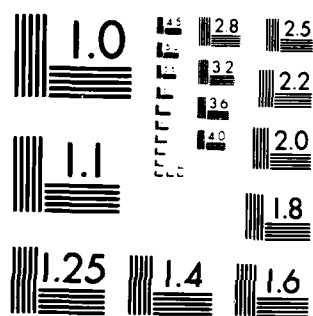
<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
30	5.9	20.5	7.9	51.0	14.6
31	8.3	15.0	11.7	48.8	16.2
32	5.4	18.7	12.0	51.9	12.0
37	14.6	45.4	18.3	17.1	4.6
38	7.1	28.0	37.2	23.4	4.2

48	3.5	6.0	9.0	51.8	29.6

The analysis of variance test for flexible and compressed schedules indicated that the mean responses to both schedules were equal (See Appendix D). Thus, there appears to be no difference in job difficulty between flexible and compressed schedules. The flexitime/compressed frequency distributions do not entirely support this ANOVA result (See Table 21). These distributions show that a noticeably higher percentage of compressed schedule workers "strongly disagree" with Questions 31 and 32. Similarly, a substantially greater percentage of compressed schedule workers "strongly agreed" with Question 37. Except for the above differences, the frequency distributions are similar. Although not evident by the ANOVA test, it appears that compressed schedule workers were more positive that their jobs had not become more difficult.

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Table 21

Flexitime (Compressed) Job Difficulty Frequency
Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
30	6.5 (6.0)	15.2 (18.7)	6.5 (6.0)	58.7 (52.0)	13.0 (17.3)
31	6.5 (7.3)	19.6 (11.9)	8.7 (9.9)	60.9 (48.3)	4.3 (22.5)
32	---- (6.0)	21.3 (14.6)	14.9 (9.9)	61.7 (53.0)	2.1 (16.6)
37	6.4 (19.2)	51.1 (46.4)	23.4 (14.6)	14.9 (15.2)	4.3 (4.6)
38	6.5 (9.3)	28.3 (31.1)	39.1 (33.8)	26.1 (19.9)	---- (6.0)

48	2.3 (3.5)	9.1 (5.6)	13.6 (7.6)	50.0 (50.7)	25.0 (32.6)

The ANOVA test comparing supervisors and non-supervisors yielded unequal means for the combined responses of statements 30, 31, 32, 37, and 38 (See Appendix D). The ANOVA test could not be performed on statement 48 because the variances were unequal. The non-parametric Mann-Whitney U-test was substituted and the results revealed equal probability distributions (See Appendix E). The supervisor/non-supervisor frequency distributions are presented in Table 22.

Table 22

Overall Supervisor (Non-Supervisor) Job Difficulty
Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
30	9.9 (3.8)	27.2 (17.1)	6.2 (8.9)	49.4 (51.9)	7.4 (18.4)
31	15.9 (4.4)	20.7 (12.0)	8.5 (13.3)	41.5 (52.5)	13.4 (17.7)
32	9.8 (3.1)	24.4 (15.7)	12.2 (11.9)	45.1 (55.3)	8.5 (13.8)
37	11.0 (16.5)	36.6 (50.0)	22.0 (16.5)	25.6 (12.7)	4.9 (4.4)
38	4.9 (8.3)	25.6 (29.3)	32.9 (39.5)	31.7 (19.1)	4.9 (3.8)

48	7.9 (1.5)	4.8 (6.6)	14.3 (6.6)	47.6 (53.7)	25.4 (31.6)
----	--------------	--------------	---------------	----------------	----------------

The unequal mean response as obtained from the ANOVA test can also be observed when comparing the frequency distributions of each statement. An examination of statements 30, 31, and 32 reveals that the percentage of non-supervisors indicating disagreement is at least 13 percent greater than the percentage of supervisors indicating disagreement. Also, the frequency distributions of statements 37 and 38 show that a noticeably higher percentage of non-supervisors responded in agreement than supervisors. These results indicate that non-supervisors felt more strongly than supervisors that AWSs did not

create more difficult working conditions.

Although the Mann-Whitney U-test indicated equal probability distributions for statement 48, the supervisor/non-supervisor frequency distributions are slightly different. A total of 73.0 percent of the supervisors and 85.3 percent of the non-supervisors felt that their jobs were not more difficult when they worked alternate schedules. This difference was reasonably consistent with the results of the other five questions which loaded on the job difficulty construct.

The supervisor/non-supervisor frequency distributions for both the flexible and compressed schedules are given in Table 23. In the flexitime category, a substantially higher percentage of supervisors than non-supervisors felt that additional problems were created (Question 31), communications were more difficult (Question 32), and that it was difficult to get help from employees because they were not at work when their services were required (Question 30). Major differences also existed between supervisors and non-supervisor responses to Questions 37 and 38. Again it is important to point out that only nine supervisors worked the flexible schedules, so the responses may not be truly representative of the subpopulation. In the compressed schedule category, the differences between supervisor and non-supervisor distributions are not nearly as dramatic as in the

flexitime category; however, it is still readily apparent that non-supervisors felt more strongly than supervisors that compressed schedules did not make work more difficult. One additional point can be made from the overall frequency distributions given in Table 23. Both the supervisors and non-supervisors working compressed schedules felt that job difficulty was less of a problem than the supervisors and non-supervisors working the flexible schedules.

Table 23

Flexitime Supervisor (Non-Supervisor) Job Difficulty Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
30	11.1 (5.4)	33.3 (10.8)	---- (8.1)	44.4 (62.2)	11.1 (13.5)
31	20.0 (2.8)	20.0 (19.4)	20.0 (5.6)	40.0 (66.7)	---- (5.6)
32	---- ----	30.0 (18.9)	30.0 (10.8)	40.0 (67.6)	---- (2.7)
37	10.0 (5.4)	50.0 (51.4)	10.0 (27.0)	30.0 (10.8)	---- (5.4)
38	---- (8.3)	20.0 (30.6)	40.0 (38.9)	40.0 (22.2)	---- ----

48	---- (2.9)	11.1 (8.6)	22.2 (11.4)	33.3 (54.3)	33.3 (22.9)

Table 23
(Continuation)

Compressed Supervisor (Non-Supervisor) Job Difficulty
Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
30	8.9 (4.3)	21.4 (17.0)	5.4 (6.4)	57.1 (48.9)	7.1 (23.4)
31	12.5 (4.2)	19.6 (7.4)	3.6 (13.7)	46.4 (49.5)	17.9 (25.3)
32	8.9 (4.2)	17.9 (12.6)	8.9 (10.5)	53.6 (52.6)	10.7 (20.0)
37	14.3 (22.1)	39.3 (50.5)	19.6 (11.6)	21.4 (11.6)	5.4 (4.2)
38	7.1 (10.5)	30.4 (31.6)	26.8 (37.9)	30.4 (13.7)	5.4 (6.3)

48	.7.8 (1.1)	3.9 (6.5)	13.7 (4.3)	49.0 (51.6)	25.5 (36.6)

The frequency distributions are given in Table 24 for 82 supervisors' opinions of their own job difficulty resulting from their subordinates working AWSs. When supervisors were questioned about their job being more difficult because their subordinates were working alternate schedules (Question 17), the majority of supervisors (65.9 percent) claimed their jobs did not become more difficult. In response to statement 23, "I had no difficulty keeping track of my subordinates even though they worked Alternate Work Schedules," a total of 70.9 percent of the supervisors were in agreement. Finally, in regard to scheduling meet-

ings with their subordinates (Question 24), supervisors were again in strong agreement (68.4 percent) that AWSs did not create any extra difficulty.

Table 24

Supervisors' Opinions of Their Own Job Difficulty

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
17	13.9	11.4	8.9	53.2	12.7
23	20.3	50.6	8.9	15.2	5.1
24	16.5	51.9	8.9	19.0	3.8

In summary, most supervisors as well as non-supervisors felt that work did not become more difficult when the alternate work schedules were in effect; however, regardless of the type of schedule, non-supervisors indicated with greater assurance that their work was not more difficult. Additionally, most supervisors did not feel their own jobs became more difficult when their subordinates worked alternate work schedules. The ANOVA test showed no difference between the responses of flexitime and compressed schedule workers, but several differences were found in the frequency distributions of both schedules. The compressed schedule workers responded more positively than flexitime workers that work was no more difficult than it was under a standard five-day, forty-hour schedule.

Research Question 4. Were AWSs well accepted by employees?

Two of the three questions (Questions 44 and 47) loading under the acceptance construct indicated that AWSs were well liked (see Table 25). Almost 78 percent of all respondents to Question 44, agreed that they would definitely work an AWS again. This compares to 80.9 percent who agreed with statement 47 which read, "I liked working an Alternate Work Schedule." Question 40 gave an indication of the success of the AWS program. Of the 240 respondents to the question, "How would you evaluate the overall success of the Alternate Work Schedule program," 35.8 percent responded by stating "very successful" and 34.6 percent stated "successful."

Table 25

Total Acceptance Frequency Distributions

<u>Question</u>	<u>VS</u>	<u>S</u>	<u>Neither</u>	<u>UNS</u>	<u>VUNS</u>
40	35.8	34.6	20.0	7.5	2.1

	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
44	53.8	24.1	9.5	7.5	5.0
47	53.8	27.1	8.5	7.5	3.0

VS-Very Successful S-Successful UNS-Unsuccessful
VUNS-Very Unsuccessful

The ANOVA test between flexitime and compressed schedules again revealed that mean employee responses were equal (see Appendix D). A comparison of the frequency

distributions of the two schedules, however, revealed some notable differences (see Table 26). First, a much greater percentage (24 percent higher) of compressed schedule workers "strongly agreed" with statement 44 which read, "I would definitely work an Alternate Work Schedule again." A similar result was found with statement 47. The compressed schedule workers "strongly agreed" much more often than the flexible workers on the statement, I liked working an Alternate Work Schedule." Although the difference was not as striking, a higher percentage of compressed schedule workers rated the AWSs program "very successful."

Table 26

Flexitime (Compressed) Acceptance Frequency Distributions

<u>Question</u>	<u>VS</u>	<u>S</u>	<u>Neither</u>	<u>UNS</u>	<u>VUNS</u>
40	29.8 (44.7)	44.7 (30.7)	14.9 (16.7)	10.6 (5.3)	---- (2.7)

	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
44	36.4 (60.4)	34.1 (20.1)	13.6 (6.9)	6.8 (8.3)	9.1 (4.2)
47	36.4 (61.8)	45.5 (19.4)	6.8 (8.3)	9.1 (6.9)	2.3 (3.5)

The ANOVA test could not be used to determine if a difference in means existed between the supervisor and non-supervisor subpopulations. The Mann-Whitney U-test, however, revealed a difference in the probability distri-

butions between the two groups (see Appendix E). An examination of the supervisor and non-supervisor frequency distributions (Table 27) showed that a higher percentage of nonsupervisors liked AWSs (Question 47) and that a greater percentage would be willing to work AWSs again (Question 44). Also, a higher percentage of non-supervisors rated the AWS program a success (Question 40). Although a large difference between these two subpopulations did not exist, supervisors were not as favorable toward AWSs as were non-supervisors.

Table 27

Overall Supervisor (Non-Supervisor) Acceptance
Distributions

<u>Question</u>	<u>VS</u>	<u>S</u>	<u>Neither</u>	<u>UNS</u>	<u>VUNS</u>
40	29.6 (39.0)	33.3 (35.2)	22.2 (18.9)	13.6 (4.4)	1.2 (2.5)

	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
44	44.4 (58.1)	28.6 (22.1)	9.5 (9.6)	9.5 (6.6)	7.9 (3.7)
47	44.4 (58.1)	33.3 (24.3)	6.3 (9.6)	9.5 (6.6)	6.3 (1.5)

The data were further analyzed based on the frequency distributions of supervisors and non-supervisors for each work schedule. These distributions indicate that supervisor acceptance of alternate work schedules was somewhat lower (ranging from 5 to 20 percent lower) than that

of non-supervisors for both the compressed and flexible work schedules (see Table 28). It is interesting to note that for each acceptance question analyzed, the differential in acceptance between supervisors and non-supervisors was always smaller for the compressed schedule than for the flexible schedule.

Table 28

Flexitime Supervisor (Non-Supervisor) Acceptance Distributions

<u>Question</u>	<u>VS</u>	<u>S</u>	<u>Neither</u>	<u>UNS</u>	<u>VUNS</u>
40	30.0 (29.7)	30.0 (48.6)	10.0 (16.2)	30.0 (5.4)	---- ----

	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
44	22.2 (40.0)	33.3 (34.4)	11.1 (14.3)	---- (8.6)	33.3 (2.9)
47	33.3 (37.1)	44.4 (45.7)	---- (8.6)	11.1 (8.6)	11.1 ----

Compressed Supervisor (Non-Supervisor) Acceptance Distributions

<u>Question</u>	<u>VS</u>	<u>S</u>	<u>Neither</u>	<u>UNS</u>	<u>VUNS</u>
40	34.5 (50.5)	34.5 (28.4)	20.0 (14.7)	9.1 (3.2)	1.8 (3.2)

	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
44	49.0 (66.7)	25.5 (17.2)	9.8 (5.4)	11.8 (6.5)	3.9 (4.3)
47	49.0 (68.8)	29.4 (14.0)	7.8 (8.6)	7.8 (6.5)	5.9 (2.2)

Another interesting point is that supervisors were slightly more positive about working AWSs than they were about letting their subordinates work alternate schedules. About 65 percent of the supervisors disagreed with statement 18 (see Table 29) which read, "I do not want my subordinates working an Alternate Work Schedule." this compares to 73 percent of the supervisors who indicated they would definitely work an AWS again.

Table 29

Supervisors' Opinions of Their Subordinates Working AWSs

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
18	10.1	12.7	12.7	35.4	29.1

A crosstabulation of rank by response for the three acceptance questions was performed. These results appear in Appendix F. Concerning the question of whether the AWSs were successful (Question 40), the responses of Airmen (E-1 to E-3) did not vary much from the responses of E-4s and E-5s. However, a much lower percentage of the Technical Sergeants (E-6s) felt that the AWS program was "very successful" than "successful." This trend was reversed again in the Master Sergeant (E-7) category. More of the E-7s felt that the AWS program was "very successful" rather than just "successful." In the Senior Enlisted category (E-8, E-9) there were only four respondents. This was too small a sample to provide very meaningful results, but note

that none of the E-8s or E-9s rated the AWS program a success. The officer respondents were also too few in number to gain very useful information. However, the one Colonel (O-6) who responded and one of the two Majors (O-4s) that responded indicated that the AWS program was "very successful." In response to statement 44, "I would definitely work an Alternate Work Schedule again," enlisted grades E-1 through E-5 responded primarily with "strongly agree." Technical Sergeants were the most positive of all ranks but were equally divided between the responses of "strongly agree" and "agree." The Master Sergeants responded primarily with "strongly agree." Of the few Lieutenants (O-1s and O-2s) and Captains (O-3s) who responded, most answered "strongly agree." When asked about liking AWSs in Question 47, the distribution of responses were very similar to those of Question 44. Most officer and enlisted members responded with "strongly agree."

Frequency distributions of the acceptance of alternate work schedules were also analyzed based on the responses of two rank structures (see Table 30). The first rank structure included the ranks E-7 through O-6. The second rank structure included ranks E-1 through E-6. Except for Question 40, the frequency distributions are very similar. In Question 40, a noticeably larger percentage of E-1s to E-6s rated the AWS program a success.

Table 30

E-7 to 0-6 (E-1 to E-6) Acceptance Frequency
Distributions

<u>Question</u>	<u>VS</u>	<u>S</u>	<u>Neither</u>	<u>UNS</u>	<u>VUNS</u>
40	31.8 (36.4)	25.0 (36.4)	25.0 (19.7)	15.9 (5.6)	2.3 (2.0)

	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
44	51.7 (53.5)	20.7 (25.6)	6.9 (9.9)	13.8 (6.4)	6.9 (4.7)
47	48.3 (54.1)	31.0 (27.3)	6.9 (8.7)	6.9 (7.6)	6.9 (2.3)

In summary, AWSs were well accepted by both supervisors and non-supervisors; however, non-supervisors showed more enthusiasm for both the flexible and compressed schedules. Although no difference between the responses of the flexible and compressed schedule workers was found from the ANOVA test, the frequency distributions show that employees had a slightly greater enthusiasm for the compressed schedules. Rank made little difference as to whether the AWSs were liked or not, but a slightly higher percentage of the lower ranks (E-1s to E-6s) felt that the AWS program was successful.

Research Question 5. Did employee fatigue increase after AWSs were put into effect?

The results of the two questions (Questions 45 and 51) which loaded under the fatigue construct indicated that

fatigue was not a problem for most employees who worked alternate work schedules (see Table 31). In response to statement 45, "I needed more sleep when I was working an Alternate Work Schedule," a total of 73.1 percent of the employees were in disagreement. Also, 61.8 percent disagreed with statement 51, "I felt more tired at the end of each workday when I worked an Alternate Work Schedule." This compares to only 25.6 percent who showed agreement with the preceeding statement. Two other related questions also support these responses. All employees were asked how many hours per day they felt tired when they worked the standard five-day, forty-hour work schedule (Question 10). A similar question (Question 56) was asked of those employees who worked alternate schedules. The frequency distributions for both questions were extremely close with most employees indicating they felt tired one hour or less each day.

Table 31

<u>Total Fatigue Frequency Distributions</u>					
<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
45	7.6	10.2	9.1	50.8	22.3
51	8.0	17.6	12.6	49.2	12.6

	<u><1hr</u>	<u>1hr</u>	<u>2hrs</u>	<u>3hrs</u>	<u>>3hrs</u>
10	54.7	17.5	15.0	6.0	6.8
56	55.7	20.8	15.6	3.6	4.2

The analysis of variance test on flexible and compressed schedules revealed that the mean employee responses were equal (see Appendix D). The frequency distributions generally bear this out (see Table 32). There is little difference in the flexible/compressed frequency distributions of the statement pertaining to needing more sleep (Question 45). However, a slightly greater percent of compressed schedule workers agreed that they were more tired at the end of each workday (Question 51). This is not unusual though, since compressed schedule workers put in more hours each day. The fact that the difference is so small is somewhat surprising. Also, note that five percent of the compressed schedule workers indicated they were tired more than three hours each day (Question 56, Table 32). None of the flexitime workers gave this response.

Table 32

Flexitime (Compressed) Fatigue Frequency Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
45	4.5 (9.2)	11.4 (9.2)	9.1 (7.0)	54.5 (50.7)	20.5 (23.9)
51	6.8 (9.0)	13.6 (18.8)	13.6 (11.8)	54.5 (47.2)	11.4 (13.2)

	<u><1hr</u>	<u>1hr</u>	<u>2hrs</u>	<u>3hrs</u>	<u>>3hrs</u>
56	54.8 (57.1)	21.4 (21.4)	19.0 (14.3)	4.8 (2.1)	----- (5.0)

The ANOVA results for supervisors and non-supervisors also showed that both subpopulations had equal mean responses (see Appendix D). The frequency distributions of both supervisors and non-supervisors were almost identical for the statements measuring their own personal level of fatigue (see Table 33).

Table 33

Overall Supervisor (Non-Supervisor) Fatigue Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
45	7.9 (7.5)	7.9 (11.2)	14.3 (6.7)	49.2 (51.5)	20.6 (23.1)
51	12.7 (5.9)	15.9 (18.4)	12.7 (12.5)	46.0 (50.7)	12.7 (12.5)

Again, the frequency distributions of the fatigue questions (45 and 51) for the compressed schedule revealed no noticeable difference between supervisors and non-supervisors (see Table 34). However, Table 34 also shows a much higher percentage of supervisors than non-supervisors "strongly agreed" that they were more tired at the end of each workday under the flexitime schedule than under the compressed work schedule (Question 51). This could have resulted because supervisors may have had to work more hours in order to monitor their subordinates' alternate schedules. Again, conclusions must be tempered by the fact that this large percentage difference represents only the opinions of two supervisors who worked flexible schedules.

Table 34

Flexitime Supervisor (Non-Supervisor) Fatigue
Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
45	---- (5.7)	11.1 (11.4)	11.1 (8.6)	55.6 (54.3)	22.2 (20.0)
51	22.2 (2.9)	---- (17.1)	11.1 (14.3)	55.6 (54.3)	11.1 (11.4)

Compressed Supervisor (Non-Supervisor) Fatigue
Distributions

<u>Question</u>	<u>SA</u>	<u>A</u>	<u>Undecided</u>	<u>D</u>	<u>SD</u>
45	9.8 (8.8)	7.8 (9.9)	11.8 (4.4)	49.0 (51.6)	21.6 (25.3)
51	11.8 (7.5)	19.6 (18.3)	11.8 (11.8)	43.1 (49.5)	13.7 (12.9)

In Question 25, supervisors were asked about the level of fatigue they observed in their subordinates. Most supervisors (62 percent) indicated that it did not change. This compares to 16.5 percent who indicated that it increased and 21.5 percent who indicated a decrease (see Table 35).

Table 35

Supervisors' Opinions of Their Subordinates' Fatigue

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
25	2.5	13.9	62.0	17.7	3.8

In summary, most supervisors and non-supervisors perceived that the level of fatigue experienced under AWSs was no higher than that experienced under the standard five-day, forty hour work schedule. The ANOVA results revealed that the type of alternate schedule worked did not produce different levels of fatigue; however, the frequency distributions show that compressed schedule workers felt slightly more tired at the end of the workday, as was expected.

Research Question 6. Did absenteeism decrease after AWSs were put into effect?

The factor analysis results identified Question 52 as a representative measure of the absenteeism construct. This question asked employees who worked one of the alternate schedules to comment on their absence from work because of sickness and other reasons, but it excluded annual leave as a form of absence. The majority of respondents (65.8 percent) claimed their absenteeism did not change; however, 30.6 percent said their absence from work decreased which was notably higher than the 3.5 percent who indicated an increase (see Table 36).

Table 36

<u>Total Absenteeism Frequency Distributions</u>					
<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
52	0.5	3.0	65.8	21.6	9.0

The ANOVA results showed that the employee mean responses for both flexible and compressed schedules were equal (see Appendix D). Even though the ANOVA results showed equal mean responses, the frequency distributions show that a higher relative percentage of the compressed schedule workers (20 percent greater) stated their absenteeism had declined (see Table 37).

Table 37

<u>Flexitime (Compressed) Absenteeism Frequency Distributions</u>					
<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
52	---- (0.7)	4.5 (2.8)	79.5 (61.8)	13.6 (22.9)	2.3 (11.8)

The unequal variances of the supervisor/non-supervisor responses prevented the use of ANOVA to test for equality of means. The substituted Mann-Whitney U-test revealed that both subpopulations had equal probability distributions (see Appendix E). The frequency distribution of the absenteeism question bears this out (see Table 38). Supervisors as well as non-supervisors felt their personal absenteeism changed little as a result of working the alternate schedules.

Table 38

Overall Supervisor (Non-Supervisor) Absenteeism
Distributions

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
52	----- (0.7)	4.8 (2.2)	61.9 (67.6)	20.6 (22.1)	12.7 (7.4)

The frequency distributions of supervisors and non-supervisors by work schedule are given in Table 39. These distributions indicate that a higher percentage of both supervisors and non-supervisors who worked the compressed schedules felt their absenteeism had decreased than did the supervisors and non-supervisors who worked the flexible schedules.

Table 39

Flexitime Supervisor (Non-Supervisor) Absenteeism
Distributions

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
52	----- -----	11.1 (2.9)	77.8 (80.0)	11.1 (14.3)	----- (2.9)

Compressed Supervisor (Non-Supervisor) Absenteeism
Distributions

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
52	----- (1.1)	3.9 (2.2)	58.8 (63.4)	21.6 (23.7)	15.7 (9.7)

When supervisors were asked to comment on their subordinates' absenteeism, most (55.7 percent) felt that it

did not change; however, 44.3 percent felt it had declined. It is interesting to note that none of the supervisors indicated an increase in absenteeism by their subordinates (see Table 40).

Table 40

Supervisors' Opinions of Their Subordinates' Absenteeism

<u>Question</u>	<u>SI</u>	<u>I</u>	<u>DNC</u>	<u>D</u>	<u>SD</u>
26	----	----	55.7	36.7	7.6

In summary, both supervisors and non-supervisors felt their own absenteeism either did not change or that it decreased. The same was true of supervisors' opinions of their subordinates' absenteeism. Although the ANOVA results did not reveal a difference in responses associated with flexible and compressed schedules, there was a greater percentage of compressed schedule workers than flexible schedule workers who felt their personal absenteeism decreased.

Questionnaire Comments

The majority of comments received were very favorable of alternate work schedules, especially for the four-day workweek. Respondents indicated that alternate work schedules provided benefits both to the individual and the organization. By far the greatest benefit reported from

alternate work schedules was increased morale. This benefit was followed by increased productivity, job satisfaction, and decreased absenteeism. Respondents were particularly pleased with the extra time-off from work because it provided them with more time to recreate, to spend with their family, or to conduct personal business, and it increased fuel savings. Respondents also commented that lengthy jobs normally requiring two trips to the job site could often be finished in one trip with the ten-hour day. Potential problem areas that could materialize following the implementation of alternate work schedules were generally reported to have been overcome. Some of these problem areas include increased management difficulty, reduced service to other base organizations, and decreased communication and cooperation between sections.

Some respondents did, however, comment on several disadvantages they perceived from alternate work schedules. Some individuals felt that service to the base on Mondays and Fridays (using the split-force concept where half of the workforce is present Monday or Friday) had decreased. Likewise, it was also reported that work delays occurred because of scheduling problems, and that worker fatigue had caused problems in CE operations. One particular individual felt that the civilian workforce was highly in favor of alternate work schedules and that their attitudes strongly influenced the younger military workers. This

individual also felt that the positive acceptance of alternate work schedules resulted because people liked the extra day off more than they liked the schedule itself. A common disadvantage reported by individuals working flexible schedules was the difficulty in keeping track of subordinates.

Perhaps the most frequent comment received was that compressed work schedules would provide the most advantages if all base organizations worked the same schedule or if the entire Civil Engineering Squadron worked the same schedule instead of working the split-shift concept. Many respondents felt that uniformity of work schedule was imperative to the success of an alternate work schedule.

Supplemental Data

In addition to the three Air Force Civil Engineering Squadrons surveyed, the Civil Engineering Squadron at Williams AFB also participated in the alternate work schedule program. The questionnaire used in this research was not administered at Williams. The Base Civil Engineer chose, instead, to provide information on the effects of AWSs in this squadron.

Alternate work schedules were implemented in the Civil Engineering Squadron at Williams in October 1979. Both compressed and flexible work schedules were implemented. In June 1980, the Industrial Engineering Branch

reported small increases in productivity attributable to alternate work schedules. At that time squadron personnel were surveyed and the survey revealed that individuals felt that morale had significantly increased after AWSs were implemented (53). In November 1980, the Industrial Engineering Branch reported that morale was still high due to alternate work schedules; however, no increases in productivity were attributed to the alternate schedules. In the spring of 1981, alternate work schedules were terminated in the Civil Engineering Squadron at Williams because of internal problems generated from these schedules.

The biggest problem reported from Williams developed from flexible schedules. Management felt that individual workers were abusing flexible schedules to the point where supervisory control was impaired (53). Although employees were required to establish their work hours in advance, they were still allowed to vary from the established schedules by thirty minutes each day. Because employees abused their flexible schedule privileges, the time required for supervision was extended beyond control.

Another problem area reported from Williams was the dead time that occurred when employees worked flexible hours with starting times earlier than normal work hours (53). Dead time resulted from the inability of management

to schedule work around every individual work schedule. Management also noted that the support function of Civil Engineering was not providing adequate service to base customers and CE operations. Alternate work schedules were terminated at Williams primarily because abuse of flexible schedules created a supervision problem and because work could not be adequately scheduled to accommodate both the compressed and flexible work schedules.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER STUDY

Overview

This research concludes with a discussion of several important considerations that should be given to the findings of each research question. The discussion also highlights the main points to be gleaned from this research as well as some final thoughts on alternate work schedules. Finally, recommendations are presented to further advance the knowledge of alternate work schedules within Air Force Civil Engineering organizations.

Conclusions

Research Question 1 (Productivity)

The analysis of the productivity questions did not provide any surprising results. As was brought out in the literature review, alternate work schedules can lead to productivity gains. This result appeared to occur within Civil Engineering as most of the surveyed employees (including both supervisors and non-supervisors) felt their own productivity increased.

Ideally, worker productivity should have been measured both before and after the implementation of alternate work schedules; however, the productivity of work

performed within Air Force Civil Engineering Squadrons is not easily measured. With Civil Engineering productivity being difficult to measure, one may ask how employees can tell if their own productivity increased or decreased. Certainly slight changes would be difficult to detect, but most workers would sense if a significant deviation were to occur. This would be especially true if productivity were to drop. By comparing current status reports with historical data, upper level managers would soon find out about a productivity decline. It normally does not take too long to trace the source of the problem and to subsequently inform employees. With the above thoughts in mind, employees' perceptions turn out to be a good measure of their own productivity albeit not the best measure.

The results obtained from this productivity analysis do not prove conclusively that alternate work schedules will lead to productivity gains in all CE organizations, but the results should alleviate any fears that CE squadron commanders may have about AWSs causing a dramatic productivity decline.

Research Question 2 (Job Satisfaction)

Most supervisors and non-supervisors felt their job satisfaction increased under alternate work schedules; however, non-supervisors felt somewhat more satisfied than supervisors. Although not proven in this analysis, the

fact that employees liked working the alternate work schedules could be one reason they felt more satisfied with their job or they could have felt greater satisfaction because they believed they were more productive.

Previous research has shown that flexitime workers tend to feel greater increases in job satisfaction than compressed schedule workers. Since flexitime workers generally have more control over their schedule, it was expected that they would respond more favorably to the job satisfaction questions. This was not the case in this research. Compressed schedule workers gave a stronger indication that their job satisfaction increased. Allowing individuals to select their own work schedule (flexible or compressed) appeared to have little effect on job satisfaction within the CE organizations surveyed.

Although the level of job satisfaction based on the above choice was not measured, some inferences can be made from the data that were gathered. Most of the compressed schedule workers were from Ellsworth AFB and they did not have the option to select flexible schedules. However, the CE employees at the two other bases did have this option. Also, the largest group of questionnaires returned came from Ellsworth. Keeping these facts in mind and recalling that compressed schedule workers showed somewhat higher levels of job satisfaction, leads one to conclude that job satisfaction was not seriously affected

because employees were not given the option to select their own work schedule. This situation could have occurred because compressed schedule workers were more enthusiastic about having an extra day off than they were about having the option to select their own work schedule.

Research Question 3 (Job Difficulty)

A non-standard work schedule would normally have little effect on job difficulty provided that employees in a particular work group worked the same schedule and that interaction with other work groups was not hindered by the schedule adopted. As was mentioned in the literature review, potential conflicts can arise from employees working different schedules. Civil Engineering employees at Mather and Chanute worked different types of schedules, and even though employees at Ellsworth only worked the four-day schedules, some employees had Monday as their day off while others had Friday off. Although employees at each base worked different hours, conflicts either did not arise or the conflicts were not serious enough for employees to feel that their jobs were more difficult. As noted earlier, however, many of the four-day workers commented that the schedule would have worked better if the squadron as well as the base would have had the same schedule with the same day off. These comments suggest that the alternate work schedules did cause some employee accessibility conflicts,

but not enough conflicts occurred to show job difficulty as a problem.

Research Question 4 (Acceptance)

There is no doubt that alternate work schedules were well accepted by both supervisors and non-supervisors, and as expected, non-supervisors liked the schedules better than the supervisors. What was not expected, however, was the overwhelming support shown by supervisors and the slight differential that occurred between supervisor and non-supervisor acceptance. Apparently, supervisors had no insurmountable problems with the additional monitoring requirements created by the schedules.

The reasons for liking AWSs are many, but hopefully the questionnaire respondents did not like the schedules so much as to totally bias their answers to the other questions. It seems highly unlikely that supervisors would rate the schedules so favorably if the schedules actually produced unfavorable results. After all, it is the supervisors who have the ultimate responsibility for the performance of their work sections. This responsibility might be part of the reason that supervisors provided slightly less favorable responses than non-supervisors. It may be that supervisors were somewhat more objective in their answers than non-supervisors. Nevertheless, most of the upper level supervisors thought that the alternate work

schedule program was a success. The case at Williams AFB is an exception to this point.

It appears that the Williams' program was not a success in the eyes of top management because too much freedom was given to the employees. Even with flexitime, limits or standards must be imposed. Allowing employees to vary their time of arrival on a daily basis is extremely difficult to monitor. Once the employee has set the time he or she wants to arrive at work, it should be maintained for an agreed upon duration (normally several weeks at the least). Work violations can also occur with compressed schedules if employees lack supervision as in the Williams AFB experiment. This analysis indicates that the above problems either did not occur or were corrected soon after implementation at Mather, Chanute, and Ellsworth Air Force Bases.

Research Question 5 (Fatigue)

Fatigue would not normally be considered to be a problem with flexitime workers except in special circumstances. For example, taking a second job because their new schedule allowed for it could result in the worker being more fatigued at his or her primary job. The compressed schedule, however, requires the individual to work more than eight hours each day. Therefore, the compressed schedule workers, on the average, should experience more fatigue than flexitime workers. The question-

naire analysis showed that regardless of schedule, most employees perceived they were no more tired at the end of each workday. Of the employees who responded that they were more tired, a slightly greater relative percentage were compressed schedule workers. Since the average age of the military workforce tends to be lower than that of the civilian workforce, one would assume that military members would be less susceptible to fatigue due to their younger age. Although this point was not studied, it should receive due consideration before AWSs are implemented.

Research Question 6 (Absenteeism)

Normally, absenteeism should either remain the same or decrease with the implementation of alternate schedules because the schedules allow employees to have more flexibility during each week for personal business. The questionnaire analysis revealed that most employees felt their absenteeism did not change. Also, about one third felt their absenteeism decreased. These results are consistent with past research. A better measure of absenteeism would have been a comparison of employee records both before and after AWSs were implemented. Unfortunately, these data were unavailable for analysis. Assuming the employees were objective in their responses, the data which were analyzed should be accurate.

Additional Conclusions

This research has attempted to provide an indepth look into the effects of alternate work schedules in Air Force Civil Engineering Squadrons. Apart from the structured data analysis portion of this research, there appear to be several generalizable findings relevant to alternate work schedules. First, compressed schedule workers consistently gave more favorable responses to all of the constructs except fatigue; however, all of the ANOVA tests between the flexible and compressed responses indicated no significant difference. The differences that existed were not enough to state with a high degree of confidence that compressed schedules are better than flexible schedules for the constructs analyzed. It is easily understood how respondents might favor compressed schedules over flexible ones because compressed work schedules provide the employee with a larger block of time to use for personal business or pleasure. The positive effects of flexible schedules are also probably short-lived because individuals may become accustomed to their new work hours. On the other hand, the benefits of compressed schedules are continuously reinforced each time the individual worker experiences a three-day weekend. This might be reason enough to favor compressed schedules over flexible schedules in Civil Engineering organizations.

A second conclusion shared by the researchers is that the effects of alternate work schedules reported by respondents may not be as positive as this research indicates. This finding was deduced from the comments received regarding alternate work schedules. Employees may like the benefits provided by these schedules, but may not like the schedules themselves. For instance, individuals working a compressed work schedule may feel that the extra day off is worth the extra fatigue and/or job difficulty possibly brought about by this schedule. As a result, individuals may have been inclined to respond more favorably to the various constructs measured simply because they liked the benefits of alternate work schedules. This finding was further supported by respondents who implied that this research would determine the future of their current alternate work schedule. In fact, several respondents expressed to the researchers their desire not to return to regular five-day work schedules.

A third conclusion is that one alternate work schedule should be implemented per work unit. Mixing both flexible and compressed schedules in one work unit causes excess supervisor and work coverage problems and is therefore not recommended. These problems can be overcome with the proper implementation of only one alternate work schedule. This finding is reinforced by the data provided from Williams AFB.

Another conclusion deduced from the comments was that compressed work schedules increase productive time by reducing the number of start-up and shut-down periods. Productive time was increased at Ellsworth AFB because of decreased shut-down periods for maintainance and repair actions at distant job sites and because of decreased shop clean-up time.

In reviewing analysis results and comments received, a final observation can be made. Organizations implementing alternate work schedules will experience resistance to change in addition to initial scheduling difficulties. Respondents generally reported that these problems can be overcome with proper management attention. Care should be taken to ensure that base level support is maintained during the initial period of adjustment to alternate work schedules.

Recommendations for Further Research

Now that the U.S. Congress has extended the Alternate Work Schedule Program experiment for another three years, ample opportunity exists for further study and analysis of alternate work schedules in Air Force organizations. By far the most important recommendation is that further research should employ a pretest design to measure constructs before implementation of alternate work schedules. Measurement of constructs should include such

instruments as the Job Design Index for measuring job satisfaction. Attempts should also be made to develop and apply quantitative measures to areas such as productivity and absenteeism.

Further research should also include the effect of alternate work schedules on the civilian workforce. This could be very important, especially in the area of fatigue, because the average age of the DOD civilian workforce is somewhat higher than that of the military. The civilian workforce should also be included in further study because a large percentage of the high-level management positions in Civil Engineering are held by civilians. Consequently, more realistic supervisor/non-supervisor perceptions of alternate work schedules could be gained by including the civilian workforce.

Further research should also be directed at studying organizations currently working alternate schedules. Unfortunately, due to the limited number of Air Force Civil Engineering organizations implementing alternate work schedules, this research included organizations where alternate work schedules had been terminated. Due to the rapid turnover of military personnel, valuable perceptions were lost.

Additional research is also recommended for supervisor perceptions of alternate work schedules. Factor analysis of supervisor perceptions should be performed to

determine if differences in factor loadings existed
between supervisor responses and total responses.

APPENDIX A
QUESTIONNAIRE



DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (ATIC)
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433

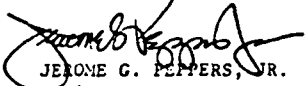
1 MAR 1992

REPLY TO
ATTN OF LSH (LSSR 50-82)/1st Lt W. Burcher/1st Lt L. Lawrence/Autovon 785-6569

SUBJECT Alternate Work Schedule Questionnaire

TO Survey Respondents

1. The attached questionnaire was prepared by a research team at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio. The purpose of the questionnaire is to acquire data concerning the effects of Alternate Work Schedules such as the four-day workweek and flexitime on Air Force Civil Engineering Squadrons.
2. You are requested to provide an answer or comment for each applicable question. Headquarters USAF Survey Control Number 82-22 has been assigned to this questionnaire. Your participation in this research is voluntary.
3. Your responses to the questions will be held confidential. Please remove this cover sheet before returning the completed questionnaire. Your cooperation in providing this data will be greatly appreciated and will be very beneficial in assessing Alternate Work Schedules within Civil Engineering. Please return the completed questionnaire in the attached envelope within one week after receipt to the Survey Coordinator in your squadron. The Survey Coordinator for your squadron is _____.


JEROME G. PEPPERS, JR.
Acting Dean
School of Systems and Logistics

- 3 Atch
1. Questionnaire
 2. Return Envelope
 3. Computer Scan Sheet

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PRIVACY STATEMENT

In accordance with paragraph 8, AFR 12-35, the following information is provided as required by the Privacy Act of 1974.

a. Authority

- (1) 5 U.S.C. 301, Departmental Regulation, and/or
- (2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or
- (3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and/or
- (4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal Purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

PLEASE READ CAREFULLY

QUESTIONNAIRE INSTRUCTIONS

1. The statements in this questionnaire relate to various aspects of Alternate Work Schedules. You are asked to indicate the response which best approximates your opinion about the statement. WE MUST EMPHASIZE THAT THIS QUESTIONNAIRE IS INTENDED FOR ALL CIVIL ENGINEERING EMPLOYEES IN YOUR SQUADRON INCLUDING THOSE EMPLOYEES WHO HAVE NOT WORKED ALTERNATE WORK SCHEDULES.
2. Transfer your responses from this questionnaire to the standard answer sheet. NOTE: DO NOT WRITE YOUR NAME OR SSAN ON THE QUESTIONNAIRE OR ANSWER SHEET PROVIDED. WE WISH THIS QUESTIONNAIRE TO BE CONFIDENTIAL.
3. Use only a soft (#2) lead pencil. DO NOT USE INK!
4. If you have to erase, be sure erasures are complete.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

ALTERNATE WORK SCHEDULE QUESTIONNAIRE

1. Sex:
A) Male
B) Female
2. Age:
A) Less than 25 yrs
B) 25 to 34 yrs
C) 35 to 44 yrs
D) 45 to 54 yrs
E) Over 54 yrs
3. What base are you currently assigned?
A) Chanute
B) Ellsworth
C) Mather

Items 4-6 refer to your rank/grade. Please indicate your rank by answering the applicable questions.

4. Officer:

A) 01 or 02	D) 05
B) 03	E) 06
C) 04	
5. Enlisted:

A) E1, E2, or E3	D) E7
B) E4 or E5	E) E8 or E9
C) E6	
6. Civilian:

A) General Schedule	C) Wage Supervisor
B) Wage Leader	D) Other

Items 7-8 pertain to your branch/section. Please indicate which one of the following categories best describes your work unit. Note: Answer item 7 or 8 but not both.

7. Operations:

A) Mechanical Section	D) Pavements/Grounds/Equipment
B) Electrical Section	E) Fire Department
C) Structural Section	
8. Support:

A) Industrial Engineering	D) Resources & Requirements
B) Engineering	E) Administrative/Other
C) Housing Referral	
9. Are you officially classified as a supervisor?

A) Yes
B) No
10. When you work a fixed, 5-day work schedule, how many hours of the workday do you feel very tired?

A) Less than 1 hour	D) 3 hours
B) 1 hour	E) Greater than 3 hours
C) 2 hours	
11. What is your present work schedule?

A) <u>Flexitime</u> -This is a work schedule that allows employees to vary their work hours by selecting their starting times each day as long as they are present for a standard specified time. The employee must fulfill the basic work requirement of 8 hours a day, 40 hours a week.	
B) <u>Compressed Workweek</u> -This is a work schedule that allows employees to work a fixed schedule that is limited to four 10-hour days a week or is limited to nine days of approximately nine hours a day in a two week period.	
C) A 5-day, 40 hour work schedule.	
D) Other	

12. The morale in my work unit is generally good:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided
13. In general, I am satisfied with my job:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided
14. I feel very tired at the end of the workday:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided
15. The productivity in my unit is generally high:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided
16. Were you working in your present squadron when the Alternate Work Schedule Program was in effect?
A) Yes
B) No

If you answered "no" to question 16, please stop. We appreciate your cooperation in spending the time to answer our questions.

If you are not officially classified as a supervisor, please go to question 23. If you are classified as a supervisor, please proceed with question 17.

17. My job was more difficult when my subordinates were working an Alternate Work Schedule:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided
18. I do not want my subordinates working an Alternate Work Schedule:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided
19. My subordinates worked harder when they worked Alternate Work Schedules:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided
20. My subordinates completed their work on time more frequently when they worked Alternate Work Schedules:
A) I strongly agree D) I disagree
B) I agree E) I strongly disagree
C) I am undecided

21. The quantity of work produced by my subordinates increased when they worked Alternate Work Schedules:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
22. The quality of work produced by my subordinates improved when they worked Alternate Work Schedules:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
23. I had no difficulty keeping track of my subordinates even though they worked Alternate Work Schedules:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
24. I had no difficulty scheduling meetings with my subordinates even though they worked Alternate Work Schedules:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
25. The level of fatigue I observed in my subordinates working Alternate Work Schedules:
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change
26. The absenteeism of my subordinates working Alternate Work Schedules:
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change
27. The productivity of my subordinates working Alternate Work Schedules:
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change
28. When the Alternate Work Schedule program was in effect some employees were not abiding by the time and attendance rules governing their work schedule:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
29. When the Alternate Work Schedule program was in effect, I had less difficulty contacting my supervisor:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided

30. When the Alternate Work Schedule Program was in effect, it was difficult to get help from other employees because they were not at work when their services were needed:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
31. When the Alternate Work Schedule Program was in effect, supervisors and subordinates worked different hours and this caused additional problems:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
32. When the Alternate Work Schedule Program was in effect, communications between branches/sections were more difficult:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
33. When the Alternate Work Schedule Program was in effect, our service to other organizations on base:
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change
34. When the Alternate Work Schedule Program was in effect, cooperation between sections:
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change
35. In my opinion, Alternate Work Schedules are more beneficial to:
 A) Employees C) Uncertain
 B) Organizations D) Both employees and the organization
36. When the Alternate Work Schedule Program was in effect, the morale of my section/branch:
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change
37. Even though supervisors and subordinates worked different hours when the Alternate Work Schedule Program was in effect, additional problems were not generated:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
38. Better communications between branches/sections resulted after the implementation of Alternate Work Schedules:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided

39. When the Alternate Work Schedule Program was in effect, my organizational unit completed its work on time more frequently:
- | | |
|---------------------|------------------------|
| A) I strongly agree | D) I disagree |
| B) I agree | E) I strongly disagree |
| C) I am undecided | |
40. How would you evaluate the overall success of the Alternate Work Schedule Program?
- | | |
|---------------------------------------|----------------------|
| A) Very successful | D) Unsuccessful |
| B) Successful | E) Very unsuccessful |
| C) Neither successful or unsuccessful | |
41. Which Alternate Work Schedule have you worked at your current base (if you have worked more than one schedule, limit your answers to this question and any remaining questions to the Alternate Work Schedule you worked most)?
- | | |
|------------------------|--|
| A) Flexitime | C) I have not worked under the Alternate Work Schedules listed above |
| B) Compressed Workweek | |

Questions 42-55 are asking you to COMPARE the alternate work schedule you worked to the typical 5-day, 40 hour workweek with fixed arrival and departure times. If you have NEVER worked an alternate work schedule STOP HERE. We appreciate your cooperation in spending the time to answer our questions.

42. While working an Alternate Work Schedule, my job was more meaningful to me:
- | | |
|---------------------|------------------------|
| A) I strongly agree | D) I disagree |
| B) I agree | E) I strongly disagree |
| C) I am undecided | |
43. I was more productive when I worked an Alternate Work Schedule:
- | | |
|---------------------|------------------------|
| A) I strongly agree | D) I disagree |
| B) I agree | E) I strongly disagree |
| C) I am undecided | |
44. I would definitely work an Alternate Work Schedule again:
- | | |
|---------------------|------------------------|
| A) I strongly agree | D) I disagree |
| B) I agree | E) I strongly disagree |
| C) I am undecided | |
45. I needed more sleep when I was working an Alternate Work Schedule:
- | | |
|---------------------|------------------------|
| A) I strongly agree | D) I disagree |
| B) I agree | E) I strongly disagree |
| C) I am undecided | |
46. When I was working an Alternate Work Schedule, people from other organizations found it more difficult to contact me because of my hours:
- | | |
|---------------------|------------------------|
| A) I strongly agree | D) I disagree |
| B) I agree | E) I strongly disagree |
| C) I am undecided | |

47. I liked working an Alternate Work Schedule:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
48. My job was more difficult when I was working an Alternate Work Schedule:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
49. I worked harder when I was working an Alternate Work Schedule:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
50. While working an Alternate Work Schedule, I found it easier to get my work completed on time:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
51. I felt more tired at the end of each workday when I worked an Alternate Work Schedule:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
52. While working an Alternate Work Schedule, my absence from work because of sickness and other reasons (excluding annual leave):
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change
53. While working an Alternate Work Schedule, I had more trouble contacting others in the organization on whom I depend for information and materials:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
54. The quality of work I produced increased when I worked an Alternate Work Schedule:
 A) I strongly agree D) I disagree
 B) I agree E) I strongly disagree
 C) I am undecided
55. While working an Alternate Work Schedule, my job satisfaction:
 A) Significantly increased D) Decreased
 B) Increased E) Significantly decreased
 C) Did not change

56. When you worked an Alternate Work Schedule, how many hours of the workday did you feel very tired:
- | | |
|---------------------|-------------------------|
| A) Less than 1 hour | D) 3 hours |
| B) 1 hour | E) Greater than 3 hours |
| C) 2 hours | |
57. How long did you work an Alternate Work Schedule?
- | | |
|-----------------------|---------------------------|
| A) Less than 2 months | D) 13-18 months |
| B) 2-6 months | E) Greater than 18 months |
| C) 7-12 months | |

COMMENTS

Please feel free to make any comments on the Alternate Work Schedule Program in your squadron.

APPENDIX B
QUESTIONNAIRE DATA RECORDS
(241 CASES)

1.	011 2 0	0011021001223323222332132202232212122322111422202
2.	001 0 1	10110310 313332131111011004333113231102
3.	011 1 2	10111310 31333113011100
4.	00 1	01103003202233331222002232202133213331223331233224
5.	001 0	013111310 414442230111011103304113231122
6.	001 0	3112111110 32333222122212222323221232223
7.	001 1 0	10100300 313331131120011113313313331104
8.	011 1 3	11111310 313332231111011113303313231111
9.	011 1	310411031033330000331323332211211121112313313231140
10.	001 0 0	11111010 102331131110111121323111231114
11.	011 1 0	12111210 33322231222111103303313332014
12.	02122	30011302031111111331311131131231211113313313231112
13.	011 2	111100310 313332230011113103303313233112
14.	0111	110113310 413431130021011104304114231001
15.	021 4	3001331301013333223341003202334312332131131203302
16.	011 1	110100310 404442130000010003304334342002
17.	011 1 0	10101300 404430030000010003404103440002
18.	001 0 0	10100400 404440030000010003404003440003
19.	001 0 0	11100300 444432231121111103303303231101
20.	111 1	4030113204422121122132302333012100443404013232134
21.	011 3 0	0111132013313343232333132201333213333111333213212
22.	001 1 0	04111310 314431130111011001404004430102
23.	011 1	0001003004400221122241333223011111103303113331203
24.	001 0 0	10100300 324442230110011103303213231004
25.	001 1	3000111310331113311211111220233113111312111213202
26.	011 1 3	0010030044000000430304331130111001103303113331103
27.	001 0	3010113220 320421232222200110201110221101
28.	101 0	3113122200 42333222112122
29.	101 1 3	0111121033111112321213431131111011102403112231111
30.	011 0	31101201102222101222124222111221111211212023121110
31.	101 1	41213311022113323223121112322333222321323111223234
32.	101 0 4	13332010 021022222333221122312333223232
33.	001 1 4	0311030034211111331321232231211011103203313331001
34.	011 1 0	0310040044000000331313330030000010003303004440004
35.	011 1 4 0	334010 44444213211102
36.	101 0	110132020 432213303343313330031330213333
37.	011 1 0	0213121022222222222333223112111211331330323213
38.	0212	4002024003211111223123211133122102
39.	011 1 0	0113101000433314023341003223443313440040330204341
40.	0110	110121410 313121201022012004303213231102
41.	0111	3 0013113000333333122331003302333313330033330203323
42.	011 2	1001113102421113222132112223222111
43.	001 1 3	12111310 314440230020010003303113331104
44.	001 0	111010210 323212301021101101102111311112
45.	011 1 2	0111010001333311022330003302333313130130030203313
46.	021 1 3	0113222032313313222330332203231213123323112213214
47.	101 0 2	14111310 313132231122010003303113231114
48.	001 0 2	12141340 404440032110010004404003440024
49.	021 3 3	0011010012311211131433112201132212121312311231224
50.	011 1 3	0410000033000000331 3333113110001

51.	011 1 2	0311130033000001331313440030111010004403003230004
52.	001 0	2112144320 424442231122112104404122441224
53.	001 0 2	10110300 413331130121011103203111221002
54.	001 0 3	13100320 314331132110011004404103231011
55.	001 0 2	1011111022 22 313332232111001113313113231103
56.	011 1 2	0011131034330221231412332231221111103304113332203
57.	011 1	013113020 110132131311211230131221213342
58.	001 0 3	1013231021413432123330014324444414440040440204442
59.	001 0 3	10044340 133232220332213330313310233103
60.	011 1	200013330034111121232423331131110112113312211431203
61.	011 1 3	001333300044444123140022202433414430040330103444
62.	001 1 3	10334430 333312233133300344433313213202
63.	011 0	3113133330 333332231122102313213323232223
64.	001 0	012130300 0444113101101000 04404240012
65.	021 3	102100200323333322313112232131111113313112331121
66.	011 2	011112310 313331131111113304303313333211
67.	001 0	11 121110 21131230222311130132221212332
68.	0010	110112120 43111320223221
69.	001 1	313111210 213331111111011112303312331124
70.	011 1	110100310 301412201132111103304313212104
71.	011 1 0	0211121033111101331313331131120011003303103330104
72.	101 1	312133310 321332202233213313311333233222
73.	001 1 4	0231011033212213232123212222221212223222211222222
74.	011 1 0	0311131034111111331413331230121111104303113231104
75.	021 3	00210040044111100341313431130311011103303114431004
76.	001 0	4111331010 23311220113212
77.	101 1 2 1	134440 414320130020012004304004240004
78.	011 1 3	0010031044000110240403441130000011003404103440004
79.	011 3 4	0011130033333313222321312201331213333123133113203
80.	001 1	3010021310 133322322211111033133032313
81.	0314	40030040014 1111124142333013000001
82.	001 0 0	11311310 113321202121122221223311222221
83.	011 0 1	10124110 323330231120011103303213331104
84.	101 1 1	10111410 403330030000010004404004240004
85.	021 3 0	001004003311011133121333113111011004404104231102
86.	021 3 0	0010131030011100240413430130011011004504114231004
87.	001 0	3010110410 231332232111111103303113232104
88.	001 0	3100101310 31333113132111
89.	011 1 2	12131310 201332232101110003304005230113
90.	001 0 0	1010040044000000220404440030000010004404004230004
91.	011 1 0	13111300 323330231120011003303313233113
92.	001 0 1	10111400 414441030110010004404004240004
93.	011 1 1	011303003301111133133332131121011003303113331113
94.	001 0 1	1014021031321311222211202322442211241022322202204
95.	101 0	312111310 121332222122212211113312332212
96.	011 1 1	12100300 303331200110110003303303230204
97.	001 1	3310110210 02133223222102203113112232104
98.	011 1 2	10100310 423330130111010103304114330003
99.	001 1 3	10100200 444442230121012002204302300011
100.	001 0 3	10123410 3444422310201221044040404340104

101.	0111	3010112410	1102110002011011201200111100
102.	111	1 0 0013110001233233122131112213332	11344440330202222
103.	001	1 4114431100332213221222333232313212	
104.	021	2 1 0010031034011111231	323331231121011112302123332104
105.	111	1 1 10111310	423330230020011003204113332104
106.	011	1 1 10100300	323330231111011103303113431104
107.	001	0 1 1 111310	32343223011001
108.	001	0 1 1 111300	42434113101102
109.	0211	112144330	412341231131012103313113331023
110.	101	0 0010102310	213412200022010001103303430002
111.	001	0 0 10300310	313332232111101113313213231101
112.	001	1 110100330	334341231131111103403311333223
113.	021	1 314111210	143331232321112113313212231202
114.	011	1 2 1 113410	313332231111410003313103231004
115.	001	0 2 11311310	313331130110011003304233233114
116.	0010	111122220	303232230021010004404202330002
117.	011	2 310102310	311003202333213323323132213202
118.	011	1 1 10100400	303440030000010004404004242004
119.	011	1 310122120	221201202443214220231230222223
120.	001	1 3 14123110	111013203333313331133311113341
121.	011	1 2 10134310	413431232111011104304004430003
122.	021	3 41 200010	340002303443413444044440204202
123.	021	3 0 0010031034201100441	404440230020011004304113441002
124.	011	1 414110410	40414212342120002310410344 02
125.	001	0 0010111310	4033311301111100043041003
126.	001	1 3 12121210	432222222122212210223112222220
127.	001	0 010100300	313322230322110001303323232003
128.	01	1 4 13314110	34332221222112
129.	001	1 3 10333320	231223422341212122122211212201
130.	001	1 3 10 21310	413332231121111113313111231101
131.	011	1 2 001121103133331212	131123302332213320132331213232
132.	011	1 011100300	331212200331010003303003220004
133.	001	1 3 001324104444403222130001200241210204404104233001	
134.	021	1 2 1011041044000000121413	312311 1101113311113231101
135.	101	1 3 11100310	224442230012010003304123231014
136.	011	2 3 0013133004121144222144012	444431
137.	1010	00110213044233100141443440230031112101403311331223	
138.	0010	110131310	111133200331012103303111221013
139.	011	1 310211110	323332222222211113311121232112
140.	100	0 011012320	231321101321102113311113232110
141.	010	2 0 00200310330001112223322222232212	
142.	000	0 010201200	023032201232101123314213221201
143.	020	2 0 0010030013111211231333111232131112103103113321104	
144.	000	0 110011310	323332231122101103303113232104
145.	0000	110211310	43233222112212
146.	010	1 0 122113003332331122233332201133103331313311233202	
147.	020	4 0 002113101222223122222111222232222	
148.	000	1 0 0001131033223111222333312331131113113313211212122	
149.	010	0 0 11222220	313331130111113113303113231210
150.	010	1 112011310	313331131111100104404114231013

151. 010 1 2 0011131044111111322313332232121112113313313232201
152. 010 1 0 0011031033111111231313331231111011113313113331103
153. 020 2 0 0020130034000011231403331130111011104404113341003
154. 020 3 301200100333333122232111020122212
155. 100 1 4100321102220111111133331131111000103313303230002
156. 020 3 310213430 333330200111010003303003330004
157. 000 1 110230310 33333220213322
158. 020 3 2 000111103311111122211 232231131001112013112131204
159. 100 0 1 10111310 304440030000010004404104340003
160. 020 2 400122012022222112222212122222222
161. 000 0 114012310 213332131100000103303003331123
162. 000 0 21102122103311111122221343223002122
163. 020 2 4 00231310333133112223 333223212112
164. 020 3 412213130 11121220112212
165. 010 0 0011222110 22323223211122
166. 020 1 3042121002111111121113332131211101113314113231131
167. 000 0 2 10110310 313330230111010013303111331004
168. 000 0 0110111210 321321232121112003303211211223
169. 020 3 1 043004000033333122213000320234332
170. 000 0 1 101113104400000024044440030000010004404443440004
171. 020 3 3 0020040000444400222330012202333304444041130203202
172. 000 1 3 10211110 13111330223330333232242213302
173. 100 1 1 10132120 123331231132112204303323233104
174. 010 1 000111410440000002301133321 32111122134142122422
175. 000 0 111232320 142332214234203221323233232211
176. 020 3 4 00200300322333112223121220223322
177. 100 1 311212220 333213202222112103103213230104
178. 010 1 00022122021333321122231123203333304341132130223220
179. 000 1 010231310 423332221122001114313223232102
180. 000 0 001020021033111111231321211320330111113304212222102
181. 000 0 2 11211310 313331031111001113313313231112
182. 010 1 2 0222112033112121222030112121332111103203000211010
183. 020 3 1 0020030034000000230414440030010011104404003241103
184. 030 3 0 142203104412120223232320132322101104204113232102
185. 000 0 1110211310 12113220122322
186. 000 1 2 10231330 13211330333332
187. 000 0 2110100400 414332231111001004303003330004
188. 000 0 2110110300 423231200121010103303201032003
189. 020 4 3012113101233333322213101220343322
190. 010 2 1 12111030 310340230000011103303311233112
191. 020 1 0 0111101034000011230203330131011010004404004230002
192. 100 1 0 10111100 423331230120011004304100230002
193. 000 1 100131310333333112333433222222220002430002222014
194. 020 2 410210320 222112202222122112213122232200
195. 000 1 114211100 32211222223112311113112313343
196. 000 1 0 12013230 2211122222220223222232221
197. 110 1 2 11013210 3233322311221011033032113
198. 010 1 312211310 332132201232101013213221232221
199. 010 1 4 1021031033111111231313331131111021103313113331103
200. 000 1 0 1211131044212111231414331230010012003404113331002

201.	020 3 4	002221201122221312233110220213222	
202.	000 0 3	14212130	223322224223213340021331203244
203.	010 3	4013111100033233322212001220233232	
204.	000 0 2	11200210	31453221213320223333311231110
205.	022 2	314211000	113330131111101113313313231111
206.	1020	110211310	033112201331101113313313213103
207.	012 1 2	0122231023111111221	313332131321121113313113331120
208.	012 1	311211110	31331223111210
209.	032 3	410210200	13133320113012
210.	002 1 0	10201310	32333123132122
211.	002 1 1	12231110	423432230211111004304013231001
212.	0121	30021141001333343223	13111330233330
213.	002 1 0	10200300	41444233002001200 404103241204
214.	002 1 1	11211130	323131200122010004404013240002
215.	002 1	330223221033222211222123332201122112212313222232212	
216.	012 2	310221310	223232 2 232
217.	012 1	210121131033111111231	33344221111111103104111431112
218.	012 0 2	10232220	313332130110010004304004430002
219.	012 2 0	0021031033111300231	313331231121111103313113231101
220.	002 0 0	12200210	32221220243222
221.	002 1	2112211110	33233222112212
222.	002 0 0	10210310	404432230000000003304004230002
223.	112 1 1	1223111033113111331	313332231111112113313313333102
224.	022 3 4	00201310223333322233100230233232	
225.	012 1 3	14244020	33 3322311211122133033232322 3
226.	00200	41122112102222221122213222202221221213313213222202	
227.	012 1	3112232110	333332231111002101314112232223
228.	0021	10020010034313111421113311230021103004404304240002	
229.	112 1	30122320011322312132331222322123203323112323202223	
230.	012 1	310221310	22100330233342
231.	022 2	411210110	132122232221201112212212221212
232.	002 1 2	1123131034111111241113210130120110103203113331112	
233.	002 1	3122 00100222111222232122230021102	
234.	0120	110210330	444332200421100004204144212001
235.	012 1	4022131003311110133121333113111111104304112231121	
236.	012 1 3	0023123033222222222223222222212212213223222202	
237.	022 4	300211430333333112224 1312201223213313113333213202	
238.	002 1 0	10310300	133131130311002004303014500001
239.	022 2	30121133033111111221313332231121101113313313231113	
240.	012 1 3	10233410	303330231221003102304412231203
241.	012 1 2	11233230	133322311111211033032033321

APPENDIX C
VARIMAX ROTATED FACTOR MATRIX

QUESTION	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6
17	-0.68962	-0.17030	-0.21795	-0.21416	-0.14397	-0.16213
18	-0.70692	-0.15377	-0.20066	-0.23424	-0.06359	-0.29366
19	0.24765	0.35591	0.67427	0.26196	0.06616	0.22426
20	0.27999	0.21779	0.65992	0.29709	0.01697	0.20569
21	0.24213	0.28249	0.72880	0.20509	0.27400	0.18700
22	0.32198	0.31912	0.54734	0.41080	0.29359	0.21806
23	0.28410	0.25455	0.11986	0.20687	0.66151	0.04215
24	0.23815	0.14759	0.34678	0.27324	0.53546	0.25127
25	-0.50882	-0.20984	-0.18109	-0.14954	-0.13881	-0.13156
26	-0.18653	-0.09847	-0.19221	-0.15209	-0.32201	-0.61934
27	0.34685	0.10125	0.49063	0.30424	0.50210	0.18422
29	0.47475	0.18065	0.57405	0.10426	0.17260	-0.05842
30	-0.33433	-0.13562	-0.32485	-0.58934	-0.24587	-0.18120
31	-0.39034	-0.17301	-0.28364	-0.59359	-0.25815	-0.18436
32	-0.26418	-0.09618	-0.32068	-0.67604	-0.11503	-0.24970
34	0.05830	0.42406	0.44557	0.37386	0.24615	0.09259
36	0.52302	0.34848	0.10660	0.23043	0.27841	0.26683

QUESTION	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5	FACTOR 6
37	0.42528	0.17202	0.15202	0.59204	0.30884	0.19778
38	0.25889	0.32416	0.44422	0.51611	0.14981	0.21897
39	0.55077	0.40006	0.28809	0.27275	0.20982	0.25744
40	0.55309	0.37437	0.39546	0.38125	0.21986	0.23922
42	0.24716	0.68532	0.26843	0.19714	0.15730	0.21532
43	0.32432	0.59987	0.22858	0.35538	0.12991	0.32726
44	0.44298	0.61932	0.19806	0.34636	0.09612	0.30220
45	-0.52453	-0.41250	-0.21011	-0.15276	0.22410	-0.08792
46	-0.59466	-0.35272	-0.13122	-0.48355	-0.08205	-0.02368
47	0.70105	0.35170	0.29089	0.20741	0.17936	0.28750
48	-0.68724	-0.20735	-0.26430	-0.21240	-0.22836	-0.03461
49	0.13543	0.45600	0.16218	-0.05949	0.05999	-0.03139
50	0.50923	0.58954	0.12041	0.24152	0.00441	-0.03996
51	-0.56257	-0.36413	-0.25928	-0.20400	-0.23198	-0.03255
52	-0.15107	-0.11557	-0.13312	-0.20772	0.01243	-0.70478
53	-0.58536	-0.22047	-0.24324	-0.53281	-0.19511	-0.21313
54	0.27019	0.55188	0.34252	0.40641	0.26294	0.25588
55	0.48411	0.60826	0.12828	0.19174	0.33837	0.19289

APPENDIX D
ANALYSIS OF VARIANCE TESTS

ONEWAY ANOVA BETWEEN FLEXIBLE AND COMPRESSED
WORK SCHEDULES

<u>Variance Check</u>		
H_0 : Variances are equal Reject null if $P < .05$ H_a : Variances are unequal		
CONSTRUCT	COCHRANS P	VARIANCES
Productivity	0.665	Equal
Job Satisfaction	0.891	Equal
Job Difficulty/Q48	0.076/0.650	Equal
Acceptance	0.679	Equal
Fatigue	0.622	Equal
Acceptance	0.511	Equal
<u>Equality of Means</u>		
H_0 : means are equal Reject null if $F \text{ Prob} < .05$ H_a : means are unequal (Provided that variances are equal)		
CONSTRUCT	F PROB	MEANS
Productivity	0.3526	Equal
Job Satisfaction	0.4211	Equal
Job Difficulty/Q48	0.8593/0.4729	Equal
Acceptance	0.1259	Equal
Fatigue	0.5742	Equal
Absenteeism	0.1416	Equal

ONEWAY ANOVA BETWEEN SUPERVISORS AND NON-SUPERVISORS

VARIANCE CHECK

H_0 : Variances are equal

Reject null if $P < .05$

H_a : Variances are unequal

CONSTRUCT	COCHRANS P	VARIANCES
Productivity	0.020	Unequal
Job Satisfaction	0.090	Equal
Job Difficulty	0.706	Equal
Acceptance	0.015	Unequal
Fatigue	0.147	Equal
Absenteeism	0.011	Unequal
Q48	0.013	Unequal

EQUALITY OF MEANS

H_0 : means are equal

Reject null if $F \text{ Prob} < .05$
(Provided that variances are equal)

H_a : means are unequal

CONSTRUCT	F PROB	MEANS
Productivity	0.0609	See Nonparametric Test
Job Satisfaction	0.0009	Unequal
Job Difficulty	0.0289	Unequal
Acceptance	0.0062	See Nonparametric Test
Fatigue	0.8783	Equal
Absenteeism	0.0775	See Nonparametric Test
Q48	0.4431	See Nonparametric Test

APPENDIX E
NONPARAMETRIC TESTS

MANN-WHITNEY U-TEST BETWEEN SUPERVISORS AND NONSUPERVISORS

EQUALITY OF PROBABILITY DISTRIBUTIONS

H_0 : Probability distributions are equal

H_a : Probability distributions are unequal

Reject null if 2-tailed $P < .05$

CONSTRUCT	2-TAILED P	PROB. DISTRIBUTION
Productivity	0.1949	Equal
Acceptance	0.0126	Unequal
Absenteeism	0.1933	Equal
Q48	0.5049	Equal

APPENDIX F
CROSSTABULATIONS OF RANK BY ACCEPTANCE

QUESTION 40

RANK	VS	S	N	U	VU	TOTAL
E1-E3	40.6 (26)	31.3 (20)	23.4 (15)	3.1 (2)	1.6 (1)	100 (64)
E4, E5	37.7 (43)	36.8 (42)	16.7 (19)	6.1 (7)	2.6 (3)	100 (114)
E6	15.0 (3)	50.0 (10)	25.0 (5)	10.0 (2)	0	100 (20)
E7	31.8 (7)	22.7 (5)	22.7 (5)	18.2 (4)	4.5 (1)	100 (22)
E8, E9	0	0	75.0 (3)	25.0 (1)	0	100 (4)
0-1, 0-2	33.3 (3)	44.4 (4)	22.2 (2)	0	0	100 (9)
0-3	33.3 (2)	33.3 (2)	0	33.3 (2)	0	100 (6)
0-4	50.0 (1)	0	50.0 (1)	0	0	100 (2)
0-5, 0-6	100.0 (1)	0	0	0	0	100 (1)

Responses by percent with number of respondents given in parentheses.

CODE

VS - Very Successful
S - Successful
N - Neither
U - Unsuccessful
VU - Very Unsuccessful

QUESTION 44

RANK	SA	A	U	D	SD	TOTAL
E1-E3	54.5 (30)	21.8 (12)	10.9 (6)	7.3 (4)	5.5 (3)	100 (53)
E4,E5	54.4 (56)	25.2 (26)	8.7 (9)	6.8 (7)	4.9 (5)	100 (103)
E6	42.9 (6)	42.9 (6)	14.3 (2)	0	0	100 (14)
E7	50.0 (7)	14.3 (2)	7.1 (1)	14.3 (2)	14.3 (2)	100 (14)
E8,E9	0	50.0 (1)	0	50.0 (1)	0	100 (2)
0-1,0-2	71.4 (5)	28.6 (2)	0	0	0	100 (7)
0-3	60.0 (3)	0	20.0 (1)	20.0 (1)	0	100 (5)
0-4	0	100.0 (1)	0	0	0	100 (1)

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Response by percent with number of respondents given in parentheses.

CODE

SA - Strongly Agree
A - Agree
U - Undecided
D - Disagree
SD - Strongly Disagree

QUESTION 47

RANK	SA	A	U	D	SD	TOTAL
E1-E3	60.0 (33)	20.0 (11)	10.9 (6)	7.3 (4)	1.8 (1)	100 (55)
E4,E5	52.4 (54)	29.1 (30)	6.8 (7)	8.7 (9)	2.9 (3)	100 (103)
E6	42.9 (6)	42.9 (6)	14.3 (2)	0	0	100 (14)
E7	50.0 (7)	28.6 (4)	7.1 (1)	0	14.3 (2)	100 (14)
E8,E9	0	50.0 (1)	0	50.0 (1)	0	100 (2)
0-1,0-2	71.4 (5)	28.6 (2)	0	0	0	100 (7)
0-3	40.0 (2)	20.0 (1)	20.0 (1)	20.0 (1)	0	100 (5)
0-4	0	100.0 (1)	0	0	0	100 (1)

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Responses by percent with number of respondents given in parentheses.

CODE

SA - Strongly Agree
A - Agree
U - Undecided
D - Disagree
SD - Strongly Disagree

APPENDIX G
DEMOGRAPHIC FREQUENCY DISTRIBUTIONS

Q1		ABSOLUTE		RELATIVE	ADJUSTED
CATEGORY LABEL	CODE	FREQ	(PCT)	FREQ	(PCT)
A	0.	215	89.2	89.2	89.2
B	1.	26	10.8	10.8	10.8
TOTAL		241	100.0	100.0	100.0
Q2		ABSOLUTE		RELATIVE	ADJUSTED
CATEGORY LABEL	CODE	FREQ	(PCT)	FREQ	(PCT)
A	0.	112	46.5	46.5	46.5
B	1.	88	36.5	36.5	36.5
C	2.	38	15.8	15.8	15.8
D	3.	3	1.2	1.2	1.2
TOTAL		241	100.0	100.0	100.0
Q3		ABSOLUTE		RELATIVE	ADJUSTED
CATEGORY LABEL	CODE	FREQ	(PCT)	FREQ	(PCT)
A	0.	65	27.0	27.2	27.2
B	1.	137	56.8	57.3	57.3
C	2.	37	15.4	15.5	15.5
MISSING	5.	2	0.8	MISSING	MISSING
TOTAL		241	100.0	100.0	100.0

Q4			
CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)
A	0.	9	3.7
B	1.	6	2.5
C	2.	2	0.8
E	4.	1	0.4
MISSING	5.	223	92.5
		----	----
	TOTAL	241	100.0
			100.0
Q5			
CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)
A	0.	64	26.6
B	1.	115	47.7
C	2.	20	8.3
D	3.	22	9.1
E	4.	4	1.7
MISSING	5.	16	6.6
		----	----
	TOTAL	241	100.0
			100.0
Q6			
CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)
MISSING	5.	241	100.0
		----	----
	TOTAL	241	100.0
			100.0

Q7	CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)
	A	0.	48	19.9	29.3
	B	1.	23	9.5	14.0
	C	2.	35	14.5	21.3
	D	3.	43	17.8	26.2
	E	4.	15	6.8	9.1
	MISSING	5.	77	32.0	MISSING
	TOTAL		241	100.0	100.0
Q8	CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)
	A	0.	25	10.4	22.9
	B	1.	45	18.7	41.3
	D	3.	26	10.8	23.9
	E	4.	13	5.4	11.9
	MISSING	5.	132	54.8	MISSING
	TOTAL		241	100.0	100.0
Q9	CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)
	A	0.	82	34.0	34.0
	B	1.	159	66.0	66.0
	TOTAL		241	100.0	100.0

Q10				
CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)
A	0.	128	53.1	54.7
B	1.	41	17.0	17.5
C	2.	35	14.5	15.0
D	3.	14	5.8	6.0
E	4.	16	6.6	6.8
MISSING	5.	7	2.9	MISSING
TOTAL		241	100.0	100.0
Q11				
CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)
A	0.	13	5.4	5.4
B	1.	134	55.6	55.8
C	2.	77	32.0	32.1
D	3.	15	6.2	6.3
E	4.	1	0.4	0.4
MISSING	5.	1	0.4	MISSING
TOTAL		241	100.0	100.0

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