

## HOME AND COMMUNITY LIFE OF A SAMPLE OF SHIFT WORKERS

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When shift workers are asked to evaluate their job schedules, effects on family and social life are reported as major concerns. Difficulty and dissatisfaction with roles and activities at home and in the community are reported in a number of studies and reviews by European and American investigators (Carpentier & Cazamian, 1977; Lein, 1974; Maurice, 1975; Mott, Mann, McLoughlin, & Warwick, 1965; Tasto, Colligan, Skjei, & Polly, 1978; Wedderburn, 1975; Young & Willmott, 1973).

Workers' own assessments of the impact of shift work on their lives are especially relevant since there is a significant association between the degree of shift satisfaction and the ability to adapt to a particular shift (Tasto et al., 1978).

Less is known about the relationship between shift work and home life or psychosocial life than about the physiological consequences of unusual work-sleep schedules. In this respect shift work partakes of a more general problem, namely the lack of sufficient research into the many occupational factors that can affect the quality and quantity of a worker's involvement in life away from work. An extensive review of the literature on the relation between work and family in the United States shows that the intersections between most aspects of work and family well-being have been relatively ignored (Kanter, 1977).

### Method

This study constituted a component part of a work-sleep study conducted in St. Louis to examine relationships among job shift hours, sleep and off-the-job life variables. The full work-sleep study consisted of three sequential methodologies: a brief Work-Sleep Survey, administered to a broad sample of labor union members; a laboratory study of sleep, performance, and mood, carried out with selected volunteers from the survey sample; and a field interview concerning life away from the job, administered to both laboratory participants and additional volunteers from the survey sample. The study was carried out with the cooperation of 17 national labor unions in the St. Louis area. The full methodology is described elsewhere (Gordon, Tepas, Stock, & Walsh, 1979; Walsh, Gordon, Maltese, McGill, & Tepas, 1979).

The present paper reports only on the interview study. It was descriptive and exploratory in nature and was designed to obtain psychosocial data on the lives of workers and their families as a function of shift. Two types of data were sought: subjective responses indicating the levels of worker satisfaction/dissatisfaction with the shift, other dimensions of the job, and life away from work; and reports of the type and frequency of leisure, family, social, and organizational activity occurring during the 12 months prior to the study. A primary intent of the study was to provide workers with an opportunity to describe freely their feelings and experiences both on and off the job.

Three shifts were included in the study: day shift (starting time from 0600 to 0900); night shift (starting time from 2300 to 0100); and rotating shift, including workers who changed either between two or among three different shifts. The two-shift rotators oscillated between day and afternoon/evening shift (starting time 1500 to 1700) the three-shift rotators changed among day, afternoon/evening, and night shifts. Steady afternoon/evening shift workers were not included.

## Respondents

Interviews were conducted with 71 volunteer respondents, whose distribution by shift and sex is shown in Table 1. Sixty percent of the rotators changed among three shifts and the remainder between two shifts. The size of the groups reflects the availability of volunteers in the sample surveyed. The intention to interview equal numbers of female and male workers was not realized, particularly in the rotator group.

Table 1  
Number of Interview Respondents by Sex and Shift

Shift	Sex		Total
	Males	Females	
Day	16	13	29
Night	12	11	23
Rotating	12	7	19
Total	40(56%)	31(44%)	71(100%)

The majority of respondents were employed by manufacturing, transportation, and utility companies; the remainder were employed by government. Most of the workers were of three types: blue-collar craft and kindred workers, blue-collar machine operators, and white-collar clerical workers. The interview sample was drawn from the membership of 12 different national labor unions.

The 71 interview respondents were selected from the pool of surveyed workers who volunteered for further participation in the study. Of the 71, 38 also slept in the laboratory and 33 did not. Those who slept in the laboratory had been selected by the investigators in the laboratory phase of the full study on the basis of certain criteria: work schedule, absence of serious medical, psychological, and sleep problems; limited use of drugs, including alcohol, caffeine, and medications; and limited off-the-job exercise. The 33 additional respondents were selected on the basis of similar criteria. It was recognized that the respondent selection process would yield a healthier-than-average sample and might tend to reduce the size of any differences among shift groups that would emerge in the findings.

## Procedure

The content and methodology of the field interview have been described previously (Walsh et al., 1979). Briefly, the interview lasted about 2.5 hours and included the following content areas: job, shift, health, leisure, home and family life, social life, and participation in organizations. The interview was composed of two formats: a nonstandardized, semi-structured conversation focusing on the worker's attitudes, feelings, and opinions; and a verbally-administered, structured questionnaire requesting specific descriptive information. Two of the present authors (Gordon & McGill) developed the interview methodology and conducted all interviews. The development period included 30 preliminary interviews.

In all aspects the interview was aimed at maximizing rapport and facilitating conversation. The majority of interviews took place at respondents' homes. Married workers were encouraged to invite spouses to join the interview session. All interviews were tape recorded with the permission of the respondent.

By incorporating the semi-structured conversation and the structured questionnaire into a single interview, it was possible to obtain two qualitatively different types of information: reports of worker and family satisfaction with the shift and off-the-job life; and description of worker and family activity, plus demographic and other concrete information.

Scoring of semi-structured conversation. Tape recordings of the semi-structured conversations were scored directly, without being transcribed, by an aural method of content analysis developed for this study. Scoring was carried out by two raters after the entire set of interviews was completed. A sub-sample of 33 respondents, 11 in each shift group, was chosen for the content analysis. Tapes were randomly selected to yield 6 male and 5 female respondents per shift. As the raters listened to each taped interview, they completed a scoring booklet in which they wrote or tabulated each specific comment within the content areas of the interview. Comments were identified and designated as follows:

1. Positive evaluations. For example, "I like the hours I work because they let me do things when I want."
2. Negative evaluations/complaints. For example, "I never get to see my children when I work the evening shift."
3. Coping strategies for shift-related problems. For example, "I've bought thicker shades so the light doesn't disturb my sleep."
4. Signs of support or assistance from the worker's family or others that facilitate his/her adjustment to the shift. For example, "My wife gets up extra early to make dinner for me when I get home in the morning."

From the collection of positive evaluations, complaints, coping strategies, and supports within a given content area, the rater made judgments of the level of satisfaction-dissatisfaction. Three judgments of the satisfied, tolerant, and dissatisfied.

A rating of "satisfied" was given when the worker voiced a preponderance of positive evaluations with few or no complaints. A rating of "tolerant" was made where the worker expressed both positive and negative comments that appeared to be of about equal significance in the worker's life. A rating of "dissatisfied" was assigned when the worker voiced a preponderance of negative evaluations with few or no positive comments. The final rating for a given area was subject to the rater's assessment of the affective import of the feelings expressed, as shown by the respondent's tone of voice and degree of emphasis.

Initially each taped interview was scored and evaluated by both judges. When ratings (satisfied, tolerant, or dissatisfied) across all content areas reached an interrater agreement rate of 85%, subsequent tapes were scored by only one of the two judges.

## Results

Results based on the semi-structured conversation and questionnaire are presented under four headings: demography, job, and shift tenure; levels of satisfaction; interview impressions; and frequency of activity.

### Demography, Job, and Shift Tenure

The sample of respondents consisted largely of mature, experienced employees. The mean ages across shift groups were similar; 42.5 years (day shift); 39.1 years (nightshift); and 41.4 years (rotators). Other demographic variables are shown in Table 2. All but four of the males were married, while only half of the females were married. The higher percentage of high school graduates on the rotator group was reflected in their higher job income ranges. The median job income range for the day and night shift groups was \$16,000 to \$18,000 per year, and the median job income range for the rotators was \$18,000 to \$20,000 per year.

Table 2

Percentage of Respondents in Each Shift Group by Selected Demography Variables

	Day	Night	Rotating
Marital status: Single	7	13	16
Married	72	74	68
Divorced	21	13	16
Households with children at home	65	47	47
Single-parent respondents	14	13	16
Ethnic background: White	79	78	95
Black	21	22	5
High school graduates	69	71	94

The mean number of years with the same employer showed the rotating group



with the longest tenure and the night shift group with the shortest: 15.9 years (day shift); 12.4 years (night shift); and 18.0 years (rotators). The mean number of years on the shift varied in a similar pattern across the three groups: 7.8 years (day shift); 6.6 years (night shift); and 11.8 years (rotators).

### Levels of Satisfaction

Levels of satisfaction were obtained in five areas of life, based upon ratings of the semi-structured, taped conversations with the sub-sample of 33 respondents. Figure 1 shows the percent of respondents in each shift group who were rated as "satisfied" (see Method) for each of the following content areas: shift hours, job, sleep, family life, and leisure-social life.

As determined by a content analysis of the taped semi-structured interviews, all of the 11 day shift workers were judged to be satisfied with their shift, while 55% of the workers on night shift and only 18% of the rotators were rated as satisfied with their shift. Responses to a questionnaire item by the 71 respondents of the full sample were consistent with the above trend. When asked, "If you had a choice, what exact hours would you like to start and end work?" 91% of the day workers stated a preference for the day shift, 43% of the night workers preferred night shift, while none of the rotators stated that they would choose a rotating shift if they had a choice.

Both the questionnaire item concerning shift preference and the ratings of shift satisfaction based upon the taped interviews thus showed a similar pattern: nearly all of the day workers appeared to be satisfied with their shift but only half of the night workers and relatively few of the rotators expressed satisfaction with their shift hours.

In contrast, the judges' ratings of worker satisfaction with the job itself, excluding the shift, showed job satisfaction to follow a different pattern that varied less across shifts. Rotators appeared most satisfied with the job itself (64%), followed by day worker (55%), and finally by the night workers (45%).

Satisfaction ratings in the three main areas of life-sleep, family life, and leisure-social life (combined), are also shown in Figure 1. In all three areas significantly fewer of the shift workers than the day workers were judged to be satisfied. The pattern of satisfaction by shift for sleep and leisure-social life parallels closely the trend noted for shift satisfaction. With respect to the percent satisfied with family life, the rotators were judged to be relatively more satisfied than in the other areas of life.

### Interviewer Impressions

During the course of conducting 100 semi-structured conversations, including 30 in the preliminary stage, the interviewers developed impressions as to the effects of working hours on the respondents' lives. These impressions were formed around two major questions: first, what is the balance of hazards and benefits experienced by workers on the different shifts? second, what kinds of coping strategies or accommodations do shift workers and their families develop?

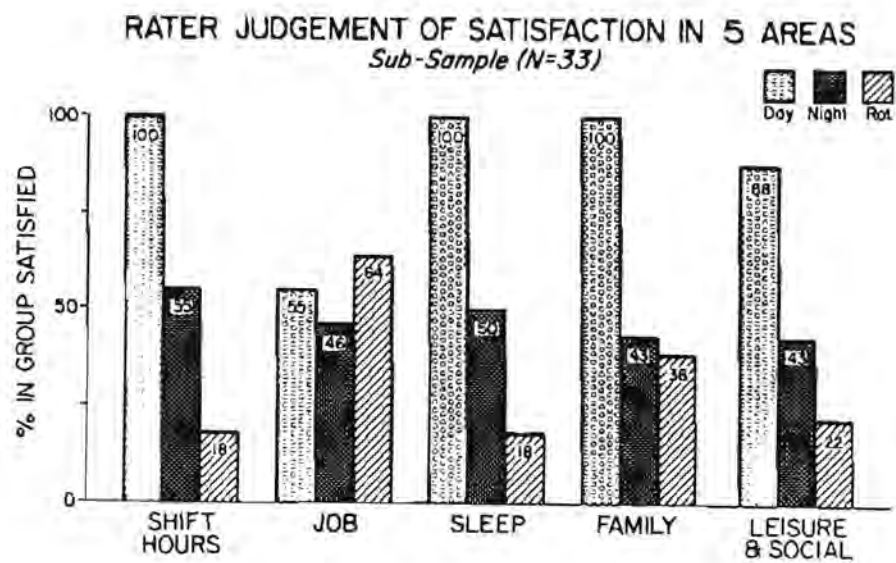


Figure 1. Percent of each shift group rated as "satisfied" on the basis of content analysis of tape-recorded semi-structured conversation.

Findings on levels of satisfaction for the random sub-sample of 33 respondents (Figure 1) corroborate the impressions that the interviewers developed during the data-collection process. Obvious qualitative differences were recognized between interviews where the respondents verbalized complaints and dissatisfactions relating to the shift and those where neutral and positive conversation was prevalent. With few exceptions, it was clear during the course of the interview which of these two general categories it represented. Interviews with day shift workers were almost always in the second category, although some day-shift respondents evidenced considerable dissatisfaction. Roughly half of the night-shift workers viewed themselves as "night people" and spoke in a generally positive vein. The other half of the nightshift group and most of the rotators described many physiological and psychosocial problems. For some, the shift hours appeared to have an all-but-overwhelming impact on their lives. The dissatisfied night and rotating shift workers sometimes expressed the opinion that they were an unattended, unappreciated, oppressed sector of the work force.

Regarding the second question about coping strategies by workers and their families, the interviewers noted a variety of styles that were not readily categorized. Two key variables were apparent: first, the extent to which the shift worker made accommodations or compromises with the "normal" schedule of his/her family and the surrounding world; second, the extent to which the worker's marital partner and children made accommodations or compromises to the working hours of their family shift worker. Family adjustments were intended to provide direct support to the shift worker or to bolster the well-being of the family as a unit. The intersection of the worker and family styles resulted in cases at one extreme where the worker and family tended to ignore each other's schedules, and the other extreme where there was considerable cooperation and often sacrifice. One pattern that emerged more clearly than others was the presence of considerable support and accommodation by the wives of male rotators.

#### Reported Frequency of Activity

In the questionnaire respondents were asked how frequently they had engaged in a given activity during the previous year, i.e., the 12 months just prior to the interview. Responses were obtained initially in terms of four frequency categories: not at all, less than once a month, at least once a month but less than once a week, and once a week or more. In the following data, two categories of once a month and once a week are collapsed into the single category of once a month or more (12+times) to indicate activities that occurred with some regularity.

Leisure activity. Frequency of leisure activity was partially assessed with the question, "Would you tell me three of your favorite ways to spend time--ways that you particularly enjoy?" Respondents also indicated how frequently they had engaged in each activity in the past 12 months. Figure 2 shows that fewer night shift workers than day or rotating shift workers reported regular involvement in their favorite activities.

Level of leisure activity was also assessed with a list of 12 pre-selected leisure activities. Frequency of engaging in these activities at least once a month is shown in Table 3. For certain of these activities fewer mem-

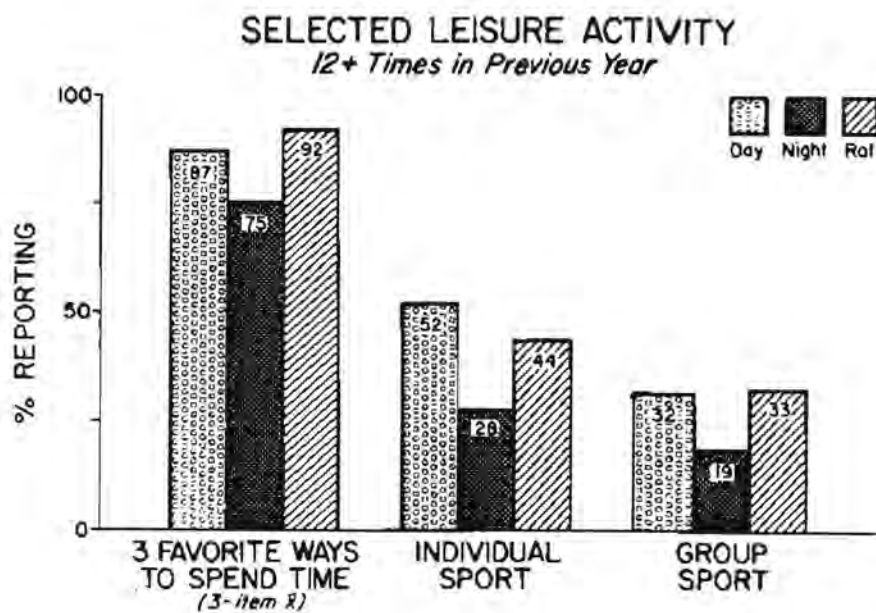


Figure 2. Percentage of each shift group reporting that they carried out specified leisure activity once a month or more in the previous year.



bers of the night shift group reported as much activity as the day or rotating shift workers: group sport, individual sport, and spectator sport. For other activities, fewer members of the day shift group were involved at least monthly: dancing, napping, window shopping, and attendance at movies, concerts, and theaters. The rotators emerged as least active of the shift groups in attending courses.

Table 3

Leisure Activity: Percentage of Respondents Reporting Activity  
Once a Month or More in the Previous Year

Activity	Shift Group		
	Day Shift	Night Shift	Rotating Shift
	n=29	n=23	n=19
Group sport	32	19	33
Individual sport	52	28	44
Dancing	4	24	19
Reading	100	95	100
Relaxing yard or house work	74	62	67
Class, course	35	32	12
Watch TV	100	95	100
Nap	61	81	81
Resting	77	80	82
Spectator sport	31	19	27
Window shopping	48	62	69
Movies, concerts, theater	22	50	44

Family life. The level of the worker's involvement with the family was determined for interactions with spouse (partner role) and with children (parent role). Five questionnaire items related to each role (Table 4). A trend is evident for a lower percentage of night workers than day and rotating workers to engage in individual partner and parent role items at least once a month.

The five-item sets of activity pertaining to partner role and parent role were combined (Figure 3) to provide a more general comparison among the three shifts of the involvement in family roles. Fewer night shift workers evidenced regular involvement with spouse and children. Rotators appeared similar to the day shift group in level of parent-role activity and exceeded the day workers in level of partner-role activity.

As an additional measure of worker-partner interaction, respondents were asked how many waking hours were usually spent in the same location as their spouse, regardless of whether there was any interaction between them. For workdays, the day-shift group reported an average of 5-6 hours of worker-

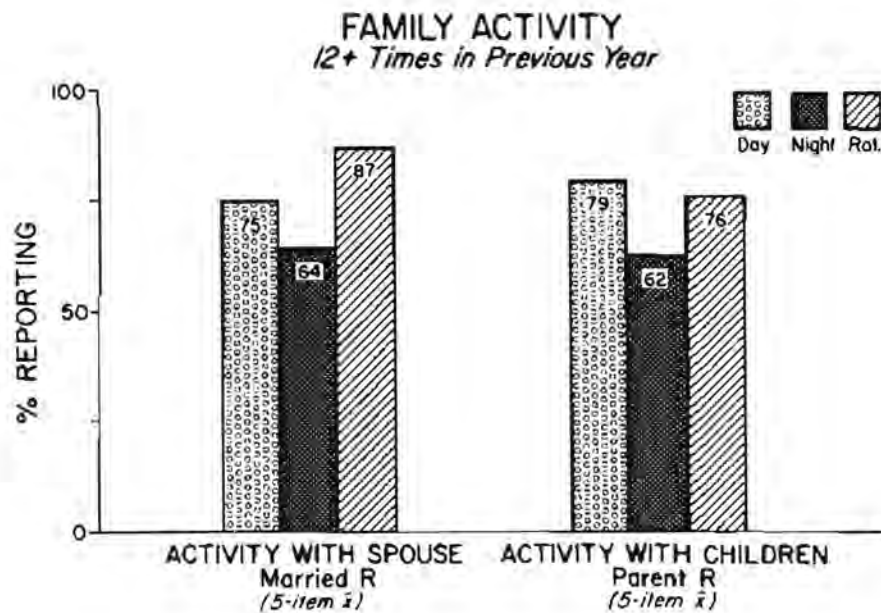


Figure 3. Percentage of married respondents and parent respondents reporting that they engaged in activity with spouse and with children once a month or more in the previous year.

partner co-presence, while the night and rotating shift groups reported an average of only 3-4 hours of co-presence. Thus, the day shift group averaged 25-30 hours of co-presence in a five day work week, while the night and rotating groups averaged ten hours less, or 15-20 hours of co-presence.

Table 4

Selected Items From Questionnaire: Percentage of Respondents Reporting Activity Once a Month or More in the Previous Year

Partner-role item	Day	Night	Rotating
Discuss family and personal problems	83	60	100
Work together around the house	76	67	91
Entertain relatives or friends at home	53	40	64
Relax together at home	88	80	100
Go out together for dinner, movies, or other recreation	72	73	81
Parent-role items			
Talk with children about their problems or things that interest them	100	89	100
Relax together with children by watching TV or working on a project	92	89	100
Attend PTA meetings, scout groups, ball games, school programs	64	11	28
Do something together as a family at home	69	44	88
Do something together as a family away from home	69	78	62
Contact with relatives and friends (flexible)			
Spend time with relatives	88	67	69
Talk with relatives on the phone	80	75	62
Spend time with friends from work	65	40	77
Spend time with other friends	60	55	69
Talk with friends on the phone	68	73	56
Social occasions (scheduled)			
Attend special occasions such as wedding, birthday, or holiday get-together	35	18	12
Visit other people at their home	64	27	56
Have other people over to your home	48	46	50
Go out with others for entertainment or any kind of outing	32	32	69

On days off, the reported co-presence increased for all three shift groups, with rotators showing a larger increase than either of the other shifts. Rotators reported six additional hours of co-presence, while the day and night workers each showed four additional hours of co-presence.

Informal social activity. Frequency of informal social activity (distinguished from participation in formal community organizations) was obtained for two types of activity that differ in the amount of scheduling flexibility they permit: activities with flexible starting and ending times; and activities with scheduled starting or ending times. The flexible activities included five items related to in-person and telephone contact with relatives and friends. The scheduled items related to four kinds of social occasions (see Table 4). The items pertaining to frequency of flexible social contact show a higher percentage of regular activity and smaller differences between shift groups than the items pertaining to scheduled social occasions. The most inflexible item of social activity (wedding, birthday, holiday) shows the night and rotating shift groups at a relatively low level of participation.

The two sets of items pertaining to contact with relatives and friends (flexible) and social occasions (scheduled) were combined (Figure 4) to provide an overall comparison of participation in informal social activity by the three shift groups.

As shown in Figure 4, regular activity was more prevalent and differed less between shifts for the flexible than for the scheduled activities. The night shift workers had a lower level of participation in the four types of scheduled occasions, averaged together.

Participation in organizations. Participation in three kinds of organized activity is shown in Figure 5: church service, labor union meeting, and class or workshop sessions. A lower percentage of both night and rotating workers attended church and union meetings as often as once a month or more, in comparison to the day workers. Attendance in class sessions was similar for day and night workers and considerably lower for rotators.

Since all respondents were union members, details were requested on their level of participation in the union. Asked whether they currently held a position in the union as an officer, shop steward, or committee member, more day workers responded affirmatively (56%) than night workers (14%) and rotators (24%), indicating relatively less union leadership by night and rotating workers than the day workers. Likewise, more day shift workers (60%) had filed grievances in the previous five-year period than night (45%) or rotating (50%) workers.

These data on level of union participation indicate a lower level of union involvement by shift workers than day workers, relatively speaking. At the same time they show that all three shift groups in the study sample represent an unusually active and involved portion of the work force.

#### Discussion

The discussion will relate to four topics: the problem of extrapolating these findings to the general population of workers; the predictive value of



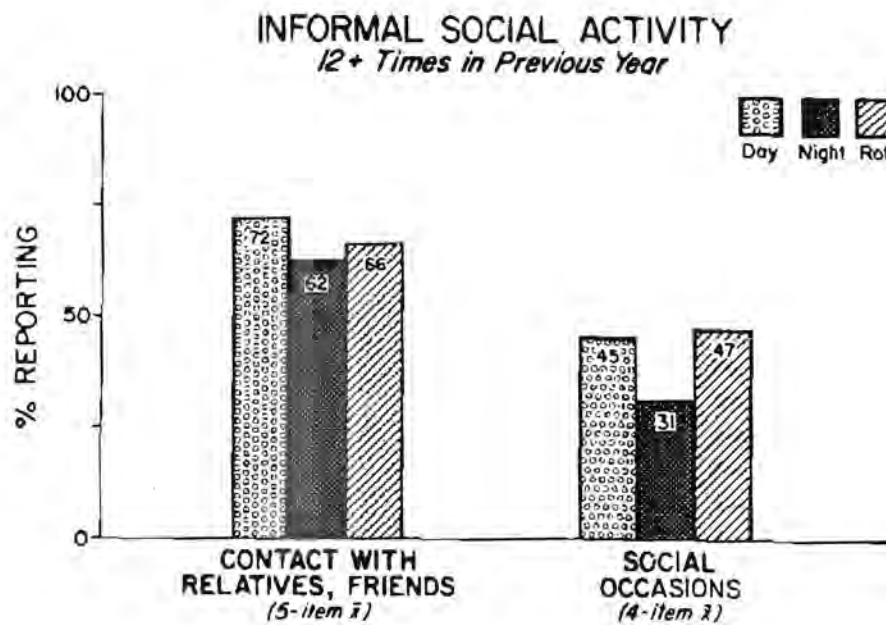


Figure 4. Percentage of respondents reporting that they engaged in two types of social activity once a month or more in the previous year.

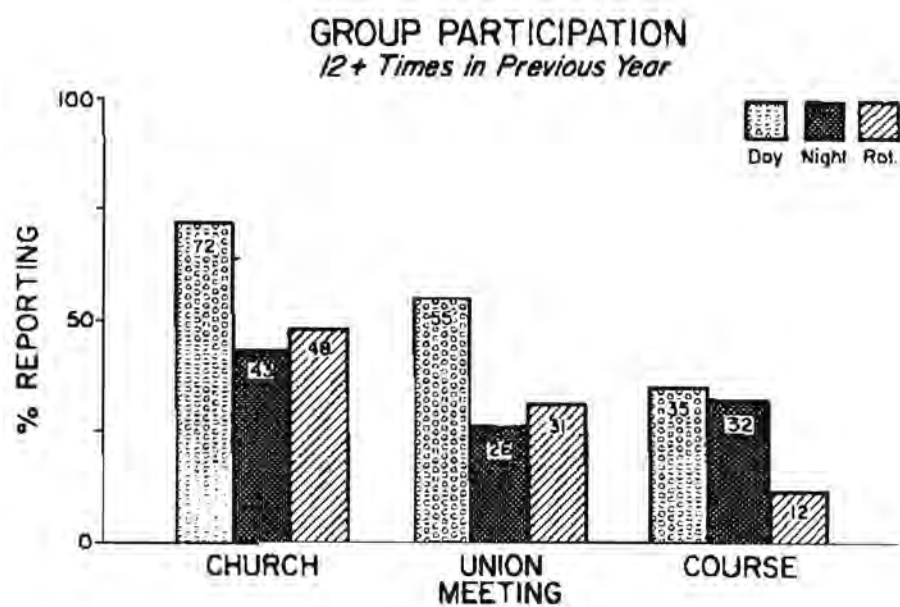


Figure 5. Percentage of respondents reporting that they participated in types of organized activity once a month or more in the previous year.

shift satisfaction for off-the-job areas of life satisfaction; the relationship between shift satisfaction and level of activity in home and community life; and the need for further interview study of shift workers, with an emphasis on females.

In interpreting the results, the nature of the study sample should be kept in mind. All respondents were union members, while only about one-quarter of the U.S. work force belongs to unions. The volunteers were selected to eliminate obvious health or sleep problems. The interview respondents were found to be more active than average in union participation and leadership. In addition, it is likely that workers with high stress levels in their lives did not volunteer for the study. Since this particular sample of workers appears to occupy a relatively advantaged position in comparison with the broad population of hourly employees, the differences between shifts found in this sample may well be an underestimation of the differences to be seen in the wider population.

An interesting finding from the semi-structured conversations (Figure 1) was that satisfaction with shift hours is more closely related than job satisfaction to the way shift workers feel about certain aspects of their lives off-the-job. The importance of shift satisfaction as a predictor of life satisfaction is easily seen in the case of the rotators. This group contained more craft workers than the other shift groups and earned a higher median job income, both of which probably contributed to the higher level of job satisfaction they reported. Yet the rotators' dissatisfaction with the changing shift hours was more predictive of their satisfaction with key elements of life away from work than was their job satisfaction.

Levels of shift satisfaction proved to have a complex relationship to levels of activity in home and community life, as seen in the questionnaire responses. It had been expected that both night and rotating shift groups would evidence more dissatisfaction with their job hours and less activity in home and community life than the day shift group. Instead, it was found that the two factors of shift satisfaction and activity level were positively associated for the night shift group and negatively associated in many measures for the rotating shift group.

A complex example can be found in the questionnaire findings about workers' favorite ways to spend time. In addition to asking respondents to indicate the frequency of engaging in their three favorite activities, they were also asked to indicate how satisfied they were with the amount of time they had during the prior 12 months to carry out each of the three favorite activities. Responses were made on a 7-point scale ranging from very satisfied to very dissatisfied. Although the night shift group reported the lowest frequency of activity, they also reported significantly more satisfaction than the other two shifts on the 7-point scale.

What interpretation can be made of the differences in activity level between the shift groups? The chronic incompatibility of the night shift worker's schedule with the "normal" day-time world would seem to explain the differences in activity levels between night and day shift groups. The rotators, on the other hand, can adopt a strategy of doing the activities that are most compatible with each shift as they change from one shift to the next.

For example, they can use their time on day shift to "make up" for what they could not do at other times. This might allow their activity level in flexible areas of family and social life to approximate that of the day worker.

As stated, half of the night shift group preferred night hours and half were dissatisfied with the hours. Why were more rotators dissatisfied with their shift hours than the night shift group, given the higher levels of activity they reported? Several suggestions can be made: the rotators may view themselves as part of the "day" world, and find it frustrating to carry on in spite of the periods of time on different shifts; the higher economic level of the rotators in this sample may have been associated with higher expectations for their quality of life than can be realized while working on a rotating shift; and in many places of employment the rotating shift schedule has the additional element of unpredictability, which creates an added burden for rotators and their families.

As a final point, it is hoped that further interviews with semi-structured components will be carried out with shift workers. In particular, special efforts will be needed to reach a sizeable sample of female shift workers. In the present study, for example, working women with families tended to be much less available for participation than working men with families. The problems of all shift workers, including females, merit further study.

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# **NIOSH**

## **PROCEEDINGS**

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### **THE TWENTY-FOUR HOUR WORKDAY: Proceedings of a Symposium on Variations in Work-Sleep Schedules**

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Centers for Disease Control  
National Institute for Occupational Safety and Health

THE TWENTY-FOUR HOUR WORKDAY: PROCEEDINGS OF A SYMPOSIUM  
ON VARIATIONS IN WORK-SLEEP SCHEDULES

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