

**The Relationship of Work Schedules and Circadian Types
to Job Satisfaction**

An Honors Thesis

by

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April 26, 1991

Expected Date of Graduation
May 4, 1991

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Introduction

A consequence of industrialized society is shiftwork. In manufacturing plants and emergency centers alone 26.8% the U.S. work force is exposed to major shift changes (Czeisler, Moore-Ede, & Coleman, 1982). To accommodate these individuals, other industries such as grocery stores, gas stations, and retail stores have extended their business hours. These businesses, in turn, often adopt work shifts. Employees can work an eight hour day, and business can operate for twelve to twenty-four hours. While shiftwork provides businesses and employees greater flexibility, research findings suggest individuals' circadian rhythms affect their ability to adapt to shiftwork (Monk & Folkard, 1983; Minors & Waterhouse, 1983; Kerkhof, 1985).

Circadian rhythms, simply defined, are the physiological and psychological factors which affect human activity. While many factors affect circadian rhythms, body temperature and the sleep wake cycle are key components. Jurgen Aschoff and his colleagues at Erling-Andechs have studied these two components by isolating over 200 subjects from everyday time clues known as zeitbergs (Weaver, 1989). Zeitbergs, which is German for "time giver", are social or physical factors such as traffic noise or a sunrise which help individuals

reset their inner clocks. Aschoff and Weaver discovered that an individual may suffer from "internal desynchronization" when isolated from zeitbergers. In "internal desynchronization" the sleep/wake rhythm, for example, may follow a 33 hour cycle while the temperature rhythm may conform to a 25 hour cycle (Monk & Folkard, 1983). Internal desynchronization occurs in about 30% of the subjects during the first month of zeitberg isolation, and was present in almost all subjects in longer experiments (Weaver, 1989). These findings suggest that adjusting to a new routine requires resetting two internal body clocks rather than just one.

Scientists have simplified circadian analysis by classifying individuals as morning, evening, or intermediate types. Morning types generally have a temperature peak and tend to be more alert in the morning. On the other hand, evening types typically have a temperature peak and are more alert in the evening (Kerkhof, 1985). Individuals who are not easily classified in either category are considered intermediate types.

Also, circadian types can be classified by a questionnaire rather than in a laboratory environment where sleep and temperature cycles are monitored. A properly constructed circadian rhythm questionnaire assigns the same circadian type which would be found in laboratory conditions (Folkard, Monk, & Lobban, 1979).

Due to the potentially variable effects of circadian rhythms on individuals, researchers are concerned with the relationship between circadian types and work schedules. In this regard, several researchers have investigated the effects of several factors on work schedules. For example, neurotic extroverts were found to have the same characteristics as evening types and had fewer problems adjusting to night work (Colquoun & Folkard, 1978). Minors and Waterhouse (1983) examined the relationship between circadian rhythm amplitude and worker motivation. While no clear relationships were found, Minors and Waterhouse suggest a "commitment" between circadian rhythms and work schedules. In another study, Rudolf Moog (1987) examined the ability of morning, evening, and intermediate types to adapt to various work shifts. He found that evening types were the most adaptable to various shifts while morning types were not as adaptable. Finally, Costa, Lievore, Casaletti, Gaffuri, and Folkard (1989) confirmed the findings of Ostberg (1973) and Breithaupt, Hilderbrandt, Dohre, Josch, Sieber, and Werner (1978) that, "morning types showed less a delay of their circadian phase position and less of an adjustment to their sleeping times" (382).

Shiftwork also appears to affect a person physically and socially. 20-30% of shiftworkers leave shiftwork within the first two to three years due to important health problems (Harrington, 1978). Intestinal disorders and insomnia are just two of the more prominent problems associated with

shiftwork adjustment. Jamal and Jamal (1982) examined the impact that the lack of routine had on nurses who worked fixed and rotating shifts. They discovered, "on average nurses on fixed shifts spent more leisure time with their family and less leisure time alone, and experienced fewer physical health and psychological depression problems than nurses on rotating shifts" (287). In addition, Wedderburn's (1967) survey of shiftworkers noted that, "shift satisfaction is positively associated with job satisfaction" (95).

To date, researchers have been concerned with explaining circadian cycles, with determining the effects of shift adaptment, and with identifying personal problems resulting from shiftwork. An area which has been overlooked is the relationship between circadian types, work schedules, and job satisfaction. Internal desynchronization, morning types unadaptability, and the effects of shiftwork outside of work can be traced to the type job that an individual performs. For example, a job which requires variable or rotating shifts promotes internal desynchronization, and an individual who cannot adapt may suffer from physical and social problems. If these problems do occur, it is unclear how job satisfaction may be affected. Considering these factors, the ability of a person to adapt to shifts and the degree to which morningness affects the ability to adapt, the purpose of this study is to determine:

- i. the distribution of morning, evening, and intermediate types working fixed, variable, and rapidly rotating schedules;
- ii. the relationship between shift satisfaction, circadian types, and work schedules; and
- iii. the relationship between job satisfaction, circadian types, and work schedules.

If morning types cannot adjust to work schedules as easily as evening types, it may be the case that more evening types work rapidly rotating schedules. The physical and emotional consequences of persons working rotating schedules (Harrington 1978; Jamal & Jamal, 1982) would also affect the morning oriented individual's shift satisfaction and job satisfaction. As a result, a negative relationship is expected between morning types and shift satisfaction and between morning types and job satisfaction. Finally, evening types are expected to have a positive relationship between shift satisfaction and job satisfaction. The findings should support Wedderburn's (1967) conclusion that shift satisfaction and job satisfaction are positively related.

Method

Subjects

Seventy-four male and female employees between the ages of 18 and 63 from three different discount retail stores completed a Circadian-Job Satisfaction Questionnaire. Subjects' participation was voluntary.

Apparatus

The Circadian-Job Satisfaction Questionnaire consists of thirty-nine questions to determine type of work schedule, circadian rhythm type, and degree of job satisfaction. Twelve questions pertain to work schedule and shift satisfaction. Thirteen questions are a composite scale based on questionnaires from Horne and Ostberg (1976) and Torsvall and Akerstedt (1980) which classifies an individual as evening, intermediate, or morning type. On this questionnaire a score less than 22 indicates an evening type. A score between 23 and 43 indicates an intermediate type while a score greater than 44 indicates a morning type. The remaining fourteen questions were taken from Robert Hoppock's Job Satisfaction Blank No. 5 (1933) which measures only a person's job satisfaction rather than relationships with supervisors and co-workers. Of these fourteen questions, a high score corresponds to high job satisfaction and a low score corresponds with low job satisfaction. Questions from both the composite scale and the Job Satisfaction blank were arranged in random order (but not reworded) to create the final questionnaire.

Procedure

A job satisfaction total and circadian total indicating circadian type were determined for each questionnaire by summing across question types. Shift determinant questions, including the shift satisfaction questions, were analyzed

independently. Correlation analysis was used to determine the relationship between shift determinant questions, job satisfaction total, circadian rhythm total, sex, retail business identification number, and age. In addition, an ANOVA was used to determine shift determinant, job satisfaction total, and circadian rhythm total relationships.

Results

Distribution of Circadian Types and Their Work Schedules

The number of questionnaires returned, average age, and sex of the respondents for each retail business polled is listed in Table 1. The average age of the respondents was 27 years and the sample consisted of 20 males, 46 females, and 8 individuals who did not specify their sex.

Insert Table 1 about here

To test the first hypothesis, responses were categorized according to the subject's schedule type: fixed, variable, or regard questions SD 12 (see Appendix A) was rationally chosen as the best indicator of shift schedule and was used to categorize the respondents into shift types.

Insert Table 2 about here

The respondents were also categorized by evening, intermediate, or morning type based on the composite scale

(see Appendix A, questions JS2, JS3, JS5, JS6, JS8, JS9, JS11, JS12, JS14, JS15, JS16, JS17, and JS19). A score less than 22 indicated an evening person. A score between 23 and 43 indicated an intermediate type, and a score greater than 44 indicated a morning type. The distribution of the circadian types per work schedule is listed in Table 3.

Relationship Between Shift Satisfaction, Circadian Types, and Work Schedules

In the final analysis, correlation coefficients were computed between the dependent variables (individuals shift determinant questions, job satisfaction total, circadian rhythm total, sex, age, and retail business identification number) and the independent variables (shift satisfaction questions, "Are you satisfied with your work schedule?" (SD8) and "Does your work schedule affect your job satisfaction?" (SD9)). Table 4 depicts the pattern of results for this analysis.

Insert Table 4 about here

Relationship Between Job Satisfaction and Circadian Type

A correlation coefficient analysis between the job satisfaction total and circadian rhythm total indicated no significant relationships between the two variables.

Relationship Between Job Satisfaction and Work Schedules

A one way ANOVA was used to test the relationship between job satisfaction and work schedules. The independent variable was the job satisfaction total. The dependent variable was the shift determinant question SD12, "In your opinion, do you have a 'fixed', 'variable', or 'rapidly rotating' work schedule?". ANOVA results ($F(2,64) = .583$ $p > .05$) revealed a non-significant relationship between the two variables.

Finally, correlation coefficient analyses were computed for the independent variable (job satisfaction total) and the dependent variables (shift determinant questions, age, sex, and retail business identification number). With the exception of the shift satisfaction question SD8 mentioned previously, no significant relationships were found.

Relationship Between Circadian Types and Work Schedules

Correlation coefficients were computed for the independent variable circadian rhythm total and the dependent variables shift determinant questions, age, sex, and retail business identification number. Analysis results are listed in Table 5. Significant positive relationships were found between the circadian total and the questions, "Do you have the same days off each week?" (SD2) and "In general, do you work the same "shift" each day that you work?" (SD10). A positive correlation also existed between circadian rhythm total and retail businesses identification number. A negative correlation existed between circadian total and questions:

"Do you work different days each each week?" (SD1); "Does your work schedule change each week?" SD(5); "Do you work different hours and different days each work week?"(SD6); and "In your opinion, do you have a 'fixed', 'variable', or 'rapidly rotating' schedule?" (SD12). At $\alpha=.05$, other correlations were not significant.

 Insert Table 5 about here

Discussion

The Circadian-Job Satisfaction Questionnaire was used to determine the possible relationship among work shift type, shift satisfaction, job satisfaction, and circadian rhythm type. Internal desynchronization, the disruption of both the sleep and body temperature cycle, created by working a variable or rapidly rotating shift was expected to have a negative effect on shift and job satisfaction. Conversely, employees working a fixed work schedule, which is not prone to internal desynchronization, were expected to have a higher shift and job satisfaction relative to their variable and rapidly rotating counterparts. Analysis of the data yielded partial support for these hypotheses.

The relationships found between work shift satisfaction questions (SD8 and SD9) and shift determinant questions suggest a correlation between shift satisfaction, shift pattern, and shift control. In the work place, a sense of control has

been "found to be linked directly to critical individual motivations and behaviors"(Turney & Chonen 1983, p. 202). As a result, employees who believe they have little control over their work environment often have minimal commitment and involvement with the organization (Turney & Chonen, 1983). The positive correlations between shift satisfaction and questions pertaining to pattern and control of schedule suggest individuals working a fixed schedule are more satisfied with their shift than individuals working variable or rapidly rotating schedule. This phenomenon can be explained by the worker's exposure to controllable or uncontrollable factors.

Fixed schedules provide employees with controllable or known factors, the days and hours they must work, over the work schedule interval. For the variable or rapidly rotating work schedule employee, the days and hours worked often change with each work schedule interval. Supporting Touney and Chonen's findings is a study by Richard Butler (1983) which identifies three "base areas" of control: dependence, routinization, and collaboration. Dependence refers to the need for rewards or power. In the discount retail environment, rewards or power can be associated with wages or position. Routinization refers to standard procedures and specific activities. While employees may have assigned duties and procedures for their occupation, the lack of routinization in their personal life may generate lack of a routine. As a result, the variable or rapidly rotating employee is

confronted with the unknown -- which days and what hours will be worked for the next work schedule interval. Staines and Pleck (1987) who studied nonstandard work schedules and family life support previous research by arguing that the time "available for family comes at the wrong period of the day; that is, schedules of family members fail to mesh, hence workers' reports of schedule conflicts" (552). The uncontrollable days and hours to be worked for the next work schedule interval, lack of control of work schedule, and unpredictable pattern of schedule changes creates shift dissatisfaction.

Supporting the aforementioned conclusions is the correlation between shift satisfaction (SD8) and request to time off (SD3). Requesting to have the same day(s) off each week provides the worker with both pattern and control. The employee is in a sense guaranteed to have the same days off each work interval because: 1)the work scheduler and employee believe there is a legitimate reason to have the day off (i.e. child care or education) 2)the work scheduler can avoid future work schedule conflicts. Having the same day(s) off each week provides the employee with a work pattern, and requesting the day(s) off provides the employee with control. As indicated by the analysis, those individuals are satisfied with their work shift.

As Wedderburn (1967) discovered, there is a relationship between shift satisfaction and job satisfaction. Correlations

between SD8 and the job satisfaction total support his findings. Unfortunately, analysis did not indicate specific factors, such as shift worked or request to have time off, influenced both shift satisfaction and job satisfaction. For this reason, shift satisfaction cannot be used to predict job satisfaction.

Another hypothesis involved the relationship between shift satisfaction and circadian rhythm total. Due to maladjusted circadian rhythm, a correlation was expected between shift satisfaction and circadian rhythm total. Correlation coefficient analysis revealed no significant relationship. Interestingly, both shift satisfaction question SD8 and the circadian rhythm total showed a positive correlation with the question, "In general, do you work the same "shift" each day that you work?" (SD10).

Circadian type showed no significant relationship to job satisfaction. A possible reason for the inconclusive findings is job satisfaction is influenced by other factors such as type and quality of work, interpersonal relationships with colleagues, and wages earned. A positive contribution of these other job satisfaction factors may override the negative effects of circadian maladjustment. In turn, a negative influence of job satisfaction factors and circadian maladjustment would suggest lower job satisfaction. No research has been conducted to determine the interrelationship

of circadian rhythm adjustment with other job satisfaction factors.

Another explanation to the nonapparent relationship between job satisfaction and circadian type is shift "commitment" (Folkard et al., 1978). Shift commitment is the long term adaptation to shift work. By working a shift for several years, the employee has learned to adapt to nonadjustment of his/her circadian rhythm. An employee may "live with" circadian maladjustment because of limited job opportunities. The employee may need the job, or has invested several years with the organization so that a change of occupation and "starting from scratch" is not desirable. Finally, the employee's work experience limits him or her to a life of shiftwork. For example, a surgical nurse will most often work a form of shiftwork regardless of the hospital.

An issue relevant to shift work adjustment is the direction of shift rotation and time intervals between shift changes. Weekly rotating systems are the considered the least adaptable for many individuals (Akerstedt & Torsvall, 1978; Czeisler, Moore-Ede, & Coleman, 1982; Monk, 1987). This is due in part to a conflict between circadian phase and work scheduling. Simply stated, the employee suffers from a form of "jet lag", a need to sleep inappropriate to the work schedule. To avoid this problem, work schedules should rotate in the same direction (usually clockwise) as the circadian rhythm. Also, the rate the schedule changes affects

adjustment. In Europe, shifts are rotated rapidly to avoid the adjustment period (Czeisler et al., 1978). This approach maintains a state of non-adjustment for the employees which is believed to protect the employee from adjustment factors such as insomnia or more serious -- gastrointestinal problems.

In this study, rapid shift changes are expected because of the nature of the work and the type of business. A majority of the respondents (Table 2) worked a variable or rapidly rotating schedule. The constant change of work schedule was expected to affect job satisfaction due to conflicting work schedules and circadian rhythms, yet the proposed advantages to rapid shift change to alleviate circadian adjustment may affect the employee's job satisfaction. A comparison of job satisfaction for individuals adapting to different types of work schedules within a given amount of time might reveal how shift adjustment influences job satisfaction. Accordingly, the type of schedule may not be an issue rather the time a person has to adapt to the schedule may be more important.

Finally, a limited number of morning and evening types who would possibly show a relationship to job satisfaction completed a Circadian-Job Satisfaction Questionnaire. A determination of job satisfaction for morning types working a rapidly rotating schedule (which was predicted to result in low job satisfaction due to morning types inability to adapt their circadian rhythm) was not possible because none

of the seventy-four respondents were classified in morning type/rapidly rotating shift category (Table 4).

Circadian types showed a correlation to the type of schedule worked. The degree of "morningness" or "eveningness" indicated by a high or low circadian score shows a positive relationship to two questions regarding a fixed shift, "Do you have the same days off each week?" (SD2) and "In general, do you work the same "shift" every day that you work?" (SD10). A positive correlation suggests a high circadian score (morningness) scored high on (SD2) and (SD10), questions pertaining to a fixed shift. Consequently, a low circadian score (eveningness) may correspond to a low score for (SD2) and (SD10). These results suggest that morning types tended to work fixed schedules while evening types tended to work variable or rapidly rotating schedules. For this study, there was an equal number of morning/fixed and morning/variable, but evening types showed the tendency to work variable schedules.

A positive correlation between circadian type and store identification also exists. Combined with distribution of morning and evening types working fixed or variable shifts, the findings suggest the stores may inadvertently promote circadian adjustment. Examining Table 5 reveals a majority of intermediate types working variable or rotating shifts. Due to the fact intermediate types by definition do not have the strong characteristics of morningness or eveningness,

shift work may be more tolerant to intermediate types. A study concentrating on intermediate types adaptation of circadian rhythm has not been conducted. The retail businesses studied may, in their selection process, opt for individuals with intermediate characteristics. Selecting intermediate types is most likely coincidental due to the fact circadian based questions (i.e. At what time of the day do you feel your best?) would probably not be asked of applicants.

Conclusion

Work schedules and circadian rhythms were studied to determine the relationship, if any, between the two elements and shift satisfaction and job satisfaction. The questionnaire results from seventy-four employees working fixed, variable, or rapidly rotating schedules in discount retail businesses partially support the hypothesis that shift satisfaction and work schedules would show a correlation with circadian types. No substantial findings were discovered pertaining to the second hypothesis that circadian type would influence job satisfaction.

Shift satisfaction and circadian types showed a positive correlation to questions pertaining to pattern and control of the work schedule. This suggests individuals who have pattern and control of their work schedule are more satisfied with their job. Other explanations of the proposed circadian/job satisfaction relationship are: other overriding factors of job satisfaction may cancel the circadian influence,

shift commitment, rotation and rate of shift adjustment, and the inadvertent selection of employees (such as evening types) who adapt easier to shift change.

Future studies regarding circadian rhythms and shiftwork should address the issues of work shift and circadian type interrelationships. One aspect which needs to be addressed is the significance of shift control. If shift control is a factor of job satisfaction and influences circadian rhythm adjustment, why don't employees take control of their schedule by requesting certain days off? A possible reason may be that employees do not want to be interpreted as demanding or inflexible when a legitimate reason to have the day off is not available. Employees usually do not want to generate negative feeling with their supervisor. Requesting certain days off may, in the employee's mind create future problems. In an attempt to maintain job security, employees deny themselves control of their work schedule.

Also, an investigation of how circadian types affect other aspects of the work environment would be beneficial. For example, which, if any circadian type, receives more promotions or excels in a particular occupation. Research in these areas would explain how circadian rhythms affect other job satisfaction factors. A study concerning shift rotation and job satisfaction might address the significance of circadian adjustment. Finally, more conclusive findings concerning job satisfaction and circadian rhythms might be

found in a larger study encompassing a variety of businesses engaged in shiftwork.

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Please answer the following questions pertaining to your work schedule, circadian rhythm, and job satisfaction. Do not write your name anywhere on the questionnaire. If you do not understand a question, please ask for help. If you feel uncomfortable answering a question, omit it. Any information gained from this questionnaire which may violate your confidentiality WILL NOT be disclosed.

- (SD1) Do you work different days each week? (Y or N) _____
- (SD2) Do you have the same days off each week? (Y or N) _____
- (SD3) If you answered yes to the above question, did you request to have those days off? (Y or N) _____
- (SD4) Do you work different hours each day that you work? [For example, you work 10:00 a.m. to 6:00 p.m. on Monday and 12:00 p.m. to 9:00 p.m. on Tuesday.] (Y or N) _____
- (SD5) Does your work schedule change each week? (Y or N) _____
- (SD6) Do you work different hours and different days each work week? (Y or N) _____
- (SD7) In your opinion, is there a pattern to your work schedule? (Y or N) _____
- (SD8) Are you satisfied with your work schedule? (Y or N) _____
- (SD9) Does your work schedule affect your job satisfaction? (Y or N) _____
- (SD10) In general, do you work the same "shift" each day that you work? (Y or N) _____
- (SD11) Do you have control over what days and hours you work? (Y or N) _____
- (SD12) In your opinion, do you have a "fixed", "variable", or "rapidly rotating" work schedule?

- (JS1) CHOOSE THE **ONE** OF THE FOLLOWING STATEMENTS WHICH BEST TELLS HOW WELL YOU LIKE YOUR JOB. PLACE A CHECK MARK () IN FRONT OF THAT STATEMENT:
- _____ I HATE IT.
 - _____ I DISLIKE IT.
 - _____ I DON'T LIKE IT.
 - _____ I AM INDIFFERENT TO IT.
 - _____ I LIKE IT.
 - _____ I AM ENTHUSIASTIC ABOUT IT.
 - _____ I LOVE IT.
- (JS2) ONE HEARS ABOUT "MORNING" AND "EVENING" TYPES OF PEOPLE. WHICH **ONE** OF THOSE TYPES DO YOU CONSIDER YOURSELF TO BE?
- _____ DEFINITELY A MORNING TYPE
 - _____ MORE A MORNING THAN AN EVENING TYPE
 - _____ MORE AN EVENING THAN A MORNING TYPE
 - _____ DEFINITELY AN EVENING TYPE

OVER

- (JS3) DURING THE FIRST HALF HOUR AFTER HAVING AWAKENED IN THE MORNING, HOW TIRED DO YOU FEEL?
- VERY TIRED
 - FAIRLY TIRED
 - FAIRLY REFRESHED
 - VERY REFRESHED
- (JS4) CHECK ONE OF THE FOLLOWING TO SHOW HOW MUCH OF THE TIME YOU FEEL SATISFIED WITH YOUR JOB.
- ALL OF THE TIME
 - MOST OF THE TIME
 - A GOOD DEAL OF THE TIME
 - ABOUT HALF OF THE TIME
 - OCCASIONALLY
 - SELDOM
 - NEVER
- (JS5) CONSIDERING ONLY YOUR OWN "FEELING BEST" RHYTHM, AT WHAT TIME WOULD YOU GET UP IF YOU WERE ENTIRELY FREE TO PLAN YOUR DAY?
- 5:00-6:30 A.M.
 - 6:30- 7:45 A.M.
 - 7:45-9:45 A.M.
 - 9:45-11:00 A.M.
 - 11:00-12:00(NOON)
- (JS6) CONSIDERING YOUR ONLY "FEELING BEST" RHYTHM, AT WHAT TIME WOULD YOU GO TO BED IF YOU WERE ENTIRELY FREE TO PLAN YOUR EVENING?
- 8:00-9:00 P.M.
 - 9:00-10:15 P.M.
 - 10:15 P.M.- 12:30 A.M.
 - 12:30-1:45 A.M.
 - 1:45- 3:00 A.M.
- (JS7) CHECK THE **ONE** OF THE FOLLOWING WHICH BEST TELLS HOW YOU FEEL ABOUT CHANGING YOUR JOB:
- I WOULD QUIT THIS JOB AT ONCE IF I COULD GET ANYTHING ELSE TO DO.
 - I WOULD TAKE ALMOST ANY OTHER JOB IN WHICH I COULD EARN AS MUCH AS I AM EARNING NOW
 - I WOULD LIKE TO CHANGE BOTH MY JOB AND MY OCCUPATION
 - I WOULD LIKE TO EXCHANGE MY PRESENT JOB FOR ANOTHER JOB IN THE SAME LINE OF WORK
 - I AM NOT EAGER TO CHANGE MY JOB, BUT I WOULD DO SO IF I COULD GET A BETTER JOB
 - I CANNOT THINK OF ANY JOBS FOR WHICH I WOULD EXCHANGE MINE
 - I WOULD NOT EXCHANGE MY JOB FOR ANY OTHER
- (JS8) ASSUMING NORMAL CIRCUMSTANCE, HOW EASY DO YOU FIND GETTING UP IN THE MORNING ? (CHECK ONE)
- NOT AT ALL EASY
 - SLIGHTLY EASY
 - FAIRLY ALERT
 - VERY ALERT
- (JS9) HOW ALERT DO YOU FEEL DURING THE FIRST HALF HOUR AFTER HAVING AWAKENED IN THE MORNING? (CHECK ONE)
- NOT AT ALL ALERT
 - SLIGHTLY ALERT
 - FAIRLY ALERT
 - VERY ALERT

(JS10) IF YOU COULD HAVE YOUR CHOICE OF ALL THE JOBS IN THE WORLD, WHICH WOULD YOU CHOOSE? (CHECK ONE)

- YOUR PRESENT JOB
 ANOTHER JOB
 A JOB IN ANOTHER OCCUPATION

(JS11) YOU HAVE DECIDED TO ENGAGE IN SOME PHYSICAL EXERCISE. A FRIEND SUGGESTS THAT YOU DO THIS ONE HOUR TWICE A WEEK AND THE BEST TIME FOR HIM IS 7:00-8:00 A.M. BEARING IN MIND NOTHING ELSE BUT YOUR OWN "FEELING BEST" RHYTHM, HOW DO YOU THINK YOU WOULD PERFORM?

- WOULD BE IN GOOD FORM
 WOULD BE IN REASONABLE FORM
 WOULD FIND IT DIFFICULT
 WOULD FIND IT VERY DIFFICULT

(JS12) AT WHAT TIME IN THE EVENING DO YOU FEEL TIRED AND, AS A RESULT, IN NEED OF SLEEP?

- 8:00-9:00 P.M.
 9:00-10:15 P.M.
 10:15 P.M.-12:30 A.M.
 12:30- 1:45 A.M.
 1:45-3:00 A.M.

(JS13) CHECK ONE OF THE FOLLOWING TO SHOW HOW YOU THINK YOU COMPARE WITH OTHER PEOPLE:

- NO ONE LIKE HIS JOB BETTER THAN I LIKE MINE
 I LIKE MY JOB MUCH BETTER THAN MOST PEOPLE LIKE THEIRS
 I LIKE MY JOB BETTER THAN MOST PEOPLE LIKE THEIRS
 I LIKE MY JOB ABOUT AS WELL AS MOST PEOPLE LIKE THEIRS
 I DISLIKE MY JOB MORE THAN MOST PEOPLE DISLIKE THEIRS
 I DISLIKE MY JOB MUCH MORE THAN MOST PEOPLE DISLIKE THEIRS
 NO ONE DISLIKES HIS JOB MORE THAN I DISLIKE MINE

(JS14) YOU WISH TO BE AT YOUR PEAK PERFORMANCE FOR A TEST WHICH YOU KNOW IS GOING TO BE MENTALLY EXHAUSTING AND LASTING FOR TWO HOURS. YOU ARE ENTIRELY FREE TO PLAN YOUR DAY, AND CONSIDERING ONLY YOUR OWN "FEELING BEST" RHYTHM, WHICH ONE OF THE FOUR TESTING TIMES WOULD YOU CHOOSE?

- 8:00-10:00 A.M.
 11:00 A.M. - 1:00 P.M.
 3:00-5:00 P.M.
 7:00-9:00 P.M.

(JS15) WHEN WOULD YOU PREFER TO RISE (PROVIDED YOU HAVE A FULL DAY'S WORK -8 HOURS) IF YOU WERE TOTALLY FREE TO ARRANGE YOUR TIME?

- BEFORE 6:30 A.M.
 6:30-7:30 A.M.
 7:30-8:30 A.M.
 8:30 A.M. OR LATER

(JS16) IF YOU ALWAYS HAD TO RISE AT 6:00 A.M., WHAT DO YOU THINK IT WOULD BE LIKE?

- VERY DIFFICULT AND UNPLEASANT
 RATHER DIFFICULT AND UNPLEASANT
 A LITTLE UNPLEASANT BUT NO GREAT PROBLEM
 EASY AND NOT UNPLEASANT

OVER

(JS17) HOW LONG A TIME DOES IT USUALLY TAKE BEFORE YOU "RECOVER YOUR SENSES" IN THE MORNING AFTER RISING FROM A NIGHT'S SLEEP?

- 0-10 MINUTES
 11-20 MINUTES
 21-40 MINUTES
 MORE THAN 40 MINUTES

(JS18) WHICH GIVES YOU MORE SATISFACTION?

- YOUR JOB or THE THINGS YOU DO IN YOUR SPARE TIME

(JS19) PLEASE INDICATE TO WHAT EXTENT YOU ARE A MORNING OR EVENING ACTIVE INDIVIDUAL

- PRONOUNCED MORNING ACTIVE (MORNING ALERT AND EVENING TIRED)
 TO SOME EXTENT, MORNING ACTIVE
 TO SOME EXTENT, EVENING ACTIVE
 PRONOUNCED EVENING ACTIVE (MORNING TIRED AND EVENING ALERT)

(JC1) HAVE YOU EVER THOUGHT SERIOUSLY ABOUT CHANGING YOUR PRESENT JOB? _____

(JC2) HAVE YOU EVER DECLINED AN OPPORTUNITY TO CHANGE YOUR PRESENT JOB? _____

(JC3) ARE YOUR FEELINGS TODAY A TRUE SAMPLE OF THE WAY YOU USUALLY FEEL ABOUT YOUR JOB? _____

THE FOLLOWING QUESTIONS NEED NOT BE ANSWERED IF THEY WOULD ENABLE ANYONE TO KNOW THAT THIS PAPER IS YOURS.

WHAT IS YOUR JOB? (FOR EXAMPLE, CARPENTER) _____

AGE AT LAST BIRTHDAY _____

SEX _____

DATE _____

ON THE LINE BELOW, PLACE FIVE CHECK MARKS TO SHOW HOW WELL SATISFIED YOU WERE WITH YOUR LAST FIVE JOBS. USE A SEPARATE CHECK MARK FOR EACH JOB. YOU MAY PLACE EACH MARK ANYWHERE ON THE LINE, EITHER ABOVE ONE OF THE STATEMENTS OR BETWEEN TWO OF THEM. IF YOU HAVE HAD LESS THAN FIVE JOBS, USE ONLY AS MANY CHECK MARKS AS YOU HAVE HAD JOBS. DRAW A CIRCLE AROUND THE CHECK MARK WHICH INDICATES YOUR PRESENT JOB.

 COMPLETELY
 DISSATISFIED

 MORE DISSATISFIED
 THAN SATISFIED

 ABOUT HALF
 AND HALF

 MORE SATISFIED
 THAN DISSATISFIED

 COMPLETELY
 SATISFIED

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

TABLE 1

Respondent Profile

Store	Questionnaires Returned	Average Age	Male	Female	Unanswered
1	9	38.5	1	8	0
2	33	26.9	13	15	5
3	32	23.8	6	23	3
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Total	74	26.97	20	46	8

TABLE 2

Work Schedules of Respondents

Store	Fixed	Variable	Rapidly Rotating	Unanswered	Total
1	1	4	3	1	9
2	3	24	2	4	33
3	12	41	5	2	32
Total	16	41	10	7	74
Percentage	22%	55%	14%	9%	100%

TABLE 3

Circadian Type and Work Schedule Type Distribution

	Morning				Intermediate				Evening			
	F	V	RR	UD	F	V	RR	UD	F	V	RR	UD
Store 1	0	0	0	1	1	1	2	0	0	2	0	0
Store 2	2	4	0	0	1	17	3	3	0	1	0	1
Store 3	4	2	0	1	9	10	5	1	0	0	0	0
Total	6	6	0	2	11	28	10	4	0	3	0	1

Note: Table 3 represents the number of respondents categorized according to circadian type (morning, intermediate, and evening) and type of shift worked (fixed(F), variable(V), rapidly rotating(RR), or undetermined(UD)).

Table 4

Coefficient Correlations for Shift Satisfaction Questions

SD8

SD1 r=-.1988 n=72	SD2 r=.1558 n=72	SD3 r=-.0359 n=36	SD4 r=-.1003 n=72	SD5 r=-.1845 n=72	SD6 r=-.2190 n=71
SD7 r=.3447* n=71	SD9 r=-.1635 n=72	SD10 r=.3752* n=72	SD11 r=.2943 n=71	SD12 r=-.1414 n=65	JSTOT r=.4714* n=72
CRTOT r=.0562 n=72	AGE r=.0408 n=62				

SD9

SD1 r=-.0609 n=74	SD2 r=.1774 n=74	SD3 r=.3394* n=36	SD4 r=.1460 n=74	SD5 r=-.0309 n=74	SD6 r=-.0216 n=73
SD7 r=-.0683 n=73	SD8 r=-.1635 n=72	SD10 r=.1091 n=74	SD11 r=-.0600 n=72	SD12 r=.1474 n=67	JSTOT r=-.0843 n=74
CRTOT r=-.1365 n=74	AGE r=-.3068* n=64				

Note: * indicates $p < .05$. Neither SD8 and SD9 showed a significant relationship with the circadian rhythm total.

TABLE 5Correlation Coefficient Analysis for Circadian Rhythm Total

CRTOT

SD1 r=-.2817* n=74	SD2 r=.2381* n=74	SD3 r=-.2442 n=36	SD4 r=-.1392 n=74	SD5 r=-.2646* n=74	SD6 r=-.2790* n=73
SD7 r=.1721 n=73	SD8 r=.0562 n=72	SD9 r=-.1365 n=74	SD10 r=.2817* n=74	SD11 r=.1209 n=72	SD12 r=-.3478* n=67
JSTOT r=.0029 n=74	AGE r=.1472 n=64	Store r=.2348* n=74			

Note: * indicates $p < .05$.