A WORK AND FAMILY PERSPECTIVE ON THE EFFECTS OF SHIFTWORK

by

Karen L. Johnson

(Bachelor of Arts, University of Alberta)

A Thesis Submitted to the
Faculty of Graduate Studies and Research
in partial fulfillment of
the requirement for the degree of

Master of Management Studies

School of Business
Carleton University
Ottawa, Ontario

March 25, 1997

ABSTRACT

Shiftwork today encompasses a much broader range of industries and occupations than it did when early shiftwork studies were conducted. This study of 270 men and women working in a modern service industry seeks to enhance our understanding of the effects of shiftwork by comparing employees on rotating shifts to those on daytime schedules in terms of individual well-being, work attitudes, and the ability to balance work and family.

Findings suggest that rotating shiftworkers experience significantly greater work-family conflict than dayworkers, greater difficulties in individual time management, and hold significantly less favourable work attitudes. Rotating shiftwork was not associated, however, with difficulties in individual functioning. Gender, parental status, and schedule control were identified as potential moderators of shift response.

ACKNOWLEDGEMENTS

This research could not have been conducted without the support of a number of individuals and agencies. First, I would like to thank the many shiftworkers who took the time to share their experiences with me during the course of the study, and to Human Resources Development Canada for providing financial assistance for this research.

Thanks are extended to my thesis advisory committee members, Drs. Deborah Compeau and Roland Thomas, for their thoughtful comments and guidance throughout this project; to Dr. Chris Higgins from the University of Western Ontario for his assistance and practical advice during the early stages of data collection and analysis; and to my colleague, Rod Bhar, for his many hours spent coding the telephone interview data.

Finally, I would like to express my sincere thanks to my thesis supervisor, Dr. Linda Duxbury, for her encouragement (and patience!) throughout this project. Without her dedication, enthusiasm, and love of learning, this research could not have been completed.

And, as always, thanks to my mother, Eleanor Graham, who taught me never to say die.

TABLE OF CONTENTS

7. QUESTIONNAIRE SURVEY RESULTS

8. INTERVIEW RESULTS

LIST OF FIGURES

1. INTRODUCTION

1.1 Introduction

The use of shift scheduling outside of the standard 9 to 5 work day has become an established labour pattern in today's work world (Dunham, 1977). In Canada, three out of ten employees work shifts, including night workers, afternoon workers, and rotating shiftworkers who circulate through different shifts over a prescribed period (Sunter, 1993). Modern society relies on shiftworkers not only to provide essential services such as policing and health care, but also to offer services we enjoy, such as dining and shopping (Monk and Folkard, 1992; Sunter, 1993). In addition, industry maintains a competitive edge through its force of shiftworkers who staff continuous operations in manufacturing and provide round-the-clock services to personal and business consumers (Ibid.).

Shiftworkers represent an unusual segment of society. Although integral to public and economic well-being, their work schedules segregate them physically and temporally from the society they serve (Simon, 1990). Such segregation may have implications both for shiftworkers' attitudes toward their work, and for their ability to integrate their work and non-work lives. There is little consensus, however, on the extent to which shiftwork interferes with employees' ability to balance work and family.

In the work domain, for example, it has been suggested that shiftworkers may have unfavourable orientations toward their jobs, particularly in instances where employees would prefer to work standard hours (Sunter, 1993). Having to work hours that are out of synch with the rhythms of society may also make home life more difficult for shiftworkers and

limit the time available for family and leisure (Finn, 1981). In addition, fatigue from interference with normal sleep patterns may place further stress on work, family and social relationships (Monk and Folkard, 1992; Sunter, 1993).

On the other hand, working a schedule that is out of phase with society has been reported to have inherent advantages, including the ability to attend to personal business during non-peak hours, or to off-shift child care with a spouse (Finn, 1981; Sunter, 1993). Shiftworkers may also experience benefits in their work lives in instances where non-day shifts are relatively quiet, or feature a strong esprit de corps (Finn, 1981; Monk and Folkard, 1992).

Although worker responses to shift schedules have been the subject of considerable research, the effects of shiftwork on the integration of work and family have not been well documented. Compared with the growing body of work-family literature that has addressed other non-standard work arrangements, such as flextime or compressed work schedules, (for a review of this literature, see Pierce et al., 1989), relatively few authors have examined the costs and benefits of shiftwork from a work-family perspective. Empirical shiftwork studies which have systematically addressed relevant outcomes such as work-family conflict, work-family interference, and time management, have been rare.

The lack of attention to work and family outcomes may be rooted in the evolution of shiftwork and the purpose it has traditionally served. Other non-standard scheduling arrangements have developed in response to employee needs for greater workplace flexibility (Pierce et al., 1989). Shiftwork, on the other hand, has been business-driven. Shiftwork grew in response to the demands of automation and continuous process industries and in an

effort to obtain greater return on capital investment (Ibid., 1989). This fundamental difference in the purpose of shiftwork has likely guided early research, as traditional shiftwork studies have centred more on business concerns, such as worker health, safety and productivity (Monk and Folkard, 1992), than on the personal needs of employees.

Whereas thirty years ago it may well have been appropriate for research to focus more on health and safety than on work-family issues (the typical industrial shiftworker of the 1960s had a wife at home to see to the needs of the family), the recent emergence of the dual-income family as the predominant family form suggests that there is a need for a new perspective in shiftwork research. In 1967, only one third of husband-wife families were families in which both spouses worked for pay (Lero and Johnson, 1994). By 1988, the proportion of dual-income families in Canada had doubled to represent approximately two thirds of husband-wife families (Ibid.) By 1991, only 19% of husband-wife families conformed to the traditional family pattern with the husband as sole earner (Ibid.).

Existing shiftwork studies, which have tended to focus primarily on male factory workers (Akerstedt and Torsvall, 1978; Cervinka, 1993; Cunningham, 1989; Frese and Semmer, 1986; Frost and Jamal, 1979; Jamal, 1981; Jamal and Jamal, 1982; Mott et al, 1965; Smith and Folkard, 1993b; Smith et al., 1982; Zedeck et al., 1983) may no longer adequately describe the needs of today's shiftworker. Home and work are no longer the separate spheres they were when early studies of shiftwork were conducted. First, the influx of women into the work force over the past few decades means that today's shiftworker is as likely to be a wife as to have one. In 1991, there were 1.5 million women working shifts, as opposed to 1.6 million men (Sunter, 1993). Second, over one third of full-time shiftworkers are parents

of children under 16; of these, half have children under 6 (Sunter, 1993). Finally, shiftwork has expanded to encompass a greater range of industries and occupations than it did in earlier years (Statistics Canada, 1993). These factors suggest that, today, shiftwork may pose new challenges to both men and women in a variety of work settings who must combine paid work with the care of families. A work-family perspective might serve as a better framework for identifying the effects of shiftwork on the work force of the 1990s.

1.2 Objectives of this Research

This research has two primary objectives. The first objective is to examine the effects of shiftwork in a work-family context. This study, therefore, uses measures commonly in use in the work-family literature to explore shiftwork in terms of work attitudes, personal life, and the ability to balance work and family.

The second objective is to attempt to move beyond the study of the traditional male factory worker to tap a sample of employees more representative of shiftworkers of the 1990s. Toward this goal, the sample is drawn from a modern utility in Western Canada, and includes both male and female shiftworkers in a variety of service occupations.

Detailed descriptions of the research questions addressed in this study are presented in Section 5 following the literature review.

1.3 Relevance of this Research

As the economy shifts from goods to services, it appears that shiftworkers will continue to play a crucial role in staffing (Mellor, 1986; Sunter, 1993). Burgeoning service

industries rely heavily on non-day workers, and have contributed to increases in the incidence of shiftwork over the past two decades (Sunter, 1993). Forecasts indicate that the need for shiftworkers will continue to grow in conjunction with greater demands for productivity and round-the-clock customer convenience (Ibid.).

In recent years, shiftwork research has not kept pace with the economic, demographic and labour force changes that are shaping the profile of shiftworkers today. Anticipated demand for employees in high skill areas means that organizations may have to become more responsive to the personal needs of their employees if they are to meet staffing goals (Ontario Women's Directorate, 1990). Corporate and public policy makers need access to more timely information on the needs of shiftworkers if they are to design effective programs, attract skilled workers, and ensure equity.

1.4 Research Overview

This paper will begin with a definition of shiftwork, and a brief description of the development and distribution of shiftwork in Canada. Section 3 discusses various theoretical frameworks for examining the relationship between shiftwork and work-family life. Section 4 summarizes and evaluates the relevant empirical literature on shiftwork. Research questions are developed in Section 5. Methodology is described in Section 6. Results are presented in Section 7 (for the questionnaire survey sample) and Section 8 (for the telephone interview sample). Results of the two studies are integrated and discussed in Section 9. The paper concludes in Section 10 with a discussion of the benefits and limitations of this study and directions for future research.

For ease in presentation, all data are tabulated in Appendix A. Copies of the research instruments can be found in Appendix B.

2. SHIFTWORK: ITS DEVELOPMENT, DEFINITION, AND DISTRIBUTION

This section of the study provides a brief history of the development of shiftwork in order to provide a framework for understanding the prevalence and distribution of shiftwork today. This section will also present a definition of shiftwork that is meaningful to the study of shiftwork in a work and family context.

2.1 Historical and Economic Perspective

Although the emergence of shiftwork tends to be associated with the advent of the Industrial Revolution, shiftwork has been around as long as recorded history. Soldiers, sailors, watchmen, bakers and other tradespeople have traditionally accepted night work as a necessary part of their jobs (Monk and Folkard, 1992). Essential services, such as health and protection, have always relied on shiftworkers.

The prevalence of shiftwork as we know it today, however, is largely a product of industrialization (Mott et al., 1965). Turn-of-the-century manufacturers recognized that operating expensive machinery on a 24-hour basis could spread the cost of their investment over more units of production, thereby reducing their unit costs (Ibid.). The benefits of shiftwork to employers also became apparent as technology spawned continuous process industries, such as nuclear power production and oil refining, which are physically impossible without round-the-clock operations (Monk and Folkard, 1992).

Taken from an historical perspective, perhaps the most important development in shiftwork in recent years has been the increase in the sheer number of individuals affected

(Monk and Folkard, 1992; Mott et al., 1965). In the very early days, shiftwork was restricted to a small group of tradespeople who regarded nightwork as a necessary component of their jobs (Monk and Folkard, 1992). Today, there are millions of shiftworkers in North America in a wide variety of occupations who work shifts for a wide variety of reasons.

The service sector has emerged as a major force in sustaining the growth in shiftwork (Mellor, 1986; Sunter, 1993). The proliferation of modern data processing, communications and other sophisticated systems has created new demand for 24-hour coverage, not only to provide timely service delivery, but also to maximize return on equipment that rapidly becomes obsolete. In addition, market pressures have served to increase the demand for shiftworkers, as consumer services move rapidly toward 24-hour availability, most notably in the entertainment, fast food, and grocery industries (Mellor, 1986; Monk and Folkard, 1992).

2.2 Defining Shiftwork

With shiftworkers spanning such a diverse range of industries, defining shiftwork can be a daunting task. Shiftwork has a long history, and has developed largely in response to staffing needs that are unique to the industry or business concerned. As a result, there is little common ground for arriving at a universally accepted definition. One of the initial challenges in investigating the effects of shiftwork, then, is to define the schedules in a manner that will provide a meaningful framework for examining variables of interest, while maintaining comparability with existing research.

Pierce et al. (1989) define shiftwork broadly as a pattern of working-hour arrangements whereby employees work organizationally defined different blocks of time on a regular basis. Normally, shifts can be classified into days (roughly 9am to 5pm), afternoons (starting times between 3pm or 4pm, ending around midnight), or the midnight or "graveyard" shift (starting time around 11pm or midnight, ending at 7am or 8am). There is, however, a great deal of variability in start and finish times within any classification.

Arriving at a satisfactory definition of shiftwork is further complicated by the fact that start and stop times are only one of many dimensions of shift schedules. Other shift characteristics are also important in defining shiftwork, including the presence or absence of a rotation and the duration of the shift. Some shifts are "fixed" (e.g., straight midnights or straight afternoons), whereas others rotate on a predictable basis. Some schedules require full rotations through all possible time blocks, and some schedules can go through "partial rotations" of only two shifts, (e.g., rotating afternoons and nights, with no day shifts). Irregular shifts that are variable and posted only a few days in advance are also not uncommon (Statistics Canada, 1993).

The length of the shift can also vary, as can the time off between shifts (e.g., 12-hour shifts tend to have a greater number of rest days between rotations than do 8-hour shifts). Some employees work split shifts requiring them to interrupt their work day with an interval of free time, and return to work later (e.g., a waiter or bus driver who works only rush hours) (Monk and Folkard, 1992).

Some authors have suggested simplifying the investigation of shift schedules by developing a dichotomy of "day" versus "non-day" shifts, the latter being a catch-all for any

shift other than the traditional 9 to 5 schedule (Finn, 1981; Presser, 1986). Whereas this categorization may be appropriate in some circumstances, it was not considered to be well suited to work-family research. It was believed that the "non-day" category was too gross to capture information relevant to the proposed study, as it ignores two important characteristics of shift schedules that might affect the ability to balance work and family: the rotational characteristics of the schedule, and the specific time of day worked.

For example, the category "non-day" shift would include both employees who work rotating shifts and those who work a fixed shift outside of the 9 to 5 workday. Information is lost, however, when these two types of schedule are combined, as rotating schedules may affect work-family balance in ways that are different from the effects of a fixed "non-day" shift. Employees with schedules that change from week to week might be expected to have unique problems in structuring their personal lives, including difficulty in finding child care for varying schedules, and being shut out of volunteer or leisure pursuits requiring fixed time commitments. On the other hand, shiftworkers who work predictable, fixed schedules (i.e., fixed nights or afternoons) might be better able to plan their personal lives around their work hours.

The "non-day" category also precludes access to information about the particular time of day worked. Research suggests that difficulties in balancing work and family are often specific to the time of day worked (Hertz and Charlton, 1989; Mott et al., 1965; Nock and Kingston, 1988). For example, working afternoon and early evening hours has been found to interfere with interactions with children (Mott et al., 1965; Nock and Kingston, 1988). Conversely, midnight shifts can cause disruption in the time couples have available to spend

alone with each other (Hertz and Charlton, 1989; Mott et al., 1965). In addition, child care may pose a real problem for workers on afternoon shifts, whereas a spouse may provide all of the necessary care for employees who work only midnights (Weiss and Liss, 1988).

In order to provide a shift classification that was sensitive both to the rotational characteristics of the shift schedule and to the time of day worked, the following four definitions were employed in this study:

Daytime	A daytime schedule which either follows a standard 9 to 5 pattern, or begins in the morning and ends in the afternoon
Afternoons/Evenings	Starting times roughly between 3pm and 4pm, ending around midnight
Nights/Graveyard	Starting times around midnight, ending around 8am
Rotating	A combination of two or more of the above shifts that change periodically

These categories generally encompass start and stop times that are meaningful to an analysis of work and family balance, and allow us to isolate shifts which rotate from those which do not. They also have the advantage of being roughly analogous to classifications commonly in use by Statistics Canada (1993) and the U.S. Bureau of Labor Statistics (Mellor, 1986).

2.3 Prevalence of Shiftwork in Canada

In order to illustrate the relevance of reexamining shiftwork from a work-family perspective, a clearer picture is required of shiftworkers in the 1990s. Recently, Statistics Canada launched an excellent survey of work arrangements conducted in conjunction with

its Labour Force Survey. This survey provides comprehensive information both on workers' schedules and on the personal and family characteristics of workers. Unless otherwise indicated, all data provided in Sections 2.3 through 2.6 have been drawn from two source publications emanating from this survey: Statistics Canada, 1993; and Sunter, 1993.

In 1991, there were 3 million employees in Canada who worked non-standard schedules outside of the regular 9 to 5 workday, representing 30% of the labour force. Although there is little historical information available, there is some evidence that shiftworkers represented only 19% of the labour force in 1967, indicating a definite upward trend in the proportion of employees working shift.

Although differences in data collection methods preclude direct international comparisons, Canada appears to have a somewhat higher rate of shiftwork than is found in other countries. Estimates suggest that only Sweden has as high a rate as Canada (30%), whereas the United Kingdom and the United States have a shiftwork incidence of roughly 22% (Mellor, 1986; Nilsson, 1980; Monk and Folkard, 1992).

The prevalent form of shiftwork in Canada is an irregular non-day schedule: 35% of shiftworkers work an irregular shift (one that varies, but is arranged roughly a week in advance). Roughly 30% work rotating shifts; 16% work afternoons and only 5% work a fixed midnight shift.

2.4 Occupational Distribution of Shiftwork

The distribution of shiftwork by occupational category illustrates the change that has taken place in the profile of shiftworkers over the last half century. The stereotype of the

shiftworker as a blue-collar factory worker is laid to rest by data showing that in 1991, employees in service occupations accounted for 25% of all shiftworkers. The next largest category of shiftworkers were in managerial and professional positions (23%). Fourteen percent of shiftworkers were in clerical positions, and 12% were in sales. Only 11% of shiftworkers were in processing, machining and fabricating. Transport and material handling accounted for another 12% of shiftworkers.

The need for 24-hour policing, fire protection, and health care is reflected in the rates of shiftwork within occupations. Seventy percent of workers in protective services work shift, as do 50% of health care professionals. Rotating shifts prevail in these occupations, but irregular shifts (no regular schedule) are also common. Transportation, food and beverage service, and material handling also have high incidences of shiftwork, ranging from 40% to 65%.

The rate of unionization among shiftworkers is roughly the same as it is in the labour force in general (38% of shiftworkers were unionized in 1991, compared with a rate of 36% for all workers).

2.5 Demographic Distribution of Shiftwork

The recent expansion of shiftwork to encompass a broad range of industries means that shiftworkers now represent a demographically diverse segment of the labour force. Following is a brief overview of the demographic characteristics of shiftworkers, including gender, educational attainment, and family circumstances.

2.5.1 Gender

The demographic profile for full-time shiftworkers is dramatically different from that for part-timers. Men 25 and over represent roughly half (51%) of full-time shiftworkers, but only 7% of part-time shiftworkers. Conversely, women 25 and over account for 32% of full-time shiftworkers, and 37% of part-time shiftworkers. Youth represent the largest segment of part-time shiftworkers (56% of part-time shiftworkers are youth aged 15-24). Only 17% of full-time shiftworkers are youth under 25.

Men who work full-time shifts are most likely to work a rotating schedule (44%). Women who work full-time shifts tend to be concentrated in irregular schedules (36%). Among part-time employees, irregular shifts are most common for both men and women (37% of part-time male shiftworkers work irregular schedules, as do 45% of part-time female shiftworkers).

2.5.2 Family Demographics

One third of shiftworkers, whether male or female, are parents of children under 18. Gender, however, does seem to influence the pattern of shifts worked. Most shiftworking fathers (52%) work rotating shifts. The incidence of rotating shifts among shiftworking mothers is only half that of men (27%). Afternoons are worked in roughly equal proportions by both mothers and fathers (12% of fathers and 16% of mothers work fixed afternoons). Fathers work a midnight shift in roughly the same proportion as men without children (5%). Virtually no mothers with children under 18 work midnights. Irregular shifts (with no predictable schedule) are more prevalent than might be expected, particularly among women

(39% of shiftworking mothers work irregular shifts, compared to 22% of shiftworking fathers).

2.6 Reasons for Working Shifts

The vast majority of shiftworkers in Canada appear to have little choice in whether or not they work shift: 74% of men and 64% of women claim they work shifts because it is required by the job. A very small proportion of men and women (4%) work shifts to earn more money, either to increase family income generally, or for the shift differential sometimes involved (Sunter, 1993). Although comparable Canadian data are not available on the proportion of shiftworkers who hold second jobs, Finn (1981) estimates the prevalence of moonlighting in the U.S. to be 23% for night workers and 19% for afternoon workers, compared with only 11% for daytime employees. Such "double jobbing" is thought to be facilitated by non-day schedules (Monk and Folkard, 1992, Mott et al., 1965). As financial pressures on families continue to grow while job security declines, the ability to moonlight may remain an attractive feature of shiftwork.

Only 9% of women report working shifts due to child care or family needs. When analysis is restricted only to shiftworkers with children, however, a different pattern emerges. Among married female shiftworkers with children under 18 years, 23% report working non-standard hours to deal with family responsibilities. This figure climbs to 34% for shiftworking mothers with children under 6. Virtually no men, regardless of the age of their children, report working a shift schedule to ease family responsibilities.

2.7 Shiftwork in Dual-Income Families

Recent growth in the prevalence of dual-income families (see Section 1.1) has prompted interest in examining shiftwork patterns in the dual-income context. The following discussion summarizes recent shiftwork research that has used couples as the unit of analysis, and illustrates the importance of studying the work and family effects of shiftwork.

2.7.1 Patterns of Shiftwork among Dual-Income Families

Literature from both Canada and the United States has examined work schedules using the couple as the unit of analysis (Presser, 1984; Lero et al., 1992). Compared to data which reflect only the schedules of individuals, this approach can provide a much more realistic picture of the extent to which shiftwork affects families.

Data on the work schedules of individuals presented earlier showed the incidence of shiftwork at roughly 30% (Section 2.3). When the couple is used as the unit of analysis, however, it can be seen that shiftwork affects a much larger proportion of families than it does individuals. Labour Force Survey data reveal that in 1991, 41% of dual-income couples in Canada included at least one spouse who worked a non-day schedule (calculated from Table 12, Statistics Canada, 1993). The most common pattern among these couples was for both partners to be employed full time, with the wife working a day shift, and the husband working a non-day shift (this combination represented 29% of "shiftworking couples" in which at least one spouse worked shift). In 22% of shiftworking couples, the husband worked the full-time day shift, with the wife on a full-time non-day schedule. In nearly as many couples (20%), the husband worked a full-time day shift, while his wife worked a non-day shift on a part-time basis. Both partners worked a full-time non-day schedule in 13%

of shiftworking couples. The presence of children appears to have little effect on the pattern of work hours among shiftworking couples: the distribution remained roughly the same for couples with children under 18 as for shiftworking couples in general.

Unfortunately, comparable data at this level of detail are not available from the U.S. Presser (1984), however, estimated from the 1980 U.S. Current Population Survey that one third of full-time dual-income couples with children included at least one spouse who worked a non-day shift. Although these figures are somewhat dated now, the incidence of shiftwork in this American sample is comparable to the rate of shiftwork among full-time dual-income couples with children in Canada (36%).

The relatively high incidence of shiftwork among dual-income couples, particularly dual-income couples with children, reveals that shiftwork is a fact of life for a substantial proportion of Canadian families. Reasons for shiftwork cited earlier in the discussion suggest that few of these parents have willingly chosen non-day shifts as a means of integrating work and family. Instead, shiftwork appears to have "come with the job". The effects of shiftwork on such families remains an important and unexplored area.

2.7.2 Off-Shifting

Presser (1984) observed that one out of ten full-time dual-income couples with children in the U.S. had no overlap whatsoever in their hours of employment (i.e., although both parents worked full time, one parent was always available at home). She inferred that shiftwork may be advantageous to couples with children in that it enabled them to reduce dependence on non-parental care arrangements by "off-shifting" child care.

Detailed data on the prevalence of off-shifting among Canadian parents with children under 13 were collected in the Canadian National Child Care Study in conjunction with the 1988 Labour Force Survey (Lero et al., 1992). Results showed that in 38% of dual-income families a spouse was available to provide care for at least some of the time the other parent worked (in fact, in only one third of families did both parents work a standard Monday to Friday daytime shift with no evening or weekend work). Seventeen percent of dual-income couples surveyed reported that they deliberately off-shifted their work schedules for child care purposes. Off-shifting was most common among couples with heavy child-rearing demands, such as those with 3 or more children under 13, or with 2 or more preschoolers.

An interesting research question remains as to whether parents who choose to off-shift child care actually derive the benefits they seek through the arrangement (e.g., reduced conflict, stress, or child care costs). Qualitative interview data reported in Section 8 of this research looks further at the issue of off-shifting.

2.8 Summary

Shaped jointly by economic, industrial and social forces, shiftwork remains an integral part of work scheduling today. The range of jobs which require non-day work continues to increase, not only in manufacturing and the essential services with which shiftwork has been traditionally associated, but also in emerging technologies where expensive equipment quickly becomes obsolete. Consumer demand for round-the-clock convenience and entertainment promises that shiftwork will continue to play an important role in industry and in the economy in the near future.

Shiftwork is a complex phenomenon whose current use and distribution is largely a function of its having evolved in response to industry-specific needs. The nature of the product or service provided determines whether non-day operations are required, and the timing of the various shifts. The move from a goods- to a service-based economy is continuing to shape the occupational distribution of shiftworkers: large proportions of shiftworkers are now classified as working in service, managerial and professional positions.

It appears that most employees work shift because it is required by the job and they have no alternative. Since in today's society women are as likely to work shift as men, new challenges are emerging for families who must balance work schedules with child care. Labour Force data indicate that over 40% of dual-income couples in Canada include at least one spouse who works a non-day schedule. Although shiftwork may provide advantages to parents, such as the ability to off-shift child care, its potential risks to individuals in terms of stress and fatigue must also be considered.

3. THEORETICAL FOUNDATIONS FOR RESEARCH ON SHIFTWORK

The potential problems associated with a non-day shift have long been evident (Monk and Folkard, 1992). The demands that the work environment has made of the shiftworker to adjust physically and psychologically to work hours that are out of synch with natural diurnal rhythms have been found to be associated with problems in employee health, productivity and safety (Ibid.; for a review of this literature, see Section 4). A shiftworker's personal life may also be affected by these unusual schedules, particularly in the area of social and family interactions (see Section 4).

The following theoretical perspectives provide frameworks for examining the particular stresses that are imposed on the shiftworker, and attempt to explain the effects on the employee in terms of biological, social, and psychological functioning. They also acknowledge individual differences in employees' adjustment to shiftwork, and identify possible intervening variables that may serve to mitigate or exacerbate the effects of non-day shifts.

3.1 The Field-Theoretical Approach

Thirty years ago, Mott, Mann, McLoughlin and Warwick (1965) published their comprehensive and now classic study of the effects of shiftwork among a sample of American industrial workers. These authors viewed shiftwork from a "field-theoretical" perspective (Cartwright, 1959), speculating that, like any human response, adjustment to shiftwork could be understood only in the context of the full range of endogenous and

exogenous forces acting on the individual. Their objective was to delineate and measure as many shift-relevant forces as possible in determining the overall effect of shiftwork on the employee.

Mott et al. posit that an individual's behaviour is determined by a field of forces that emanate both from the environment and from within the individual. Causes of behaviour are seen as multiple and interdependent. Mott et al. (1965) argue that employee responses to shiftwork are best understood when viewed as products of both environmental components (the timing of the shift, the difficulty of the work, its wages, supervision and other work context forces), and social forces (the rhythms of social and business activity in the shiftworker's community, the amount of noise in his/her neighbourhood, and the family's ability to adjust to the shift schedule). Operative forces also come from internal (psychological and physiological) sources, such as the shiftworker's health, personality, and the ease with which he or she is able to adjust time-oriented body rhythms.

Today, this broad, ecological approach to studying human behaviour is one in which most psychological theory is rooted. Its application to shiftwork research, however, represented a milestone in a field that too often viewed the worker and his organization as a closed system. Much of the early shiftwork research had tended to examine health and productivity measures only in relation to shift per se, with disregard for the larger systems that shaped shiftworkers' responses to work schedule demands (Mott et al., 1965). This new framework set the stage for a more enlightened examination of the social, psychological, physical and work-related determinants of responses to shiftwork.

The influence of the field-theoretical approach can be seen in most of the perspectives discussed below. In fact, its scope is so broad that there is inevitably overlap in the frameworks employed. Most models differ only in which of the shift-relevant "forces" (i.e., physiological forces, work-related forces, social forces, etc.) they choose as focus.

3.2 Adjustment

There is a vast amount of research to attest to the fact that human physiological functions operate on a 24-hour clock, with predictable diurnal peaks and troughs (see Section 4.2 for a summary of this research). Social rhythms are oriented accordingly. Time for family, recreation, and relaxation are structured according to a pattern of work-by-day and sleep-by-night (Dunham, 1977; Monk and Folkard, 1992). Working a schedule that is out of synch with established biological and social rhythms might be expected to be a source of stress, but research has shown that there is variability in the extent to which individuals successfully adapt to their work pattern (Monk and Folkard, 1992; Mott et al., 1965).

Monk and Folkard (1992) describe two models of "stress and strain" which attempt to account for the various effects of shiftwork on individuals. The first is Colquhoun's and Rutenfranz' (1980) stress and strain model, which asserts that detrimental effects do not arise from the objective stresses of shiftwork per se, but from the subjective strain that develops within an individual who is trying to cope (more or less successfully) with the disturbed pattern of sleep and activity that the job requires. This model identifies intervening coping variables that can affect strain (perceived adjustment), even when the stress (shift schedule)

remains the same. Intervening variables in the model include psychological characteristics of the individual, domestic circumstances, and characteristics of the job.

The second framework presented by Monk and Folkard is Monk's (1988) model of coping. This model views shiftwork strain as a function of three basic stresses: circadian (biological clock) factors, sleep factors, and social-domestic factors. All three are interrelated in this model, so all three must be functioning well for strain to be entirely absent. For example, circadian rhythms may be well aligned, and sleep undisturbed, but such gains cannot be at the expense of marital harmony, or it is hypothesized that strain will persist.

3.3 Community Rhythms

Advanced by Dunham (1977), this theory focuses on one dimension of the above adjustment models: social factors as determinants of shiftwork adjustment. Community rhythms theory postulates that a shiftworker's level of adjustment will be determined by the extent to which there is synchrony between his or her schedule and the temporal patterns of the community in which he or she lives.

According to Dunham (1977), there is a critical window for social activities that occurs between 4pm and 12am. Virtually all "normal" community activities are structured to be available during this time period. Dunham claims that for the afternoon shiftworker, this block of hours conflicts directly with his or her work schedule. For the night worker, this period is blocked either by sleep time, or by the need to prepare for work and get there. Thus, the shiftworker does not have free time when most social activities are available: when

children are home and awake, businesses and recreational facilities are open, organizational meetings occur, sporting activities are scheduled, and eating and drinking facilities are open. Out of phase with the rest of the community in this cycle, the shiftworker becomes the deviant. Dunham suggests that this deviancy "costs" the shiftworker through adjustment problems in important non-physiological functions, including attitudes toward both home and work life.

Dunham notes that communities differ in their social rhythms, influenced by such factors as the percentage of shiftworkers in the community and the attitude of the community toward shift schedules. He hypothesizes that communities with shiftwork as the norm would be more likely to be viewed favourably by the shiftworker than those with daywork as the norm. The implications of Dunham's community rhythms theory, therefore, is that employee responses to shift schedules will vary as a function of specific community rhythms. The highest incidence of shift-related problems are expected to occur in communities which are not adapted to the needs of the shiftworker.

3.4 Routine Formation

A second model which examines the fit between the temporal patterns of shiftwork and social rhythms is Jamal's (1981) theory of routine formation. Whereas Dunham (1977) stressed the relationship between shift schedules and community routines, Jamal's approach looks at the degree to which the shift schedule leads to the establishment of a daily routine for the individual.

According to this theory, adjustment is determined not only by synchrony with community patterns, but by the individual's general ability to form fixed and predictable patterns for work and non-work activities. Jamal claims that personal and family activities are facilitated through shift schedules which provide for predictable and regular time off. This model suggests that the time of day worked (days vs. afternoons vs. nights) may be less important than having a fixed work schedule (steady days, afternoons, or nights) in terms of shiftworker adjustment.

Jamal argues that high routine schedules enable employees to plan and fulfil family responsibilities, arrange consistent child care, take part in regularly scheduled social activities, and cope with physical and emotional fatigue. Individuals on variable and rotating shifts, on the other hand, experience a low degree of routine in everyday life and remain in a "constant changing and adapting mode" (Jamal, 1981, p. 536). By the time they have adjusted to one schedule, they are expected to move on to the next. Jamal hypothesizes, therefore, that shiftworkers on high routine-oriented work should view this work more favourably than low routine-oriented work, and should show beneficial outcomes in both work and non-work domains.

3.5 Frame of Reference

Research on the effects of non-standard work arrangements typically seeks to identify traits, attitudes and behaviours that will distinguish employees who work alternative schedules from those who work a "normal" day (Morrow, McElroy and Elliott, 1994). Employees on non-standard schedules, however, fail to conform to any predictable pattern,

and can vary greatly in their work attitudes (Ibid.). The frame of reference model is one that has been employed to conceptualize the work-related attitudes and orientations of employees with alternative work arrangements, usually in the context of part-time schedules (Miller and Terborg, 1979; Rotchford and Roberts, 1982; Feldman, 1990). As a framework for studying orientations toward work scheduling, this model has equal relevance to shiftwork.

The frame of reference theory suggests that workers compare themselves to other employees in the organization when judging the fairness of the rewards they receive as employees (Miller and Terborg, 1979; Rotchford and Roberts, 1982; Feldman, 1990). This perceived "equity" is hypothesized to influence workers' levels of satisfaction, commitment and other work-related attitudes (Feldman, 1990). A theoretical question arises, however, as to whether employees on non-standard schedules actually compare themselves to workers on "normal" schedules, as might be assumed. Feldman and Doerpinghaus (1992), for example, suggest that employees on part-time schedules may use other part-timers, not the full-time staff, as their referent others, and hence, have better work attitudes than might be expected. On the other hand, these authors suggest that part-timers who work a large number of hours per week may tend to use full-time staff as referents, due to the increased contact they have with them. Employees with greater contact with full-time staff, therefore, may hold less favourable work attitudes, particularly if the full-timers are perceived as having better work conditions.

In terms of shiftwork, this model suggests that employees on non-day schedules may not see "normal" dayworkers as their referent others. Their work orientations may be tempered to some degree by the belief that shiftwork "comes with the job"; hence other

shiftworkers logically represent the standard by which equity is judged. Moreover, if the extent of exposure to employees on "normal" schedules is a factor in whether or not "normal" employees are used as referents, shiftworkers would be even less likely than, say, part-timers to view those on normal schedules as comparative others. Shiftworkers on permanent nights or afternoons may in fact seldom encounter the day staff. This theory implies, then, that caution should be exercised in comparing the work attitudes of shiftworkers to those of dayworkers. The determinants of attitudes like job satisfaction and commitment may be different for shiftworkers than for dayworkers.

3.6 Discrepancy Theory

Another way of conceptualizing differential responses to work schedule characteristics has been suggested by Morrow, McElroy and Elliott (1994). These authors suggest that the discrepancy model of job satisfaction advanced by Lawler (1973) and Locke (1969) might also serve to clarify how work scheduling affects work-related attitudes. The discrepancy model asserts that when employees realize desired levels of personally important job outcomes, they will show high levels of job satisfaction. In terms of scheduling, then, employees who achieve a match between their preferred and actual schedule are more likely to be satisfied with their jobs. This model is important to the study of shiftwork in that it introduces schedule preference and schedule control as intervening variables between shift and work-related attitudes.

3.7 Relevance of Theory to the Study of Shiftwork and Family

The preceding summary indicates that considerable groundwork has been laid that may provide a useful framework for examining shiftwork in the context of work and family.

Theories advanced by Mott et al. (1965), Colquhoun and Rutenfranz (1980), and Monk (1988) view shiftwork from an interactive, ecological perspective. These models underscore the importance of moving beyond the physiological effects of non-day shifts to consider the contribution of psychological, social, and situational influences on shiftwork response. An examination of shiftworkers' ability to balance work and family is consistent with these perspectives, since family responsibilities might be considered one of the more relevant "social" influences operating on shiftworkers today.

In addition, the ecological perspectives point to the need for a closer examination of shiftworkers in terms of such variables as gender and work environment. Research has shown that both of these factors can contribute to work attitudes and the ability to balance work and family (Bohle and Tilley, 1989; Cervinka, 1993; Duxbury et al., 1991; Frese and Semmer, 1986; Higgins, Duxbury and Lee, 1992; Peterson, 1985; Shamir, 1983), and hence, might introduce gender- or job-specific factors into the model. For example, Mott et al.'s model would suggest that different contingencies might be in effect for men versus women, both in terms of psychological pressures (stress, work-family conflict), and social factors (time spent in child care, household duties, etc.). Similarly, the work environment might introduce situational factors (work stress, work conflict) linked to characteristics of the job.

Dunham's and Jamal's social rhythms theories point to the need to control for variation in the temporal patterning of shift scheduling. These models are time-based,

explaining worker response to shift scheduling in terms of his or her need for synchrony between work schedules and organized or personal activities. Social rhythms theories suggest that shiftwork response can be studied more meaningfully when shifts are defined in ways that are sensitive to the rhythms of social and family life.

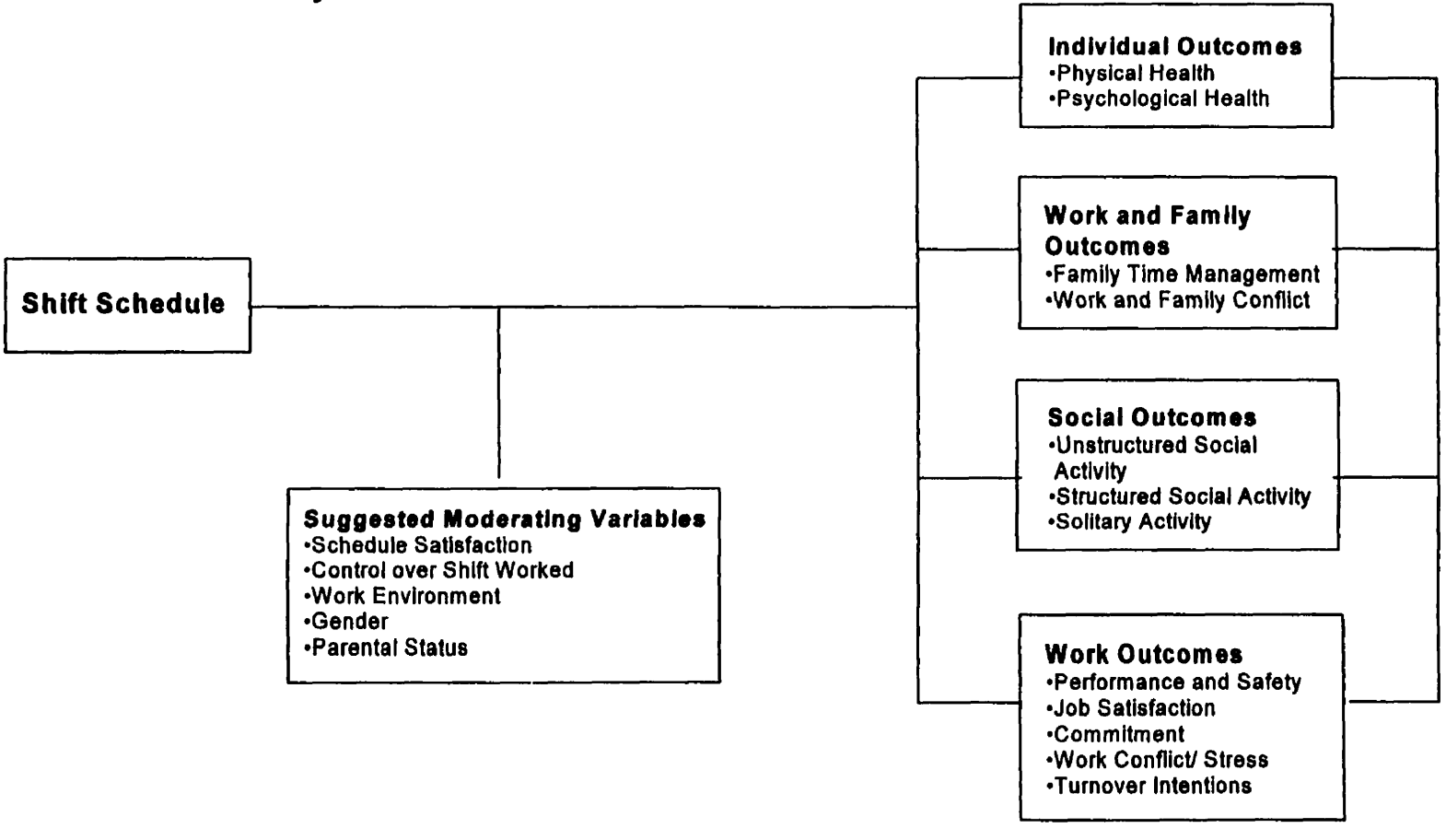
The last two theories, "frame of reference" and "discrepancy", have implications for the study of employees' work orientations, such as job satisfaction and commitment. Both models introduce psychological factors (frame of reference, perceived equity, and congruence between preferred and realized job outcomes) as variables that may moderate the relationships between shift and work attitudes. These theories imply that it may not be appropriate to study work attitudes in isolation from the personal situations and preferences of employees. The extent to which employees' non-work needs are satisfied may also contribute to their work orientations. The link between work attitudes and personal preferences suggested in these models provides further justification for studying shiftwork in a work-family context.

All of the frameworks discussed portray shiftwork response as a complex phenomenon, with many potential determinants. They illustrate how experiences in the home and work domains have the potential to interact. The models studied are also consistent in suggesting that the extent to which shiftwork is viewed as satisfactory or unsatisfactory can be mediated by personal and psychological factors which may be unique to the individual employee. In combination, these theories suggest that the interface between home and work life may be the appropriate starting point for a better understanding of employee response to shiftwork.

3.8 A Composite Model of Shiftwork and Family Life

The model presented in Figure 1 provides a basis for conceptualizing the relationships between shiftwork and aspects of personal, family, and social life. This model pulls together the theories presented in this section, and identifies individual, social, work-family, and work-related variables relevant to the study of shiftwork and family life. It also identifies some of the personal and work-related variables thought to moderate the effects of shiftwork.

Figure 1: Composite Model of the Ways in Which Shiftwork May Affect Work and Family Life



4. LITERATURE REVIEW

4.1 Overview

As the theoretical frameworks discussed in the previous section illustrate, the possible effects of non-day schedules on individual functioning are far-reaching. The scope of variables that have been examined in relation to shiftwork is vast. Not all outcomes have received equal attention, however. Some immediate individual effects, notably health and performance, have a long research history, with some studies in this area dating to the first quarter of this century (for a review of this early literature, see Mott et al., 1965). It is only within the last 30 years or so that attention has shifted to include some of the social, psychological, and work-related consequences of non-day shifts. It is this latter category of variables that will be the primary focus of this summary.

The literature in this review is presented in four sections. Section 4.2 summarizes the literature on the individual effects of shiftwork, including outcomes in physical and psychological health. Section 4.3 reviews literature on the effects of shiftwork on work-family balance, such as family time management, work-family conflict and role overload. Section 4.4 presents literature on the effects of shiftwork on an employee's social life and solitary activities. In Section 4.5, attention is directed to work outcomes associated with shiftwork, including job satisfaction and commitment, and effects on turnover, performance and safety. Section 4.6 provides a discussion of some of the factors thought to moderate the consequences of shiftwork, such as schedule satisfaction and preference, perceived control,

work characteristics, and gender. Section 4.7 concludes the review with a critique of the shiftwork literature.

It should be noted that the information available from this body of literature was limited by a lack of consistency in the research designs that have typically been used to investigate shiftwork. A preliminary review of the literature identified four approaches to studying shiftwork effects. These approaches included:

1) studying only rotating shiftworkers, and comparing measures collected at different times of day (i.e., collecting data from the day shift, and comparing them to data collected later from workers on the night rotation);

2) creating a day/ non-day dichotomy (i.e., comparing measures for employees who work days only to those for employees who work any other schedule, including fixed non-days, rotating, etc.);

3) creating a fixed/ rotating dichotomy (i.e., comparing measures for employees who work a fixed shift at any time of day, such as straight days, straight afternoons, straight nights, to measures for employees who work a rotating schedule);

4) doing a four-group comparison among employees on fixed days, fixed afternoons, fixed nights, and rotating schedules.

The fact that shift categories had been empirically conceptualized in such a variety of ways made direct comparisons between studies difficult, if not impossible. In addition, it was difficult to interpret the findings in a work-family context due to the composite nature of the study groups. As discussed in Section 2.2, designs in which shift arrangements are lumped together to create dichotomies can be particularly problematic, especially when the combined shifts in fact span different time periods (e.g., combining fixed afternoons with fixed days), or ignore other important rhythmic characteristics of the schedule (e.g., combining fixed non-day schedules with rotating schedules to create a "non-day" category).

The use of such "hybrid" categories often blurred temporal distinctions that were needed in order to draw inferences about the impact of shiftwork on family life.

In order to overcome such problems, the study groups employed in this research were designed so as to remain sensitive to both the time of day worked and the temporal patterning of shifts (see Section 6.1 for a detailed description of the shift categories used for the purposes of this research).

4.2 Individual Effects of Shiftwork

The following section examines literature on the relationships between shiftwork and physical and psychological health.

4.2.1 Physical Health

An extensive literature exists on the effects of shiftwork on physiological functioning. More than three decades of research have established fairly clearly that human beings function according to diurnal rhythms that cycle every 24-25 hours, and that these rhythms are disrupted by non-day shifts (Simon, 1990). Although much of this material is beyond the scope of a study of shiftwork and family, a discussion of the effects of shiftwork on individuals would be incomplete without at least some consideration of the health consequences of non-day shifts. Interference with these basic biological rhythms may be one of the fundamental causes of shiftworker problems and, arguably, is the foundation for social and domestic consequences (Monk and Folkard, 1992).

Sleep disturbances are perhaps the primary physical complaint of shiftworkers, stemming both from endogenous sources (the worker's internal circadian clock) and

exogenous factors (noise and daylight, etc.) (Ibid.). As many as 60 to 70% of shiftworkers complain of sleep disruption (Rutenfranz, Haider and Koller, 1985). Non-day shifts have been associated with both poor sleep quality and reductions in sleep time (Cunningham, 1989; Frese and Semmer, 1986; Mott et al., 1965; Smith, Colligan and Tasto, 1982; Smith and Folkard, 1993b; Tilley et al., 1982). Recent evidence suggests that sleep disturbances are linked to particular temporal characteristics of the shift and can be more severe for: (1) employees who work a greater number of hours per shift (Williamson, Gower and Clarke, 1994); (2) those who have a high incidence of night shifts in their rotations (Cervinka, 1993); or (3) employees whose shifts rotate in a counter clockwise direction (nights to afternoons to days) (Monk and Folkard, 1992). All of these schedule characteristics are reported to interfere with the body's ability to "phase adjust" to a new pattern (Ibid.).

Although, to date, much of the research on physiological responses to rotation characteristics is inconclusive, the literature is unequivocal that the worst speed for a shift rotation is the weekly rotation (Akerstedt, Patkai and Dahlgren, 1977; Akerstedt and Torsvall, 1978; Czeisler, Moore-Ede and Coleman, 1982; Rutenfranz et al., 1977; Smith, 1979). Schedules that require employees to rotate after four to seven shifts are too rapid to allow for reorientation, but slow enough to create a sleep deficit (Monk and Folkard, 1992). It is believed that either slower or more rapid rotations are preferable (Ibid.).

Digestion is another rhythmic physiological function that can be subject to disruption under altered shift schedules. Mott et al. (1965) found that 75% of rotating shiftworkers reported at least some disturbance in appetite and digestion. Digestive disruptions are

particularly pronounced for night and rotating workers (Mott et al., 1965; Rutenfranz et al., 1977; Wyatt and Marriott, 1953). There is evidence that digestion problems can be significantly reduced, even among rotators, by eliminating the night shift from the rotations (Akerstedt and Torsvall, 1978).

Whereas the evidence is fairly conclusive that shiftwork interferes with these two basic physiological functions, the extent of individual impairment may vary (Akerstedt and Torsvall, 1981; Mott et al., 1965; Monk and Folkard, 1992). Ultimately, interindividual variability in adaptation may account for whether or not basic physiological disruptions in sleep and digestion set the stage for chronic ailments, such as ulcers, cardiovascular problems, or psychiatric illness (Monk and Folkard, 1992; Mott et al., 1965). The theoretical frameworks presented in Section 3 suggest that it may not be the shift per se that leads to chronic health problems, but the combination of physical and psychological stress that results from an inability to adapt.

4.2.2 Psychological Health

There is substantial evidence that working a non-day shift is associated with problems in psychological functioning (Akerstedt and Torsvall, 1978; Bohle and Tilley, 1989; Frese and Semmer, 1986; Frost and Jamal, 1979; Smith et al., 1982; Smith and Folkard, 1993b; Zedeck et al., 1983). Shiftwork has been connected to increases in tension, stress, psychological depression, irascibility, and a host of other psychological outcomes. Among studies of rotating shiftworkers, stress has been found to be highest on the midnight shift and lowest on days (Smith and Folkard, 1993b). Similarly, Zedeck et al. (1983) found that tension, irascibility and lack of enthusiasm was greatest for rotators on the midnight shift,

and lowest on the day shift. Bohle and Tilley (1989) reported that stress was significantly greater for 3-shift rotators than for 2-shift rotators who worked no midnights. Akerstedt and Torsvall (1978) found that eliminating midnights from rotations led to significant improvement in mood.

Studies that compare dayworkers to those on shift schedules indicate that mental health is generally better for workers on day schedules. Psychological stress has been reported to be lower for dayworkers than for employees who work rotating 12- or 8-hour shifts (Frese and Semmer, 1986) or employees who work fixed afternoons or midnights (Frost and Jamal, 1979). Smith et al. (1982) found significantly higher depression and anger in afternoon workers, as compared to dayworkers; however, night and rotating workers did not differ significantly from dayworkers on the same measures.

Evidence also suggests that a fixed schedule, regardless of time of day, is more advantageous in terms of mental health than a rotating schedule. Jamal (1981) and Jamal and Jamal (1982) created a dichotomy to compare employees on fixed schedules (including fixed days, fixed afternoons and fixed nights) to those on rotating schedules and found better mental health and lower depression for the fixed schedule group. Barton et al. (1993) also reported lower psychological stress among employees on fixed night shifts when compared to employees on rotating schedules.

Only one study has failed to find a relationship between shift and psychological health. Mott et al. (1965) found no differences in the level of anxiety reported by workers on four shift schedules: fixed day, fixed afternoon, fixed night, or rotating shifts. The authors attributed this result to an unusually high rate of anxiety among employees on the

day shift (employees on the day shift had to work weekends, and many of the dayworkers had transferred off of another shift due to an inability to cope).

There are a number of other reasons, however, why this study may have generated results that contradict other findings. First, three of the four factories surveyed were in rural areas. More recent research suggests that community support may be unusually high for shiftworkers in such settings (Dunham, 1977), thus minimizing stress for the non-day samples. Methodological differences between this study and more recent research, particularly in the measurement scales employed, might also have rendered these findings incomparable. Finally, this was one of the earlier studies of psychological outcomes, conducted in the '60s when norms were quite different from what they are today. Clearer role definitions prevailing in the '60s for breadwinning men and stay-at-home wives imply a different generation was being tapped (the large majority of the respondents had wives at home full time to see to the needs of the family).

4.3 Work and Family Outcomes

Individuals who have difficulty balancing their work with their home lives may experience problems in two major areas. First, they may have difficulties in time management and find it hard to work out the logistics of family life or to make time for family activities and responsibilities (Bohen and Viveros-Long, 1981).

Second, they may perceive high levels of work-family conflict, defined by Kahn et al. (1964), as a form of interrole conflict in which the pressures from the work and family domains are mutually incompatible in some respect. Kahn identifies two components of

work-family conflict. Role overload exists when the total demands on time and energy associated with the prescribed activities of multiple roles are too great to perform the roles adequately or comfortably. Role interference occurs when conflicting demands make it more difficult to fulfil the requirements of multiple roles.

Shiftwork clearly has the potential to generate conflict from both sources. Directly, it dictates the time available for family; indirectly, the physiological and psychological stresses associated with non-day shifts might lead to substantial negative carryover to family life.

The following section of the review summarizes the shiftwork literature on family time management and work-family conflict.

4.3.1 Family Time Management and Family Relationships

Although there is consistent evidence that shiftworkers report difficulty in participating in family activities (Hertz and Charlton, 1989; Knuttson, 1986; Mott et al., 1965; Tasto et al., 1978), much of this research has been limited by the use of shift categories that have not always been sensitive to the temporal patterns of family life. A separate body of the work-family literature suggests that the specific time of day worked can impede or facilitate family interactions (Nock and Kingston, 1984; Nock and Kingston, 1988; Kingston and Nock, 1985).

Nock and Kingston (1988) suggest that the degree to which work interferes with family roles is determined in part by the worker's gender, and in part by the particular time of day the worker is unavailable to the family. These authors determined that absence during the late afternoon and early evening interfered more with a mother's time with her children

than it did with a fathers's. This research indicated that for every hour worked during this after-school "window", women lost an estimated 42 minutes with their children. Men who worked during this period lost 30 minutes. These findings imply that workers on afternoon shifts (which by definition span most or all of the after-school hours) will experience greater interference in their roles as parents than workers on other shifts. In addition, the research suggests that women on afternoons may experience more interference than will men.

The only two shiftwork studies which have isolated afternoon workers from those on other fixed schedules (Mott et al., 1965; Tasto et al., 1978) tend to support the hypothesis that afternoon work interferes with parenting. These studies indicated that workers on afternoon shifts did in fact report more interference with parental activities than workers on other shifts. Unfortunately, these findings are somewhat dated, and gender effects were not addressed.

Night work, on the other hand, has been associated with disruption in marital relationships (Knutsson, 1986; Mott et al., 1965; Tepas, 1985; Tasto et al., 1978). Time alone after the children have gone to bed can be valued highly by many couples, and late night and graveyard shifts can cut into this time together (Mott et al., 1965). Mott et al. (1965) and Tasto et al. (1978) found that workers on night shifts and rotating shifts experienced greater disruption in the spousal role, including interference with time for relaxation and sexual activities. Knutsson (1986) and Tepas (1985) reported significantly increased divorce rates for night shiftworkers as compared to dayworkers. Only one study (Staines and Pleck, 1983) revealed no significant relationship between marital satisfaction and non-day shifts. It is difficult to interpret Staines and Pleck's findings, however, since the

category "non-day shifts" included both night and afternoon workers (afternoon workers may still have time available in the late evening to spend with a spouse).

A small but interesting branch of the shiftwork literature has sought to substantiate the purported ill effects of shiftwork through interviews with the partners of shiftworkers (Hertz and Charlton, 1989; Mott et al., 1965; Smith and Folkard, 1993a). These studies support the contention that shiftwork can have a significant detrimental effect on family relationships. Mott et al. (1965) found that wives of night and rotating shiftworkers experienced difficulty in providing emotional support to their husbands. Wives of night workers reported interference with sexual relations. Unlike their husbands, however, wives of shiftworkers did not experience interference with their own roles as parents.

It is important to note that wives in this early study were primarily full-time homemakers with ample time for interacting with children. More recent research involving samples of both traditional and dual-income couples suggests that the wives of shiftworkers do in fact experience difficulty both in their roles as parents and as spouses. Smith and Folkard (1993a) found that 50 to 70% of the wives of rotating shiftworkers reported increased child care responsibilities and disrupted contact with their children. Conflict with their partners and disruption to intimate relationships was also significantly higher for the partners of shiftworkers.

Qualitative data collected by Hertz and Charlton (1989) also revealed substantial interference with parenting among wives of rotating shiftworkers, including difficulty synchronizing children's activities with their spouse's work schedule. Many wives in this

study reported that they had to make sacrifices to find time for leisure and intimacy with their spouses.

4.3.2 Work-Family Conflict and Role Overload

The effects of shiftwork on specific aspects of personal and family life (e.g., parenting, spousal role) reported in the preceding sections suggest that shiftworkers might encounter substantial conflict between their work and family roles. Only three studies were identified, however, which employed either a global or composite index to access perceptions of interrole conflict.

Using a measure of role overload, Jamal and Baba (1992) reported that nurses on 3-shift rotations reported greater overload between their work and non-work lives than those on 2-shift rotations or fixed shifts. Work by Shamir (1983) and Bohle and Tilley (1989) indicated that work-family conflict was significantly higher for afternoon workers, as compared to workers on either days or other non-day shifts, and that work-family conflict was a good predictor of psychological symptoms for afternoon workers. Since late afternoon and early evening hours are times typically reserved for family and social interaction, it makes sense that afternoon shifts should generate greater perceptions of conflict. These two latter studies are also consistent with the previously cited work by Nock and Kingston (1988), Mott et al. (1965), and Tasto et al. (1978) which concluded that afternoon shifts were most disruptive to family activities, particularly the parenting role.

4.4 Social Outcomes

Investigators of the effects of shiftwork on social life typically divide social activities into two categories: structured social activities, such as club membership, charitable work, or community involvement; and unstructured social activities, such as visiting with friends and relatives. This review will examine these two categories separately, and discuss a third related category, solitary activity.

4.4.1 Structured Social Activities

The evidence is fairly consistent that non-day shifts interfere with participation in structured social activities (Akerstedt and Torsvall, 1978; Frost and Jamal, 1982; Jamal, 1981; 1989; Mott et al., 1965). Shiftworkers reduce their organizational participation, presumably because of the irregularity with which they are able to attend functions (Pierce et al., 1989). Mott et al. (1965) found that night, afternoon, and rotating shiftworkers reported a significantly lower number of organizational memberships than dayworkers. Frost and Jamal (1982), using a combined category of fixed non-day and rotating workers, also found fewer hours in formal activities among shiftworkers as compared to dayworkers. In their longitudinal study of schedule changes, Akerstedt and Torsvall (1978) reported that time for clubs and hobbies increased when the night shift was eliminated from employees' schedules.

Work by Jamal (1981; 1989) suggests that having stable, predictable hours, regardless of time of day, may facilitate involvement in organized activities. These studies indicated that workers on fixed schedules had higher organizational participation rates than rotators. Again, the two-group design is somewhat difficult to interpret, since a large number

of regular 9 to 5 workers were included in the "fixed shift" category. Since dayworkers have a high rate of organizational participation, their inclusion may have inflated the organizational participation rate for the fixed category (i.e., the "fixed shift" subsample is confounded by the inclusion of dayworkers who are not "shiftworkers" at all). It seems likely that having regular daywork (with evening hours available for activities) may have contributed more to the higher level of community involvement in the fixed shift category than having predictable hours per se.

4.4.2 Unstructured Social Activities

Time available to spend with friends may be considerably more flexible than time for organized activity. Friendships might also be established with coworkers on similar schedules. It might be expected, therefore, that informal social time would be less affected by shiftwork than structured social activities.

The few studies which have examined time with friends have been contradictory and provide little support for this hypothesis. Mott et al. (1965) reported no differences between the day shift and other shifts in the frequency of visitations with friends for workers under 40; workers over 40 years of age, however, visited friends less frequently than did their cohorts on the day shift. The authors concluded that reduced contact with friends was a function of the workers' changing interests as they grew older, and that time spent in social activities was more affected by age than work schedule.

When comparing workers on fixed shifts to those on rotating schedules, Jamal (1982) found that rotating shiftworkers in a manufacturing sample spent less time with friends. In the same study, however, they found no difference in time spent with friends for a separate

nursing sample. Although the authors did not attempt to account for the conflicting findings, it may be that socialization with friends was more related to gender than shift, as the nurse sample was primarily female, while the manufacturing sample was majority male. Although any conclusion would be premature, Mott et al.'s and Jamal's work would suggest that personal and demographic factors may account for more of the variability in unstructured social time than shift.

4.4.3 Solitary Activities

One of the few purported benefits of shiftwork is its potential to increase an employee's opportunities to pursue hobbies, outdoor sports, gardening and other solitary or semi-solitary activities (Mott et al., 1965). To date, there is scant evidence to support this assumption. Although Mott et al. (1965) found that shiftworkers were significantly more likely than dayworkers to say that their schedules facilitated solitary pursuits, there was no indication of frequency or actual time spent in solitary activities so that a comparison could be made between workers on day and non-day shifts.

A measure of actual time spent in solitary activities was included in research by Jamal and Jamal (1982). This study found that rotating shiftworkers spent more time alone than those on fixed shifts. This information is limited, however, by the fact that there was no breakdown as to how this time was spent, (i.e., whether employees were engaging in pleasurable activities, or merely "killing time" because friends and family were not available).

It is difficult, therefore, to determine from these limited data whether shiftwork does in fact increase the amount of time spent in solitary pursuits, or if it does, whether time alone

is a desired end or an incidental outcome. Any increase in solitary activity may simply reflect difficulty in arranging more desired social interactions. As expressed by Dunham (1977), "Solitary activities may not be a desired result of shiftwork but merely a poor substitute for ... more highly desired activities" (p. 627).

4.5 Work Outcomes

It has been suggested that the incompatibility between shiftwork schedules and opportunities for non-work activities can adversely affect employees' attitudes toward their jobs (Dunham, 1977; Frost and Jamal, 1979; Jamal, 1981). It is also possible that schedules that generate fatigue or other somatic complaints may contribute to unfavourable work orientations, or, ultimately, lead to increased absences or turnover intentions (Pierce et al., 1989). Worker health and safety may also be jeopardized if sleep loss impairs performance (Monk and Folkard, 1992).

This section reviews the literature on the relationships between shiftwork and various work outcomes, such as job satisfaction, organizational commitment, work conflict, and turnover intentions. Although performance and safety data were not collected for the purposes of this research, literature on these variables is also briefly reviewed here in the interest of completeness.

4.5.1 Performance and Safety

One might expect that having to attend to tasks in the middle of the night, sometimes with insufficient sleep, would compromise a worker's safety and job performance. Shiftworkers may become agents of risk not only because they are sleepy, but also as a result

of mood changes and simple performance decrements which tend to follow circadian patterns (Monk and Folkard, 1992). Case studies (Ehret, 1981; Price and Holley, 1980) which have traced disasters like Three Mile Island to human error illustrate some of the worst-case scenarios that can evolve when the performance of weary shiftworkers deteriorates. Evaluating the safety risks associated with impaired performance, therefore, is especially important given the preponderance of shiftworkers who are responsible for essential services.

Although not all shiftworkers are in occupations where performance declines imply risk, regularly impaired performance on night shifts may interfere with overall productivity and the work of colleagues who count on the output of affected employees. Monk and Folkard (1992) review six studies which show clear decrements in performance as a function of time of day worked. Two measured speed of performance (Browne, 1949; Wojtczak-Jaroszowa and Pawlowska-Skyba, 1967); one measured accuracy (Bjerner and Swensson, 1953); and the remainder examined the consequences of lapses in attention or vigilance (Folkard, Monk and Lobban, 1978; Hildebrandt, Rohmert and Rutenfranz, 1974; Prokop and Prokop, 1955). All were in agreement showing performance to be worse during the night and early morning hours. Although such research strongly suggests that performance is impaired via interference with normal circadian rhythms, the mechanism is not likely this direct. Monk and Folkard (1992) caution that there are many factors other than time of day which may explain intershift task performance differences, such as differences in lighting, levels of supervision, group morale, and distractions. In addition, poor performance may occur simply because there is insufficient support in place for the night shift (e.g., no technicians on hand to repair equipment) (Ibid.).

4.5.2 Job Satisfaction

Because the temporal component of shiftwork is so salient a feature of the job, it is sometimes difficult to examine job satisfaction independently of schedule satisfaction. In fact, some authors have tended to equate the two concepts by discussing such ambiguous notions as "satisfaction with shiftwork" (Dunham, 1977), or making inferences about job satisfaction from items addressing scheduling (Weiss and Liss, 1988). In this review, job satisfaction will be considered a multifaceted construct encompassing such factors as the nature and variety of the work, the pay level, and the number of hours required. Although for shiftworkers, schedule satisfaction likely exerts a strong influence on work attitudes, it represents but one aspect of job satisfaction. The construct "schedule satisfaction" will be considered separately in Section 4.6.1 of this review as a potential moderator of the effects of shiftwork.

Research on the relationship between shiftwork and job satisfaction has yielded mixed results, due largely to a lack of comparability between study groups employed. Kundi et al. (1980) compared dayworkers to rotating workers and reported significantly lower job satisfaction for the shiftworking group. Using the "fixed" versus "rotating" dimension, Jamal (1981; 1989) and Jamal and Baba (1992) found lower job satisfaction among nurses on rotating schedules as compared to those with fixed schedules, but were unable to replicate this finding in a manufacturing sample (Jamal, 1981). Dirkx (1993) studied nurses on fixed midnights and found no differences in satisfaction levels when comparing employees on slow vs. swift alternations between nights on duty and time off (i.e., many nights on versus only a few nights on before rest days). Peterson (1985) found no differences in a three-group

comparison of job satisfaction among workers on fixed days, afternoons and nights (i.e., found no shift effects when schedules were fixed). Unfortunately, it is difficult to compare Peterson's results to the findings of the other four studies, since he did not include a sample of employees on rotating shifts.

Three studies, on the other hand, have examined job satisfaction among rotating shiftworkers, but had no comparison groups from employees on other shifts. Cunningham (1989) and Williamson, Gower and Clarke (1994) found no difference in job satisfaction between rotating 12-hour shiftworkers and those on rotating 8-hour shifts. Cervinka (1994) found no difference in satisfaction between rotating shiftworkers with a high exposure to night shifts and those with a lower "night shift dose".

Although it is difficult to draw conclusions from such varied approaches to the study of job satisfaction, two general patterns might be observed: (1) there appears to be a lower level of job satisfaction associated with rotating shifts as compared to fixed schedules; and (2) variations in the temporal components of the rotations (shift duration, speed of rotation, etc.) seem to have little effect on job satisfaction. A possible explanation for such observations is that having to work a rotating schedule at all has such a deleterious effect on job satisfaction that minor alterations in characteristics of the rotation do little to improve work attitudes. Such conclusions are premature, however, without more empirical evidence to demonstrate that rotators are in fact less satisfied than workers on other shifts.

4.5.3 Commitment

A committed employee is one who is loyal and willing to exert extra effort on behalf of the organization (Mowday, Steers and Porter, 1979). Organizational commitment has

received very little attention as a dependent variable in the context of shiftwork. Exceptions are Jamal (1981; 1989) and Jamal and Baba (1992) who reported lower commitment among rotating shiftworkers as compared to workers on fixed schedules.

4.5.4 Work Conflict and Stress

Work role conflict can take the form of incompatibility between work demands and one's values, interpersonal conflicts, or conflict between too numerous or too difficult tasks (Rizzo, House and Lirtzman, 1970). Work conflict may be related to shiftwork in a number of ways. It has been suggested that shiftwork may increase conflict under circumstances where non-day workers are offered less interesting tasks, have access to fewer resources, or are stigmatized by others in the organization as holding positions of "low prestige" (Finn, 1981). Conversely, non-day shifts might reduce work conflict for employees, especially for those on the graveyard shift where there can be a strong esprit de corps, small work crews, and relative peace and quiet (Ibid.). Some shiftworkers may also appreciate being "invisible" to upper management who typically are not around on the night shift (Ibid.).

Evidence of relationships between work conflict and shift is scant and inconclusive. Jamal and Baba (1992) found higher levels of job stress, work role overload and role ambiguity among rotating shiftworkers than among workers on fixed shifts. Cunningham (1989), looking only at rotating shiftworkers, reported no difference in job tension between workers on 12-hour shifts and those on 8-hour shifts. Peterson (1985) using a composite measure of work role integration, tension, and intergroup (peer and supervisor) tension, concluded that shift explained very little variance in work conflict scores. His findings indicated that the specific worksite was a better predictor of work conflict than the shift

itself. Peterson's conclusions are supported by work by Frese and Semmer (1986) and Cervinka (1993) who argue that relationships between job stress, ill health, and specific characteristics of the work environment hold irrespective of shift (See section 4.6.3).

4.5.5 Turnover

If shiftwork has negative consequences for employees, then one might expect a greater desire to leave the organization or to switch jobs. The connections between shiftwork and turnover remain unclear. Frost and Jamal (1979), Jamal (1981), and Jamal and Baba (1992) reported lower intent to turn over among samples of nurses and blue collar workers on fixed shifts, as compared to rotators. Cunningham (1989) and Williamson et al. (1994) found no change in actual turnover rates when workers on rotating 8-hour rosters were compared with those on 12-hour rotations. Zedeck et al. (1983) found turnover intention to be correlated with job dissatisfaction, unhappiness with the work environment, poor mood, and interference with non-work activities. Zedeck et al. concluded that these factors may contribute more to turnover intentions than the shift schedule itself.

4.6 Moderating Variables Reported to Affect Individual, Work-Family, and Organizational Outcomes

Much of the shiftwork literature has focused on the identification of attitudes and behaviours presumed to be products of shift schedules. In some instances (for example, sleep and digestion), relationships between problems and time of day worked seem consistent and direct. Many other outcomes in personal and work life, however, show no clear patterns. A growing trend in shiftwork research is to look for variables other than shift

system characteristics that might account for employee responses. The following review provides a brief list of some of the factors thought to moderate the consequences of shiftwork, including schedule satisfaction, perceived control, work environment characteristics, gender, and parental status.

4.6.1 Schedule Satisfaction

As mentioned in Section 4.5.2, work attitudes can be influenced by employees' satisfaction with the scheduling of work time. Shift schedules may be attractive to some employees for personal or family reasons; others may work shift simply because there is no available alternative. The extent to which hours of work mesh with individual preferences and needs is likely to influence both employee work attitudes and the level of disruption experienced in personal life. For such reasons, "satisfaction with shift schedule" has occasionally been used instead of shift as a predictor of work and non-work outcomes (Mott et al., 1965; Morrow et al. 1994; Zedeck et al., 1983)

Zedeck et al. (1983) found that rotating workers who were satisfied with their work schedules had fewer work absences, higher job satisfaction, better mood and sleep habits, and were more satisfied with time for family and social life than workers who were not satisfied. Morrow et al. (1994) found a significant overall effect of shift preference on a set of work attitudes, including job satisfaction, commitment, and intent to stay. On the other hand, Mott et al. (1965) found that intershift differences in family satisfaction held irrespective of desire to change shifts (i.e., shiftworkers who were satisfied with their shift still reported higher interference with family than dayworkers). It appears that the evidence

is mixed as to whether schedule satisfaction moderates the personal and work-related effects of non-day shifts.

4.6.2 Control

The freedom to make decisions and exercise discretion over work demands has been shown to be related to reduced strain and increased job satisfaction (Karasek, 1979). Application of Karasek's work to the study of shiftwork would suggest that input into the sequencing or timing of shifts might reduce strain for employees, as it would allow them some flexibility to tailor their work hours to their non-work lives or to organize their home lives to accommodate their unusual work hours. The assumption that schedule control might moderate the adverse effects of shiftwork is also consistent with work by Jamal and Baba (1992) and Mott et al. (1965) who found higher schedule satisfaction among workers on fixed schedules, as compared to those on rotating shifts. Although not explicitly tested in these studies, it might be argued that such predictable schedules increase schedule satisfaction by enhancing employees' perceived control over their work and non-work lives.

Only two studies were identified that directly measured shiftworkers' perceived control over work hours (Barton et al., 1993; Voydanoff, 1988). Barton and Folkard (1991), surprised at a finding which showed no difference in schedule satisfaction between day nurses and night nurses, identified schedule control as a factor that may have moderated the nurses' attitudes toward their shifts (all nurses in the study had been given their choice of schedules when hired). The authors also suspected that schedule control accounted for their failure to find differences in absence rates, or in sleep or social problems between the two shifts. In a subsequent study, therefore, the authors addressed control directly and found that

having control over work hours, either through choosing a fixed schedule or through a system of flexible rostering, significantly reduced social, domestic and health-related problems (Barton et al., 1993).

Voydanoff (1988) examined the relationship between work-family conflict and control and found that control over work hours buffered the effect of working a non-day shift (working a non-day shift was related to increased work-family conflict only for those with low schedule control).

4.6.3 Work Environment

Specific differences in the work environments encountered by shiftworkers may also account for some of the conflicting results reported in the literature. A host of differences may exist between the work settings encountered by day and non-day workers, including differences in: the levels of supervision, communication, and technical support; the quality of relationships with coworkers; the nature of task assignments; and differences in noise levels, performance expectations, and other environmental and psychological stressors (Finn, 1981; Monk and Folkard, 1992; Simon, 1990). In turn, these work context differences may have a variety of outcomes in terms of work attitudes, work-family balance, health, and well-being.

Studies on the effects of work environment on shiftworkers have been few and somewhat divergent in focus (Bohle and Tilley, 1989; Cervinka, 1993; Frese and Semmer, 1986; Peterson, 1985; Shamir, 1983). The available evidence suggests that characteristics of the work environment may be better predictors of attitudes and behaviours than shift. In a study of work attitudes, Peterson (1985) addressed the issue by comparing the effect of

shift assignment to the effect of working for a particular organization. The best single predictor of work attitudes was the organization for which the employee worked. Shift assignment explained no more than 2% of the variance in work attitudes. Similarly, Shamir (1983), looking at work-nonwork conflict, found that work characteristics accounted for a greater proportion of the variance in conflict than did schedule characteristics. Cervinka (1993) and Frese and Semmer (1986) showed environmental stress factors at work to be good predictors of ill health independent of shiftwork. Finally, Bohle and Tilley (1989) looked at the relationship between social support at work and psychological stress, and found that supervisor support moderated the effect of nightwork.

Whereas it is difficult to draw conclusions from such diverse studies, the tendency for work-related variables to override shift schedules as predictors of work and non-work orientations highlights the need to control for specific work conditions in the study of shiftwork. As the type of work performed may contribute to differences in conflict and work orientations (if, for example, some jobs entail greater autonomy and flexibility than others), occupation may, therefore, be a potential confound that needs to be taken into account. As expressed by Bohle and Tilley (1989), "As work scheduling is superimposed upon many other qualities of the workplace that may affect health and well-being, control subjects who are doing the same job, but on a different work schedule, are vital" (p. 1091).

4.6.4 Gender

Although some men may be expressing interest in greater involvement in domestic life, research consistently shows that women continue to bear primary responsibility for household chores and child care (Duxbury et al., 1991; Higgins et al., 1992; Lero et al., 1993;

Nock and Kingston, 1985; 1988). In fact, employed women have been found to spend as much time in domestic chores as women who are at home full time (Nock and Kingston, 1988). Given these realities, it may be that women and men respond differently to the demands of shiftwork due to gender-specific demands from the home domain. The "second shift" (Hochschild, 1989) that may be imposed on women who return from their paid work to a full schedule of housework and child care may make the stress of shiftwork even greater for women. On the other hand, shiftwork may relieve women of some of their domestic responsibilities if it removes them from the home during hectic times, or if a spouse assumes household chores during their absence.

There has been little empirical research that has directly investigated gender-based responses to shiftwork (i.e., compared male shiftworkers to female shiftworkers in terms of work and family outcomes). Exceptions are Pleck and Staines (1985) and Voydanoff (1988), who found some interesting connections between gender and work-family conflict. These two studies found significant relationships between non-day shifts and increased work-family conflict, but only for men. Women on non-day shifts had conflict levels similar to those on day shifts. Pleck and Staines (1985) speculate that there may be an element of selection operating on women who work in jobs that generate high conflict with family responsibilities. The authors suggest that women with high work-family conflict may withdraw from the labour force or move to jobs more compatible with family life; men in high conflict jobs generally do not have the option to cease working. Pleck and Staines conclude that work-family conflict may be underestimated for female shiftworkers, as the population surveyed may include only those with satisfactory work-family adjustment.

Other inferences regarding gender effects may be drawn from some of the dual-income work schedule literature (Kingston and Nock, 1985; Nock and Kingston, 1984; 1988; Pleck and Staines, 1985; Staines, 1986). Pleck and Staines (1985) and Staines (1986) examined "crossover" effects (the effects of a husband's shiftwork on his wife, and the effects of a wife's shiftwork on her husband). They found that a spouse's non-day shifts increased work-family conflict only for men (i.e., a wife's non-day shift increased her husband's reported conflict, but a husband's non-day shift had no significant effect on the wife's conflict). The authors explained these findings in terms of gender-based differences in the division of labour. Their time use measures indicated that a wife's shiftwork increased her husband's time in childcare, thereby adding to his responsibilities. By comparison, when a husband worked a non-day shift, he increased his housework, thus taking over some of his wife's traditional family responsibility. A wife's conflict, therefore, was not significantly increased by her husband's shiftwork (Staines, 1986).

Kingston and Nock (1985) found significant gender differences in the division of labour and the allocation of time associated with the length of the "family work day" (a combined measure defined as the amount of time in which at least one spouse is at work). Longer family work days (i.e., instances where spouses work opposing shifts) increased pressures and domestic responsibilities only for women. For women, longer work days were associated with more time in chores, greater work-family interference, less time with spouse, and a sense of having less free time than needed. None of these outcomes were significant for men.

Although clear relationships between gender and shiftwork remain to be demonstrated, the work-schedule literature does lend support to the notion of a gender-based division of labour. It seems that wives may be responsible for family coordination irrespective of their spouse's work schedule or their own employment status (Charles and Brown, 1981; Hertz and Charlton, 1989; Nock and Kingston, 1988). It has been argued that societal norms may pose many problems for the female shiftworker (Gadbois, 1981, cited in Monk and Folkard, 1992). Nightwork in particular may allow women to meet the needs of children at the expense of their own well-being, since women can work nights without any challenge to the stereotyped roles within the family (Charles and Brown, 1981). Nightwork takes place without any fundamental transformation of the sexual division of labour (Ibid.). A closer examination of the effect of gender on response to shiftwork seems warranted.

4.6.5 Parental Status

Linked to the notion of gender and the division of family labour is parental status. Married workers without families may well have "family responsibilities", such as household chores, errands, and commitments to a spouse, but research shows that the perceived pressures from the home domain are lower for childless couples than for parents (Higgins et al., 1992).

Unfortunately, no shiftwork studies were identified which compared parents to non-parents on relevant work-family outcomes. Prevalence data reported by Statistics Canada, however, suggest that women with children tend not to work rotating shifts (Sunter, 1993; see also Section 2.5.3). This trend is consistent with a small study by Charles and Brown (1981) which showed that shiftworking mothers with young children tended to be

concentrated in part-time afternoon or fixed night schedules, and were in the minority in split or rotating shifts. Whether mothers deliberately avoid rotating shifts (or simply work other shifts by chance) has not been empirically demonstrated. The contribution of parental status to shiftwork response remains a largely unexplored area.

4.7 Critique of Shiftwork Literature

Although the preceding review reveals a vast, often ambitious, literature, the relationships between shiftwork and both work outcomes and the ability to balance work and family remain unclear. It is surprising, given that this line of inquiry has been active since the turn of the century, that so few conclusions can be drawn. There are several possible reasons that research on the work-family effects of shiftwork has remained in an "embryonic" stage.

First, the effects of shiftwork have seldom been studied under a work-family "template". Several useful scales have been developed over the past 15 years to access constructs associated with work orientations and the inability to balance work and family (see Section 6 for a description of the work-family scales used in this research). These measures seem very appropriate to a study of shiftwork, given its inherent potential to interfere with family life.

There is a paucity of research, however, that has applied these measures in a shiftwork context. Instead, shiftwork research seems to have evolved in tandem to the work-family approach to studying non-standard work arrangements. Early recognition of the adverse health effects of non-day shifts seems to have spawned and sustained a literature that

has traditionally focused on individual biological functioning (Akerstedt and Torsvall, 1978; Cunningham, 1989; Frese and Semmer, 1986; Mott et al., 1965; Rutenfranz et al., 1977; Smith, Colligan and Tasto, 1982; Smith and Folkard, 1993b; Tilley et al., 1982; Wyatt and Marriott, 1953), and the implications of impaired functioning for workplace safety and job performance (Bjerner and Swensson, 1953; Browne, 1949; Folkard, Monk and Lobban, 1978; Hildebrandt, Rohmert and Rutenfranz, 1974; Prokop and Prokop, 1955; Wojtczak-Jaroszowa and Pawlowska-Skyba, 1967). Psychological correlates of shiftwork strain, such as tension, depressed mood, and stress have also been well documented (Akerstedt and Torsvall, 1978; Smith et al., 1982; Smith and Folkard, 1993b; Zedeck et al., 1983).

As we move from biology to the social and organizational consequences of shiftwork, however, the literature becomes somewhat sparse and difficult to interpret. Although the available evidence consistently shows that shiftwork interferes with time for spouse, children and social pursuits (Akerstedt and Torsvall, 1978; Frost and Jamal, 1982; Mott et al., 1965; Tasto et al., 1978), often the measures used have been somewhat ad hoc, and difficult to compare to other findings. Work attitudes have received very little attention. No more than a handful of authors have examined shift-related differences in such outcomes as job satisfaction, commitment and work conflict (Jamal, 1981; 1989; Jamal and Baba, 1992; Kundi et al., 1980; Peterson, 1985). Of these, only Jamal and his colleagues have tended to use scales commonly in use in the work-family literature (see, for example, Jamal and Baba, 1992). Reexamination of both work orientations and work-family outcomes through the use of standard work-family measurement scales might contribute to a better understanding of the effects of shiftwork.

A second explanation for there being scant evidence of work-family outcomes is the lack of comparability between studies due to research design. It is a daunting task to find a subject pool in which there is a variety of both fixed and rotating shifts, and where such settings can be found, subgroups on the various shifts are often too small to allow for between-group analysis. Practical and methodological limitations frequently mean that shift categories are combined in ways that preclude comparison from study to study. In addition, the composite categories that tend to be employed (e.g., fixed versus rotating; day versus non-day) are not sensitive to the temporal rhythms of family and social life. The ideal classification would allow for categorization on two dimensions: the particular time of day worked (day, afternoon, night), and the rotational characteristics of work hours (fixed or rotating). Moreover, shift groupings should remain as homogeneous as possible on these two dimensions (i.e., rotating shifts should not be combined with fixed shifts; fixed days should not be combined with fixed non-day shifts).

Third, there are few studies that have collected data on possible moderating influences that may also contribute to orientations toward shiftwork. The degree to which shiftwork is perceived to interfere with family or social life is likely dependent on an employee's personal needs and lifestyle and the level of responsibility he or she holds both inside and outside of the workplace. Consideration of gender and parental status in shiftwork research seems essential, as the review shows consistent empirical evidence that stresses from the home domain are greatest for parents, particularly women. Similarly, job context factors in an employee's work environment also need to be taken into account as an important source of support or stress for shiftworkers. Additional factors, such as schedule

preference and control, imply intrinsic differences among shiftworkers that need to be measured and reported.

Finally, the samples employed in the shiftwork literature have been drawn from a limited, fairly traditional variety of shiftworkers, notably nurses (Barton and Folkard, 1991; Barton et al., 1993; Bohle and Tilley, 1989; Dirkx, 1993; Jamal, 1981; Jamal and Baba, 1992; Jamal and Jamal, 1982; Morrow, McElroy and Elliott, 1994; Peterson,1985) and factory workers (Akerstedt and Torsvall, 1978; Cervinka, 1993; Cunningham, 1989; Frese and Semmer, 1986; Frost and Jamal, 1979; Jamal, 1981; Jamal and Jamal, 1982; Mott et al, 1965; Smith and Folkard, 1993b; Smith et al., 1982; Zedeck et al., 1983). There seems a need to examine employees in occupations more representative of shiftworkers of the '90s, particularly in the growing service sector.

5. METHODOLOGICAL REQUIREMENTS AND RESEARCH QUESTIONS

This section summarizes the methodological issues arising from the literature review, and identifies the specific research questions that are addressed in this research. (For a complete discussion of the methodology, refer to Section 6).

5.1 Methodological Requirements

The preceding critique of the literature identified four methodological requirements for a meaningful examination of shiftwork within a work and family context: (1) requirements pertaining to *measurement*; (2) requirements involving the *definition of shift categories*; (3) recognition of *potential moderators* of shift response; and (4) *sample* requirements. This research was designed to address these four requirements as follows:

1) Measurement For greater comparability of results, standard measurement scales currently in use in other branches of the work-family literature were employed.

2) Definition of shift categories Shift categories were designed to avoid "hybrid" groupings, and to remain sensitive to the rhythms of social and family life. Literature reviewed for this research had indicated that availability during the dinner hour and early evening was critical to family and social interactions. Although the ideal classification would have employed four study groups as defined in Section 2.2 (fixed day, fixed afternoon, fixed midnight, and rotating schedules), such a variety of schedules was not available within the participating organization. The following two shift assignments, therefore, were studied in this research:

Daywork: a daytime schedule which rotates through a variety of day shifts, *the latest of which ends by 6pm* (e.g., 7am to 3:30pm, 9am to 5pm, 10am to 6pm, and similar variations ending before or at 6pm). Although the precise time of arrival and departure varies, employees in this shift assignment are able to predictably spend the dinner hour and early evening at home.

Rotating Shiftwork: a schedule which rotates through a variety of shifts, and which encompasses *at least one shift which extends beyond 6pm.* This category includes both employees with 3-shift rotations (mornings, afternoons, midnights), and those with 2-shift rotations (e.g., alternations between days and afternoons, but no midnights). Employees in this shift assignment, therefore, do not routinely have their evenings free.

Readers will note that both of the final study groups consisted of rotating workers, but with a much narrower bandwidth for the daywork category. It was believed that limiting the "dayworker" category to employees whose stop time was no later than 6pm allowed the researcher to distinguish those employees whose schedules predictably provided them with free time during the critical early evening period from those whose schedules did not. Given the limitations of the available sample, the two shift assignments described above were felt to adequately meet the requirements of the research (they did not combine rotating shifts with non-rotating shifts, and distinguished dayworkers from those who worked shifts involving evening or night work). For further discussion of the benefits and limitations of these shift categories, see Section 10.2.

3) Potential moderators of shift response were incorporated in the research methodology. *Gender* and *parental status* were taken into account through the use of data analysis procedures which allowed for the examination of the independent effects of these factors on the dependent variables under study. *Work environment*

was controlled in two ways: by using job type as a surrogate for various work context factors (career employees were distinguished from those in non-career tracks to control for any preexisting differences in terms of job content, autonomy, performance expectations, etc.); and by surveying a single organization. Sampling a single organization has been recommended as a means of controlling for a variety of confounds (e.g., organizational culture, extraorganizational environments, etc.) through elimination (Bausell, 1994). The single-organization design, however, increases control for work environment at the expense of external validity: as the sample is made more homogeneous in terms of work environment, it loses generalizability to workers in other settings (Ibid.). It was believed that the study design used in this research partially balanced this loss of external validity through random sampling of an *internally* diverse organization (each shiftworking department was heterogeneous in incorporating a number of work sites, responsibilities, etc.; see Sections 6.1 and 6.2.1 for a description of the participating organization). Finally, *schedule preference*, *schedule control,* and *work-family control* were also measured and reported in order to assess these potential sources of individual variability in shiftwork response.

4) The sample of employees was drawn from a modern service industry felt to be more representative of shiftworkers of the '90s.

5.2 Research Questions

In order to address the following research questions, both quantitative and qualitative data were collected. Quantitative data were used to test for the effect of rotating shiftwork on the work and family outcomes of interest. Qualitative data were then used to clarify and understand the observed relationships.

5.2.1 Questions for the Quantitative Analysis (Survey Study)

The following research questions (1 through 3) were addressed through a pencil and paper survey of a sample of men and women working in a modern utility in Western Canada.

1. a) What are the relationships between shift assignment (daywork versus rotating shiftwork) and:
   - individual outcomes (stress , life satisfaction);
   - work-family conflict (role overload, interference from work to family, interference from family to work);
   - the ability to manage non-work time (individual time management, family time management);
   - work outcomes (organizational commitment, job satisfaction, work stress, intent to turnover)?

   b) Does the effect of shift assignment differ as a function of gender or parental status?

2. a) What are the relationships between shift assignment (daywork versus rotating shiftwork) and:

   - perceived control over work scheduling;
   - perceived control over work-family balance?

   b) Does the effect of shift assignment differ as a function of gender or parental status?

3. a) What is the relationship between shift assignment (daywork versus rotating shiftwork) and preferred work schedule (i.e., do rotating shiftworkers differ from dayworkers in terms of the extent to which they find their shift assignment appealing)?

   b) Does schedule preference differ as a function of gender or parental status?

5.2.2 Questions for the Qualitative Analysis (Interview Study)

The literature reviewed for this research also suggested that shiftwork may serve different purposes for women than it does for men, particularly for mothers who may wish to balance their work schedules with the schedules of husbands and children (see Sections 2.6, 2.7, and 4.6.4). As a preliminary exploration of some of the personal, family, social, and organizational factors that may underlie women's response to shiftwork, the remaining research questions (4 through 7) were addressed through structured telephone interviews with a subsample of mothers on rotating shifts:

4. Why do mothers who work rotating shifts work the schedules that they do?

5. What do mothers who work rotating shifts perceive to be the advantages and disadvantages of their work schedules?

6. What type of support is available to shiftworking mothers in the workplace?

7. What would shiftworking mothers like from their organization in the way of support?

The following section provides a detailed description of the methodology used to address these questions, and further information on the organization from which the samples were drawn.

6. METHOD

This section presents the methodology used to address the research questions identified in Section 5. It is divided into three parts. The first describes the participating organization from which the research sample was drawn. The second section provides detail on the survey study methodology, including the procedures for sample selection and data analysis, and a description of the measures. The third section describes the interview study sampling procedure and methodology. (Full copies of the questionnaire and interview schedule are provided in Appendix B.)

6.1 The Company

The participating organization was a large utility in Western Canada with an employee population of roughly 10,000. Human resource staff provided a list of five departments within the company that were involved in shiftwork. The exact shift assignments varied depending on departmental needs and hours of operation. The departments and hours of operation as identified by the company were as follows: installation and repair (7am to 10 pm); retail (8am to 9pm); operator services (24 hours); customer service (7am to 8pm); and telesales (8am to 1am). Contacts within the organization indicated that all employees who worked within a shiftworking department worked some variety of rotating schedule (i.e., fixed shifts were not available among shiftworking departments in this organization).

6.2 The Survey Study

Quantitative data for this research were collected by pencil and paper survey. Questionnaires were randomly distributed via internal mail to 1,662 male and female employees working in the organization's five shiftworking departments. This represented roughly half of the population of shiftworkers in the organization. A systematic random sampling technique was employed (i.e., an organizational representative generated a complete list of employees in the shiftworking departments, and then mailed questionnaires to every second employee on the list).

A total of 511 questionnaires were returned, representing a response rate of 31%. Questionnaires were returned to the investigators unopened to protect confidentiality.

6.2.1 Sample Selection

Following is a description of the procedure used to pare down the initial sample so as to meet the methodological requirements identified in Section 5 (i.e., to obtain "non-hybrid" shift categories and to determine job type and parental status). Rationale for each step of the procedure are presented where relevant. A graphic representation of this elimination process is provided in Figure 2.

Figure 2: Sample Selection Process

Original Sample	**N = 511**
Step 1: Remove employees in "uncodable" shift category	- 13
Step 2: Remove employees in "other" shift category (e.g., 12-hour shifts, split shifts, on-call)	- 31
Step 3: Remove employees on fixed nights/graveyard	- 16
Step 4: Remove employees on fixed afternoons	- 73
Step 5: Remove career employees	- 51
Step 6: Remove employees, single, no children	- 55
Final Sample	**N = 272**

Shift assignment (i.e., the categorization of employees according to shift) was determined through a preliminary item which asked respondents to identify their usual work schedule as per the following categories: rotating; fixed afternoon/evenings; fixed nights/graveyard; fixed days; other (categories were defined for respondents as indicated in Section 2.2). Respondents were also requested to indicate their usual start and stop times. This open-ended item allowed the investigator to double check for appropriate self-classification, and to reassign shift codes where necessary.

Examination of the "fixed day" category revealed considerable variability in start and stop times, with schedules ranging from 7am - 3pm to 12 noon - 8pm. Personal communication with the organization indicated that many employees who classified

themselves as "dayworkers" were in fact working in departments with varied start and stop times within a 7am to 8pm bandwidth. In effect, therefore, there were no "fixed" dayworkers in the sample. In order to generate a more homogeneous daywork category, it was decided that only workers whose latest shift ended by 6pm would be retained in the dayworker category. Those with varying schedules which included at least one shift that ended after 6pm were recoded as rotating shiftworkers.

Thirteen records were identified in which the shift item contained no response or was otherwise uncodable. These were the first records to be deleted from the file (Step 1 in Figure 2). In order to render the rotating shift category as homogeneous as possible, rotators who reported 12-hour shifts were excluded from analysis, as were shiftworkers who reported split or irregular (on-call) schedules (31 records deleted in Step 2, Figure 2). The "rotating shiftwork" group, therefore, now included only employees whose schedules were posted in advance, and whose normal shift duration was roughly 8 hours or less.

Only 16 respondents reported a fixed midnight shift. This number was far too small to be divided into the necessary subgroups (based on gender and parental status) required for analysis. To maintain homogeneity in the shiftwork category (i.e., instead of combining these cases with the rotating shiftwork group), they were deleted (Step 3, Figure 2).

There was a large contingent of employees who reported a fixed afternoon/evening schedule (73 respondents). Over 80% of them, however, were female. Again, this rendered the subgroups (in this case men) too small for analysis. Although women on fixed afternoons represented an interesting study group for future research, all afternoon/evening workers were eliminated for the purpose of this analysis (Step 4, Figure 2).

The next step in the selection process involved examination of the data to control for job type. It has been shown that career and non-career employees experience considerably different work contexts, due to the higher levels of flexibility and autonomy, supervisory duties, etc., associated with managerial and professional tracks, as compared to clerical, retail and similar positions (Higgins et al., 1992; Duxbury and Higgins, 1994). Job type, therefore, was selected as a surrogate measure of preexisting differences in work environment.

Job type was determined through an item asking respondents to self classify into one of the following categories: manager; installation and repair; retail representative; operator; customer service representative; or telesales. Only employees in the managerial category were deemed by the participating organization to be in career tracks. The remainder were identified as working in clerical, technical, retail, and similar non-professional occupations. Only 51 respondents identified themselves as managers (career employees). Career employees were again majority female, and rendered the male subgroups too small for analysis. To remove the potential confound of job type, these 51 records were deleted (Step 5, Figure 2). The final sample, therefore, represents only non-career employees.

Finally, parental status was determined through an item which asked for the number and ages of the respondents' children. Employees with children 18 or under living at home were selected for the parent category. Although not shown in Figure 2, it should be noted that not all employees in the parent subgroup lived in two-parent families. Virtually all fathers in the sample were living with their partners. Fifteen percent of the women in the parent subgroup, however, were single parents.

Marital status was also examined for the non-parent group. Fifty-five of the respondents without children were found to be single (no spouse, no children). Although single individuals may also have some level of family responsibility, the pressures on these employees in terms of time and energy were considered to be less than those existing for married couples. Because the purpose of this research was to explore shiftwork within a work-family context, employees who lived alone were excluded from analysis (Step 6, Figure 2).

The comparison group of non-parents, therefore, consisted of both married employees without children (n = 58) and employees with grown children over 18 years (n = 69). Although the non-parent category was not as homogeneous as might have been desired, this combined category was felt to be justified because: (1) qualitative data collected by the author in previous research suggested that these two groups tended to respond similarly in terms of their perceived ease or difficulty in handling work-family integration; and (2) deleting either one of the groups in the non-parent category (either married employees with no children or employees with only grown children) would have rendered the non-parent subgroups too small for analysis when divided by gender and shift assignment.

The final study sample by shift, gender and parental status is described in Table 1. It is important to note when reading this table, and throughout this research, that *employees in both the rotating shiftwork category and in the daywork category worked some variety of rotating schedule*: the critical distinction between the rotating shiftworkers and the

dayworkers was the latest time of day worked (dayworkers did not work shifts extending beyond 6pm, whereas rotating shiftworkers did).

6.2.2 The Measures

A 14-page questionnaire was distributed to all study participants. The questionnaire was divided into the following sections: Demographics; Shift Arrangements; Feelings About Your Job; Child Care; Time Management; Work and Family; and Health and Stress. A full copy of the questionnaire is provided in Appendix B.

Well-established measures from the work-family literature were used to operationalize constructs of interest. Constructs included two individual outcomes (stress, life satisfaction), three work-family conflict outcomes (role overload, interference from work to family, and interference from family to work), two time management outcomes (individual time management and family time management), and four work outcomes (organizational commitment, job satisfaction, work stress, intent to turnover). Descriptions of these scales, as well as descriptions of the scales used to measure potential moderating variables (schedule preference, schedule control, and control over work-family balance), are provided below.

Individual Outcomes

Stress was measured by means of the Perceived Stress Scale (PSS; Cohen, Kamarck and Mermelstein, 1983). The PSS was designed to assess appraisals of the extent to which one's current life situation is unpredictable, uncontrollable and burdensome. Cohen et al.'s (1993) modified 9-item measure (the original scale contained 14 items) was used in this analysis. Respondents answer the PSS by indicating on a 5-point Likert-type scale the

frequency within the last month that they have experienced various stressful feelings. Higher scores on this measure indicate greater levels of perceived stress. A Cronbach's alpha of .87 was obtained on this measure.

Life Satisfaction was measured using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen and Griffin, 1985). The SWLS was designed to measure the respondent's global life satisfaction. The SWLS is a Likert-type scale on which respondents indicate the extent to which they agree with 5 statements of their present state. Higher scores indicate greater levels of life satisfaction. A Cronbach's alpha of .91 was obtained on this measure.

Work-Family Outcomes

Work-family conflict, as defined by Kahn et al. (1964) is a form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible in some respect. Participation in the work (or family) role is, therefore, made more difficult by virtue of participation in the family (or work) role. The cumulative demands of multiple roles can result in role strain of two types: overload and interference. Overload exists when the total demands on time and energy associated with the prescribed activities of multiple roles are too great to perform the roles adequately or comfortably. Role interference occurs when conflicting demands make it more difficult to fulfil the requirements of multiple roles.

Overload was assessed using a modified version of the scale developed by Bohen and Viveros-Long (1981) to measure the impact of flextime programs on reducing work-family stress. The scale enables employed persons to indicate on a Likert format how often they feel strains of various kinds related to time for job and time for family. High scores indicate

greater conflict between work and family. Cronbach's alpha was .83 for the overload measure.

Interference from work to family and interference from family to work were assessed by means of a 9-item Likert type scale developed by Gutek, Searle and Kelpa (1991). High scores indicate higher levels of perceived interference. Family to work interference yielded a Cronbach's alpha of .77. Coefficient alpha for work to family interference was .64, somewhat low, but within the "acceptable" range for alpha according to criteria given by Bohrnstedt and Knoke (1994).

Time Management Outcomes

Individual time management and family time management were measured using the Family Time Management Scale (Bohen and Viveros-Long, 1981). This scale taps respondents' feelings about the logistics of the integration of work and non-work life-- how easy or difficult it is to accomplish certain activities. It focuses on both routine and special activities that employed persons must manage outside their hours of work. These activities may involve interactions with schools, health services, service organizations, or various other institutions or individuals in the social environment in which the family functions. On days when a person is working a job, his or her ability to interact with or on behalf of other family members will depend in part on the work schedule that defines when the person may or may not be present on the job.

This scale has two groups of questions. One set consists of 10 items (items 1 through 5, 7 through 10, and 17) and reflects management of individual time. Items 11 through 16 deal with interaction with children and, therefore, reflect family management time.

Respondents indicate on a scale of 1 to 5 how difficult it is for them to have time for the various activities. Both sub-scales are summed averages of the relevant item scores. High scores indicate greater ease in time management. Cronbach's coefficient alpha was computed as .90 for the individual time scale, and .84 for the family time management measure.

Work Outcomes

Organizational commitment refers to loyalty to the employing organization. Mowday, Steers and Porter (1979) indicate that commitment is characterized by three factors: acceptance of the organization's values; willingness to exert effort on behalf of the organization; and a strong desire to remain an employee of the organization. The nine-item short form of the Job Commitment Scale developed by Mowday et al. (1979) was used in this study to measure commitment. This scale is considered to be very reliable. Its development was based on research carried out over a nine-year period with employees from widely divergent work organizations. A 5-point Likert-type scale (1 indicating strongly disagree, 5 indicating strongly agree) was used for all items. The scale score is the summed average of the item scores. High scores indicate greater commitment to the organization. Cronbach's alpha coefficient was .91 for this measure.

Intent to turn over is defined as an individual's desire to cease being an organizational member. This construct was measured using a modified two-question scale from the Michigan Organization Assessment Questionnaire (Mowday et al., 1979). A 5- point Likert-type scale (1 indicating strongly disagree, 5 indicating strongly agree) was used. The scale score is the summed average of the two item scores. High scores indicate high intent to turn

over. A Cronbach's coefficient could not be calculated due to the inclusion of only two items in this score; however, this scale correlates highly with organizational commitment (and is in fact often used as a subscale of the commitment scale; Mowday et al., 1979). When tested in conjunction with the commitment items (above), a coefficient alpha of .76 was obtained for the combined measure.

Job Satisfaction is the degree to which employees have a positive affective orientation toward employment. The "facet-specific" measure of satisfaction developed by Quinn and Shepard (1974) was used in this study. Employees indicate how satisfied they are with their jobs in general, their pay, their work hours, their work schedule and their work tasks on a scale of 1 (very dissatisfied) to 5 (very satisfied). Job satisfaction is calculated as the summed average of item scores. High scores represent high job satisfaction. A large amount of work has gone into this scale. It has been used by the Survey Research Centre of the University of Michigan as part of its continuing monitoring of the quality of employment in the United States. Cronbach's alpha for this measure was .70.

Job tension was assessed using the Job Tension subscale of House and Rizzo's (1972) Work Stress Scale. The authors describe this scale as a measure of "the existence of tensions and pressures growing out of job requirements including the possible outcomes in terms of feelings or physical symptoms" (p. 481). A 5-point Likert scale (1 indicating strongly disagree, 5 indicating strongly agree) is used. High scores indicate high job tension. Cronbach's alpha for this measure was .85.

Measures of Potential Moderating Variables

Perceived work-family control Control is defined as the belief that one can exert some influence over the environment, either directly or indirectly, so that the environment becomes more rewarding or less threatening (Ganster and Fusilier, 1989). Perceptions of control are believed to lessen the stress of exposure to threatening events. Perceived control over work and family pressures was assessed using a modified version of a 14-item scale developed by Thomas and Ganster (1995). This scale allows respondents to indicate on a 1 to 5 Likert type format the extent to which they have control over various aspects of work and family life (such as the ability to make a phone call from work, the ability to choose vacation days, etc.). High scores indicate high control.

The modification of this scale involved reducing the original 14-item version to 7 items relevant to this research, and adding an 8th item, "How much choice to you have over which shift you will work?". The computed Cronbach's alpha coefficient for this modified scale was .63. Although this alpha is within the lower limits of "acceptable" (Bohrnstedt and Knoke, 1994), it was considered adequate for this research, as it was expected that interitem correlations on this measure would be lower for a group of shiftworkers than it would be for other employees (i.e., several items tapped specific scheduling factors over which shiftworkers might have little control, as compared to their control over other work and non-work factors accessed in the scale).

Schedule preference was measured by means of a question designed for this research: "To what extent are the following work arrangement appealing to you?". Seven scheduling arrangements were then listed (rotating, fixed afternoon, fixed midnights, fixed daytime, job

share, flextime, compressed work week), and respondents were asked to rate these on a 5-point Likert format from "very appealing" to "not appealing". High scores indicate strong preference for the schedule options.

Schedule control was measured via a single item, also designed for this research: "To what extent do you have any say as to which shift you are scheduled to work?". Respondents indicated on a 5-point scale their perceived level of input ranging from "a great deal of input" to "little or no input".

6.2.3 Data Analysis

All data analysis was performed using SPSS.

Data analysis for Question 1 was performed using a series of 2 X 2 X 2 MANOVAs with shift, gender and parental status as independent variables. Three sets of dependent variables were used: *individual outcomes* (stress, life satisfaction); *work-family conflict* (overload, work interferes with family, family interferes with work); and *work outcomes* (organizational commitment, job satisfaction, work stress, intent to turnover). All interactions were tested. Following a significant MANOVA, univariate F tests were conducted using a Bonferroni adjustment (dividing the overall alpha of .05 by the number of dependent variables in the variable set).

Time management was assessed by two analyses. Individual time management was analysed for the entire sample by means of a 2 X 2 X 2 ANOVA, with shift, gender and parental status as the independent variables. Because family time management items applied only to parents, a separate 2 X 2 ANOVA was conducted for parents only, with shift and gender as independent variables. All interactions were tested.

Question 2 was addressed by a series of 2 X 2 X 2 ANOVAs to test for group differences on each of two response variables (*schedule control, work-family control*). Independent variables consisted of shift, gender, and parental status, factorially combined. All interactions were tested.

Question 3 (*schedule preference*) was addressed by dichotomizing the 5-point rating scale used to measure the personal appeal of a selection of work schedules (see Section 6.2.2 for a description of the original measure). Individuals who rated the appeal of their current schedules as a 4 or 5 on this scale were considered to have high schedule preference. Those rating their schedules 3 or lower were considered to have low preference for their current schedules. Chi square analysis was then performed for each of the 8 employee groups categorized by shift, gender, and parental status .

6.3 The Interview Study

On the last page of the shiftwork questionnaire, respondents were asked:

> Would you be willing to be interviewed by telephone in order to contribute to a better understanding of how shiftworkers balance their work and family lives? If so, please fill in your first name and a telephone number.

This item was used to generate a list of names from which to create a telephone interview sample. Sixty-five parents from the initial survey offered to be interviewed.

6.3.1 Sample Selection

In order to obtain insight into the unique circumstances affecting shiftworking parents today, interview questions were designed to pertain to shiftworkers with children. Although interviews with a comparison group of parents on days might also have been of interest,

interviews were considered to be a very labour intensive data collection method, and the time constraints associated with doubling the number of respondents seemed prohibitive. Consequently, it was decided that a sample comprised of the group of primary research interest (shiftworking parents) was adequate for exploratory purposes.

Of the 65 interview volunteers, 29 were rotating shiftworkers. Ideally, interview groups would have mirrored the survey groups, with adequate representation of both men and women. Unfortunately, there were too few male volunteers to allow the construction of a separate study group of shiftworking men with children (only 9 of the 29 volunteers were men). It was decided that the sample of interviewees would be limited to the 20 female respondents. Interviews with an exclusively female sample was thought to be very useful as it allowed an exploration of the perceptions of a group of employees for whom work-family balance was expected to be especially difficult: shiftworking mothers.

Since a larger sample size was desired, a snowball sampling technique was applied to the initial sample of women. After preliminary contact, volunteers were asked whether they had shiftworking colleagues who were parents. The snowball technique generated an additional 7 participants; however, upon contact, 3 of these volunteers were found to work only afternoon shifts. After exclusion of these 3 participants, the final interview sample consisted of 24 mothers on rotating schedules.

Interviews were conducted by a same-sex interviewer and tape recorded with permission. Interviews lasted approximately one half hour.

6.3.2 The Measures

A copy of the interview questionnaire is provided in Appendix B.

6.3.3 Data Analysis

Interviews were analyzed using content analysis (Jones, 1985; Kassarjian, 1977; Krippendorff, 1980), an approach defined by Berelson (1955) as: "a research technique for the objective, systematic, and quantitative description of the manifest content of the communication" (p.55). Content analysis can be particularly useful when the subjects' own language and mode of expression is crucial to the investigation (Kassarjian, 1977).

A coding scheme was developed by the author, and an experienced coder was recruited to code the interviews. Responses were analyzed to identify common themes, grouped accordingly, and numerically coded for data analysis. The coding scheme's adequacy was validated by the author, who spot checked a random sample of 7 interviews to ensure coding consistency from interview to interview. This validation procedure suggested that the coder had been successful in classifying responses given the parameters of the coding scheme, and no inconsistencies were detected. Data were tabulated as percent response per category using SPSS.

7. QUESTIONNAIRE SURVEY RESULTS

This section presents the results of the questionnaire survey. Its purpose is to describe the survey sample in terms of demographics, and to present the results of the statistical analyses. (For a more detailed discussion of the findings in the context of the empirical and theoretical literature, refer to Section 9).

This section is divided into five parts. First, the survey sample is described with respect to demographic characteristics. Second, the data are examined for their ability to satisfy the practical requirements of the statistical tests that were selected for their analysis. A third part presents the results of the analyses of the effects of shift assignment on individual, work-family, and work outcomes, with separate consideration of the independent effects of gender and parental status (Research Question 1, Section 5.2). A fourth part presents the results of the analyses of the effects of shift assignment in terms of schedule preference and control (Research Questions 2 and 3). The section concludes with a summary of the survey findings. Results are tabulated in Appendix A.

Readers are reminded that throughout this discussion, shift categories are as defined in Section 5.1. The term *rotating shiftworkers* is used to refer to employees who work rotating shifts, at least one of which extends beyond 6pm. The term *dayworkers* refers to employees who work rotating shifts within a narrower bandwidth, encompassing only daytime hours ending no later than 6pm. The term *shift assignment* is used generically to refer to either of these groupings.

Qualifications to the use of the terms *parent* and *non-parent* should also be noted. For brevity, these terms are used to refer to employees with children under 18 and employees without children under 18, respectively. The non-parent category, therefore, in fact includes parents who have only older children as well as employees without children.

7.1 Sample Characteristics

The following discussion describes the questionnaire survey sample in terms of: (1) an overview of the sample grouped by shift, gender, and parental status; (2) age; (3) age range of children in the family; (4) reasons for working current schedule; (5) educational attainment; (6) work hours per week; (7) organizational and shift tenure; (8) full- and part-time status; and (9) department.

7.1.1 Shift, Gender, and Parental Status Table 1 (Appendix A) presents data on the questionnaire survey respondents, grouped by shift, gender, and parental status. Fifty-five percent of the sample worked rotating shifts; 45% worked days. The two shift assignments (rotating shiftworkers and dayworkers) were roughly similar in terms of their distribution by gender and parental status. The rotating shiftwork group had a somewhat higher proportion of women (69% female versus 63% for the daywork group), and parents (57% of the shiftworkers had children under 18 versus 49% of the daywork group).

Overall, female respondents in the survey sample outnumbered male respondents 2 to 1 (181 women versus 91 men). Women were somewhat more likely than men to work rotating shifts (57% of women worked rotating shifts, versus 49% of men).

Fifty-three percent of the sample had children at home under 18 years of age; 47% either had no children or only grown children over 18. Men in this sample were more likely to have children at home than were women (60% of men had children under 18, versus 50% of women; Table 1). This trend held within shift assignment (i.e., 64% of men on rotating shifts had children under 18, versus 54% of women on rotating shifts, and 56% of dayworking men had children in this age range, compared to 44% of their female counterparts). Parents were more likely to work rotating shifts than were non-parents (59% of parents worked rotating shifts, compared to 50% of non-parents).

7.1.2 Age Age data reported in Table 2 indicate a tendency for the dayworkers in this sample to be older than the rotating shiftworkers. This pattern held across both gender and parental status, and suggests that daywork at this organization may be "earned" through seniority.

Age appeared to be strongly related to parental status. As expected, parents (both male and female) were heavily concentrated in the 35-44 year age range. Non-parents tended to be more evenly distributed across the age categories, likely resulting from the definition of "non-parent" used in this study (i.e., the non-parent group included both younger couples with no children, and older couples with grown children). Fifty-four percent of the non-parent group were parents of children over 18; 46% were married, but had no children.

It is also important to note that among non-parent groups, intershift differences existed for women, but not for men. Over 50% of men without children were 45 or over, irrespective of shift assignment. Among women without children, dayworkers were concentrated in the 35-44 year age range, but rotating shiftworkers showed a strongly bimodal distribution: women without children on rotating shifts were concentrated both in the younger age ranges under 35 (40% were in these younger ranges), and in the older ranges 45 or over (40% in the older ranges as well). Although it is difficult to account for the intershift differences in the age distribution of the female non-parents in this sample, the large contingent of both younger and older women in the rotating shiftwork category should be borne in mind in interpreting education and tenure data for this group.

7.1.3 Age of Children The age range of children in the family was important to this research as the presence of preschool-aged children has been shown to be associated with increased child care demands in the household (Lero et al., 1992). Due to confidentiality requirements set by this company's union, however, data on the specific age of each child in the family could not be collected. Instead, respondents were allowed only to indicate the interval within which their children's age fell (refer to Appendix B for questionnaire format for this item).

In order to obtain a useful indication of the age distribution of the respondents' children, Table 3 summarizes children's age data by the presence of preschoolers (i.e., provides data on the proportion of respondents with at least one child under 6, versus the proportion with only school-age children aged 6 to 18). These data suggest that fathers in the sample were much more likely to have preschool aged children than were the mothers

surveyed (45% of fathers had at least one child under 6, versus 28% of mothers; Table 3). The gender difference was particularly marked for the rotating shiftwork groups: 48% of fathers on rotating shiftwork had children under 6 years of age, compared to only 25% of mothers on rotating shifts. Dayworkers showed a less dramatic gender difference in terms of the age of their children (42% of dayworking fathers had at least one preschooler, versus 32% of dayworking mothers). The observation that comparatively few mothers with very young children were represented in the rotating shiftwork group suggests that mothers with children in this age range may find rotating shifts incompatible with their child rearing demands.

7.1.4 Reasons for Current Schedule Table 4 presents data on the reasons respondents cited for working their current schedule. Irrespective of shift assignment or parental status, roughly 90% of men indicated that they worked their current schedules because it was a job requirement. Among women, however, the reasons given for working their current schedule varied according to both shift and parental status. Mothers who worked days tended to do so for family responsibilities (58% of dayworking mothers said they worked their shift due to family responsibilities, compared with only 15% of mothers on rotating shifts). Mothers who worked rotating shifts did so because of job requirements (84% cited this as the reason for their current schedule, compared with only 36% of mothers on days).

These data suggest that women on rotating shifts in this sample did not choose shiftwork as a means of facilitating work-family balance, but because it was part of the job. This interpretation of the data is also consistent with the pattern observed in the

analysis by age of children (i.e., mothers on rotating shifts were less likely to have preschool aged children than were mothers on days, suggesting that rotating shifts may be incompatible with child-rearing demands).

7.1.5 Education Table 5 provides data by educational level. Intershift differences were related to both gender and parental status.

Among men, rotating shiftwork was associated with higher educational attainment than daywork, and this held irrespective of their parental status. Among women, shiftwork was also consistently associated with higher education than daywork, but the magnitude of the disparity depended on parental status. Mothers on rotating shifts had somewhat higher educational attainment than mothers on days (54% of mothers on rotating shifts had attended college or university, compared with 44% of mothers on days). Among women without children, however, rotating shiftwork was associated with much higher levels of education than was daywork (69% of women without children on rotating shifts had attended college or university, compared with only 45% of their dayworking counterparts).

Although it is difficult to account for the particularly high educational attainment of female non-parents in the rotating shift category, these data are consistent with the large contingent of young women in this group (40% under 35 years of age; see Section 7.1.2). Combined, these data again suggest that new recruits are being assigned to rotating shiftwork, and movement to daywork is "earned" through seniority. Such career paths would account for a higher level of education among incoming (younger) rotating

shiftworkers, and a lower level of education among more tenured (older) dayworkers who have possibly been allowed to progress to daywork based on years of service.

7.1.6 Work Hours Table 6 provides selected work demographics for the sample. Intershift differences in work hours were strongly related to gender. The data suggest that daywork in this organization is associated with reduced work hours for women, but not for men.

Men in all study groups (i.e., irrespective of shift and parental status) averaged 38 hours per week. On the other hand, women's work time was related to both their shift assignment and the presence of children. Work hours were longer for women on rotating shifts, as compared to their dayworking counterparts, and this was especially true for women without children: women without children on rotating shifts averaged as many hours as did the men in the sample (38 hours per week); women without children who worked days averaged only 35 hours. Irrespective of shift, mothers worked fewer hours than did their counterparts without children. Mothers on rotating shifts averaged 35 hours per week. Mothers on days reported the lowest number of work hours of any of the women surveyed, averaging 31 hours per week.

The gender differences in the work hour data suggest that women in this sample are working part time, whereas men are not (for further discussion of part-time work, see Section 7.1.8). The tendency for women to work part time is consistent with labour force data which indicate that part-time work is largely the domain of women (it is estimated that 1 in 4 women work part time, as compared to an incidence of 1 in 25 among men; McKie, 1992). However, the fact that women on rotating shifts worked longer hours than

their counterparts on days suggests that part-time work may be less available to rotating shiftworkers in this sample than it is to dayworkers. Combined, these patterns suggest that mothers working shift in this sample cope not only with changing work schedules, but also with longer work hours than mothers who are able to work days.

7.1.7 Organizational and Shift Tenure Organizational tenure data provided in Table 7 indicate that this sample is comprised of long-standing employees. Fifty to ninety percent of the sample had been with the company for 10 or more years. Like the age data presented earlier, tenure data also support the notion that daywork at this organization is "earned". Over 90% of dayworkers in the sample had 10 or more years with the company, irrespective of gender. Only 50% to 75% of shiftworkers, on the other hand, had been with the organization for 10 or more years. It might be noted that the lowest organizational tenure was observed among women without children on rotating shifts, consistent with the relative youth of the women in this category (see Section 7.1.2).

Shift tenure data provided in Table 6 indicate that shiftworkers in this sample also had considerable experience with their current shift schedules. Shift tenure was related to gender. Irrespective of shift or parental status, men had greater experience with their current schedules than did their female counterparts. The gender difference was particularly pronounced among rotating shiftworkers without children (men in this group averaged 13 years on their current schedule, compared to only 3 years for their female counterparts). Again, these data are consistent with the age profile of these two groups: men without children were heavily concentrated in the age ranges over 45, whereas

women without children were concentrated in the under-35 age ranges (see Section 7.1.2).

7.1.8 Full-time/ Part-time Status Table 8 provides a breakdown of the survey sample by job status. Gender differences in job status were pronounced, and mirrored the work hour data presented earlier.

Virtually all of the men in this sample worked full time irrespective of shift assignment or parental status. For women, on the other hand, the tendency to work part time appeared to be linked to shift assignment. Women who worked days were more likely to report part-time hours than were their counterparts on rotating shifts. Although this intershift difference pertained to both mothers and women without children under 18, mothers on days were especially likely to work part time (38% of mothers on days worked part time, compared to only 14% of their counterparts without children).

7.1.9 Department Table 9 provides sample data by department. There is evidence of gender segregation in these data with respect to the type of work performed. Over two thirds of the men surveyed worked in installation and repair (I&R), compared with less than 5% of the women. Men on days were especially likely to be in I&R positions (over 80% of men on days worked in I&R).

Women in the sample tended to work in customer service, operator services, or retail positions. As was the case for men in the sample, there was a shift-related difference in the departmental distribution for women. Women on rotating shifts were heavily concentrated in customer service positions (roughly 55% of women on rotating shifts, irrespective of parental status, were customer service representatives).

Dayworking women were more evenly distributed, again showing little relationship to parental status (roughly 40% of dayworking women were operators; 38% worked in retail; and roughly 20% were customer service representatives).

Overall, the relationships between department and shift assignment in these data suggest that employee schedules are determined largely by the business demands of the unit for which they work. In addition, the different departmental distributions of rotating shiftworkers versus dayworkers should be borne in mind when interpreting the intershift differences observed in the following data analysis.

7.2 Evaluation of Assumptions

Before proceeding with MANOVA and ANOVA, variables were assessed with respect to the practical limitations of the techniques.

7.2.1 Unequal Sample Sizes and Missing Data

SPSS was run with SPLIT FILE to divide cases into 8 subsamples when grouped by shift, gender, and parental status. Data were examined for accuracy of data entry, missing values, and sample size for each of the 8 subgroups.

No out of range data were found. Two missing values were identified on gender, so these cases were deleted. No other missing data were detected.

After deletion of the two cases with missing gender values, the resulting cell sizes were as shown in Table 1. Table 1 indicates that the largest cell contains 56 observations, and the smallest, 16, (a ratio of 3.5 : 1, within the acceptable limit of 4:1 indicated by Tabachnik and Fiddell, 1989). Although sample sizes were unequal, no attempt was

made to equalize cell sizes, as these differences in cell size were considered to meaningfully reflect differences in the population sizes for the groups (i.e., men and women tended to be unevenly distributed among shifts, parental status, etc.). Sample sizes were retained, and MANOVA SEQUENTIAL SUMS OF SQUARES was selected as the method of analysis, a technique suggested to be suited to nonorthogonal datasets (Tabachnik and Fidell, 1989).

7.2.2 Multivariate Normality

Since SPSS provides no multivariate test of normality, within-group distributions were examined separately for each of the dependent variables (life satisfaction, stress, organizational commitment, job satisfaction, work stress, intent to turnover, work-family overload, interference from family to work, interference from work to family, family time management, individual time management, schedule control, and work-family control).

Both graphic representations (histograms, p plots) and descriptive statistics showed evidence of skewness on several variables (positive skews on intent to turnover and schedule control for all groups, and family to work interference for men non-parents). These deviations from normality were not considered problematic, however, since MANOVA is fairly robust to violations of normality even among samples with unequal cell sizes, provided the violation is due to skewness (Stevens, 1992; Tabachnik and Fidell, 1989).

On the other hand, kurtosis can influence alpha in MANOVA (Stevens, 1992). Although with such small sample sizes, graphic portrayals of distributions can be misleading, several of the distributions suggested platykurtosis. It was not feasible,

however, with this large a number of study groups, to statistically test kurtosis by calculating critical values for coefficients. It was decided to continue with the investigation of assumptions, bearing in mind that non-normality in the univariate case (and, accordingly in the multivariate case) was still a possibility.

7.2.3 Linearity

Within-group scatterplots were examined for each dependent variable. Although skewness was again apparent (e.g., a "bunching up" of scores at low values of schedule control, and intent to turnover), relatively symmetrical distributions gave no reason to suspect nonlinearity in the univariate case. To assess multivariate linearity, several pairs of dependent variables were "spot checked", as has been recommended for samples with large numbers of cells and variables (Tabachnik, 1989, p. 379). No serious evidence of curvilinearity was found.

7.2.4 Homogeneity of Covariance Matrices

Because of the unequal cell sizes in this sample, robustness of MANOVA to violation of the homogeneity of covariance matrices assumption could not be guaranteed (Tabachnik and Fiddell, 1989). Box's M test was therefore applied within each MANOVA analysis to determine whether this assumption was met. In addition, Box's M was thought to provide an additional safeguard against the suspected violations of the normality assumption, since this test is extremely sensitive to multivariate normality (i.e., it is possible to reject with the Box test due only to a lack of multivariate normality, not because covariance matrices are necessarily different) (Stevens, 1989).

Significance of the Box test was determined through the F value, as is appropriate for samples with more than 6 groups (Stevens, 1992). Alpha was set at .001, as recommended by Tabachnik and Fidell (1989). Table 10 shows significance values for the Box's M performed on each MANOVA. As none of the tests was significant at p <.001, homogeneity of variance was confirmed for all MANOVAs, and it was assumed that the practical requirements of MANOVA had been adequately satisfied.

It is important to note, however, that the Box test for the MANOVA for work outcomes approached significance, with F (70, 35341) = 1.54, p = .003. Although this was not *statistically* significant according to Tabachnik and Fidell's conservative cutoff criterion of . 001, *practically*, there was cause to suspect that there may be a problem with heterogeneity of covariance matrices for this set of variables. Since violation of this assumption would cast doubt on the use of a MANOVA test for this set of variables, a confirmatory non-parametric test was run to avoid erroneous interpretation of the MANOVA.

The work outcome MANOVA (see Section 7.3.3) showed that the significant main effect of shift (Hotelling's = .135, F (4, 255) = 8.61, p < .000) had been driven by the significantly lower job satisfaction reported by rotating shiftworkers as compared to dayworkers (F (1, 258) = 28.37, p < .000). To avoid misinterpretation of this finding (i.e., inferring significance based on an assumption of normality, when the sample was in fact not normally distributed) a Kruskal-Wallis one-way ANOVA was run on the job satisfaction scores (job satisfaction by shift) using SPSS NONPARAMETRIC. This test was also highly significant (chi-square of 27.96 (df = 1), p < .000). Given the combined

observations that: 1) the original Box's M test, although approaching significance, had not met criteria for rejection; and 2) a non-parametric test had confirmed a significant intershift difference (i.e., had supported the findings of a test based on characteristics of the normal distribution), it was decided that MANOVA would be retained for the analysis.

7.3 Results of Survey Data Analysis

Following are the results of the data analyses described in Section 6.1.3.

7.3.1 Individual Outcomes

Means and standard deviations for the dependent variables used in the 2 X 2 X 2 MANOVA for individual outcomes (stress and life satisfaction) are provided in Table 11. According to Cohen et al.'s (1983) population norms, a cutoff of 2.8 on these scales indicates a high level of stress or life satisfaction. The means reported in Table 11, therefore, suggest that the level of life satisfaction in this sample was in the moderate range for all groups, and the level of stress was in the moderate range.

None of the two-way or three-way interaction terms was significant. Only gender had a significant main effect on individual well being (Hotelling's = .044, $F(2, 260) = 5.75$, $p < .004$). Univariate follow-ups of this main effect indicated that women in this sample were significantly more likely than men to experience symptoms of stress ($F(1, 261) = 6.55$, $p < .011$).

Shift and parental status had no independent effects on individual well-being.

7.3.2 Work and Family Outcomes

7.3.2.1 Work-Family Conflict

Table 12 provides means and standard deviations for the dependent variables used in the 2 X 2 X 2 MANOVA for work-family conflict (overload, family interference with work, work interference with family). Work by Duxbury and Higgins (1991) and Higgins and Duxbury (1992), in their study of over 20,000 private and public sector employees in Canada, suggests that a cutoff of 3.5 on these scales is indicative of high conflict. According to this criterion, Table 12 suggests that respondents in this sample averaged in the moderate range for overload and work to family interference, and in the very low range for interference from family to work.

None of the two-way or three-way interaction terms was significant. Shift had a significant main effect on perceived work-family conflict (Hotelling's = .043, $F(3, 256) = 3.67$, $p < .013$). Univariate follow-ups indicated that shiftworkers experienced significantly greater interference from work to family than did dayworkers ($F(1, 258) = 10.68$, $p < .001$).

Gender and parental status were not significantly related to work-family conflict.

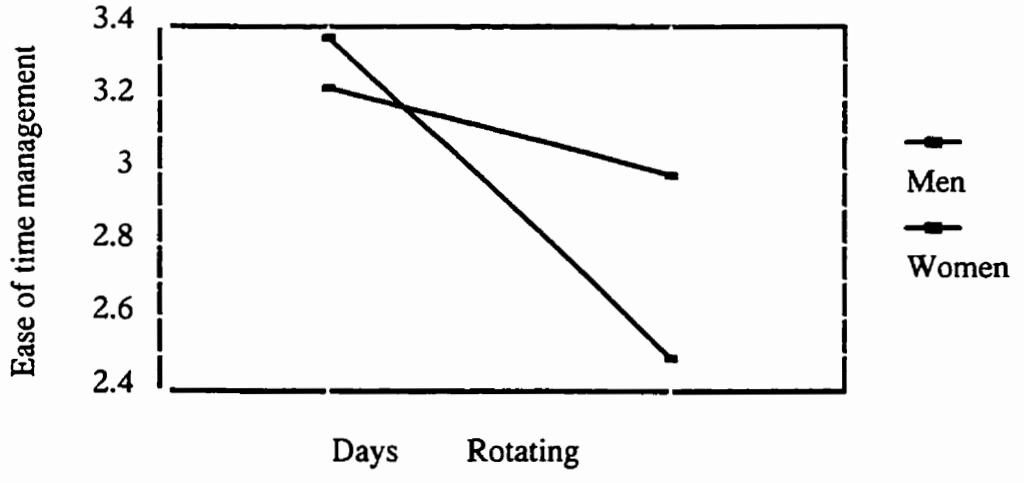
7.3.2.2 Time Management

Means and standard deviations for both the individual and family time management analyses are provided in Table 13. Means were in the moderate range for both of these measures according to criteria established by Duxbury and Higgins (1991) and Higgins and Duxbury (1992).

The 2 X 2 X 2 ANOVA for individual time management yielded no significant two- or three- way interactions for the independent variables. However, all of the main effects were significant. Shiftworkers experienced significantly more difficulty managing their individual time than did dayworkers ($F = 7.06$, $df = 1$, $p < .008$); women experienced significantly greater difficulty than men ($F = 4.05$, $df = 1$, $p < .045$); and parents experienced more difficulty than non-parents ($F = 4.82$, $df = 1$, $p < .029$).

The 2 X 2 ANOVA (run only on parents) for family time management resulted in a significant interaction between shift and gender ($F = 4.11$, $df = 1$, $p < .045$), so precluded a meaningful interpretation of their main effects. It is of interest to note, however, that a plot of the interaction (Figure 3) indicated that shiftwork was associated

Figure 3: Family Time Management
Shift and Gender Interaction



with greater difficulty in family time management for both men and women in the sample (i.e., the effect was in the same *direction* for both mothers and fathers). The *magnitude* of

the difference, however, was far greater for women (i.e., shiftwork interfered more with family time management among mothers than it did among fathers).

7.3.3 Work Outcomes

Means and standard deviations for the dependent variables used in the 2 X 2 X 2 MANOVA for work outcomes (job satisfaction, job stress, organizational commitment, intent to turn over) are provided in Table 14. According to Duxbury and Higgins (1991) and Higgins and Duxbury (1992), the means presented in this table indicate moderate to high commitment, and low intent to turn over. Job stress in this sample was in the moderate range. Job satisfaction varied from moderate to high levels, but it should be noted that the high job satisfaction means were consistently associated with daywork categories.

None of the two-way or three-way interaction terms was significant. Examination of main effects indicated that only shift had a significant effect on work orientations (Hotelling's = .135, $F(4, 255) = 8.61$, $p < .000$). Univariate follow-up indicated that shiftworkers experienced significantly lower job satisfaction than dayworkers ($F(1, 258) = 28.37$, $p < .000$).

There were no significant main effects of gender and parental status on work outcomes.

7.3.4 Perceived Control

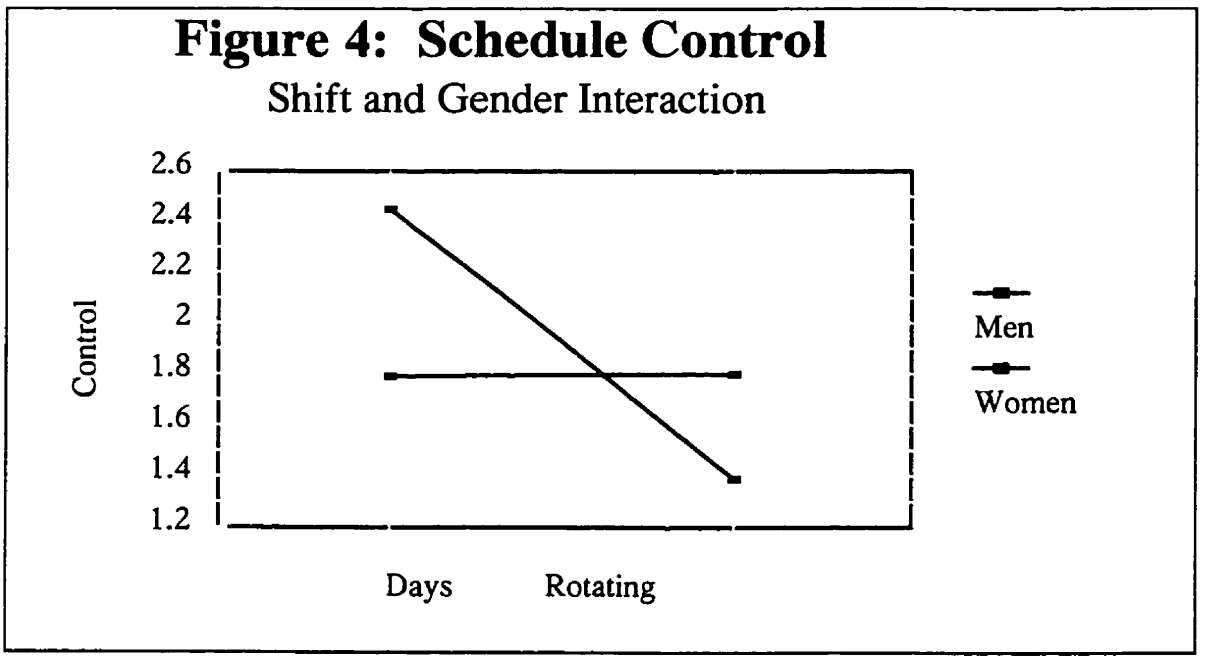
Means and standard deviations for the dependent variables used in the 2 X 2 X 2 ANOVAs for work schedule control and control over work-family balance are provided

in Table 15. Control over work scheduling was very low for all subgroups. Control over work-family balance was low to moderate.

7.3.4.1 Control over Work Scheduling

The three-way interaction term was not significant for this single-item measure of work schedule control.

One of the two-way interactions (gender by shift), however, was significant ($F = 11.92$, $df = 1$, $p < .001$). A plot of this interaction (Figure 4) revealed that shiftwork reduced schedule control among women, but not among men. Working a rotating



schedule had virtually no effect on schedule control for men (i.e., both shiftworking men and men on days reported similar levels of control), whereas women on rotating schedules reported far less control than women who worked days (refer to Table 15 to compare means for these groups).

Although analysis of main effects was not pursued, the gender-dependent effect of shift on schedule control is worthy of attention. The gender-shift interaction suggests that, at this organization, shiftwork is associated with reduced schedule control for women, but not for men. It is also important to note that schedule control was rather low for all groups. The highest rating for any study group was a mean of 2.6 on this 5-point rating scale (reported by mothers on day schedules).

7.3.4.2 Control over Work-Family Balance

None of the three- or two-way interaction terms was significant on the ANOVA for the work-family control scale. Only shift had a significant main effect on perceived work-family control ($F = 14.05$, $df = 1$, $p < .000$). Shiftworkers reported significantly lower control over the work-family interface than did dayworkers (refer to Table 15 to compare means for these groups). Again, it is important to note that perceived work-family control was low to moderate for all groups. And again, the highest level of control was reported by mothers on day schedules (whose mean was 2.6 on this 5-point scale).

7.3.5 Preferred Work Schedule

Table 16 presents data on schedule preference for each of the study groups in the survey sample. Employees who rated the appeal of their current work schedules as a 4 or 5 on a 5-point rating scale were considered to have "high satisfaction" on this measure.

The preference data suggest that shiftworkers, irrespective of gender and parental status, were much less satisfied with their current work schedule than were dayworkers. Only 10 to 15% of shiftworkers rated the appeal of their current schedule as highly satisfactory, compared with 75 to 95% of dayworkers. Within-group chi-square analyses

performed separately for each of the 4 study groups (men with children, men without children, women with children, women without children) were all highly significant ($p < .000$) by use of a Pearson product moment coefficient.

7.4 Summary

Demographic data presented in this section reveal two trends relevant to evaluating the effects of shiftwork. First, women on rotating shifts in this sample were notably different from their male counterparts in terms of work demographics, family demographics, and their reasons for working shift. In terms of work demographics, the "typical" woman on rotating shifts was a customer service representative working roughly 36 hours per week, and she had been working her current shift for 3 or 4 years. The "typical" man on rotating shifts worked in I & R, averaged 38 hours per week, and he had been working his current schedule for between 6 and 13 years. These characteristics suggest different work environments for shiftworking men versus shiftworking women in this sample (men worked largely in technical areas, whereas women worked in front-line service positions). In addition, men seemed to be comparative "old-timers" when it came to shiftwork, suggesting considerable experience with rotating shift schedules and possible adjustment to any adverse effects.

Gender differences were also evident in terms of the family characteristics of shiftworkers in this sample, and in the reasons given for working a rotating shift. Men on rotating shifts were more likely than their female counterparts to have children at home, and were twice as likely to have preschool age children. In spite of their apparently

heavier child-rearing demands, however, men's work hours and reasons for shiftwork were largely unrelated to their parental status. In fact, irrespective of shift and parental status, virtually all of the men in this sample worked full time (roughly 38 hours per week), and said that they worked the schedule they did because it was part of the job.

On the other hand, women's reasons for working their current schedules were strongly linked to their shift and work hours. Women on rotating shifts were much more likely to work full time than were women on days, and this held within parental status (i.e., mothers who worked rotating shifts were more likely to work full time than mothers on days). Accordingly, women on rotating shifts worked longer work weeks than did their dayworking counterparts.

These work hour data suggest that reduced hours may be available to women in day positions in this sample, but not to rotating shiftworkers. Not surprisingly, women on days tended to say they worked days in order to meet family responsibilities, whereas the vast majority of mothers on rotating shifts said they worked shift because it was required by the job. These data suggest that rotating shifts may be unattractive to mothers in this sample, due not only to the timing of work hours, but also to the longer work week associated with these schedules. This pattern of findings is suggestive of an element of selection operating for mothers in this sample, wherein women who cannot cope with the combination of longer hours and rotating schedules either move into daywork or look for work elsewhere. These data, therefore, tend to refute any suggestion that parents in this sample have "chosen" shiftwork as a means of helping them balance work and family.

The second pattern evident in the demographics of this sample was an indication that daywork was "earned' through seniority. Rotating shiftworkers were younger than the dayworkers surveyed, and had much lower organizational tenure. This pattern provides further evidence that rotating shift schedules generally are not "chosen" by employees in this organization. "Earned" daywork is also consistent with the tendency for shiftworking women to say that they worked the schedule they did because it was a job requirement (i.e., if new recruits accept shiftwork as a way in to the organization, and then move into daywork as it became available).

Statistical analyses of the outcome data were consistent with these patterns in suggesting that shiftwork interferes with employees' personal lives. Rotating shiftworkers experienced significantly greater work-family conflict than dayworkers, as evidenced in interference from work to family, and difficulties in individual time management. The low levels of work-family and schedule control reported by shifworkers suggested that rigid time demands may have been one of the factors contributing to elevated work-family conflict among the rotating shiftwork groups. Such problems are consistent with a work environment where shiftwork "comes with the territory", and where inflexible work hours impinge on personal time.

As expected, given their high level of perceived conflict between work and family, their low schedule control, and their general dissatisfaction with their work schedules, rotating shiftworkers held significantly less favourable work orientations than did dayworkers. Poorer work attitudes resulted primarily from low job satisfaction among rotating shiftworkers. Although it is tempting to attribute this observation to a

reaction to rotating shifts per se, the finding should likely be interpreted with caution. Since shiftwork tended to be linked strongly to department (i.e., rotating shiftworkers tended to be distributed differently from dayworkers in terms of unit/division, etc.), satisfaction with specific facets of the job may have been a function more of departmental differences than of work schedule differences.

Combined, demographic and statistical data suggest that rotating shiftwork may pose unique problems to both men and women in this sample. Control over work scheduling and work-family balance was very limited for these shiftworkers, irrespective of gender. Low control may pose a challenge to shiftworking fathers in the sample, half of whom had preschool aged children at home.

Analysis of the outcome data, however, indicated that women on rotating shifts may experience some of the greatest pressures, due to heavy stress, low control, and greater difficulty in individual time management. Combined with their longer work hours, it may be that rotating schedules make it difficult for these women to combine their paid work with their responsibilities at home. The next section draws on personal interview data to take a closer look at the unique challenges faced by shiftworking women in this organization.

8. INTERVIEW RESULTS

The survey results presented in the previous section indicated that rotating shiftwork in this organization was associated with a variety of adverse effects in terms of the ability to balance work and family. Observed interactions between shift and gender also suggested that the integration of work and family was particularly difficult for shiftworking women in the sample.

This section of the report addresses Research Questions 4 to 7 (see Section 5). It provides qualitative interview data which allow a more detailed look at some of the personal, family, social, and organizational factors that may have contributed to the survey results. It also serves as a preliminary exploration of some of the controversial issues arising from the literature review regarding women and shiftwork, such as whether shiftwork might in fact facilitate work-family balance or whether it might serve some other needs unique to women. In order to obtain information relevant to work and family life, therefore, the interview sample was limited to women with children under 18 who worked rotating shifts (for a full description of the sampling procedure, refer to Section 6.3.1).

The section is divided into five parts. The first part presents demographic characteristics of the interview sample. The second part examines the reasons for shiftwork cited by respondents, and explores their expressed preferences in terms of scheduling. Part three summarizes the perceived advantages and disadvantages of working rotating shifts. Part four looks at the respondents' perceptions of the level of

organizational, supervisor, and coworker support available to them as shiftworkers, and identifies the type of support they would find most helpful. The section concludes in part five with a summary of the interview results.

8.1 Sample Characteristics

Table 17 provides demographic characteristics of the interview respondents. Age and marital status data were comparable to those of the survey sample (the average age of interview respondents was 39 years; 88% were married). Women in the interview sample tended to have younger families than did mothers on rotating shifts in the larger survey (42% of the interview respondents had preschool-aged children under 6, compared with only 25% of shiftworking mothers in the survey).

The average work week was 37 hours, slightly higher than the mean of 35 for shiftworking mothers in the survey sample. Like the survey sample, interview respondents were long-term employees of the organization, with an average tenure of 14 years, and roughly 3 years' experience working their current shift schedule. Separate analyses (not shown) indicate that interview respondents had roughly the same departmental distribution as shiftworking mothers in the survey sample (approximately 60% customer service, 25% operator services, and 10% telesales). The proportion of operators in the telephone sample was slightly higher than in the survey sample due to the use of the snowball sampling technique.

8.2 Reasons for Shiftwork

In order to determine underlying motivations for working a rotating shift schedule, respondents were first asked "Why did you initially choose a job requiring shiftwork"? The responses were fairly evenly distributed among three categories (Table 18). One third of the sample (33%) indicated they chose shiftwork because it was the only way in to the company ("I thought this was a pretty good company to get in with, and they're not hiring for anything with straight days-- if you want to work here, you work shift"). One third (33%) thought the pay was above average ("I don't have much in the way of education. This work pays good money for someone with my background"). One fifth of the sample (21%) said that they did not choose shiftwork, but had started on days-- shiftwork had been introduced later when the office hours changed (over half of the respondents had been on straight days immediately before beginning their current schedule). Although the reasons for choosing shiftwork were varied, perhaps the most important observation to be made from this item was that no one indicated they had chosen rotating shiftwork because they found the schedule appealing.

When asked "Why do you still work this job?" (Table 19), respondents cited reasons that, for the most part, reflected their rationale for choosing the job: 25% thought there was nothing else available, and 21% thought the money was good enough to warrant staying. A substantive minority, however (21%), indicated that the hours had proved convenient ("I don't mind a day off during the week-- I can shop when the stores aren't busy, or do chores at home when no one's around").

Although this small group of respondents said that they found the hours convenient, the response to the next question in the interview was perhaps more telling. When asked "If a similar job became available at a comparable rate of pay but with straight days, would you take it?", 83% of the respondents said "yes" (Table 20). Thirty-three percent said they might take a job with fewer hours if it were available.

It soon became apparent that the primary reason for wanting a day job or one with fewer hours was to allow them more time with their families. When asked what the "ideal" work day would be for them, 33% would have liked to work only "earlies" (i.e., out by 2:30 or 3:30 pm); 25% wanted to work 8 to 4, and 21% preferred a 9 to 5 schedule (Table 21). When asked why these shifts would be appealing, over 45% of respondents indicated they wanted to work only school or daycare hours (Table 22). Twenty-one percent mentioned that they wanted to be home every night for dinner. Only one respondent of the 24 indicated that if given a chance to reschedule her workday, she would choose the schedule she had.

8.3 Advantages and Disadvantages of Shiftwork

In order to see whether there were any inherent advantages or disadvantages to shiftwork, respondents were prompted to look for costs and benefits in four particular areas of their lives: economic aspects, work-related aspects, home-related factors, and advantages and disadvantages in terms of their social lives.

8.3.1 Advantages

Table 23 presents the advantages cited by respondents. The number one advantage was economic: over half (54%) of the respondents mentioned the shift differential associated with evening hours, although it should be noted that the majority of those mentioning the differential felt it was rather small ("Well, there is a differential available for evening work, but it amounts to maybe a couple of dollars a shift"). One quarter of the sample (25%) indicated that their shift reduced their daycare costs. The ability of a spouse to cover evening hours likely contributed to this savings (separate analyses indicated that 33% of respondents were able to rely on their partners for at least some child care to cover their work hours).

The next largest category of advantages was in the home domain. Forty-two percent of respondents felt they could shop and run errands during non-peak hours. This finding is supported by data shown in Table 25, which indicate that 100% of the sample reported that they lived in communities in which shopping and banking were readily available to them during their off hours. Similarly, two-thirds (67%) had no difficulty arranging medical and dental appointments.

A third area in which respondents were able to identify advantages of shiftwork was in their work lives. Thirty percent of the sample thought that there were advantages in terms of the relaxed atmosphere at work; 13% preferred the client group on the late shift ("We have a different client base at night. During the day you have the business clients who are always so demanding-- at night things are quieter, and customers are more relaxed, it's more personal service").

Advantages in terms of social life were very few. A small minority of respondents (17%) felt they could visit with friends early in the day when they worked a late shift. For the most part, however, respondents were unable to identify any social advantages from having to work shift (67% of the sample said there were no advantages). In fact, one in five respondents answered this item with the reply, "Advantages in my social life? What social life?".

8.3.2 Disadvantages

Table 24 presents a summary of the disadvantages associated with shiftwork. These data are generally consistent with the advantages discussed above. Primary disadvantages were related to home and social life, and there was little downside in terms of work life or economic factors.

Consistent with their expressed desire to work only school hours (see Section 8.1), many respondents indicated that the biggest home-related disadvantage to shiftwork was that they missed their children. Forty-six percent of respondents said they seldom saw their children on the late shift ("By the time I get home, everybody's in bed... I can go all week without seeing my kids when I'm on lates"). Thirty percent said they missed having the dinner hour to spend with the family. Twenty-one percent of the women surveyed said that their home life was disrupted because there was no set routine ("Every week is different... even the kids don't join activities because they know I can't be counted on to get them there every week").

Disadvantages in social life revolved around having to miss functions that were typically scheduled with the dayworker in mind. Forty-six percent of respondents said it

was difficult to attend parties and events in the early evening ("All of my relatives and friends work days... I always miss the special dinners and birthdays, sometimes I miss Christmas dinner"). Problems in scheduling social activities were consistent with the community data presented in Table 25. When asked if they were able to join clubs and sports groups in their communities, only 25% of respondents said they were able to participate in activities with fixed time commitments.

Most respondents (58%) were unable to identify economic disadvantages to shiftwork. Only the costs associated with take-out food emerged as a problem (21% of respondents mentioned the family spent more on take-out when they worked lates).

There were also very few disadvantages related to work. A small proportion of respondents (8%) mentioned that they experienced fatigue on the job; an equal proportion cited inadequate resources and support from other units and staff in the evenings; and 8% were annoyed by "crazy" customers who tended to call in on the night shift. Overall, the majority of women (63%) felt there were no particular disadvantages to shiftwork in terms of their work life.

8.4 Support in the Workplace

In the last part of the interview, respondents were asked to identify the kinds of support they felt they received from their coworkers, their supervisors, and from the company itself. They were then asked if there was anything in particular that made it more difficult for them as shiftworkers. Finally, they were asked what they would like to see in the way of support.

8.4.1 Coworker Support

Table 26 summarizes respondents' perceptions of the types of support provided to them by coworkers. The primary source of support centred around their coworkers' willingness to trade shifts. Fifty-eight percent of interviewees said their coworkers made shiftwork easier by trading shifts when they were asked. Twenty-one percent felt a sense of camaraderie with other staff at work ("We're all in the same boat, we all help each other out"). A high level of mutual support was also evident in the finding that the vast majority of respondents (83%) said they could think of nothing their coworkers did that made it more difficult to work shift. Again, the only barrier identified pertained to trading: 17% of the sample indicated that their coworkers made it harder for them as shiftworkers when they refused to trade shifts.

When asked what they would like from their coworkers in the way of support, most respondents (79%) said there was nothing more they needed from them. The theme again reflected support and camaraderie, and a sense that there was really little their coworkers could do to make shiftwork easier: "We all do our best-- the schedule gets posted and if you need a trade, you can usually find one. It's sort of a 'scratch my back and I'll scratch yours' thing. Beyond trading, there's little else they can do".

8.4.2 Supervisor Support

Table 27 provides data on perceived and desired support from supervisors. The results are strikingly similar to the coworker items. The only supportive behaviour mentioned was again related to trading: 17% of respondents said their supervisors were responsive to trade requests ("Oh, she's great-- if there's some time I really need to have

off, she's fine with that as long as I can find someone to cover me"). The only non-supportive behaviour cited was in reference to supervisors who were not responsive to trading: 17% of respondents said their supervisors were inflexible about trades.

Also much like the coworker items, there was a sense that the supervisor's hands were tied anyway. Eighty percent of respondents said there was nothing their supervisor did to make shiftwork easier, and an equal proportion said there was nothing he or she did to make it more difficult. Over 90% of respondents said there was nothing they really wanted from their supervisors; nearly 50% said there was nothing the supervisor *could* do ("It's not really within her control to help"; "Scheduling is a complicated business done at a much higher organizational level-- my supervisor has absolutely nothing to do with it").

8.4.3 Organizational Support

Table 28 provides data on perceived and desired support at the level of the company. Even when asked to examine supports at the organizational level, the dominant theme was trading. Thirty percent of respondents thought the organization made shiftwork easier by allowing trades. The only barrier cited was the requirement that employees find their own replacements ("Once in a while you need to go to an appointment, or you have an emergency just like any employee. They'd never ask a nine to fiver to find a replacement for themselves. Just because they give us the option of trading, they figure we should never miss a day from work").

Over half of the sample (54 - 58%) thought there was really nothing at the company level that had either helped or hindered them as shiftworkers. When asked what

they would like in the way of support from the company, the most prevalent answer was more flexibility in scheduling ("Maybe we could have more input into our own schedules-- we get to know who needs what schedule when around here-- we could work some of it out"; "When scheduling is done at such a high level, they haven't a clue what our needs are"). Seventeen percent mentioned the replacement problem again, indicating they would like emergency time off without the stress of finding a replacement. An equal proportion wanted preferential scheduling (based on seniority) to be introduced. (It should be noted that this proportion reflects only those respondents who worked in units without preferential scheduling-- many other respondents already had access to this benefit). Thirteen percent wanted the schedule posted further in advance. Only 17% of respondents could think of nothing they wanted from the company in the way of support.

8.5 Summary

Although findings based on so small a sample cannot be generalized to the broader shiftworking population, the results of the interview study provide a glimpse of some of the possible contributors to work-family conflict among shiftworking mothers in this organization. First, it seemed that the majority of women in this group worked shift because it "came with the job". Respondents initially took the work because it was the only thing available, because they wanted in with the company, or because they felt it paid well given their limited education or work experience. In fact, one in five women had never actually chosen shiftwork at all, but instead, had been moved into it in response to business demands. Most importantly, none of these women had chosen shiftwork

because they found the work hours attractive. These findings provide no support for the suggestion that women may choose non-day work hours as a means of integrating their work and home lives.

On the contrary, dissatisfaction with shiftwork stemmed primarily from interference with home life, especially in time with children. The vast majority of respondents would have preferred to work a schedule that coincided with school and daycare hours and would get them home in time to see their families after school. One third of respondents indicated that they would seriously consider a job with fewer hours if it were available. (This finding is consistent with survey results which indicated a low level of part-time work among mothers on rotating shifts.) Although many women were able to identify at least some advantage to shiftwork (such as the shift differential, a more relaxed work atmosphere, and the ability to shop and run errands during the day), evidently, the disadvantages far outweighed these few benefits: over 80% of respondents said they would gladly accept a day job if one became available.

Social life was also disrupted by shift schedules. Nearly half of respondents said they regularly missed special occasions and family get-togethers in the evenings. Three-quarters were unable to join clubs, take courses, or pursue other interests requiring fixed time commitments.

In terms of work life, there appeared to be little in the way of either advantages or disadvantages associated with shiftwork. Again, there seemed to be a sense that shiftwork just "came with the territory". Instead, these women appeared to accept the inevitability of shift scheduling, and coped by banding together informally to trade off

shifts that were problematic to them. Supervisors, too, seemed to be liked or disliked based on their receptiveness to trade proposals. Even when asked about support at the organizational level, trading was the dominant theme: the only supportive behaviour identified at the company level was some sense that the company "allowed" trading.

Only a small minority of women felt there was nothing the company *could* do to help them. There appeared to be frustration that scheduling was done outside the unit through an involved, bureaucratic process that more or less "steamrolled" them into their shift assignments. These comments were reminiscent of the low level of schedule control reported by women in the survey data. These data indicate that lack of control over work scheduling may be creating substantial problems among shiftworking women in this organization. Interview data suggest that what these shiftworkers want most from the company is more flexibility in scheduling, more input into scheduling, and schedules that are posted further in advance. The high level of interest in daywork and the substantial contingent of interview respondents who found the idea of reduced hours appealing also suggests that a part-time or job-share option might be attractive to these mothers.

9. DISCUSSION OF RESULTS

This section of the paper provides a discussion of the survey and interview results in the context of the theoretical and empirical literature. It is presented in six parts, organized so as to address the research questions identified in Section 5.

The first three parts will discuss the questionnaire survey results in order to explore the effects of shiftwork on individual, work-family, and work outcomes, with separate consideration of the independent effects of gender and parental status (Research Question 1). A fourth part will look at the schedule preference and control results from the survey study and discuss their possible moderating effects in terms of shift response (Research Questions 2 and 3). Interview results will then be discussed in part five in order to obtain the unique perspective of shiftworking mothers, and to explore some of the personal and work-related perceptions which may have provided a basis for the survey results (Research Questions 4 through 7). A summary section will integrate the results of the two studies.

9.1 Individual Outcomes

9.1.1 Shift

Shift assignment was found to have no independent effect on individual well-being as measured by perceived stress and life satisfaction. This rather encouraging finding contradicts previous research which has connected shiftwork with decreases in psychological functioning, and increases in tension, moodiness, and stress (Akerstedt and

Torsvall, 1978; Bohle and Tilley, 1989; Frese and Semmer, 1986; Frost and Jamal, 1979; Smith et al., 1982; Smith and Folkard, 1993b; Zedeck et al., 1983). It may be erroneous to infer from this result, however, that shiftwork has no adverse effect on well-being. There may be several sample-specific reasons that this research did not identify problems in individual functioning.

The first is related to the definition of shiftwork used in this study. Respondents to this survey identified themselves as working rotating shifts if their schedules underwent two or more rotations; therefore the rotating category included employees on both 3-shift rotations (full 24-hour rotations), and 2-shift rotations (no midnights). Work by Bohle and Tilley (1989), Zedeck et al.(1983) and Smith and Folkard (1993b) suggests that psychological problems are greatest for rotators on the midnight shift, and lowest on the day shift. Akerstedt and Torsvall (1978) found that mood could be significantly improved even among rotating shiftworkers if the midnight rotation was eliminated. It is possible, therefore, that stress was minimized in this sample because many of the shiftworkers sampled did not have graveyards included in their rotations (and, hence, did not encounter the same level of stressors as would a sample comprised exclusively of 3-shift rotators).

A second explanation for the lack of a shift effect in terms of individual functioning is suggested in the theoretical literature on individual adjustment (Colquhoun and Rutenfranz, 1980; Monk and Folkard, 1988). These theories suggest that detrimental effects arise, not from the schedule per se, but from the subjective strain that develops among individuals who are unable to cope successfully. Demographic data on this

sample indicate that employees in this research may have already adapted rather successfully: the average rotating shiftworker in this sample had at least 10 years with the company, and at least 3 years of experience with his or her current schedule. In other words, due to selection, there may have been no measurable effect of shiftwork on individual functioning because the sample contained only workers who *had* adjusted (i.e., presumably those who could not adapt had already self-selected into other work).

9.1.2 Gender

Examination of the main effect of gender indicated that women experienced significantly greater difficulty in terms of individual functioning than did men. Stress was identified as the variable contributing to the significant multivariate effect. This finding is consistent with the work-family literature which has shown stress to be higher for employed women than it is for employed men, due largely to an inequitable distribution of household labour (Duxbury et al., 1991; Higgins et al., 1992).

Two other factors, however, may also have contributed to the higher level of stress reported by women in this sample. First, all of the respondents in this study were in non-career tracks. Stress has been shown to be higher among women in such 'earner' groups, due to the combined effect of little autonomy on the job and limited financial resources to purchase services to help them cope at home (Higgins et al., 1992). Second, stress may also have been exacerbated by the very low level of control women in this sample had over their work schedules. The lack of freedom to make decisions and to exercise discretion over work demands has been shown to be related to increased stress (Karasek, 1979).

9.1.3 Parental Status

Parental status had no independent effect on individual well-being. This too was a surprising finding, since stress emanating from pressures from the home domain might be expected to be greater for parents than it would be for non-parents (Higgins et al., 1992).

The composition of the parent/non-parent groups may have accounted for the lack of significance on this measure. First, the substantial age range of children in the parent sample (0 - 18 years) may have increased within-group variance for this group (i.e., the demands on parents of preschoolers might have been considerably greater than those on parents with school-age children or teenagers). Similarly, inclusion of both childless couples and couples with only older children (over 18) in the non-parent group may also have resulted in a less than homogeneous study group, due to the differing demands on their time. Unfortunately, insufficient sample size precluded examination of "purer" groups (e.g., parent/non-parent groups stratified by both presence and age of children).

9.2 Work and Family Outcomes

9.2.1 Work-Family Conflict

9.2.1.1 Shift

Rotating shiftworkers were found to have significantly greater levels of work-family conflict than were dayworkers. This difference was shown to be attributable primarily to the high level of interference from work to family life perceived by the groups on rotating shifts.

These findings are consistent with empirical shiftwork literature which has indicated that work-family conflict is higher among shiftworkers than dayworkers, particularly among those whose shifts span the afternoon or evening hours (Bohle and Tilley, 1989; Shamir, 1983). Since the majority of rotating shiftworkers in this sample rotated through "early" and "late" day shifts, frequent absences from home during dinner and the early evening were commonplace. Regular absence during these critical times (which are typically reserved for family and social interaction) has been shown to be extremely disruptive to family activities, particularly the parenting role (Nock and Kingston, 1988; Mott et al., 1965; Tasto et al., 1978).

9.2.1.2 Gender

Gender was not significantly related to work-family conflict in this study. This finding was contrary to what might have been expected, since women, particularly mothers, have been found to experience significantly higher levels of conflict than men, due to their greater involvement in domestic roles (Higgins et al., 1992).

It should be noted, however, that mean scores on the work-family conflict measures indicate that conflict levels were in fact in the moderate range for both the men and women surveyed (Table 12). This suggests that the similarity in perceived conflict between male and female respondents may have been attributable to a *higher* level of conflict among the men than would be expected (as opposed to a *lower* level among the women). This possibility is consistent with the fact that men in this sample had younger children than did the women surveyed.

9.2.1.3 Parental Status

Also contrary to what might be expected, parental status was unrelated to work-family conflict in this sample. Typically, parents would show higher conflict levels than would non-parents due to the additional pressures associated with child rearing (Higgins et al., 1992).

Two factors may have contributed to this unexpected outcome. First, it must be noted that, although statistically insignificant, the test of the main effect of parental status on work-family outcomes very nearly approached significance ($p < .047$). The decision not to reject was reached only on the basis of the Bonferroni criterion. Examination of the mean scores for this measure (Table 12) indicates that conflict levels were indeed higher for parents in this sample as compared to non-parents (suggesting an adequate effect size). It is possible that the lack of significance on this measure, therefore, might be attributable to low power emanating from the small subgroup sizes. This near significant finding should be borne in mind when interpreting these results.

Second, it is possible that the broad age range of children of the parent group (0 - 18 years) may have "watered down" the level of conflict reported by this group (i.e., conflict was high for parents of preschoolers, whereas it was low for parents of older children in the same study group). In order to explore this possibility, a separate MANOVA of work-family conflict outcomes was performed with the parent group only, using parents with preschoolers and those with only older (school-age) children as the independent variables. This test was significant (Hotelling's = .065, $F(3, 141) = 3.03$, $p < .03$), with the parents of preschoolers showing significantly greater conflict. This

supplemental analysis supports the possibility that the absence of a parental status effect on these outcomes may have been attributable to the heterogeneity of the parent group in terms of age of children. Parental status, therefore, is likely as important a contributor to work-family conflict among shiftworkers as it is among employees in general.

9.2.2 Time Management

9.2.2.1 Shift

The individual time management measure used in this study addressed employees' ability to find time to socialize with friends and relatives, to participate in structured activities, or simply to spend time by themselves. The analysis indicated that rotating shiftworkers experienced significantly greater difficulty managing their individual time than did dayworkers. This finding is consistent with theoretical perspectives which suggest that shiftworkers become "out of synch" with the rhythms of society and everyday life (Dunham, 1977). It is also consistent with Jamal's (1981) contention that continuously rotating schedules create greater time management problems than other shift schedules due to the inability to from predictable routines and patterns in everyday living.

The main effect of shift on the ability to manage family time, unfortunately, could not be determined due to the significant two-way interaction between shift and gender. The nature of this interaction, however, proved to be more interesting than the effect of shift alone, as it revealed the differential effect of shiftwork on family time management as a function of gender.

Although shiftwork increased family time management problems for both men and women, the magnitude of the disruption was much greater for women. As compared to dayworking women, women on rotating shifts reported much greater difficulty finding time to relax with their children, to take them to appointments, and to attend their special activities and events. For men, however, shift assignment showed very little effect on the ease with which they were able to spend time with their children (i.e., men on rotating shifts experienced only slightly more difficulty managing their family time than did their dayworking counterparts).

The fact that rotating shiftwork resulted in greater disruption in the parenting role for women than it did for men supports Nock and Kingston's (1988) work on the family work day. These authors reported that the degree to which work interfered with family roles was determined in part by a worker's gender, and in part by the particular time of day a worker was unavailable to the family. They found that absence during the late afternoon and early evening interfered more with a mother's time with her children than it did with a father's. The shift and gender interaction obtained in this study, therefore, strongly reflects the relationship described by Nock and Kingston. Such findings serve as a further indication that employed women retain their traditional roles in the home irrespective of their involvement in paid work. The introduction of an afternoon shift to a woman's work schedule means she loses time that would be nearly exclusively devoted to family responsibilities (meeting children after school, preparing dinner) were she not at work (Nock and Kingston, 1988). It is possible, therefore, that rotating shiftwork did not similarly reduce men's time with their family simply because there was less time

spent with children to begin with. As expressed by Nock and Kingston, " ...on workdays employed... mothers still have much more contact with children than fathers, and the men in dual-earner couples generally have not adjusted their allocations of time to 'compensate' for their wives' lesser time with children" (p.81).

9.2.2.2 Gender

Women in the sample experienced significantly greater difficulty in individual time management than did the men surveyed. These findings are consistent with the greater level of perceived stress reported by women in this study. As the individual time management items addressed such activities as time for self, friends, chores, and errands, it is possible that due to their heavier domestic responsibilities, women were simply less able to combine their full work day with a "second shift" at home. Again, these findings support the work-family literature in suggesting that responsibilities in the home may generate more conflict and time management problems for women than they do for men.

As the effect of gender on family time management could not be independently assessed, refer to Section 9.2.2.1 for a discussion of this interaction.

9.2.2.3 Parental Status

The presence of children was significantly related to difficulties in individual time management. This finding was not surprising, and supports other work-family studies that have shown that parents have more problems than non-parents in finding time for personal errands, activities, or just time to relax (Higgins et al., 1992). Given that there are only so many hours in the day, parents likely "trade off" their personal time in order

to accommodate the needs of their children. Non-parents, on the other hand, may have more time available to spend alone or in personal activities.

9.3 Work Outcomes

9.3.1 Shift

Rotating shiftworkers reported significantly less favourable work orientations than did dayworkers. Low job satisfaction was shown to be the primary contributor to the observed shift effect. This result is consistent with much of the empirical literature which has suggested that shiftwork, particularly rotating shiftwork, is associated with lower job satisfaction than other work schedules (Jamal, 1981; 1989; Jamal and Baba, 1992).

In spite of its consistency with existing literature, however, this significant effect should probably be interpreted with caution. Other studies have suggested that both personal factors (Barton et al., 1993; Morrow et al., 1994; Mott et al., 1965; Voydanoff, 1988; Zedeck et al., 1983), and factors related to work environment (Frese and Semmer, 1986; Peterson, 1985; Zedeck, 1983) may be better predictors of work orientations than the shift schedule itself. Several patterns evident in this research suggest that factors other than shift may also have contributed to the lower satisfaction among rotating shiftworkers in this sample.

In terms of personal factors, rotating shiftworkers in this sample reported very low levels of schedule satisfaction and schedule control as compared to dayworkers. Given that low control (Barton et al., 1993; Karasek, 1979), and low schedule satisfaction

(Morrow et al, 1994; Mott et al., 1965; Zedeck, 1983) have themselves been associated with reduced job satisfaction, it may be that these factors also contributed to the lower satisfaction among the rotating shiftwork groups. Control and schedule satisfaction will be discussed further in Section 9.4.

Differences in work environment between rotating shiftworkers and dayworkers in this sample may also have contributed to the significant shift effect on these measures. In response to varying business demands (different hours of operation) and different scheduling policies (i.e., the availability of preferential scheduling versus "equitable" rotations for all), shiftworkers in this sample did not show the same departmental distribution as did the dayworkers. Rotating shiftworkers were heavily concentrated in customer service (48%) and installation and repair (23%). An additional 14% of rotating shiftworkers worked in telesales. Dayworkers, on the other hand, were more evenly distributed across departments (roughly 36% in installation and repair; 25% operator services, and 25% retail).

In order to explore the possibility that observed shift-related differences in work outcomes were in fact resulting from departmental differences, a separate MANOVA was run with department as the independent variable. This analysis indicated that there were highly significant differences in work orientations attributable to department (Hotelling's = .301, $F(16, 976) = 4.5$, $p < .000$). Univariate follow-ups indicated that job satisfaction, commitment, and intent to turnover each made a significant contribution to the multivariate effect. Means scores by department (not shown) indicated that retail workers in this sample had very favourable work attitudes, whereas telesales employees had very

unfavourable work attitudes. Since nearly all retail employees were dayworkers, and nearly all telesales employees were rotating shiftworkers, it is impossible to tease out the effect of shift from the effect of the different job demands encountered by these two groups. Preexisting work-related differences between rotating shiftworkers and dayworkers in this sample, therefore, should be borne in mind when interpreting these results.

9.3.2 Gender and Parental Status

Work outcomes in this research were unrelated to gender and parental status. This finding is consistent with the observation that work-family conflict was also not dependent on gender or parental status (i.e., since the literature suggests that work attitudes are adversely affected under circumstances where employees perceive that their work schedules conflict with valued non-work activities; Dunham, 1977; Frost and Jamal, 1979; Jamal, 1981).

9.4 Potential Moderators of the Effects of Shiftwork

9.4.1 Perceived Control

9.4.1.1 Control Over Work Scheduling

The ability to exercise control over the timing of work hours has been shown to be an important buffer of the adverse effects of shiftwork in terms of both work behaviours and work-family conflict (Barton et al., 1993; Voydanoff, 1988). Unfortunately, the extent of the relationship between shift assignment and schedule control could not be determined in this analysis due to the significant interaction between gender and shift.

Although the relationship between shift and control could not be tested statistically, some discussion of schedule control in this sample seems warranted. Its potential contribution to the shift effects observed in this research should not be overlooked for a number of reasons.

First, schedule control was very low for rotating shiftworkers in this organization. The average level of perceived control was under 2 on a 5 point scale for all groups on rotating shifts (Table 15). It seems likely that the high level of work-family conflict and time management problems reported by these shiftworkers might be at least partly attributable to this very low level of control. Employees who lack input into the timing of their work hours have little flexibility to tailor their work hours to their non-work lives. Employees who cannot control the rotational sequence of their shifts are unable to preplan and organize their home lives to accommodate their unusual work hours. Without at least some input into rostering, therefore, rotating shiftworkers may be unable to make satisfactory adjustments in either work or home domains to help them blend work and family responsibilities.

Second, the interaction between shift and gender in the control analysis provides some insight into some of the gender effects observed in this research. Examination of the gender-shift interaction indicated that rotating shiftwork was associated with reduced schedule control for women, but not for men. This pattern was reminiscent of the gender-shift interaction on the family time measure: rotating shiftwork greatly reduced family time management ability for women, but did so only marginally for men. The extremely low levels of schedule control among shiftworking women in this sample, therefore, may

have contributed to their high stress, and their difficulties in managing their individual and family time.

Finally, low schedule control may partly account for the unfavourable work orientations of rotating shiftworkers in this study. Intuitively, it would appear that low control, particularly where it is associated with high work-family conflict, might be expected to "spill over" to influence an employee's attitude toward the source of the inflexibility. A positive relationship between schedule control and work attitudes would be consistent with the very low level of schedule satisfaction expressed by shiftworkers in this study (see Section 9.4.2).

9.4.1.2 Control Over Work-Family Balance

Control over the interface of work and family was a broader concept than the schedule control previously discussed. This scale accessed flexibility, not only in scheduled work hours, but also in other areas thought to facilitate work-family balance, such as vacation time, days off, discretion to make personal phone calls at work, and the ability to arrange emergency child care.

Rotating shiftworkers reported significantly less control over the work-family interface than did dayworkers. This finding is consistent with the high work-family conflict and low ability to manage individual time reported by shiftworkers in this sample.

It is difficult to compare the work-family control results to the schedule control item, because the main effect of shift could not be determined for schedule control. Examination of the means for both of the control items, however, suggests that work-

family control was consistently higher than schedule control (i.e., all shiftworking groups reported greater control over work-family balance than they did over their schedules). Because of the broader scope of items accessed in the work-family scale, the higher control on this measure suggests that there may be more informal flexibility in the work environment of these shiftworkers than there is formal flexibility provided through scheduling. For example, the ability to make a personal phone call, to trade a shift, or to take a few hours off might have contributed to heightened perceptions of control over work-family balance in general (but not over scheduling specifically). Some of the informal control shiftworkers may be able to achieve through their own cooperative efforts will be discussed with the interview results (Section 9.5).

9.4.2 Preferred Work Schedule

Not surprisingly, given their low control, high work-family conflict, and difficulties in time management, rotating shiftworkers tended to dislike their work schedules. Shiftworkers were significantly less likely than dayworkers to say they found their current work schedules appealing. The difference was vast: only 10 to 15% of shiftworkers said their schedules appealed to them versus 75 to 95% of dayworkers. The fact that parents were no more likely to be satisfied with their shift schedules than were non-parents refutes the notion that shiftwork may be chosen by some families to facilitate child care and work-family coordination.

Like low schedule control, a low level of satisfaction with their work hours may have contributed to the unfavourable work orientations of rotating shiftworkers in this study. This interpretation of the data would be consistent with Lawler's (1973)

discrepancy model of job satisfaction, which suggests that employees who experience a mismatch between preferred and realized job outcomes will be less satisfied with their jobs. In terms of this research, then, the mismatch between rotating shiftworkers' preferred schedule and their existing schedule may have contributed to their lower scores on the work outcome data, particularly on the job satisfaction measure.

9.5 Perceptions and Motivations of Mothers on Rotating Shifts

The above survey results suggest that rotating shiftwork appeared to be particularly difficult for women with children in the home. Perceptions and motivations which may have contributed to the survey results were obtained through structured interviews with a subsample of mothers on rotating shifts.

9.5.1 Reasons for Shiftwork

Interview data indicated that the majority of women working rotating shifts in this organization did so because the job demanded it. This finding is consistent with Sunter's (1993) labour force data which indicate that the vast majority of shiftworkers in Canada have little choice in whether or not they work shift, but do so because it is required by the job.

It has been suggested that one of the few reasons a mother might choose shiftwork might be the opportunity to spend time with very young children during the early part of the day (Finn, 1981). Even though this interview sample consisted exclusively of mothers (and over 40% had preschoolers at home), not one respondent indicated that she had chosen shiftwork in order to spend time with her children. In fact, it seems that

shiftwork made work-family balance more difficult for these mothers: four out of five of the respondents indicated that they would take a day job if they could find one, and the primary reason was to enable them to be home during the late afternoon for their families. One third of the sample would have liked to work fewer hours, many citing the desire to work only school or daycare hours. This research, therefore, provides little support for the notion that shiftwork can help women blend their work and home lives.

9.5.2 Advantages and Disadvantages of Shiftwork

Consistent with their reasons for shiftwork (i.e., it "comes with the job"), respondents were hard pressed to come up with advantages to shiftwork. Where they were able to cite advantages, most centred on economic or work factors. The most frequent advantage cited was that there was a small shift differential associated with evening work. Respondents also tended to think that the evening shift was more relaxed, with a more pleasant client base.

In non-work activities, however, disadvantages prevailed. In terms of family life, interference with time with children was again a recurrent theme. Respondents indicated that the biggest single disadvantage associated with shiftwork was that they missed their children. Again, no one cited more time with children as an advantage. These data are consistent with previous research that has shown shiftworkers to have particular difficulty participating in family activities (Hertz and Charlton, 1989; Knuttson, 1986; Mott et al., 1965; Tasto et al., 1978), and that the interference can be particularly great for mothers (Nock and Kingston, 1988).

In terms of social life, the greatest disadvantage of shiftwork was the lack of freedom to pursue interests requiring a fixed time commitment, such as club activities, sports, and organized study. This finding supports empirical literature which has suggested that non-day shifts interfere most with structured social activities (Akerstedt and Torsvall, 1978; Frost and Jamal, 1982; Jamal, 1981; 1989; Mott et al., 1965). On the other hand, solitary activities appeared to pose no problem to the shiftworkers in the interview sample: 100% of respondents thought they could shop and bank easily; nearly as many were easily able to arrange medical appointments.

Combined, the interview data provide strong support for Dunham's (1979) community rhythms theory. Many of the disadvantages cited by respondents emanated from work schedules that were out of synch with the rhythms of their surrounding environments. Disruptions in family life resulted from having a work day that did not correspond to the children's school day. Disruptions in social life stemmed from the lack of opportunity to engage in structured social activity, typically scheduled with the dayworker in mind. Also consistent with Dunham's theory was the finding that a considerable *advantage* of shiftwork was the ability to shop and run errands during non-peak hours. Automated banking and extended business hours in most urban centres mean that community rhythms have to some degree aligned with the needs of shiftworkers. This alignment may have provided a measure of support to shiftworking women in this sample.

9.5.3 Support in the Workplace

Interviews also provided some insight into employees' perceptions of the level of support available to them in the workplace. A sense of mutual cooperation between coworkers was evident in the large proportion of respondents who indicated that their coworkers helped them out by trading shifts since they all were more or less "in the same boat". This finding supports the (primarily anecdotal) claim that shiftworkers enjoy the sense of camaraderie and esprit de corps that stems from smaller work groups and a more relaxed atmosphere (Finn, 1981; Monk and Folkard, 1992). It should be noted, however, that much of the cooperation between coworkers appeared to emanate from a mutual desire to get rid of shifts that conflicted with their home lives. This serves as a reminder that, in spite of finding their coworkers supportive, most of these women would rather not have been working shift at all.

Interviews indicated that little support for shiftworkers was available either at the supervisory or organizational level. Supervisors were perceived as powerless in terms of easing the burden of shiftwork, since scheduling was not within their control. On the other hand, most of the respondents felt the organization had a role to play in making shiftwork easier, primarily in the area of scheduling. Respondents wanted more flexibility in scheduling and more input into the scheduling process.

Unfortunately, direct comparisons with other research cannot be made, as no studies were identified which had examined supervisor, coworker, or organizational support in a shiftwork context. The interview data on workplace support, however, add to our knowledge of the work environment in this organization, and draw attention to

potential moderating variables that may have existed in the work context. For example, the cooperative nature of peer relationships in this sample suggests that bonds between shiftworkers (the "all in the same boat" mentality) might be serving to moderate the effects of shiftwork for these women. Frame of reference theory (as applied by Feldman and Doerpinghaus; 1992) suggests that work orientations of these shiftworkers may have been tempered to some degree by the belief that shiftwork "comes with the job"'; hence, shiftworking peers represent the standard by which equity is judged. Since, according to company data, all employees in the shiftworking departments worked shift to some degree, shiftworkers in this sample would have little contact with true "nine to fivers", and would not view those on so-called "normal" schedules as comparative others. Equity theory, therefore, might account for survey findings which indicated that women on shift did not experience more stress than women on days in spite of longer work hours, and greater time management problems (i.e., the potential for adverse effects had been moderated by perceived equity with shiftworking peers).

9.6 Summary

The findings of this study support the contention that shiftworkers experience considerable problems in the integration of work and home life. Consistent with previous research that has linked shiftwork to interference with personal and family activities (Bohle and Tilley, 1989; Hertz and Charlton, 1989; Jamal and Baba, 1992; Knuttson, 1986; Mott et al., 1965; Shamir, 1983; Tasto et al., 1978), shiftworkers in this sample experienced greater difficulty managing their individual time than did dayworkers, and

reported significantly greater work-family conflict. Conflict emanated from shiftworkers' perceptions that work intruded on family life; conversely, interference in the other direction (i.e., from family to work) was very low.

Combined, these data suggest that a primary source of conflict for shiftworkers may be the inherent difficulty of adjusting personal life to the rigid time and place constraints associated with this type of work. The prominence of work schedules in the lives of shiftworkers was a prevailing theme in both survey and interview data. Shiftworkers reported substantively less control over their work hours than did dayworkers, and significantly less control over the interface of work and family. Not surprisingly, shiftworkers were also significantly less likely than dayworkers to say they favoured their current work arrangement. Dissatisfaction with work hours surfaced repeatedly in interviews, as shiftworkers described their efforts to "trade away" their scheduled shifts.

Gender proved to be an important contributor to individual and work-family outcomes, with women experiencing significantly greater stress and individual time management problems than men. These findings are consistent with much of the work-family literature in suggesting that women may experience problems in individual functioning due to their dual role as employees and homemakers (Duxbury et al., 1991; Higgins et al., 1992; Lero et al., 1993; Nock and Kingston, 1985; 1988). This differential effect of gender on shift response was also suggested in the family time management data: shiftwork greatly interfered with child-related activities for women, but did so only marginally for men.

This research provides no support for the notion that shiftwork may help women balance work and family. Although a third of the interview respondents indicated that their spouses were able to provide at least some child care, this advantage was apparently incidental, and more than offset by the perceived loss of time that they themselves had to spend with their children: the number one disadvantage cited by interview respondents was that they missed their children. Given the chance, the vast majority of these women would simply have preferred to work days. One third would have liked to work fewer hours, consistent with survey data which indicated that women on rotating shifts in this sample worked a longer work week than did women on days.

In terms of work attitudes, the results of this research were equivocal. Although shiftworkers showed significantly less favourable work orientations than did dayworkers, the confounding effect of department remained a possibility. Preexisting differences in terms of the departmental composition of the shift groupings imply real differences in the job content of rotating shiftworkers versus dayworkers (e.g., the shiftwork group was majority customer service and I & R, and the day group was majority retail, operator, and I & R). Such differences may equally have contributed to the low job satisfaction among rotating shiftworkers in this study. The fact that shiftworkers consistently showed problems in areas less directly related to the actual work done, however, (i.e., in measures of work-family conflict, personal time management, control, and schedule satisfaction), strongly suggests that intershift differences might have persisted even if adequate control for department had been obtained.

10. CONCLUSIONS, LIMITATIONS, AND FUTURE RESEARCH

The final section of this paper is presented in two parts. The first draws some general conclusions from this research, and discusses shiftwork in the broader context of the workplace of the '90s. The last section identifies limitations of this study and suggests directions for future research.

10.1 Conclusions

This study of a group of men and women working in a modern service industry has allowed us to reexamine the effects of shiftwork in a context more representative of shiftwork in the '90s. The results of the research reveal not only how much has changed in the shiftworker's work and home life since early shiftwork studies were conducted, but also how much has remained the same.

As implied in the review of labour force trends, what has changed is the face of the shiftworker. Demographic data on the organization surveyed for this research indicated that two thirds of the respondents from shiftworking departments were women. Over half of the sample (both male and female) had children under 18 at home. Shiftworking women were much less likely than their male counterparts to have preschool aged children, providing some support for the notion that women with high child rearing demands may be "self selecting" out of shiftwork (Charles and Brown, 1981; Nock and Kingston, 1988). Combined, these data suggest considerable pressures on today's shiftworker in terms of family responsibilities.

What hasn't changed is the workplace's ability to accommodate the personal needs of shiftworkers. First, scheduling in this organization was evidently structured around a traditional seniority-based system. Demographic and interview data indicated that shiftwork was assigned largely to new hires, with advancement to day shifts "earned" through years of service. Although it may seem somewhat equitable to have everyone "pay their dues" in this manner, such preferential scheduling means that rostering is necessarily done without an eye to individual preferences and needs. As a result, those employees most in need of flexibility (i.e., young workers with families) are least likely to obtain it. In addition, the input of the shiftworkers themselves (who can perhaps best reconcile the unit's unique business demands with staff's scheduling needs) is lost.

Second, shiftwork in this organization showed the same rigid time and place constraints that shiftwork has traditionally imposed on employees. In spite of suggestions that shiftwork may increase flexibility for employees trying to blend work and family (Finn, 1981; Presser, 1986), shift scheduling in this organization was clearly still "business-driven" (Pierce et al., 1989). Work schedules were determined in advance in order to meet the particular staffing needs of a variety of units with a variety of hours of operation. Although no one would argue against the need for customer-responsive business hours, all scheduling appeared to be done at such a high organizational level that the needs of the units' particular employees were invisible to those doing the scheduling.

As a result, lack of control over work hours was a recurring theme throughout this research. Scaled scores from the survey results suggested that shiftworkers perceived a very low level of control over their work scheduling, and reported significantly less

control over the work-family interface than did dayworkers. When asked what they would most like from their employer in the way of support, again, interview respondents wanted more control and more input into their work scheduling.

High pressures from the work and home domains combined with low control over work hours likely contributed to many of the shift effects observed in this research. Shiftworkers experienced significantly greater work-family conflict than dayworkers and reported significantly more difficulty managing their individual time. Interview data suggested that shiftwork also interfered with participation in informal and formal social pursuits and shut employees out of activities requiring a fixed time commitment. Not surprisingly, shiftworkers had significantly poorer work attitudes than did the dayworkers surveyed, and were significantly less satisfied with their work schedules. Given the choice, the vast majority would have preferred to work days.

Some of the independent gender effects observed in this research suggest that changes have been slow on the home front, as well. Work-family literature has consistently shown that, in spite of their additional responsibilities in the paid work force, women have retained their roles as primary caregivers in the home (Duxbury et al., 1991; Higgins et al., 1992; Lero et al., 1993; Nock and Kingston, 1985; 1988). Findings from this research support this contention. Women reported significantly greater stress than the men surveyed, and greater difficulty managing their individual time.

Examination of some of the gender-shift interactions (an increase in family-time management problems among women on shift, but not among men) also suggests that an imbalance in the division of household responsibilities may be contributing to a

differential (gender-based) response to shiftwork. As suggested by Charles and Brown (1981), women can work shift without any challenge to stereotyped roles within the family. Evening work in particular can allow women to add to the family's income, while maintaining their roles as caregivers. As expressed by one interviewee:

> "I can be with my kids during the day, clean the house, and prepare dinner ahead of time. Then when I get to the office I can finally sit down. I consider my paid work a break. It takes a lot less energy to answer that phone at night than it does to take care of the house all day."

In summary, although the results of this study cannot be generalized to the wider shiftworking population, this research takes a first step toward moving shiftwork research into the broader framework of work and family. Application of the relevant work-family measurement scales has yielded results that largely support many of the findings from the more traditional shiftwork literature. Previous evidence that shiftwork disrupted time for self, family, and social pursuits (Akerstedt and Torsvall, 1978; Frost and Jamal, 1982; Mott et al., 1965; Tasto et al., 1978) found support in the high work-family conflict and low individual time management scores obtained in this research. Similarly, reexamination of work orientations by use of standardized scales has lent support to previous research associating shiftwork with reduced job satisfaction and increased work conflict (Jamal, 1981; 1989; Jamal and Baba, 1992; Kundi et al., 1980).

The work and family framework also served as a guide to examining some of the potential moderators of shiftwork response, such as gender and parental status. As expected, gender and parental status were significantly related to difficulties in terms of individual functioning (problematic for women) and individual time management

(problematic for both women and parents). These findings underscore the need to interpret shiftwork response only in the context of these potential moderating variables.

Finally, qualitative interview data obtained in this research highlight the disparity between a workplace that is rapidly changing, and an infrastructure that lags behind. In this organization, operating hours continued to expand with no concomitant increase in support for the workers affected by the changes. In addition, the "double day" described by many of the shiftworking mothers indicated that few adjustments to accommodate their work hours had been made at home either. Such observations illustrate some of the unique pressures that may exist for the modern shiftworker, as the confluence of labour force, social, and economic changes increase pressures from both the work and home domains.

As globalization and burgeoning service industries continue to exert pressure for round-the-clock staffing (Sunter, 1993), shiftwork can be expected to continue to play an integral role in industry and in the economy. In many ways, shiftwork research has not kept pace with the economic, demographic, and labour force changes that are shaping the profile of shiftworkers today. The results of this study suggest that for many shiftworking employees, home and work are no longer the separate spheres they were when early studies of shiftwork were conducted. Anticipated demand in high skill areas means that organizations may have to become more responsive to the needs of shiftworkers if they are to meet staffing goals, attract skilled workers, and ensure equity.

More research is needed on today's shiftworkers, particularly in the growing service sector. Future research should look further at the issues of shift preference and

control and continue to collect qualitative data to help increase our understanding of how shiftworkers cope with the competing responsibilities of work and family. The final section of this paper identifies the limitations of the current study and suggests directions for future shiftwork research.

10.2 Limitations and Future Research

10.2.1 Generalizability

This sample represents a single organization, and as such, is not generalizable to other organizations or to the population of shiftworkers in general.

10.2.2 Occupational Groupings

Section 2 discussed recent increases in the proportion of managers and professionals working shift. This occupational category might have been of research interest. Unfortunately, preliminary numbers obtained from the participating organization indicated that questionnaires had been distributed to only 80 managers. Taking non-response into consideration, it was felt that the resulting sample would not be large enough for analysis. This study, therefore, limits itself to non-career employees. Future research might benefit from a comparison between both career and non-career employees who work shift.

10.2.3 Definition of Shiftwork

Literature reviewed for this research indicated that shift categories had seldom been classified on both rotational characteristics (fixed versus rotating) and time of day worked (days, afternoons, midnights). Central to this research was the development of

shift categories that were sensitive to the rhythms of family life. Toward this end, attention was focused on availability during the dinner hour and early evening. Any employee who identified his or her latest stop time as 6 pm or earlier was coded as a "dayworker". This classification, therefore, was chosen because it was able to distinguish those employees who were predictably able to spend early evenings with their families (dayworkers)from those who were not (shiftworkers). The "time of day" criterion, therefore, had been satisfied.

The shiftwork versus daywork categories, however, were not dichotomized on the "rotational" dimension. "Dayworkers" in any shiftworking department in this organization also rotated, but within a narrower bandwidth than the rotating shiftwork groups. Although having rotators in both groups initially appeared problematic in terms of within-group variability, the categories were retained for three reasons. First, having a daywork group from within the shiftworking departments allowed some degree of control over work environment (i.e., work context similar for both groups as opposed to going outside the departments to find strict nine to fivers). Second, this distinction allowed a clean look at the effect of time of day worked on work and family outcomes, since variability in scheduling was common to both groups (i.e., if the daywork group had been both a day shift and a fixed shift, the effects attributable to time of day could not be teased out from those attributable to having a predictable shift per se). Finally, the author questioned the likelihood of finding a purer "fixed" day group outside the shiftworking departments either. Few employees today have the luxury of walking out the door at a

prescribed time, and start and stop times which vary (within the limits described above) seemed more representative of the norm.

In order to better capture both rotational characteristics and time of day worked, future researchers might attempt to find an organization in which it is possible to obtain a four-group shift classification (fixed day, fixed afternoon, fixed night, and rotating). Unfortunately, such a wide variety of scheduling arrangements was not available within the participating organization.

10.2.4 Treatment of Potential Moderating Variables

As an exploratory study, this research was designed to search for relationships between a wide variety of variables assumed to pertain to the work and family effects of shiftwork. Gender and parental status were treated as independent variables in order to determine whether there was in this sample a relationship between these context variables and the individual, work-related, and work-family outcomes of interest. It was also thought that control and schedule satisfaction might vary as a function of shift, and these variables, therefore, were treated as dependent variables in the analysis.

The model used to guide the selection of variables (Figure 1), however, would indicate that all five of these variables are best thought of as moderators of shift response. Several important relationships were identified through these analyses, and emphasize the need to control for these potential moderators in future research on the effects of shiftwork. Future analyses might focus on one or two of these variables and position them as moderators of the shift response (e.g. analysis of covariance with adjustment for differences attributable to gender, parental status, control, or satisfaction).

10.2.5 Relationship Between Shift, Gender, and Department

In spite of achieving some success in obtaining both shiftworkers and dayworkers from the same group of shiftworking departments, it should be noted that the final study groups were not parous in terms of their departmental distribution. Due to differing business demands, departments necessarily scheduled their workers differently. As a result, the rotating shiftwork group was heavily concentrated in customer service and installation and repair, whereas the daywork group was more evenly distributed across installation and repair, operator services and retail employees. The different work environments between such groups as customer service representatives (comprising nearly half of the rotating shiftwork group) and retail representatives (nearly exclusively in the daywork category) may have contributed to the observed shift effects, particularly in terms of work attitudes. (See Section 9.3).

Department worked may also have contributed to some of the observed gender effects in this research. Analysis of department by gender indicated some degree of occupational segregation. Any differences obtained on the gender analyses, therefore, may have reflected the fact that women and men in this organization worked in different environments (women in operator services, retail and customer service; men in installation and repair). Unfortunately, such occupational segregation is a reality in the work world, and was considered unavoidable. In addition, since work environment might be expected to contribute more to work attitudes than to other outcome measures, the finding that there were no gender differences in work orientations provided a measure of comfort with the data.

It should also be noted that, although these potential sources of bias remain, the study still benefited from drawing its sample from a single organization. The reviewed literature suggests that the employing organization is a major predictor of work behaviours and attitudes. Sampling a single organization allowed more control over organizational context factors which might otherwise have confounded observed shift-related differences.

REFERENCES

Akerstedt, T., Patkai, P. and Dahlgren, K. (1977). Field studies of shiftwork: II. Temporal patterns in psychophysiological activation in workers alternating between night and day work. Ergonomics, 20, 621-631.

Akerstedt, T. and Torsvall, L. (1978). Experimental changes in shift schedules-- Their effects on well-being. Ergonomics, 21, 10, 849-856.

Barton, J., Smith, L., Totterdell, P., Spelten, E. and Folkard, S. (1993). Does individual choice determine shift system acceptability? Ergonomics, 36, 93-99.

Barton, J. and Folkard, S. (1991). The response of day and night nurses to their work schedules. Journal of Occupational Psychology, 64, 207-218.

Bausell, R. (1994). Conducting meaningful experiments. Thousand Oaks, CA: Sage.

Bjerner, B. and Swensson, A. (1953). Shiftwork and rhythm. Acta Medica Scandinavia, 278, 102-107. Cited in Monk and Folkard, 1992.

Bohen, H. and Viveros-Long, A. (1981). Balancing jobs and family life. Temple University Press.

Bohle, P. and Tilley, A. (1989). The impact of night work on psychological well-being. Ergonomics, 32, 1089-1099.

Bohrnstedt, G. and Knoke, D. (1994). Statistics for social data analysis. Itasca, Ill.: Peacock.

Browne, R. (1949). The day and night performance of the tele-printer switchboard operators. Occupational Psychology, 23, 121-126. Cited in Monk and Folkard, 1992.

Cartwright, D. (1959). Lewinian theory as a contemporary systematic framework. In S. Koch (Ed.), Psychology: a study of a science. New York: McGraw Hill. Cited in Mott et al., 1965.

Cervinka, R. (1993). Night shift dose and stress at work. Ergonomics, 36, 155-160.

Charles, N. and Brown, D. (1981). Women, shiftwork and the sexual division of labour. Sociological Review, 29, 685-704.

Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385-396.

Colquhoun, W. and Rutenfranz, J. (1980). Introduction. In W. Colquhoun and J. Rutenfranz (Eds.), Studies of shiftwork. London, England: Taylor and Francis. Cited in Monk and Folkard, 1992.

Cunningham, J. (1989). A compressed shift schedule: Dealing with some of the problems of shift-work. Journal of Organizational Behavior, 10, 231-245.

Czeisler, C., Moore-Ede, M. and Coleman, R. (1982). Rotating shiftwork schedules that disrupt sleep are improved by applying circadian principles. Science, 217, 460-463.

Diener, E., Emmons, R., Larsen, R. and Griffin, S. (1985). The Satisfaction with Life Scale. Journal of Personality Assessment, 49, 71-75.

Dirkx, J. (1993). Adaptation to permanent night work: The number of consecutive work nights and motivated choice. Ergonomics, 36, 29-36.

Dunham, R. (1977). Shift work: A review and theoretical analysis. Academy of Management Review, 2, 624-634.

Duxbury, L., and Higgins, C. (1994). Part-time work for women: its effects and effectiveness.

Duxbury, L., Higgins, C., Lee, C., and Mills, S. (1991). Balancing work and family: A study of the Canadian Federal Public Sector. December, 1991.

Ehret, C. (1980). New approaches to chrono-hygiene for the shift worker in the nuclear power industry. In Reinberg, A., Vieux, N. and Andlauer, P. (Eds.), Night and shift work: Biological and social aspects. Oxford: Pergamon Press, 263-270.

Feldman, D. (1990). Reconceptualizing the nature and consequences of part-time work. Academy of Management Review, 15, 1, 103-112.

Feldman, D. and Doerpinghaus, H. (1992). Patterns of part-time employment. Journal of Vocational Behavior, 41, 282-294.

Finn, P. (1981). The effects of shift work on the lives of employees. Monthly Labor Review, 104, 10, 31-35.

Folkard, S. (1993). Editorial. Ergonomics, 36, 1-2.

Folkard, S., Monk, T. and Lobban, M. (1978). Short and long-term adjustment of circadian rhythms in 'permanent' night nurses. Ergonomics, 21, 785-799.

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

Frost, P. and Jamal, M. (1979). Shift work, attitudes, and reported behavior: Some associations between individual characteristics and hours of work and leisure. Journal of Applied Psychology, 64, 77-81.

Ganster, D. and Fusilier, M. (1989). Control in the workplace. In C. Cooper and I. Robertson (Eds), International review of industrial and organizational psychology, 235-280. London: Wiley.

Gutek, B., Searle, S., and Kelpa, L. (1991). Rational versus gender role explanation for work-family conflict. Journal of Applied Psychology, 76, 560-568.

Hertz, R. and Charlton, J. (1989). Making family under a shiftwork schedule: Air Force security guards and their wives. Social Problems, 36, 5, 491-507.

Higgins, C., Duxbury, L., and Lee, C. (1992). Balancing work and family: A study of Canadian private sector employees. London, Ontario: Western Business School, University of Western Ontario.

Hildebrandt, G. Rohmert, W. and Rutenfranz, J. (1974). Twelve and 24 hour rhythms in error frequency of locomotive drivers and the influence of tiredness. International Journal of Chronobiology, 2, 175-180. Cited in Monk and Folkard, 1992.

Hochschild, A. (1989). The second shift: Working parents and the revolution at home. New York: Viking.

House, R. and Rizzo, J. (1972). Role conflict and ambiguity as critical variables in a model of organizational behavior. Organizational Behavior and Human Performance, 7, 467-505.

Jamal, M. (1981). Shift work related to job attitudes, social participation and withdrawal behavior: A study of nurses and industrial workers. Personnel Psychology, 34, 535- 547.

Jamal, M. (1989). Shiftwork creates unusual problems. Personnel Psychology, May, 114-117.

Jamal, M. and Baba, V. (1992). Shiftwork and department-type related to job stress, work attitudes and behavioral intentions: A study of nurses. Journal of Organizational Behavior, 13, 449-464.

Jamal, M. and Jamal, S. (1982). Work and nonwork experiences of employees on fixed and rotating shifts: An empirical assessment. Journal of Vocational Behavior, 20, 282-293.

Jones, S. (1985). Depth interviewing: The analysis of depth interviews. In R. Walker (Ed.), Applied Qualitative Research. Aldershot: Gower, 45-70.

Kahn, R., Wolfe, D., Quinn, R., Snoek, J. and Rosenthal, R. (1964). Organizational stress: Studies in role conflict and ambiguity. New York: John Wiley and Sons.

Karasek, R. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. Administrative Science Quarterly, 24, 285-309.

Kassarjian, H. (1977). Content analysis in consumer research. Journal of Consumer Research, 4, 8-18.

Kingston, P. and Nock, S. (1985). Consequences of the family work day. Journal of Marriage and the Family, August, 619-629.

Knutsson, A., Akerstedt, T. and Orth-Gomer, K. (1986). Increased risk of ischaemic heart disease in shift workers. Lancet, 12, 89-92. Cited in Monk, T. and Folkard, S. (1992). Making shift work tolerable. London, England: Taylor and Francis.

Krippendorff, K. (1980). Content analysis: An introduction to its methodology. Beverly Hills: Sage.

Kundi, M., Koller, M., Cervinka, R., and Haider, M. (1980). Job satisfaction in shift workers and its relation to family situation and health. In Reinberg, A., Vieux, N. and Andlauer, P. (Eds.), Night and shift work: Biological and social aspects. Oxford: Pergamon Press, 237-243.

Lawler, E. (1973). Motivation in work organizations. Monterey, CA: Brooks-Cole. Cited in Morrow, McElroy and Elliott, 1994.

Lero, D., Brockman, L., Pence, A., Goelman, H. and Johnson, K. (1993). Workplace benefits and flexibility: A perspective on parents' experiences. Ottawa: Statistics Canada, Human Resources Development. Catalogue 89-503E.

Lero, D., Goelman, H., Pence, A., Brockman, L. and Nuttall, S. (1992). Parental work patterns and child care needs. Ottawa: Statistics Canada, Health and Welfare Canada. Catalogue 89-529E.

Lero, D. and Johnson, K. (1994). 110 Canadian statistics on work and family. Ottawa: Canadian Advisory Council on the Status of Women.

Locke, E. (1969). What is job satisfaction? Organizational Behavior and Human Performance, 4, 309-336. Cited in Morrow, McElroy and Elliott, 1994.

McKie, C. (1992). Part-time work in the North Atlantic Triangle: The United States, the United Kingdom, and Canada. In B. Warme, K. Lundy and L. Lundy (Eds.), Working part time: Risks and opportunities. Westport, CON: Praeger, 21-40.

Mellor, E. (1986). Shift work and flexitime: How prevalent are they? Monthly Labour Review, 109, 11, 14-21.

Miller, H. and Terborg, J. (1979). Job attitudes of part-time and full-time employees. Journal of Applied Psychology, 64, 4, 380-386.

Monk, T. (1988). Advantages and disadvantages of rapidly rotating shift schedules- A circadian viewpoint. Human Factors, 28, 553-557. Cited in Monk and Folkard, 1992.

Monk, T. and Folkard, S. (1992). Making shift work tolerable. London, England: Taylor and Francis.

Morrow, P., McElroy, J. and Elliott, S. (1994). The effect of preference for work status, schedule, and shift on work-related attitudes. Journal of Vocational Behavior, 45, 202-222.

Mott, P., Mann, F., McLoughlin, Q. and Warwick, D. (1965). Shift work. The social, psychological, and physical consequences. Ann Arbor: University of Michigan Press.

Mowday, R., Steers, R. and Porter, L. (1979). The measurement of organizational commitment, Journal of Vocational Behaviour, 14, 224-247.

Nilsson, C. (1980). Social consequences of the scheduling of working hours. In Reinberg, A., Vieux, N. and Andlauer, P. (Eds.), Night and shift work: Biological and social aspects. Oxford: Pergamon Press, 489-494.

Nock, S. and Kingston, P. (1984). The family work day. Journal of Marriage and the Family, May, 333-343.

Nock, S. and Kingston, P. (1988). Time with children: The impact of couples' work-time commitments. Social Forces, 67, 1, 59-85.

Ontario Women's Directorate (1990). Work and family: The crucial balance. Toronto: Ontario Ministry of Community and Social Services.

Peterson, M. (1985). Attitudinal differences among work shifts: What do they reflect? Academy of Management Journal, 28, 3, 723-732.

Pierce, J., Newstrom, J., Dunham, R. and Barber, A. (1989). Alternative work schedules. Boston: Allyn and Bacon.

Pleck, J. and Staines, G. (1985). Work schedules and family life in two-earner couples. Journal of Family Issues, 6, 1, 61- 82.

Presser, H. (1986). Shift work among American women and child care. Journal of Marriage and the Family, August, 551-563.

Presser (1984). Job characteristics of spouses and their work shifts. Demography, 21, 4, 575-589.

Price, W. and Holley, D. (1980). The last minutes of Flight 2860: An analysis of crew shift work scheduling. In Reinberg, A., Vieux, N. and Andlauer, P. (Eds.), Night and shift work: Biological and social aspects. Oxford: Pergamon Press, 287-294.

Prokop, O. and Prokop, L. (1955). Ermunudung und Einschlafen am Steuer, Zentralblatt fur Verdehrs-Medizin. Verkehrs-Psychologie und angrenzende Gebiete, 1, 19-30. Cited in Monk and Folkard, 1992.

Quinn, R. and Shepard, L. (1974). The 1972-73 Quality of Employment Survey. Institute for Social Research, University of Michigan, Ann Arbour, MI.

Rizzo, J., House, R. and Lirtzman, S. (1970). Role conflict and ambiguity in complex organizations. Administrative Sciences Quarterly, 15, 150-163.

Rotchford, N. and Roberts, K. (1982). Part-time workers as missing persons in organizational research. Academy of Management Review, 7, 2, 228-234.

Rutenfranz, J., Colquhoun, W., Knauth, P. and Ghata, J. (1977). Biomedical and psychosocial aspects of shift work: A review. Scandinavian Journal of Work Environment and Health, 3, 165-182. Cited in: Smith and Folkard (1993)

Rutenfranz, J., Haider, M. and Koller, M. (1985). Occupational health measures for nightworkers and shift workers. In Folkard, S. and Monk, T. (Eds.), Hours of work-Temporal factors in work scheduling. New York: John Wiley and Sons.

Shamir, B. (1983). Some antecedents of work-nonwork conflict. Journal of Vocational Behavior, 23, 98-111.

Simon, B. (1990). Impact of shift work on individuals and families. Families in Society, June, 342-348.

Smith, P. (1979). A study of weekly and rapidly rotating shift workers. International Archives of Occupational and Environmental Health, 43, 211-220. Cited in Monk and Folkard, 1992.

Smith, M., Colligan, M. and Tasto, D. (1982). Health and safety consequences of shift work in the food processing industry. Ergonomics, 25, 133-144.

Smith, L. and Folkard, S. (1993a). The perceptions and feelings of shift workers' partners. Ergonomics, 36, 299-305.

Smith, L. and Folkard, S. (1993b). The impact of shiftwork on personnel at a nuclear power plant: An exploratory survey study. Work and Stress, 7, 4, 341-350.

Staines, G. (1986), Men's work schedules and family life, Marriage and Family Review, 9, 43-65.

Staines, G. and Pleck, J. (1983). The impact of work schedules on the family. Ann Arbor: Institute for Social Research. Cited in Staines, G. (1986), Men's work schedules and family life, Marriage and Family Review, 9, 43-65.

Statistics Canada, Labour and Household Surveys Analysis Division (1993). Work arrangements. Ottawa: Minister of Industry, Science and Technology. Catalogue 71-535, no. 6.

Stevens, J. (1992). Applied multivariate statistics for the social sciences. Hillsdale, N.J.: Lawrence Erlbaum Publishers.

Sunter, D. (1993). Working shift. Perspectives, 5, 1, 16-23.

Tabachnick, B. and Fidell, L. (1989). Using multivariate statistics. New York: Harper and Row.

Tasto, D., Colligan, M., Skjei, E. and Polly, S. (1978). Health consequences of shift work. SRI Project URU-4426. Cited in Staines, G. (1986), Men's work schedules and family life, Marriage and Family Review, 9, 43-65.

Tepas, D. (1985). Flexitime, compressed workweeks and other alternative work schedules. In Folkard, S. and Monk, T. (Eds.), Hours of work-- temporal factors in work scheduling. New York: John Wiley and Sons.

Thomas, L. and Ganster, D. (1995). Impact of family-supportive work variables on work-family conflict and strain: A control perspective. Journal of Applied Psychology, 80, 1, 6-15.

Tilley, A., Wilkinson, P.,, Warren, B., Watson, B. and Drud, M. (1982). The sleep and performance of shift workers. Human Factors, 24, 629-641.

Voydanoff, P. (1988). Work role characteristics, family structure demands, and work/family conflict. Journal of Marriage and the Family, August, 749-761.

Weiss, M. and Liss, M. (1988). Night shift work: Job and family concerns. Journal of Social Behavior and Personality, 3, 4, 279-286.

Williamson, A., Gower, C. and Clarke, B. (1994). Changing the hours of shiftwork: A comparison of 8- and 12-hour shift rosters in a group of computer operators. Ergonomics, 37, 287-298.

Wojtczak-Jaroszowa, J. and Pawlowska-Skyba, K. (1967). Night and shift work. I: Circadian variations in work. Med. Pr., 18, 1. Cited in Monk and Folkard, 1992.

Wyatt, S. and Marriott, R. (1953). Night work and shift changes. British Journal of Industrial Medicine, 10, 164-172. Cited in: Dunham, 1977

Zedeck, S., Jackson, S. and Marca, E. (1983). Shift work schedules and their relationship to health, adaptation, satisfaction, and turnover intention. Academy of Management Journal, 26, 2, 297-310.

APPENDIX A

DEMOGRAPHIC AND STATISTICAL TABLES

Table 1: SAMPLE BY SHIFT, GENDER, AND PARENTAL STATUS (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Count	%	Count	%	Count	%	Count	%
Rotating	29	52.7	16	44.4	56	62.2	48	52.7
Days	26	47.3	20	55.6	34	37.8	43	47.3
Total	**55**	**100.0**	**36**	**100.0**	**90**	**100.0**	**91**	**100.0**

Notes:
1. This sample includes only non-career employees.
2. The category "without children" includes married couples with no children, and couples with only older children 18 years and over.

Table 2: SAMPLE BY AGE (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Rotating	Days	Rotating	Days	Rotating	Days	Rotating	Days
	(Percent)							
18-24	.0	.0	.0	5.0	.0	.0	6.3	.0
25-34	24.1	20.0	25.0	20.0	19.6	11.8	33.3	18.6
35-44	51.7	36.0	18.8	20.0	67.9	70.6	20.8	39.5
45-54	20.7	44.0	50.0	45.0	12.5	17.6	33.3	32.6
55-64	3.4	.0	6.3	10.0	.0	.0	6.3	9.3

Table 3: SAMPLE BY AGE OF CHILDREN (Survey Respondents, Parents Only, N = 145)

	Male				Female			
	Rotating		Days		Rotating		Days	
	Count	%	Count	%	Count	%	Count	%
With at least one child < 6	14	48.3	11	42.3	14	25.0	11	32.4
All children 6 to 18	15	51.7	15	57.7	42	75.0	23	67.6

Table 4: REASON FOR WORKING CURRENT SCHEDULE (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Rotating	Days	Rotating	Days	Rotating	Days	Rotating	Days
	(Percent)							
Requirement of job	89.3	95.8	100.0	88.9	83.6	36.4	89.1	56.8
Earn more money	.0	.0	.0	.0	.0	.0	.0	5.4
Family responsibilities	3.6	4.2	.0	.0	14.5	57.6	.0	8.1
Allow time for study	3.6	.0	.0	5.6	.0	.0	.0	.0
Other	3.6	.0	.0	5.6	1.8	6.1	10.9	29.7

Table 5: SAMPLE BY EDUCATION (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Rotating	Days	Rotating	Days	Rotating	Days	Rotating	Days
	(Percent)							
High School or less	10.3	50.0	37.5	40.0	46.4	55.9	31.3	54.8
Community college	65.5	26.9	31.3	45.0	33.9	20.6	31.3	28.6
Some university	13.8	23.1	31.3	10.0	17.9	23.5	29.2	11.9
University	6.9	.0	.0	5.0	1.8	.0	6.3	4.8
Post-graduate	3.4	.0	.0	.0	.0	.0	2.1	.0

Table 6: SELECTED WORK DEMOGRAPHICS (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Rotating								
Job Hours/Week	37.9	6.2	37.9	.9	35.2	7.5	38.0	3.4
Years This Shift	6.3	6.7	13.4	11.7	4.1	5.6	3.0	4.3
Days								
Job Hours/Week	37.8	3.5	38.0	1.1	31.1	9.7	35.2	6.3
Years This Shift	8.4	8.4	9.6	11.4	6.2	7.4	6.9	7.2

Notes: 1. The lower mean job hours for women reflect the higher proportion of women who reported part-time work. Roughly 17% of women in the sample classified themselves as part-time workers, compared to 2% of men. Part-time employees averaged 18 to 23 hours per week depending on the unit for which they worked.

Table 7: SAMPLE BY ORGANIZATIONAL TENURE (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Rotating	Days	Rotating	Days	Rotating	Days	Rotating	Days
	(Percent)							
< 1 yr	.0	3.8	6.3	.0	1.8	.0	4.2	2.3
1-3 yrs	13.8	.0	18.8	5.0	12.5	.0	16.7	2.3
4-6 yrs	10.3	3.8	6.3	5.0	3.6	.0	14.6	4.7
7-9 yrs	.0	.0	.0	.0	5.4	2.9	14.6	.0
10 or more yrs	75.9	92.3	68.8	90.0	76.8	97.1	50.0	90.7

Table 8: SAMPLE BY FULL-TIME/PART-TIME STATUS (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Rotating	Days	Rotating	Days	Rotating	Days	Rotating	Days
	(Percent)							
Full-time	96.6	96.2	100.0	100.0	82.1	61.8	95.8	86.0
Part-time	3.4	3.8	.0	.0	17.9	38.2	4.2	14.0

Table 9: SAMPLE BY DEPARTMENT (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Rotating	Days	Rotating	Days	Rotating	Days	Rotating	Days
	(Percent)							
Installation & Repair	65.5	96.2	62.5	80.0	1.8	5.9	2.1	2.3
Retail	.0	3.8	.0	.0	3.6	38.2	.0	37.2
Operator	6.9	.0	.0	.0	16.1	35.3	14.6	41.9
Customer Service Rep	13.8	.0	6.3	5.0	57.1	20.6	56.3	16.3
Telesales	6.9	.0	25.0	10.0	10.7	.0	14.6	.0
Other	6.9	.0	6.3	5.0	10.7	.0	12.5	2.3

Table 10: MULTIVARIATE HOMOGENEITY OF VARIANCE TESTS (Survey Data)

TEST	DF	BOX'S M VALUE	p VALUE
Individual Outcomes	21,73768	.80838	.713
Work-Family Outcomes	42,44347	1.20307	.172
Work Outcomes	70,35341	1.53501	.003

Table 11: INDIVIDUAL OUTCOMES (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Rotating								
Life Satisfaction	2.9	.9	3.2	.9	3.1	1.0	3.2	.9
Stress	2.5	.8	2.3	.5	2.7	.8	2.4	.6
Days								
Life Satisfaction	3.5	.7	3.3	.8	3.2	.9	3.5	.9
Stress	2.2	.5	2.3	.7	2.6	.7	2.5	.7

Table 12: WORK-FAMILY OUTCOMES (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Rotating								
Overload	3.1	.8	3.2	.8	3.4	1.1	3.1	.9
Interference - FTW	1.9	1.0	1.7	1.1	2.0	.8	1.8	.6
Interference - WTF	3.0	.8	2.9	.8	3.1	.9	3.0	.8
Days								
Overload	3.0	.9	2.7	.8	3.4	1.0	2.8	1.1
Interference - FTW	1.9	.9	1.5	.5	1.8	.6	1.7	.7
Interference - WTF	2.6	.9	2.5	.9	2.8	.9	2.7	.8

Table 13: TIME MANAGEMENT (Survey Respondents)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Rotating								
Individual Time	3.1	.8	3.2	1.0	2.8	.9	3.0	.8
Family Time	3.0	.9	--	--	2.5	.9	--	--
Days								
Individual Time	3.4	.9	3.5	.8	3.0	.8	3.4	.8
Family Time	3.2	.9	--	--	3.4	.9	--	--

Notes: 1) Only parents of children 18 and under included in family time analysis (N = 145).

Table 14: WORK OUTCOMES (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Rotating								
Job Satisfaction	3.3	.7	3.1	.7	3.2	.8	3.4	.8
Job Stress	2.7	.9	2.9	.8	2.9	1.1	2.8	1.1
Commitment	3.5	.9	3.4	1.0	3.8	.7	3.8	.7
Intent to Quit	2.2	1.1	1.9	1.1	1.9	1.0	1.9	1.2
Days								
Job Satisfaction	3.8	.7	3.8	.6	3.6	.7	3.9	.6
Job Stress	2.5	1.2	2.7	1.1	2.5	1.0	2.6	1.0
Commitment	3.5	1.0	3.5	1.1	3.7	7	4.0	.7
Intent to Quit	1.8	1.0	1.8	1.1	1.7	1.1	1.5	.8

Table 15: CONTROL MEASURES (Survey Respondents, N = 272)

	Male				Female			
	With children <18		Without children <18		With children <18		Without children <18	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Rotating								
Work-Fam Control	2.5	.5	2.2	.6	2.3	.6	2.1	.5
Schedule Control	1.9	1.0	1.6	1.0	1.6	1.0	1.2	.5
Days								
Work-Fam Control	2.5	.6	2.6	.6	2.6	.7	2.5	.7
Schedule Control	1.9	1.3	1.7	1.0	2.6	1.6	2.3	1.6

Table 16: PERCENTAGE OF SURVEY SAMPLE REPORTING HIGH SATISFACTION WITH CURRENT WORK SCHEDULE (Survey Respondents, N = 272)

	Male		Female	
	With children <18	Without children <18	With children <18	Without children <18
Rotating	10.3	12.5	10.7	14.6
Days	96.6	75.0	73.5	90.7

Table 17: DEMOGRAPHIC CHARACTERISTICS (Interview Respondents, N = 24)

Age (x)	38.6
Number of children (x)	2.1
Work hours per week (x)	36.6
Years job tenure (x)	6.9
Years this shift (x)	3.2
Years organizational tenure (x)	13.9
Married (%)	87.5
With preschool-aged children (%)	42.0
With weekend work hours (%)	50.0

Notes: 1) The interview sample included only women with children under 18 who worked a rotating shift schedule.

Table 18: WHY DID YOU INITIALLY CHOOSE A JOB REQUIRING SHIFT WORK? (Interview Respondents, N = 24)

REASON	PERCENT
Only way in to the company	33.3
Good money	33.3
I didn't choose shiftwork-- it was brought in later	20.8
Wanted this type of work	12.5
All I could find	12.5
Convenient location	8.3

Table 19: WHY DO YOU STILL WORK THIS JOB? (Interview Respondents, N = 24)

REASON	PERCENT
Nothing else available	25.0
Convenient hours (weekday off, miss traffic, etc.)	20.8
Good money	20.8
Convenient location	16.7
Got used to it, accustomed to hours	4.2

Table 20: PREFERENCE FOR OTHER WORK ARRANGEMENTS? (Interview Respondents, N = 24)

PREFERRED ARRANGEMENT	PERCENT YES
Would you take a similar job, same pay, but straight days?	83.3
Would you take a similar job, but with fewer hours (e.g., job share)?	33.3

Table 21: IF YOU COULD SCHEDULE YOUR OWN WORKDAY, WHAT HOURS WOULD YOU CHOOSE? (Interview Respondents, N = 24)

PREFERENCE	PERCENT
All earlies (in by 6:30 or 7:30 a.m. and out by 2:30 or 3:30 p.m.)	33.3
8 a.m. to 4 p.m.	25.0
9 a.m. to 5 p.m.	20.8
My current shift is my preference	4.2

Table 22: WHAT WOULD BE APPEALING ABOUT THESE WORK HOURS? (Interview Respondents, N = 24)

REASON	PERCENT
Work only school hours, be home to see kids after school	37.5
Be home for dinner	20.8
Work only daycare hours	8.3

Table 23: WHAT ARE THE ADVANTAGES OF WORKING YOUR PARTICULAR SHIFT ARRANGEMENT? (Interview Respondents, N = 24)

ADVANTAGES	PERCENT
ECONOMIC	
Differential	54.2
Daycare costs reduced	25.0
None	33.3
HOME-RELATED	
Can shop, run errands during non-peak times	41.7
More time with spouse	16.7
Get chores done before leaving for late shift	16.7
None	25.0
WORK-RELATED	
Relaxed atmosphere, less hectic on late shifts	29.2
More relaxed customer base at night, more personal service	12.5
None	62.5
SOCIAL LIFE	
"What social life?"	20.8
Can visit friends before leaving for late shift	16.7
None	66.7

Table 24: WHAT ARE THE DISADVANTAGES OF WORKING YOUR PARTICULAR SHIFT ARRANGEMENT? (Interview Respondents, N = 24)

DISADVANTAGES	PERCENT
SOCIAL LIFE	
I miss evening functions, parties	45.8
All my friends, relatives work days	16.7
None	25.0
HOME-RELATED	
I miss my kids, seldom see them, in bed when I get home	45.8
I miss dinner with the family	29.2
No set schedule, no routine	20.8
None	4.2
ECONOMIC	
Rely on take out food	20.8
None	58.3
WORK-RELATED	
Get the "crazy" customers at night	8.3
Fatigue, still tired when leaving for work again	8.3
Resources not available on late shift (other units, coworkers, etc.)	8.3
None	62.5

Table 25: IN YOUR COMMUNITY, ARE YOU ABLE TO EASILY ARRANGE/ PARTICIPATE IN: (Interview Respondents, N = 24)

	PERCENT YES
Shopping, banking	100.0
Doctor, dentist appointments	66.7
Organized activities (sports, clubs, etc.)	25.0

Table 26: COWORKER SUPPORT FOR YOU AS A SHIFTWORKER (Interview Respondents, N = 24)

	PERCENT
COWORKERS MAKE SHIFTWORK EASIER BY:	
Trading shifts	58.3
Companionship, we're all in the same boat, etc.	20.8
They do nothing to make shiftwork easier	20.8
COWORKERS MAKE SHIFTWORK HARDER BY:	
Not trading with me	16.7
They do nothing that makes shiftwork more difficult	83.3
I WOULD LIKE MY COWORKERS TO:	
Nothing needed from coworkers	79.2

Table 27: SUPERVISOR SUPPORT FOR YOU AS A SHIFTWORKER (Interview Respondents, N = 24)

	PERCENT
SUPERVISOR MAKES SHIFTWORK EASIER BY:	
Being responsive to trade requests, flexible	16.7
Has done nothing to make shiftwork easier	79.2
SUPERVISOR MAKES SHIFTWORK HARDER BY:	
Not being responsive to trade requests, emergencies, is inflexible	16.7
Has done nothing to make shiftwork more difficult	83.3
I WOULD LIKE MY SUPERVISOR TO:	
Nothing needed from supervisor	91.7
There's nothing my supervisor can do-- scheduling is at higher level, out of his/her control	45.8

Table 28: ORGANIZATIONAL SUPPORT FOR YOU AS A SHIFTWORKER (Interview Respondents, N = 24)

	PERCENT
ORGANIZATION MAKES SHIFTWORK EASIER BY:	
Allowing us to trade shifts	29.2
Has done nothing to make shiftwork easier	54.2
ORGANIZATION MAKES SHIFTWORK HARDER BY:	
Requiring us to find our own replacements	12.5
Has done nothing to make shiftwork more difficult	58.3
I WOULD LIKE THE ORGANIZATION TO:	
Provide more flexibility in scheduling (flextime, allow us more input, etc.)	20.8
Not make us find our own replacements (sometimes we need to miss work like any employee)	16.7
Introduce preferential scheduling	16.7
Post schedule further in advance	12.5
Nothing needed	16.7

APPENDIX B

SURVEY INSTRUMENT/

TELEPHONE INTERVIEW SCHEDULE

Note: In order to protect confidentiality, this draft of the questionnaire replaces the name of the participating organization with "this co".

Shift Work Survey

Please be assured that your responses will be held in confidence by the researchers.

Please note that throughout the questionnaire N/A means Not Applicable.

Thank you for taking the time to fill out this questionnaire. Your response is greatly appreciated. Should you have any questions, please call Karen Johnson at ...

Dr. Linda Duxbury
Associate Professor
School of Business
Carleton University
Ottawa, Ontario
K1S 5B6

Dr. Chris Higgins
Associate Professor
School of Business Administration
University of Western Ontario
London, Ontario
N6A 3K7

Karen Johnson
M.M.S. Student
School of Business
Carleton University
Ottawa, Ontario
K1S 5B6

SECTION A: DEMOGRAPHICS

We need some information about you to help us interpret your answers. Questions concerning your spouse refer to your spouse or partner. Please circle the letter of the answer that best describes you and/or fill in the information requested.

1. What is your gender?

   A. Male

   B. Female

2. Are you married (or living with a partner)?

   A. NO

   B. YES

3. What is your age (in years)?

   A. Under 18
   B. 18 to 24
   C. 25 to 34
   D. 35 to 44
   E. 45 to 54
   F. 55 to 64
   G. 65 or over

4. Do you have any children?

   A. NO

   B. YES (If no, skip to Q.6)

5. Please answer the following items concerning your children.

	AGE (IN YEARS) (Please circle)				LIVING AT HOME (Please circle)	
CHILD # 1	0-5	6-12	13-18	Over 18	NO	YES
CHILD # 2	0-5	6-12	13-18	Over 18	NO	YES
CHILD # 3	0-5	6-12	13-18	Over 18	NO	YES
CHILD # 4	0-5	6-12	13-18	Over 18	NO	YES
CHILD # 5	0-5	6-12	13-18	Over 18	NO	YES
CHILD # 6	0-5	6-12	13-18	Over 18	NO	YES

6. Please circle the letter which best describes your education.

   A. High school or less

   B. Community college

   C. Some university

   D. University degree

   E. Post graduate degree

7. Please circle the letter that best describes your job.

   A. Manager

   B. Installation and Repair

   C. Retail Representative

   D. Operator

   E. Customer Service Representative

   F. Telesales

   G. Other (Please specify) _____

8. If you are a manager please circle the letter which best describes the employees you supervise (if not skip to Q.9).

   A. Installation and Repair

   B. Retail Representative

   C. Operator

   D. Customer Service Representative

   E. Telesales

   F. Other (Please specify) _____

9. Is YOUR job considered to be: (CIRCLE one)

   A. Full-time

   B. Part-time

10. Approximately how many hours per week do you work at your job? _____ HOURS

11. Does your job include weekend work?

    A. NO

    B. YES

12. How often would you say you are requested to stay on for another part or full shift at the end of your scheduled shift? _____ TIMES PER YEAR

13. Do you receive a shift differential (extra money because you work shifts)?

    A. NO

    B. YES

14. How long have you worked for (this co) (in years)?

    A. Less than 1
    B. 1 to 3
    C. 4 to 6
    D. 7 to 9
    E. 10 or more

15. Do you have a second job for pay?

    A. NO

    B. YES (If no, skip to Q.17)

16. Roughly how many hours per week do you spend at this second job?
    _____ HOURS PER WEEK

SECTION B: SHIFT ARRANGEMENTS

The following types of shift arrangements are common in North America:

Fixed daytime: Work either follows a standard 9 to 5 schedule, or begins in the morning and ends in the afternoon.
Fixed afternoon/evenings: Work starts at about 3pm or 4pm and ends roughly around midnight.

Fixed nights/graveyard: Work starts at or around midnight and ends around 8am.

Rotating: A combination of two or more of the above shifts. The combination may change periodically.

Other: Any schedule that does not fit within any of the above categories (e.g., split shift, on-call arrangement).

17. Please circle the letter that BEST describes YOUR work schedule. PLEASE BE SURE TO FILL IN YOUR USUAL START AND STOP TIMES AND CIRCLE AM OR PM WHERE INDICATED.

A. Rotating
B. Fixed afternoon/evenings:
Start time approx. _____ pm
Ending approx. _____ pm/am (Circle one)
C. Fixed nights/graveyard:
Start time approx. _____ pm/am (Circle one)
Ending approx. _____ am
D. Fixed days:
Start time approx. _____ am/pm (Circle one)
Ending approx. _____ pm
E. Other (Please specify) _____

18. Please circle the letter that BEST describes YOUR SPOUSE'S work schedule. PLEASE BE SURE TO CIRCLE AM OR PM WHERE INDICATED.

A. No spouse
B. Rotating
C. Fixed afternoon/evenings:
Start time approx. _____ pm
Ending approx. _____ pm/am (Circle one)
D. Fixed nights/graveyard:
Start time approx. _____ pm/am (Circle one)
Ending approx. _____ am
E. Fixed days:
Start time approx. _____ am/pm (Circle one)
Ending approx. _____ pm
F. Spouse not employed
G. Other (Please specify) _____

19. To what extent are the following work arrangements APPEALING to you?

	NOT APPEALING		SOMEWHAT		VERY APPEALING
Rotating shift	1	2	3	4	5
Fixed afternoon/evening	1	2	3	4	5
Fixed midnights/graveyard	1	2	3	4	5
Fixed daytime	1	2	3	4	5
Job sharing/ part-time hours	1	2	3	4	5
Flextime/ flexible hours	1	2	3	4	5
Compressed work week (one working day off every week or two in return for working longer days)	1	2	3	4	5
Other (Please specify) _____	1	2	3	4	5

20. What is the MAIN REASON that you work the shift that you do? (CIRCLE)

A. It is a requirement of the job/no choice

B. To earn more money

C. Family responsibilities (to care for children or other relatives)

D. To allow time for school/study

E. Other (Please specify) _____

21. To what extent do you have any say as to which shift you are scheduled to work?

I HAVE A GREAT DEAL OF INPUT		I HAVE SOME SAY		I HAVE LITTLE OR NO INPUT: EMPLOYER/UNION SETS SCHEDULE
1	2	3	4	5

22. Please consider each of the following questions. Please **CIRCLE** the appropriate answer.

	NONE		SOME		A LOT	
How much choice do you have over when you begin and end each workday or each workweek?	1	2	3	4	5	
How much choice do you have in arranging part-time employment?	1	2	3	4	5	
How much choice do you have over when you take vacations or days off?	1	2	3	4	5	
How much control do you have over when you can take a few hours off?	1	2	3	4	5	
To what extent are you expected to limit the number of times you make or receive personal calls while you work?	1	2	3	4	5	
How much choice do you have in making unanticipated child-care arrangements (e.g., during snow days or unexpected job delays)?	1	2	3	4	5	N/A
In general, how much control do you have over the way you balance working and parenting	1	2	3	4	5	N/A
How much choice do you have over which shift you will work?	1	2	3	4	5	

23. Approximately how many years have you been working shifts? _____ YEARS

24. How long have you worked this particular shift? _____ YEARS

25. If a similar job became available at a comparable rate of pay but with straight days, would you take it?

A. NO

B. YES

SECTION C: FEELINGS ABOUT YOUR JOB

The following questions ask about your job and your experiences with your employer.

26. Please indicate the extent to which you agree or disagree with the following by circling the appropriate number:

	STRONGLY DISAGREE		NEUTRAL		STRONGLY AGREE
I am willing to put in a great deal of effort beyond that normally expected in order to help (this co) be successful.	1	2	3	4	5
I talk up (this co) to my friends as a great organization to work for.	1	2	3	4	5
I would accept almost any type of job assignment in order to keep working for (this co).	1	2	3	4	5
I find that my values and (this co)'s values are similar.	1	2	3	4	5
I am proud to tell others that I am part of (this co).	1	2	3	4	5
(This co) really inspires the very best in me in the way of job performance.	1	2	3	4	5
I am extremely glad that I chose (this co) to work for over others I was considering at the time I joined.	1	2	3	4	5
I really care about the fate of (this co).	1	2	3	4	5
For me, this is the best of all possible organizations to work for.	1	2	3	4	5
I will probably look for a new job in the next year.	1	2	3	4	5
I often think about quitting.	1	2	3	4	5

27. Please indicate how satisfied you are with:

	VERY DISSATISFIED		NEUTRAL		VERY SATISFIED
Your job in general	1	2	3	4	5
Your pay	1	2	3	4	5
The number of hours you work	1	2	3	4	5
The schedule of your working hours	1	2	3	4	5
The sorts of things you do on the job	1	2	3	4	5

28. To what extent do you agree with the following:

	STRONGLY DISAGREE		NEUTRAL		STRONGLY AGREE
I work under a great deal of tension	1	2	3	4	5
I have felt fidgety or nervous as a result of my job	1	2	3	4	5
If I had a different job, my health would probably improve	1	2	3	4	5
Problems associated with my job have interfered with my ability to sleep	1	2	3	4	5
I often "take my job home with me" in the sense that I think about it when doing other things	1	2	3	4	5

SECTION D: CHILD CARE

The following questions look at the arrangements you use to care for your child(ren) while you work. PLEASE CONSIDER ONLY CHILD CARE THAT IS REQUIRED TO COVER YOUR WORK HOURS.

---

29. Do your children require care while you work?

    A. NO (If no, skip to Q.32)
    B. YES

30. What percentage of the time is your spouse able to provide care for your child(ren) while you work?
    _____ PERCENT (If no spouse, skip to Q.31)

31. What percentage of the time are you able to have child care provided IN YOUR OWN HOME while you work (include time child is in spouse's care if applicable)? _____PERCENT

SECTION E: TIME MANAGEMENT

The following questions pertain to how you spend your time when you are not at work.

32. How easy or difficult is it for you to:

	VERY DIFFICULT		NEITHER EASY NOR DIFFICULT		VERY EASY	
	1	2	3	4	5	
Spend time by yourself	1	2	3	4	5	
Go to personal health care appointments	1	2	3	4	5	
Go on errands (e.g., post office, car service)	1	2	3	4	5	
Go shopping (e.g., groceries, clothes, drug store)	1	2	3	4	5	
Be home for services/ deliveries (e.g., telephone, appliances)	1	2	3	4	5	
Have relaxed, pleasant time with spouse	1	2	3	4	5	N/A
Visit/help relatives	1	2	3	4	5	
Visit with neighbours or friends	1	2	3	4	5	
Participate in organized community activities (e.g. join clubs, volunteer, little league)	1	2	3	4	5	
Take care of household chores	1	2	3	4	5	
Have meals with the family	1	2	3	4	5	N/A
Have relaxed, pleasant times with your children	1	2	3	4	5	N/A
Be home when your children finish school	1	2	3	4	5	N/A
Take your children to health appointments	1	2	3	4	5	N/A
Attend your child's school events	1	2	3	4	5	N/A
Make child care arrangements to cover your work hours	1	2	3	4	5	N/A
Study, take courses or upgrade	1	2	3	4	5	

SECTION F: WORK AND FAMILY

The following are ways in which work and family life can interact. Family can include spouse and/or children.

33. Please indicate the extent to which you agree or disagree with the following statements by circling the appropriate number:

	STRONGLY DISAGREE		NEUTRAL		STRONGLY AGREE
I feel I have more to do than I can comfortably handle	1	2	3	4	5
After work, I am too tired to do the things I'd like to do	1	2	3	4	5
I feel physically drained when I get home from work	1	2	3	4	5
On the job I have so much work to do that it takes away from my personal interests	1	2	3	4	5
I feel emotionally drained when I get home from work	1	2	3	4	5
My family/friends feel I am preoccupied with my work while I am at home	1	2	3	4	5
I feel I have to rush to get everything done each day	1	2	3	4	5
My work does not interfere with time that I'd like to spend with family/friends	1	2	3	4	5
I feel I don't have enough time for myself	1	2	3	4	5
I'm often too tired at work because of things I have to do at home	1	2	3	4	5
My personal demands are so great that it takes away from my work	1	2	3	4	5
My superiors and peers dislike how often I am preoccupied with my personal life while at work	1	2	3	4	5
My personal life takes up time that I'd like to spend at work	1	2	3	4	5

SECTION G: HEALTH AND STRESS

The following items deal with your feelings of physical and emotional well-being.

34. Not counting regular and maternity-related check-ups, how many times **DURING THE LAST 3 MONTHS** have you seen a physician? ____TIMES

35. **DURING THE LAST 3 MONTHS** have you been unable to work or carry out your usual activities because of **health problems**?

    A. NO

    B. YES -> How many days? _____ DAYS

36. **DURING THE LAST 3 MONTHS** have you been unable to work or carry out your usual activities because of **family-related problems** (e.g.. sick child, relative needed help)?

    A. NO

    B. YES -> How many days? _____ DAYS

37. **DURING THE LAST 3 MONTHS** have you been unable to work or carry out your usual activities because you were emotionally, physically or mentally **fatigued**?

    A. NO

    B. YES -> How many days? _____ DAYS

38. **DURING THE LAST 3 MONTHS** have personal or family responsibilities caused you to **miss time during a work day** (e.g., arrive late, leave early, leave and return)?

    A. NO

    B. YES -> On how many occasions? _____ OCCASIONS

39. Please indicate how often in the **LAST MONTH** you have:

	NEVER		SOMETIMES		ALWAYS
Been upset because something happened unexpectedly	1	2	3	4	5
Felt that you were unable to control important things in your life	1	2	3	4	5
Felt nervous or stressed	1	2	3	4	5
Felt confident about your ability to handle your personal problems	1	2	3	4	5
Felt that things were going your way	1	2	3	4	5
Found that you could not cope	1	2	3	4	5
Been able to control irritations in your life	1	2	3	4	5
Felt you were on top of things	1	2	3	4	5
Been angered because of things that happened that were outside of your control	1	2	3	4	5
Felt difficulties were piling up so high that you could not overcome them	1	2	3	4	5

40. Below are five statements. Please indicate your agreement by circling the appropriate number.

	STRONGLY DISAGREE		NEUTRAL		STRONGLY AGREE
In most ways my life is close to my ideal	1	2	3	4	5
The conditions of my life are excellent	1	2	3	4	5
I am satisfied with my life	1	2	3	4	5
So far I have gotten the important things I want in life	1	2	3	4	5
If I could live my life over, I would change almost nothing	1	2	3	4	5

WOULD YOU BE WILLING TO BE INTERVIEWED BY TELEPHONE IN ORDER TO CONTRIBUTE TO A BETTER UNDERSTANDING OF HOW SHIFT WORKERS BALANCE THEIR WORK AND FAMILY LIVES? IF SO, PLEASE FILL IN YOUR FIRST NAME AND A TELEPHONE NUMBER.

PLEASE BE ASSURED THAT YOUR RESPONSES WILL BE HELD IN CONFIDENCE.

THANK YOU

Dr. Linda Duxbury	Dr. Christopher Higgins	Karen Johnson
Associate Professor	Associate Professor	M.M.S. Student

FIRST NAME _____

TELEPHONE ( ) _____

Items for Shiftwork Interview

May I speak to _____?

My name is _____. I am working with Dr. Linda Duxbury from Carleton University. A while ago you completed a questionnaire at work about shiftwork and family life, and you gave us your phone number, saying you might be willing to be interviewed on this topic. That's why I am calling today. We are conducting the interviews now for the second phase of this research.

The interview will likely take 1/2 hour. Is this a good time to talk? If not, when would be a better time for me to call back?

_____ Time for call back

Background I just want to give you a quick background on the research so that you have an idea of who we are and what we are investigating. This study is part of independent research initiated by Professor Duxbury at the School of Business, and will be used toward a Masters thesis for one of her students. We use the information for professional journals, conferences, etc. Hopefully, it will be used by policymakers in both government and private sector organizations to make workplaces friendlier for employees with families.

Purpose The purpose of the study is to have a look at some of the unique needs of shift workers. Much of the literature is rather outdated and does not paint a very accurate picture of today's shiftworker, especially when so many workers today are from dual-earner families. That's why we will focus on both work and non-work aspects of the shiftworker's life and try to get a grasp on how work and family life mesh for people who don't have a 9 to 5 schedule.

We collect our interview information by taperecording, then we label the tape with an ID number, not your name. After we have coded the tape, we destroy it, so I want to assure you that your answers are still confidential. Of course, if there are any questions you are not comfortable with, you aren't obligated to answer them.

****Are you comfortable talking on a tape recorder?**

(If no, advise that the interview will take a bit longer, and write out responses by hand!!)

If you are interested in the results of the interviews, we will be happy to send you a copy of results.

(If yes, get address and full name and keep on separate mailing list).

Do you have any questions before we start?

Answer questions, then .....

START TAPING

First I'll update our demographic information to make sure it's current:

You're married?

How old are you?

How many children do you have?

How old are they?

What is your job title?

What is your spouse's job title?

Work Info

Now some information about your job.

1. What days and what hours do you work? (Be sure to determine if a.m or p.m.)

1a. Does your job include weekend work?

(If yes)

How often do you work weekend hours?

2. How long have you been in this job?

3. How long have you been working this shift?

4. What were you doing prior to starting on your current shift? (prompt: working days, home full time with kids, etc.)

5. How long have you been with your current employer?

6. Do you have anybody who reports to you?

   (If yes) _____ number

   (If yes)

   Have you experienced any difficulties associated with your supervisory duties?

7. Do you have a second job for pay?

   (If yes)

   Roughly how many hours per week do you spend at this job?

   Why do you work a second job?

Reasons for Shiftwork

Let's look at some of your reasons for working shifts.

8. Why did you initially choose a job requiring shiftwork?

9. Why do you still work this job?

10. If a similar job became available at a comparable rate of pay but with straight days, would you take it?

11. If a similar job became available, but with fewer hours per week (such as job sharing), might you consider it?

12. If you could have any shift or schedule you liked (i.e., if you could arrange your own workday), what schedule would you choose?

Child Care

Some questions about child care in your family.

13. Do your children require care while you work?

(If no, i.e., kids grown, skip to Advantages/Disadv)

14. What kind of arrangements do you have for each child while you work? (Get all that apply)

15. (For rotating shifts: If not, skip to Advantages/Disadv):
Do your child care arrangements change when your shift changes?

(If yes) How do they change?

Advantages/Disadvantages

We're interested in both the positive and negative aspects of shiftwork.

16. First the economic aspects.

Are there any economic advantages to working your particular shift(s)?

(Specify)

Are there any economic disadvantages to your shift?

(Specify)

17. What about your work life?

Have you experienced any advantages at work of working your particular shift(s)?

(Specify)

Have you experienced any disadvantages at work from working your shift(s)?

(Specify)

18. Now we'd like to ask about your experiences at home with your spouse and children.

Have you experienced any advantages in your family life that you would say result from the shift(s) you work?

(Specify)

Have you had disadvantages in your family life from your working shifts?

(Specify)

19. What about your social life with friends and relatives?

Have you experienced any advantages in your social life that you would say result from the shift(s) you work?

(Specify)

Have you experienced any disadvantages in your social life from working shifts?

(Specify)

20. What about the community in which you live?

Are you able to shop, bank, etc. at times that are convenient for you?

Can you make doctors', dentists' appointments for convenient times?

Can you participate in organized activities (volunteer work, clubs, group sports, etc.)?

Adjusting Life to Shiftwork

21. Are there any particular adjustments that you have to make in your day-to-day home life to accommodate your shifts?

22. Are there any particular adjustments that your spouse has to make in her/his day-to-day home life to accommodate your shifts?

23. Are there any particular adjustments that you feel your children have to make to accommodate your shifts?

24. Thinking about your personal or family life, can you think of anything in particular that you feel you really miss out on because you work shifts? (prompt: any one thing that you regret missing as a result of having to work..."Working shifts really deprives me of being able to....")

25. What single part of your personal or family life do you really not mind missing? (prompt: you really sort of appreciate not being there, shiftwork allows you to "get out" of having to do this)

Supports

We're also interested in some of the things in your life that you consider to be supportive of your working shifts.

26. Is there anything specific your spouse does that you find most helpful in helping you as a shiftworker?

Is there anything your spouse does that makes it more difficult for you to work shifts?

Is there anything you would like him/her to do that would help you as a shiftworker?

27. Can you think of anyone else in your life who helps you balance the demands of shiftwork and family responsibilities?

How do they help?

28. What about the organization you work for? What has your employer done to make it easier for you to work shifts?

Has your organization done anything that makes it more difficult for you to work shifts?

Is there anything that you would like your employer to do to make it easier for employees like you to work shifts?

29. What about your immediate supervisor? Has he/she done anything that makes it easier for you to work shifts?

Has he/she done anything that makes it more difficult for you to work shifts?

Is there anything you would like you supervisor to do that would make it easier for you to work shifts?

30. Thinking about your coworkers. Is there anything they do that makes it easier for you to work shifts?

Do they do anything that makes it more difficult for you?

Is there anything you would like your colleagues to do that would make it easier for you to work shifts?

31. Finally, if a colleague asked you whether or not he/she should switch to a work schedule like yours, what advice would you give?

These are all the questions I have for you. Do you have any questions for me or any comments you would like to make about the interview?

Thank you for your participation.

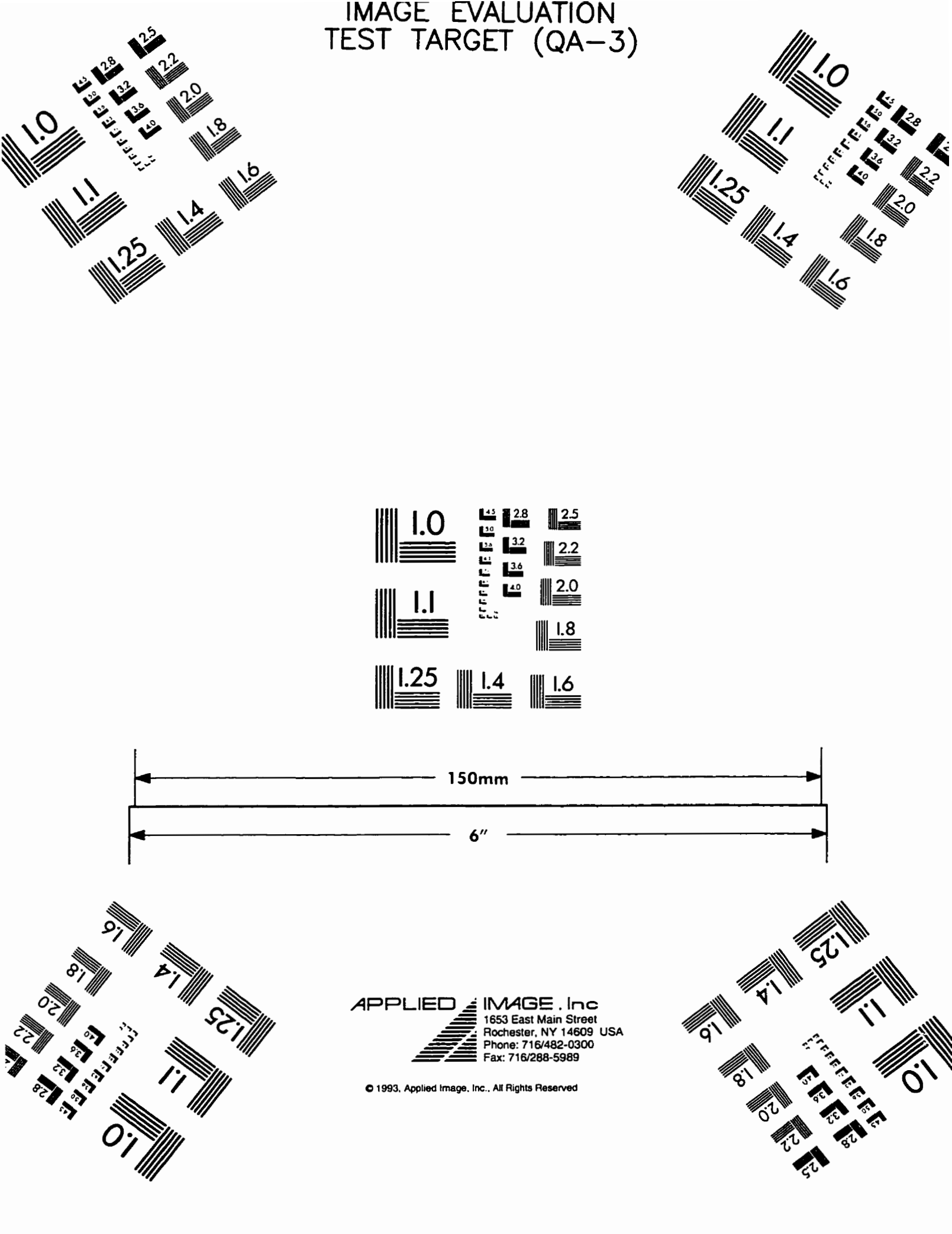


IMAGE EVALUATION
TEST TARGET (QA-3)
1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
150mm
6"
APPLIED IMAGE, Inc
1653 East Main Street
Rochester, NY 14609 USA
Phone: 716/482-0300
Fax: 716/288-5989
© 1993, Applied Image, Inc., All Rights Reserved