

# SELECTED REFERENCES

INDUSTRIAL RELATIONS SECTION

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## WORKERS AND SHIFT SYSTEMS\*\*

### 1. SHIFT WORK PRACTICES AND WORKER CHARACTERISTICS

King, Sandra L. and Harry B. Williams. "Shift work pay differentials and practices in manufacturing." *Monthly Labor Review* (U.S. Bureau of Labor Statistics; distributed by U.S. Government Printing Office, Washington, DC 20402), December 1985. pp. 26-33. \$4.75.

This article provides detailed information on the percent of manufacturing production and related workers on late shifts and the proportion of workers paid shift differentials. In metropolitan area factories, 24.9% of 6 million production workers, were employed on late shifts in the early 1980s, and this proportion has remained stable for two decades. In 1984, about 90% of these workers received premium pay for such schedules. However, shift differential pay has not increased as rapidly as basic day shift wage levels. Statistics are listed according to year of survey, industry, and by region.

Medley, Carol. *Shift workers: a descriptive analysis of worker characteristics*. Columbus, Ohio 43201. Ohio State University. Center for Human Resource Research. (1375 Perry St., Suite 585). 1975. 18 + pp. On request.

Based on data from the National Longitudinal Surveys of Labor Force Experience (NLS), this study describes people working outside of the traditional 9am-5pm job schedule enjoyed by day workers. These include "evening workers" (those who reported most of their hours between 6pm and midnight), "night workers" (those who worked mostly between midnight and 6am), and "split shift workers" (those whose working hours were interrupted by a period of nonworking hours). Among the observations: Of the three groups, day workers were in more prestigious and lucrative occupations requiring higher levels of education. Although they were more likely than day workers to have union representation and extra pay for overtime, evening workers, like split shift workers, also had lower wages and fewer hours. Night shift workers tended to have longer job tenure (comparable to that of day workers) than evening workers. Blacks and younger workers did not predominate among late workers. Evening, split, and night shift workers were most likely to live in urban areas outside the South. The shift of a worker appeared to be tied directly to industry, and more importantly to occupation.

Mellor, Earl F. "Shift work and flexitime: how prevalent are they?" *Monthly Labor Review* (U.S. Bureau of Labor Statistics; distributed by U.S. Government Printing Office, Washington, DC 20402), November 1986. pp. 14-21. \$4.75.

Mellor's article on the numbers and characteristics of full-time/part-time employees who work shift or flexitime schedules reveals that 1 of 10 full-time wage and salary workers is on an evening or night shift, and only 1 of 8 has a flexible schedule. In contrast, nearly half of all part-time employees work schedules other than the regular day shifts, and nearly one fifth have

\* Prepared by Kevin Barry, Librarian and Julienne Waldron, Industrial Relations Library, and Mary Chaikin, Psychology Librarian.

\*\* Items on this list should be ordered directly from the publisher. Addresses are given in connection with each reference.

flexible scheduling. While the incidence of shift work and flexitime varies by sex, age, race, and other characteristics, differences are most evident by occupation and industry.

Tasto, Donald L. and Michael J. Colligan. *Shift work practices in the United States*. Springfield, VA 22161. National Technical Information Service. U.S. Dept. of Commerce (5285 Port Royal Rd.). 1977. 49 pp. (NTIS no. PB-274-707). \$14.95.

The results of this study indicate numerous shift schedules and many systems of rotation which vary in complexity and differ across industries, companies, and occupations. The hospital, transportation, food processing, and health care industries were identified as employing the highest percentage and absolute number of shift workers, while the chemical, lumber and wood products, and textile industries were identified as among the lowest.

## 2. SPECIAL PROBLEMS ASSOCIATED WITH SHIFT WORK

Benjamin, Gerald A. "Shift workers." *Personnel Journal* (A.C. Croft, Inc., 245 Fischer Ave., B-2, Costa Mesa, CA 92626), June 1984. pp. 72-76. \$3.00.

Benjamin defines the steps employers should take when the need for implementing a shift system arises. These include acquiring background information on an employee's medical history, providing medical counseling services, presenting informative programs on the potential physical and sociological problems associated with shift work, offering ways to minimize these problems, and transferring employees who are unable to adapt.

*Biological rhythms, sleep and shift work. Proceeding of a conference on variations in work-sleep schedules: effects on health and performance sponsored by NIOSH and the Office of Naval Research, held in San Diego, CA, Sept. 19-23, 1979.* Edited by Laverne C. Johnson and others. 1981. 618 pp. (Advances in Sleep Research. v. 7). o.p.

This conference assembled workers concerned with a common problem, variations in work-sleep (particularly sleep loss or the fragmentation thereof) and biological rhythms. The social and health problems that arise with shift work are discussed.

Frost, Peter J. and Muhammad Jamal. "Shift work, attitudes, and reported behavior: some associations between individual characteristics and hours of work and leisure." *Journal of Applied Psychology* (American Psychological Association, Order Dept. 1200 17th St., NW, Washington, DC 20036), February 1979. pp. 77-81. Info on request.

This study of six Canadian manufacturing companies explores the compatibility between hours of work and hours available for nonwork activities among day and other shift manufacturing industry workers. The results indicate that, relative to workers on other shifts, day shift workers rank highest for compatible fit between work and nonwork hours, expect to stay longer in their companies, report more social activity away from work, and perceive themselves more favorably in terms of fulfillment of needs at work and perceived emotional well-being.

Gannon, Martin J., Douglas L. Norland, and Franklin E. Robeson. "Shift work has complex effects on lifestyles and work habits." *Personnel Administrator* (American Society for Personnel Administration, 606 N. Washington St., Alexandria, VA 22314), May 1983. pp. 93-97. \$5.00.

This article is a literature review of research examining the quality and quantity of production and the quality of life for shift system workers.

Krieger, Gary R. "Shift work studies provide clues to industrial accidents." *Occupational Health & Safety* (Medical Publications, Inc., 225 N. New Rd., Waco, TX 76710), January 1987. pp. 21-22, 34. o.p.

Three major industrial disasters—Union Carbide Corporation's chemical accident in Bhopal, India, the Three Mile Island nuclear accident, and the Chernobyl nuclear explosion in the Soviet Union—share a common link. All three accidents occurred between midnight and 6 a.m., during the 'graveyard shift'. The need for designing shift schedules that minimize worker fatigue and sleepiness is emphasized by the author. Several charts underscore the points made, including safety near-miss events and operator error plots which demonstrate circadian variability.

Monk, Timothy H. "Advantages and disadvantages of rapidly rotation shift schedules: a circadian viewpoint." *Human Factors* (Human Factors Society, Inc., P.O. 1369, Santa Monica, CA 90406), October 1986. pp. 553-557.

Monk introduces the circadian system and the debate over scheduling slow versus rapid shift rotation. He stresses that schedulers must take job type and whether it is highly motivating or monotonous into consideration before deciding upon the speed of shift rotation.

Moore-Ede, Martin C. and Gary S. Richardson. "Medical implications of shift-work." *Annual Review of Medicine* (Annual Reviews, Inc., 4139 El Camino Way, Palo Alto, CA 94306), no. 36, 1985. pp. 607-17. \$27.00.

Circadian rhythms resynchronize slowly in those involved in shift work. Symptoms show themselves in a variety of disorders, specifically with the gastrointestinal and cardiovascular systems. The problems grow more intense with age, and poor adapters show more pathology.

*Night and shiftwork: longterm effects and their prevention.* Edited by Manfred Haider, Margit Koller, and Renate Cervinka. Frankfurt. Verlag Peter Lang. 1985. 483pp. (Studies in Industrial and Organizational Psychology, v.3). \$44.00.

This volume offers an overview of the possibilities of improving long-term adaptations to night and shift work and preventing adverse effects. Newer aspects of shift work research such as combined effects (night work combined with chemical or physical environmental loads and irregular working hours) are stressed. The topic of shift work for women and how differently this problem is handled in various countries receives special attention.

Siegel, Karolynn. "Shift work: the wave of the future." *SAM Advanced Management Journal* (Society for Advancement of Management, 2331 Victory Parkway, Cincinnati, Ohio 45206), Autumn 1982. pp. 42-48. \$9.00.

Technological changes in industry and the demand for around-the-clock services have compelled more employers to introduce shift work systems. Siegel examines this trend and the way in which a new generation of younger, more educated workers view shift systems.

Straines, Graham L. and Joseph H. Pleck. "Nonstandard work schedules and family life." *Journal of Applied Psychology* (American Psychological Association, Order Dept. 1200 17th St., NW, Washington, DC 20036), August 1984. pp. 515-523. Info. on request.

Employing data from the 1977 Quality of Employment Survey, this study explores the impact of nonstandard work schedules on the family life of workers and finds that such schedules are associated generally with less time in family roles and a higher degree of conflict between work and family life. It is interesting to note that shift workers spend more time than others on one family role, housework, and that while the amount of time shift workers have to invest in family roles is adequate, the scheduling of this time is a problem for them. This situation lends itself to a lower quality of family life for shift workers. Included in this issue is "Reasons to leave shiftwork and psychological and psychosomatic complaints of former shiftworkers," by Michael Frese and Klaus Okonek (pp. 509-514).

U.S. Congress. House. Committee on Science and Technology. Subcommittee on Investigations and Oversight. *Biological clocks and shift work scheduling: hearings*. . . 98th Congress, 1st session. Washington, DC 20402. Superintendent of Documents, U.S. Government Printing Office. 1983. 407 pp. o.p.

The Subcommittee's objective was reaching a better understanding of circadian rhythms and how employers who learn the implications of biological clocks for shift workers might design work schedules that take into consideration the public welfare as well as worker health, job satisfaction, and productivity. Witnesses include an assembly line worker, a police officer, a registered nurse, an airline pilot, and a nuclear reactor operation, all testifying about their difficulties with and adjustments to rotating and other shift work practices in their fields. Included among the several accompanying documents and reprints are: *Pilot Fatigue and circadian desynchronization* (NASA Technical Memorandum 91275), April 1981; *European Shiftwork Research* by Timothy H. Monk; "Sleep, biological clocks, and health" reprinted from *Health and Behavior: a Report of the Institute of Medicine* (National Academy Press, 1982); and *Critical human factors issues in nuclear power regulation and a recommended comprehensive human factors long-range plan*. (Nuclear Regulatory Commission NUREG CR-2833).

Wojtczak-Jaroszowa, Jadwiga. *Physiological and psychological aspects of night and shift work*. Springfield, VA 22161. National Technical Information Service. U.S. Dept. of Commerce (5285 Port Royal Rd.). 1977. 88 pp. (NTIS no. PB-86-152-972). \$14.95.

The necessity for night and shift work is clear in both public service occupations (e.g. transport, army, police, telecommunications, health care) and certain branches of industrial jobs (e.g. electrical plants, gas works, oil refineries, glass factories, printing houses, coal mines). Circadian rhythms in biological functions are carefully reviewed. Problems related to physical work are covered, as are some aspects of night work in hot environments. The importance of sleep after night duty is stressed. Data are presented on various arrangements of shift systems, as well as on organization of working time and breaks during the night shift.

Zedeck, Sheldon., Susan E. Jackson, and Elizabeth Summers Marca. "Shift work schedules and their relationship to health, adaption, satisfaction, and turnover intention." *Academy of Management Journal* (Academy of Management, P.O. Drawer K2, Mississippi State University, Mississippi State, Mississippi 39762), June 1983. pp. 297-310.

The results of a survey of 732 plant operators who work a shift schedule indicate that an employee's shift work satisfaction is correlated to his personal, job and family circumstances. The authors note that while eventually most workers adjust to shift work, the older they are and the longer they have worked the shift schedule, the more likely they are to adapt.

### 3. BIBLIOGRAPHY

*Annotated bibliography on working time*. Washington, DC 20006. International Labor Office (1750 New York Ave. N.W.). 1986. 100 pp. \$12.25.

The second part of this two-part annotated bibliography on working time is a compilation of studies, articles, official reports, and proceedings on shift and night work. Materials cover the diverse information of shift systems in various countries and industries, the advantages of shift systems to productivity, and the impact of new technology on the shift work schedule.