INTRODUCTION

The intersection between work and family lives has been an on-going topic of research for decades. One theme that is on-going is the *conflict* between work and family – mainly work spilling over into family life, as well as family spilling over into work (Glass and Estes 1997). Apparently, men and women themselves express this conflict --employed men and women with children wish they could work fewer hours and spend more time with their spouse and children (Bond, Galinsky, and Swanberg 1998; Moen and Dempster McClain 1987).

Besides the number of hours, the *scheduling* of work hours is also associated with work-family conflict. On the one hand, flexible work hours – the ability to vary the time workers begin or end work – and control over work hours are linked to more satisfaction with family life (Staines and Pleck 1983). Not to be confused with flexible hours, however, a recent study finds that employment at nonstandard work hours is associated with a higher likelihood of divorce for parents with children (Presser 2000). This suggests a grim outlook for some couples, given that the majority of parents with children are dual-earner couples, and opportunities to perform shift work are growing.

Do non-standard work schedules also influence relationship quality? One possible explanation for the association between nonstandard work hours and divorce is that working nonstandard hours might interfere with the quality and quantity of time that couples have to spend together (Presser 2000). Nonstandard shifts are typically worked outside of regular day hours. Employees working 'fixed evening' and 'fixed night' shifts work most of their hours between 4pm and midnight, and midnight to 6am, respectively (Presser 2000). Another type of nonstandard shift is a 'rotating shift' – in this type of shift an employee may work a regular shift for a fixed period of time, such as a week or month, but then 'rotates' to a different shift, and so on. Employees working 'split-shifts' have their work hours spread discontinuously across one day. One last type of nonstandard work shift is irregular hours- these are work hours that are too irregular to define.

It has been suggested that working alternating shifts is an approach that might help couples cope with their work and family demands. When one person works a day shift and the other works a non-standard shift, this could reduce the cost and difficulty in finding quality childcare. At the same time there is evidence that non-day shifts pose unique stresses on individuals and families. Non-day schedule demands are often determined by employers, rather than employee preference. A host of negative health consequences have been linked to shift work. And, as mentioned above, working a nonstandard shift increases the likelihood of divorce for men and women with children.

Therefore, the process and extent to which these schedules help or hinder family functioning is a question that bears examination.

In this research, I explore the association between non-standard work hours and marital quality for dual-earner couples with children. I focus on one main question: Do the non-standard work hours of one spouse increase relationship conflict and decrease positive relationship interaction? I additionally address alternative explanations for the observed associations between non-standard work schedules, on the one hand, and relationship quality, on the other hand. I focus specifically on dual-earner couples with children working 30 or more hours week—a subgroup for whom family stability might be especially vulnerable. Overall, my results indicate reason to be concerned for parents when one person works a day shift and the other works a nonstandard shift.

There have been few analyses of the links between shift work and family interaction, and this research contributes to this literature. Earlier research examining the influence of shift work on employees was typically qualitative and based on small samples. It was also often based on the notion that men were the sole breadwinners of the family, and therefore only men's work-shifts were considered. With the movement of the majority of women into the workforce, the nature of shift-work investigations has also shifted. Recent work has considered women's as well as men's nonstandard work hours. The conflict between worker and spousal/parent roles in shift work families has been introduced. And linkages between the timing of one's work hours and society-wide trends such as divorce have been established. And yet, a limitation of this research so far is that it does not distinguish combinations of work schedules among couples. It also does not distinguish shift-working couples where both persons work full-time from those

couples where one is unemployed or works part-time -- a non-trivial distinction when considering the amount of overlap in couples' schedules. I address these previous limitations in my research.

REVIEW OF THE LITERATURE

Employment and American Families

Spending time in paid labor is an integral part of most Americans' lives. The total labor force participation rate in October 2002 was 67 percent. Men aged 20 or older have higher labor force participation rates than women (76 percent), but the majority of women aged 20 or older work (61 percent). Even most women with young children work. In 1996, 74 percent of women with children under 18 worked, and 68 percent of women with children under 6 worked (Bianchi and Spain 1996).

Employment – both women's and men's – is beneficial. Employment is associated with greater feelings of life satisfaction among women in a range of occupations, although these effects may vary depending on occupational and workplace characteristics (Lennon and Rosenfeld 1994), family demands (Glass & Fujimoto 1994), and gender ideology (Menaghan and Parcel 1990). Women's employment has helped families maintain their standard of living while men's wages have declined (White and Rogers 2000).

At the same time, however, 70 percent of both fathers and mothers feel they do not have enough time with their children, and about half of workers report negative spillover from their work into their family life (Bond, Galinsky and Swanberg 1998). In fact, some of the main themes in recent research on work and family revolve around work stress and the balancing of worker, parent and spouse roles and the consequences for health and familyrelationships (Perry-Jenkins, Repetti, and Crouter 2000). While much research has focused on the consequences of individuals' work characteristics for themselves and their families, less research has focused on parents' combined work arrangements, particularly arrangements that include non-standard work hours, and their consequences.

In the following sections I will discuss the increasing prevalence of shift work, the reasons why work at non-standard hours is a potentially important consideration for marital satisfaction, and prior research on non-standard work hours and marital outcomes.

Emergence of a 24-Hour Economy and Prevalence of Nonstandard Work Hours

In the year 2001, 14.5 percent of all full-time wage and salary workers worked an alternate shift (Department of Labor, 2002), which is to say they worked either evening shifts, night shifts, irregular hours, or rotating shifts. Men are somewhat more likely than women to work these shifts (16.4 percent compared to 12.1 percent). These estimates are even higher when considering dual-earner couples with children as the unit of analysis. Presser reports that among dual-earner couples with children under age 5, about 1 in 3 have a spouse who regularly works day shifts (fixed hours, most of which fall between 8am and 4pm) while the other works mostly in the evening, night, or on a rotating schedule. Mothers are more likely than women who do not have children to work a shift-schedule, whereas men are about equally as likely to work a shift-schedule regardless of whether they live with children or not (Presser 1995). In general, Presser's research (1984, 1987, 1989) reveals a high prevalence of shift work among parents, especially mothers.

Presser cites the pervasiveness of work during non-standard hours as evidence that the United States is moving towards a 24-hour, seven-days-a-week economy. We do not have precise national estimates of the amount of this growth in recent decades, since questions on work hours have been asked differently by the Bureau of Labor Statistics throughout the 1980's (Presser 1999). But there are a number of events that are linked with this trend. Since the industrial revolution, "there has been an increase in the prevalence of shift work as industrial needs for 24-hour operations combined with more and more service industries providing evening or around-the-clock coverage"(U.S. Congress, 1991). The increasing participation of women in the labor force contributes to the growth of the service economy, which in turn creates needs for more services (Presser 1999). Busy dual-earner families have increased demands for services such as shopping, food and entertainment in the evening. More recently, the aging of the population has created a demand for health-related services around the clock (Presser 1999), a trend that is expected to continue.

The occupations with the highest prevalence of shift-workers have been growing and are predicted to continue growing. Nine of the top ten occupations projected by the Bureau of Labor Statistics to have the largest growth between 1994 and 2005 have very high percentages working nonstandard hours and/or days. These occupations include cashiers, janitors and cleaners, retail salespersons, waiters and waitresses, registered nurses, general managers and top executives, home health aides, guards, and nursing aides, orderlies, and attendants (Presser and Cox 1997). Many of these occupations are predominantly female – cashiers, waiters and waitresses, retail salespersons, registered nurses, home health aides, and nursing aids, orderlies and attendants. The percentages working nonstandard hours or days in these occupations range from 41.4 percent for general managers and top executives, to 91 percent for waiters and waitresses (1991 Current Population Survey data, analyzed by Presser 1997). It appears that increased employment at nonstandard work hours is linked largely to growth of the service sector.

As of 2001, the prevalence of shift work indeed was greatest among workers in service-oriented occupations. Forty-nine percent of those working in protective services, which includes police, firefighters, and guards, and 40 percent of food service employees worked nonstandard hours (Bureau of Labor Statistics 2002). In private-sector industries, the percent of workers in non-standard shifts was highest in eating and drinking places (46.2 percent) (Bureau of Labor Statistics 2002). The jobs with the lowest prevalence of shiftwork include: construction (2.5 percent); finance, insurance, and real estate (4.6 percent); managers and professionals (6.7

percent); those in administrative support occupations (8.4 percent); and workers in farming, forestry, and fishing occupations (5.6 percent) (Bureau of Labor Statistics 2002). Given the association between service sector work and nonstandard work hours, and the high percentage of women who work in this sector, Presser predicts continued growth in the number of women who work nonstandard work shifts.

When nonstandard workers are asked about their reasons for working these alternative shifts, the most common reason given is the "nature of the job" (53.3 percent) (Bureau of Labor Statistics 2002). After “nature of the job”, workers cite "personal preference" (13.3 percent), "better arrangements for family or child care" (9 percent), "better pay" (6.9 percent), and "because it allows time for school" (3.3 percent). When looking specifically at the type of nonstandard schedule, a modest proportion of those who worked night and evening shifts chose such schedules due to personal preference (21.5 percent and 17.3 percent, respectively) or because these shifts facilitatedbetter arrangements for family or childcare (14.9 percent and 12.1 percent, respectively).

Estimating the reasons for working nonstandard hours in the population as a whole masks the prevalence of childcare as a reason for working these hours among parents. When limiting her sample to shift-workers who have children under 14 living with them, Presser found that 32.4% of women with a child under 5, and 19.9% of women whose youngest child was school aged, reported child care as the reason for working a nonstandard shift. These percentges are even lower for fathers -- 5.3 and 4.2, respectively) (Presser 1995). Even among this group, however, the “nature of the job” remains the most common reason to work nonstandard hours.

The timing of work hours is also associated with who cares for the children. Over a third of dual earner couples use joint parental care when one of them was employed full-time on a fixed, nonday shift. For such couples, the father is the primary childcare provider while the mother is at work; this contrasts with parents who are both employed in regular day shifts, who rely on caretakers other than the father as the primary childcare provider while mothers are at work (Presser 1994; Kingston and Nock 1987). Those on rotating shifts also show relatively high rates of joint parental care (Presser 1994).

Finally, it is important to note that non-day work shifts are not distributed evenly across the population. Less educated women and men are much more likely to work non-standard hours and days than are better-educated women and men (Presser and Cox 1997; Adler and Adler 2001). This may partially explain why some dual-earner couples work alternating schedules and rely primarily on joint parental care: these families may need the income from two workers, but cannot secure jobs with good enough wages to pay outright for childcare.

Work Hours and Work-Family Conflict

Social capital theory (Coleman 1988) suggests that the bonds between family members are shaped by the time and effort expended by parents. Stronger bonds demand both physical presence and attention and involvement. The attachment between spouses could be thought of as a form of marriage-specific capital, with pleasurable shared time an input that augments the specific capital and thus discourages marital dissolution both in the present and in the future (Hill 1988).

There are multiple ways in which the intersection between jobs and family life can influence workers and the bonds they create with their family. Piotrkowski (1979) conceptualizes two interfaces between work and family systems; she specifies both a structural and psychological interface. Structural interference is defined as "the extent to which the organization and demands of one role (work or family) promote practical difficulty in managing the demands of the other" (Hughes, Galinsky and Morris, 1992, p. 32). So, those aspects of work which organize the worker's time or determine when, where or how long one works are a source of structural interference (Piotrowski 1979). Psychological interference is defined as the "transfer of job-generated moods to the family domain" (Hughes et al., p. 32), which affects the worker's mood and energy level at home. Researchers also refer to structural and psychological interference as 'work-family conflict' (Glass and Estes 1997; Hughes et al. 1992).

In support of the notion that structural job characteristics may create interference, higher hours worked per week by wives decreases marital quality and stability by decreasing couple time together (Booth et al. 1984; Hill, 1988; Kingston & Nock, 1987). Moen and Yu (1999) find that when one spouse works 45 or more hours, both husbands and wives are less likely to report work/life success.

Non-overlapping work shifts may also limit couples' time together, thereby influencing relationship satisfaction. When one person works a day shift and the other works an alternate shift, this plausibly leaves less time in the day available for couple time spent together. Indeed, in a national sample of married couples, Presser (2000) found that couples with a spouse working a night shift at the interview spent less time alone together.

Suggestive that non-standard work hours might be associated with higher marital conflict and less time spent together, shift work is associated with greater levels of work-family conflict. Afternoon and night shiftwork and rotating shifts increase reports of total work family conflict as well as reports that work schedules interfere with family responsibilities (Staines and Pleck 1983). Looking more specifically at who works these schedules, shift-working men in dual earner couples report work and family conflict, but shift-working women do not (Staines and

Pleck 1983). A qualitative study of husbands that work night shifts as Air Force security guards may provide some insight into why shift-working men would sense work-family conflict (Hertz and Charlton 1989). Men report feeling a sense of guilt that they are not able to spend time with their children; even when they are at home with their children, the fathers are often sleeping, and their children do not understand when they can expect their father to be available to them. This feeling of guilt can be compounded when considering their wives' roles in the household. Even when they were employed, wives of shift-working men bore the responsibility for organizing household routines and responsibilities. Some men confessed that their wives contributed much more to their well-being than they themselves contributed to the well-being of their wives. This, however, does not shed insight into why shift-working women failed to report work-family conflict in the study by Staines and Pleck (1983).

Work hours, Children, and Relationship Satisfaction

Job characteristics can be stressful when they cause role conflict or role overload between the roles of worker and family member (Hughes et al. 1992). Role overload results from a 'level of demands which exhausts individuals' supply of time and energy' (Rosenfeld 1989). It has been suggested that employed mothers may be the most likely to experience feelings of role overload. Women perform most of the household labor, even when they are employed in paid labor (Lennon and Rosenfeld 1994). Men have increased their participation in housework, particularly child care (Coltrane 1992), but to a much smaller degree compared to women's increased involvement in the workforce.

The strain of multiple roles is expected to be most evident in the presence of more or younger children. Voydanoff (1988) suggests that larger numbers of children and younger children may be associated with lesser physical availability for work, preoccupation with childrearing activities and overload. So, it is not the presence of children, but "the level of demands and responsibility among employed women versus those among housewives and among men" that is critical for the issue of role overload (Rosenfeld 1989).

In support of the notion of role overload, Ross and Mirowsky (1988) find that women who have difficulty finding childcare and who have the sole responsibility for their children's care have higher levels of depression than other women (Ross and Mirowsky 1988). Depression, in turn is associated with decreased levels of marital quality. Taken together, these findings suggest that dual-earner employment can affect marital satisfaction by increasing feelings of role conflict and overload, particularly among wives (Voydanoff 1988, 1989) who are likely to bear responsibility for the majority of housework, as well as for their own jobs.

There are a few implications of role overload for couples who work different shifts from each other. On the one hand, the presence of younger and more children might further strain the limited time that couples have together. It has been argued that when couples work different shifts, this may make their time parenting feel like 'solo-parenting', since the other partner is likely unavailable at work (Hattery 2001). On the other hand, the 'doing gender' perspective might suggest that fathers spend more time in childrearing when a mother isn't present, possibly relieving feelings of role overload for mothers, but increasing them for fathers. In fact, both Harriet Presser (1988) and Kingston and Nock (1987) find that fathers in dual-earner couples spend more time in childrearing when either they or their spouse works a nonstandard shift. Presser notes that this situation may increase feelings of overload for men, thereby having negative implications for relationship satisfaction Presser (1988).

The strength of these relationships should be affected by control over either domain. Control over work hours might facilitate abilities to combine work and family role obligations. "thus, individuals who have control over the time and stress associated with their activities may experience less work-family conflict than those without such control" (Voydanoff 1988).

Non-standard Work Hours and Health

As discussed above, the psychological carryover from either work or family roles can affect the psychological availability and energy available for other roles. For example, overload from work can reduce parents' energy, and they may put less effort into their relationships with their children (Menaghan 1991) or their spousal relationships. In a similar way, the negative health consequences surrounding shift work may increase the chances that one spouse might not feel her/his best when a couple does get to spend time together.

Studies show that the interruption of circadian rhythms among shift workers has negative physical effects, such as insufficient and low-quality sleep (U.S. Congress 1991). Not only does shift work interrupt a body's biological circadian rhythms, but there are also social sources for sleep disturbances. Shift workers with children may be catching up on their sleep when others around them are awake. They may face a host of disturbances, such as heat and daylight , or noises from children, housecleaning, phone calls, and street traffic. Indeed, fatigue is reported more frequently by shift workers than by day workers, and about 60 to 70 percent of workers on rotating shifts complain of sleep disruption (U.S. Congress 1991). Night shifts, long hours and irregular hours have also been linked to sleep disturbances (U.S. Congress 1991).

In addition to sleep disturbances, a greater proportion of shift workers than day workers suffer general health complaints. Surveys have shown that shift workers, particularly those on rotating shifts, have a higher rate of visits to clinics at the work site, and poorer scores on a variety of health indexes (U.S. Congress 1991). Shift workers, particularly those on night shifts, commonly complain of gastrointestinal disorders. A government report by The U.S. Office of Technology Assessment concludes that the health effects of shift work schedules "generally manifest themselves as complaints of decreased well-being, chronic malaise, and poor sleep" (1991).

Prior Research on Non-standard Work Schedules and Couple Relationships

Three studies to date have used national samples to look specifically at the relationship between shiftwork and marital quality and stability. Examining data from the 1977 Quality of Employment Survey, Staines and Pleck (1983) examine a subset of 1,090 workers living with a spouse or with a child under 18. Five percent of these workers are single female parents, 61 percent have a spouse who also works, and 33 percent are the sole breadwinners in married couple families. About 72 percent of the respondents work a day shift, and similar percentages of male and female respondents work afternoon, night, rotating and other shifts. Their measure of 'family adjustment' is an index that includes three items: 1) how satisfied the respondent is with his or her family life; 2) how happy s/he thinks the marriage is; and 3) asked of families with children, how satisfied the respondent is with his or her family life. Multivariate equations controlled for joint employment status of spouses, education, and age of the youngest child. Their results suggest that working afternoons, nights and rotating shifts do not significantly affect time spent in childcare or this measure of family adjustment, but do increase time spent in housework, work-family conflict, and schedule conflict.

Staines and Pleck also examine a subset of 500 dual-earner couples from their sample, of whom 62 percent had children under 18. In order to qualify as a dual-earner couple, the respondent had to work a minimum of 20 hours per week, and her/his spouse had to participate in paid employment, regardless of the number of hours worked per week. For this subset, they again find that non-day work hours or variable hours does not significantly affect satisfaction in family relations, and the direction of the effects is mixed depending upon whether the husband or the wife is the reporter.[1] Non-day or variable hours of either spouse do not significantly predict higher work-family

[1] The multivariate equations for this analysis control for the age of the youngest child in the household, education, Duncan SEI, formal childcare arrangements, and work characteristics (number of hours worked, second job).

conflict, but the effects are in the predicted direction. The lack of significance may be due in part to the small number of cases in this analysis.

One of the most important insights to come out of this study is that control over one's work hours is an important moderator of work spillover onto family life. Control over one's work hours is measured as an index of 3 items: How hard do you think it would be to get the days you work changed permanently if you wanted them changed? How hard do you think it would be to get the hours you begin and end work changed permanently if you wanted them changed? How hard is it for you to take time off during your workday to take care of personal or family matters? The answers range from very hard, somewhat hard, not too hard, not hard at all. Weekend work, variable patterns of days, shiftwork and large number of hours each week appear to have the most negative effects on workers who have the least control over their schedules. Among workers who have high schedule control, the impact on family life of weekend work, shiftwork, and excessive weekly hours seems to be less detrimental, even beneficial at times. Also, one spouse's job can influence the other spouse's job. One spouse's stressful job schedule can reduce the quality of the other spouse's family life, and it can intensify the relationship between the other spouse's job schedule and family life. This summarizes effects for the outcomes of time spent in childcare, total work-family conflict, and schedule conflict; results were not significant for time spent in housework, or respondent reports of marital adjustment.

Staines and Pleck (1983) offer important insights into work and family life. They do not, however, specify the impacts of shift work for an important subsample – dual-earner couples with children. Their measure of family adjustment is comprehensive, incorporating happiness with marriage and general family life, but is not targeted enough to offer insight into communication between couples – an important predictor of relationship instability. They also do not include cohabiting couples in their study. Further, their study is somewhat outdated. Their data is from 1977, twenty-five years ago, when shift work was less common and dual-earner couples with children were also less common.

The second study that examined shiftwork and marriage used data from a national sample of married couples (White and Keith 1990). Their sample was made up of 1,668 individuals who were married and under the age of 55 in 1980, and were subsequently re-interviewed in 1983. Their analyses included controls for demographic and job characteristics that might predict both marital quality and shift work - race, age, years of schooling, family income, wife's employment, years married and number of children at home. Shift work was defined as any schedule

in which more than half of the hours worked fall outside of 8am to 4pm. White and Keith showed in cross-sectional analyses that couple shift work significantly decreased measures of marital happiness and increased sexual problems, although it did not affect the frequency of marital interaction, the intensity of marital disagreements, the presence of general problems, or a scale of child-related problems. Non-standard work schedules were also associated with a greater probability of divorce in the next three years. Controlling for marital quality reduces the impact of shift work on divorce to non-significance. Thus, shift work is associated with reduced marital quality (less marital happiness and more sexual problems), which in turn increases the risk of divorce.

White and Keith (1990) also examined whether changes in shiftwork status between 1980 and 1983 influences couples. Their data show substantial changes in work schedules over this time period: 12 percent of the couples previously without a shift worker added one by 1983, and 43 percent dropped one by 1983. In analyses that regress 1983 marital quality on the 1980 value of marital quality, the control variables and shift work, respondents in marriages that added a shift worker showed significant increases in disagreements, whereas respondents from couples that dropped a shift worker showed an increase in interaction and a decrease in child-related problems. The authors find no significant differences in these patterns depending on the sex of the shiftworker. These findings are supportive of the notion that the association between shift work and marital quality is causal; the longitudinal analysis further supports this notion.

White and Keith's study of shiftwork is notable for including a wide range of indicators for marital interaction, a national sample, and a longitudinal design. It is also limited, however, in its measurement of shiftwork. Respondents were simply asked whether their jobs included shiftwork (yes/no), and not which shifts they worked. Respondents were not asked about control over work hours, which Staines and Pleck (1983) had found to be an important moderator. They also did not test for potential interactions between family life stage and shiftwork.

Most recently, Presser (2000) examined the relationships between the shift-work status of men and women, on the one hand, and couple time spent together and marital instability on the other hand. She drew her sample of 3,476 married couples from two waves of the National Survey of Families and Households. Because relationship duration was an important determinant of marital instability, she conducted analyses separately for three groups: a) all married couples; b) couples married less than 5 years at wave 1; and c) couples married 5 or more years at wave 1. She also repeated her analyses for a subset of her sample with one or more children living at home (approximately 2000 couples). The types of shift status she considers separately for wives and husbands include:

Fixed days; fixed evenings; fixed nights; rotating shifts; and employed but shift unknown.[2] Analyses on families with children include those with children 18 years and younger.

Presser's results suggest that nonstandard work hours at wave 1 increase the likelihood of divorce by wave 2, about 5 years later. This association depends on the presence of children and is specific to the type of nonstandard schedule, the gender of the spouse and the duration of the marriage (Presser 2000). Among men who had children and were married less than 5 years at Wave 1, working fixed nights made separation or divorce six times more likely relative to working days. There were no significant associations between shift work and divorce among men with children who were married longer, nor among men without any children whatsoever. Fixed evening and rotating shifts do not seem to matter for divorce likelihood.

Among women who had been married more than 5 years at wave 1, working fixed nights increased the odds of divorce for those with and without children; for women with children, the odds of divorcing by wave two increased by three times. When women with children worked a rotating shift, this increased the odds of divorce by about two times. There were no significant associations between shift work and divorce among women who were married a shorter period of time. Presser also finds that working fixed nights decreases couple time spent alone together, but this only partially explains why fixed nights worked by women is associated with divorce. Fixed evening shifts do not seem to matter for divorce likelihood. These findings are evident when controlling for the number of hours worked as well as for demographic variables.

These results suggest that nonstandard shifts can complicate the lives of families with children considerably, increasing the risk of separation or divorce relative to other couples with children. Presser suggests that difficulties with sleep schedules may play a role in these findings that night-shifts, and for women, rotating-shifts, increase the odds of divorce. Both these types of shifts mean that one spouse sleeps during the daytime, while the other does not, and it is difficult to get sufficient sleep when children are present. Previous research cited in this article shows that physiological stress to individuals is greatest for night and rotating workers. Presser also suggests

[2] Other variables included in her models are husband's employment status and shift; wife's employment status and shift; weekend work hours; number of work hours; respondent's and spouse's family background; respondent's and spouse's education; whether the respondent had ever cohabited; whether the respondent's spouse had ever cohabited; respondent's and spouse's marital history; duration of current marriage; time between waves 1 and 2; age of wife; difference in respondent's and spouse's age; and the number of children present in the household. Additional models add respondent's and spouse's gender ideology, and how often couples spent time together, measured by the question "during the past month, about how often did you and your husband/wife spend time alone together?" Responses ranged from 0 'never' to 6 'almost every day'.

that gender differences in the reasons for working nonstandard shifts may explain why marriages under 5 years are especially vulnerable when men do shift-work. Men might do shift-work more out of necessity than women, and the necessity might arise in the early years of marriage. She may observe the vulnerability of marriages lasting 5 years or more when women perform shift work, because many of the shift jobs in the female labor market require stamina and are stressful, such as nursing or waiting tables, and this may become more problematic with age. Since women assume the major share of household tasks, even when one spouse works a nonstandard shift, they may have little energy leftover to handle their 'second shift' at home; when children are present, the workload might be especially excessive.

Presser indirectly tests for the possibility that spouses who work night and rotating shifts did so because their marriages were shaky, and not vice versa. She selected men and women who were married at both waves, but were not working night or rotating shifts at wave 1. She then evaluates whether the quality of their marriages at wave 1 determine whether they worked a night or rotating shift at wave 2. Neither trouble with marriage nor couple time together are significant determinants of whether spouses began working night or rotating shifts by wave 2.

Summary

Research on work and family life provides strong evidence that employment and family commitments influence each other. Recent trends also point to high rates of divorce in American society, which have been on a downturn but are still high, and the emergence of a 24-hour economy in which many workers, particularly parents, will be engaged in nonstandard work hours. Presser concludes, and previous literature also suggests, that working non-day hours exerts a toll on family life for many families. Stronger bonds demand both physical presence and attention and involvement, which is difficult to do when parents work opposing work schedules. In particular, couples with children seem to be most affected, but we don't fully understand the processes by which working nonstandard hours impacts family life, or how to ease these tensions. The research presented here will add to our understanding in a number of ways. First, I focus on couples with children, who seem to be most at risk of facing work-family conflict when one person works a non-standard work shift. I also focus not only on the general conflict levels of couples, but also on positive communication between couples. This research also examines differences by the type of work-shift, and combinations of work-shifts. And further, I am able to consider both spouses' and cohabiting partners' work-shifts, and the overlap between these shifts.

The main hypotheses are as follows:

1. I hypothesize more negative and lower frequency marital interactions when mothers or fathers have nonstandard work schedules compared to couples where both work a day shift.
2. Among non-day work shifts, working night shifts should have more negative effects on marital interactions than evening shifts, due to the double whammy of non-overlapping workshifts and the negative health consequences of working a night shift.
3. Among non-day work shifts, working irregular shifts should have more negative effects on marital interactions than regular shifts, as predictable and regular work shifts may facilitate family routines.

METHODOLOGY

Data

In this research I use data from the 1979 National Longitudinal Survey of Youth (NLSY79), designed to study the labor market experiences of a national sample of 12,686 youth aged 14-21 in 1979. The initial sample overrepresented blacks, Hispanics and economically disadvantaged white youth, and included a supplemental military sample. Interviews of the military sample ceased in 1985, dropping the sample size to 11,607, and the economically disadvantaged white youth were dropped from the sample in 1991 (n=1,643). The remaining 9,964 cohort members have been interviewed every year from 1979 through 1994, and biennially since then.

The longitudinal nature of this survey, combined with the variety of sources reporting on work and couple interaction, make the NLSY79 an ideal data set for my research. A benefit of this data source is that respondents were initially a nationally representative sample of their age cohort. This eliminates the selection bias inherent in sampling shift workers, which is present in much prior research on non-standard work schedules.

In addition to being an important national resource for employment information, this survey also collects extensive information about marriage and marriage-like relationships. Reports of couple interaction have been collected from NLSY women in 1988 and continuously since 1992, for both spouses and opposite-sex partners. Marital status has been reported repeatedly since 1979. The relationship histories collected at every survey round allow me to track the dates that the current marriage or relationship began, as well as whether and when current marriages were preceded by cohabitation. This degree of detail surrounding respondents' relationships in the NLSY79 is rivaled by very few other datasets.

Sample

I draw my sample from the 1996 wave of data collection, when respondents were between the ages of 31 and 38. The retention rate for the 1996 survey round was 86.7 percent. The sample is limited to women, since only women are asked questions about the quality of their relationships. The year 1996 was selected as a year that could offer a range of childbearing experiences, an important moderator of work-family conflict. In earlier years (e.g. prior to 1992), NLSY79 women were 26-34 or younger; therefore, the majority of women with adolescent children were likely to have had these births very young, and likely disadvantaged. In later years, e.g. 2000, women were aged 35-42, and entering the later years of child-bearing, presenting yet another barrier for capturing a wide range of child ages in the household. In 1996, 3,489 of the NLSY79 women interviewed were mothers. Their average age at first birth was 24 years, with the youngest age at first birth being 13 years, and the oldest 37 years.

This study includes both married and cohabiting women. The decision to include cohabitors is based on research showing an increase in cohabitation as a setting for rearing children (Bumpass and Lu, 2000; Graefe and Lichter 1999), and as a substitute for marriage for many couples (Bumpass et al. 1991). Further, cohabiting unions tend to be more fragile than married unions, so it is especially important to identify stressors for such couples. We know little about the dynamics of cohabiting compared to married relationships among parents.

The sample is also limited to couples with children 18 and younger in their household. Nonstandard work hours appear to have the worst implications for couples with children. Presser finds that the positive association between non-standard work schedules and divorce is contingent on the presence of children (2000). Parents with children not only have work commitments but childcare responsibilities that may further strain their time spent together. And the consequences of poor marital quality and divorce are greater when children are involved, because it has consequences for the children as well as the parents.

Finally, I limit the sample to dual-earner couples each working 30 or more hours per week. A primary interest of this study is to examine how couples navigate full-time employment and family responsibilities at a time when the majority of women with children are in the labor force. Even when young children are present, the majority of women are employed: 63% of women with children under 3 were in the labor force in 1998 (U.S. Department of Labor 1999).

It is rare for both partners or spouses to work a non-standard shift (Presser 2000). Since the study hypotheses do not extend to this type of couple, and because sample sizes for combinations of shift arrangements were very small (n=59 in total), they were excluded from the final sample.

This yields a sample of 1,022 dual-earner couples with children; 1,016 when considering only those who have valid values on the outcomes of relationship quality. Table 3.1 presents descriptive statistics for this sample. Seven percent of these couples are unmarried. Eight percent of the sample has a newborn child under 1 year old. For thirty-seven percent of couples the youngest child in the house is 1 to 5 years old. The youngest child is 6 to 12 years old for 41 percent of the sample, and 13 to 18 years old for 16 percent of the sample. Sixty-nine percent of these couples are dual-earner day-shift couples (both work regular, day-time hours). In thirty-one percent of these couples, one spouse or partner works a day shift while the other spouse works a non-standard-shift; these are 'split-shift' couples.

Measures of Dependent Variables

Relationship conflict. I chose five measures that tap into conflict about issues pertinent to combining work and family responsibilities (see Table 3.1). In 1996, respondents were asked "How frequently do you and your (husband/partner) have arguments about: a) chores and responsibilities; b) children; c) money; d) showing affection; and e) leisure time. Responses are coded to each question so that higher numbers indicate higher levels of conflict: 3=often, 2= sometimes, 1=hardly ever and 0=never. Respondents appear to argue most about chores and responsibilities, and children, with average scores of about 'sometimes'. They rarely argue about leisure time or receiving affection, as the average score on these variables is approximately 'hardly ever'.

In my analyses, I first use an index of these variables to examine the association between work schedules and general conflict. The index is the average of the five conflict items described above; each case has complete information on these items. This index is reliable (Cronbach's Alpha=.75).

Positive interaction. Important developments in the study of marital satisfaction over the past decade have occurred as a result of careful observational studies of couple interaction during conflict resolution. For example, there is a growing appreciation that a satisfying marriage is not merely a relationship characterized by the absence of negative behaviors. Social support and other positive behaviors in marriage are attributes of long-term satisfying relationships (Cutrona 1996). Pasch and Bradbury (1998) and Pasch, Bradbury, and Davis (1997) studied social support in marital interaction, finding that provision and receipt of social support predicted better marital

outcomes 2 years later, independent of the negative behaviors exhibited during marital conflict. Gottman et al. (1988) found that positive affect during conflict discussions in the early months of marriage predicted both lower likelihood of later divorce and higher marital happiness among the stable couples. In general, marital quality has been increasingly defined not just by the presence of negative behaviors such as conflict, but also by the presence of positive behaviors. I therefore include a measure of positive relationship interaction as an outcome in my analyses.

Positive relationship interaction is an index of three items that, unlike conflict, indicate more pleasurable time spent together. I examine this outcome in addition to conflict, since it may be that decreased positive time invested in the couple's interpersonal relationship is the main consequence of split-shift work arrangements, and not conflict. Respondents were asked "how often do you and your (husband/partner) calmly discuss something", "how often do you laugh together", and "how often do you tell your spouse/partner about your day?" Responses were coded so that higher scores measure more time spent together: 0=less than once a month; 1=once or twice a month; 2= once or twice a week; and 3=almost everyday. All but one case had complete information on these items. The index has a satisfactory Cronbach's Alpha of .79.

On average, these couples frequently interact positively (see Table 3.1). The index indicates that, on average couples laugh, talk calmly, and/or talk to their spouse or partner about every day.

The possibility exists that couple time spent together and conflict both measure relationship quality in the same way. If this is true, then it would be prudent to combine these measures into a single index. To examine this possibility, I performed a factor analysis. The results of this examination suggest that conflict and positive time spent together are two separate constructs, since conflict items load highly on one factor, and positive interaction items load highly on a second factor. Therefore, I conduct analyses on conflict and positive interaction items separately from each other. The results of this investigation are reported in Table 3.2.

Measures of Key Independent Variables

Work shifts. Each respondent is asked "which of the following categories best describes the hours you [work(ed)] at this job?" for her main job. The respondent is also asked about the hours that her spouse or partner usually works at his main job. Response categories include "regular day shift", "regular evening shift", "regular night shift", "rotating shift ", "split shift", "irregular schedule or hours" and "other". Those who work irregular hours are also prompted "Who [set(s)] your hours?" Response categories for this question include "employer", "respondent", and "both respondent and employer". I distinguish irregular hours that are decided by the employee

from other irregular hours, since control over work hours is an important predictor of more positive family interaction (Staines and Pleck 1983; White and Keith 1990).

I create a classification of the overlap in couples' work arrangements from the responses of each spouse's or partner's work shift (see Table 3.3). The majority of the couples in my sample – 69 percent - are classified as both working a day shift. The remaining couples work a mixture of shifts. I therefore create 4 categories in addition to 'both work a day shift': One works day, other works evening (about 7 percent of the sample); one works day, other works night (5 percent); one works day, other works irregular hours (set by the employer), rotating shift, or a split shift (13 percent); and one works day, other works irregular hours set by the worker (6.5 percent). About the same number of male and female partners work the evening shift (about half of all evening shifts in this sample are worked by men, and about half by women), but more men than women work the other types of non-standard work shifts (71, 67 and 65 percent, respectively) (see table 3.3).

For the women in my survey I have data describing the title of their occupation. Appendix A lists the 1980 census occupational codes and titles for the 97 women in my sample who are working nonstandard schedules (not including irregular hours that the worker herself sets); Appendix B lists the 1970 census occupational codes and titles for the 172 spouses or partners who are working nonstandard schedules. My literature review pointed out that 9 out of the top 10 occupations projected by the Bureau of Labor Statistics to have the largest growth between 1994 and 2005 have very high percentages working nonstandard hours and/or days. About 48 percent of the women working nonstandard hours in my sample are working in one of these occupations. My literature review also suggested that these nonstandard schedule occupations are predominantly female; accordingly, only thirty-one percent of the spouses and partners working nonstandard hours are working in one of the occupations projected to have the highest growth between 1994 and 2005.

Statistical package and methods. I use the statistical package SPSS to perform the analyses described below. SPSS is an ideal statistics package for handling large datasets, bivariate, and multivariate analyses. I use Ordinary Least Squares techniques to estimate multivariate models. I also present unweighted coefficients for the multivariate analyses, even though the sample design for the NLSY79 oversamples blacks and Hispanics. The rationale for this decision is as follows. While it is clear that sampling weights must be used to produce descriptive estimates of the population, it is less obvious whether these sampling weights should be used when estimating regression equations. My objective here is not to produce population estimates, but rather to conduct multivariate

regression analysis to understand the association between work schedules and relationship quality. In fact, Winship and Radbill (1994) suggest that unweighted regression analyses are preferable to weighted regression analyses when the weighted and unweighted results are similar, because the unweighted analyses produce more efficient standard errors.

RESULTS

Sample Descriptives

How do shift work couples look compared to couples who both work day shifts? Table 3.6 compares the relationship, background and family characteristics of shiftwork couples and those who both work day shifts. Column 1 lists the dependent and independent variables described in the measurement section. The following columns list the values of these variables for 1) couples where one person works a day shift and the other works nonstandard hours, 2) couples where one person works a day shift and the other sets his/her own irregular hours, and 3) couples who both work day shifts. This last group, 'both work day' serves as the reference category for tests of significance using ANOVAs. So, for example, the average score on the positive interaction index is 7.91 for couples where one works nonstandard hours, which is significantly less than couples that both work day shifts ($p<.05$); this relationship is in the direction hypothesized. I also hypothesized that split-shift couples would have higher levels of conflict in their relationships than couples who both work day shifts. Table 3.6 shows that split-shift couples have higher levels of relationship conflict than couples in which both partners work day shifts, particularly conflict regarding affection. Descriptively, couples in relationships where one of them sets their own irregular hours are similar to both day couples in their positive interaction levels, but similar to other nonstandard workers in their levels of conflict. However, these differences are not statistically significant. This may be due to smaller n of this group (n=64).

I did not expect that number of children, marital status, or relationship duration would be associated with timing of work hours, but they all have been shown in prior research to influence relationship quality. Accordingly, split-shift couples do not have significantly more children (about 2 on average) nor longer relationships (about 11 years on average) compared to couples that both work a day shift. Neither are they significantly more likely to be married: Ninety-four percent of dual-earner parents both working days lived together as spouses, while ninety-two percent of dual-earner parents working split-shifts lived together as spouses.

The chi-squared for race/ethnicity by shift status is not significant at the $p < .05$ level, $\chi^2 = 8.34$ (4,1016). In the general population, black workers are more likely to work nonstandard hours than white workers—19.7 percent of blacks have shift schedules compared to 14.8 percent of Hispanics and 13.6 percent of whites (Bureau of Labor Statistics 2002).

Consistent with Presser's observation that the jobs offering nonstandard work hours are likely to employ less educated workers (1997), the average education level is lower for split-shift couples compared to couples that both work a day shift.

Since intact family status in childhood is linked to better socioeconomic status in later years, and since jobs with nonstandard work hours tend to require workers with lower levels of education, it is plausible that intact family status is associated with participation in nonstandard work hours. Accordingly, significantly more women in both-day couples lived with their parents through age 16 compared to women in nonstandard couples (77 percent compared to 71 percent).

Presser's research shows that employees working nonstandard hours often have young children, and nonstandard workers living with young children are more likely to report that childcare is the main reason they work those hours than other nonstandard workers. In my sample, the average age of the youngest child in the household is higher for nonstandard workers compared to those who both work day shifts. This masks the fact that the percentage of shiftwork couples who have a very young child (under 1) is higher than the percentage of both day couples who have children under 1 (11% compared to 4%, $p < .05$, not shown). Shiftwork couples are also more likely than both day couples to have only older children in the household aged 13 through 18 years (19% compared to 11%, $p < .05$, not shown).

RELATIONSHIP QUALITY, WORK SCHEDULES AND BACKGROUND CHARACTERISTICS

Split-shift couples

Tables 4.1 and 4.2 address the question of whether couples with a split-shift work arrangement have higher relationship conflict and less positive interaction compared to couples that both work day shifts. I present the bivariate relationship between work arrangements and relationship quality in the first panel of each table. I then add background factors that influence both employment and relationships in the second panel. Unstandardized regression coefficients are presented. Since I have made directional hypotheses for the effects of split shift schedules, irregular hours controlled by the worker, education, and respondent's family background, I subject the

coefficients for these variables to a one-tailed test of significance**.** Since the hypotheses are supported on a strong theoretical and/or empirical basis, it is common practice to use a one-tailed test of significance (Cohen et al). I have no directional hypothesis for the association between race/ethnicity and relationship conflict (and positive interaction), so I subject the coefficients for these variables to a two-tailed test of significance, which is more stringent than a one-tailed test. This will reduce the risk that I will commit a type 1 error in my analysis. A type 1 error occurs when a significant association is observed between two variables, but this association is due to chance rather than true patterns that occur in the population.

Relationship Conflict. The first thing to notice from Table 4.1 is that the timing of couples' work hours matters. According to panel 1, and consistent with the notion that nonstandard hours might impede relationship quality, couples that work split-shifts argue significantly more often than couples who both work day shifts. Couples where one partner has some say over his/her irregular work hours do not argue significantly more than couples who both work day shifts, and the coefficient is about half the size of the coefficient for split-shift couples—supporting the notion that control over one's work hours is helpful.

It is possible that the observed relationship between work schedules and relationship conflict is spurious; that is to say, it may not be split-shifts that increase relationship conflict, but lower levels of education or living without both parents in childhood, which both increase the likelihood of working in lower quality jobs and increase relationship conflict**.** If the bivariate relationship between split-shift schedules and relationship conflict is spurious, than it will become insignificant when I add education and family background to the equation.

In panel two I present the coefficients for the equation that adds education and family background. I also add race/ethnicity to adjust for the oversampling of blacks. The pattern observed in panel 1 remains significant, which gives more confidence that the relationship between split-shifts and conflict is not spurious. The split-shift couple coefficient becomes smaller by about 15 percent in panel two, suggesting that at least some of the bivariate association between split-shifts and conflict is due to education, race, and possibly family background.

In relationships where at least one person holds a college degree, the partners argue less often than couples with a high school education or less. When the highest education of at least one partner is 'some' college, this also appears to reduce arguing relative to couples with a high school education or less, although the effect is smaller and statistically non-significant.

I did not hold any a priori hypotheses about the association between race/ethnicity and conflict. In a review of the literature on marital processes and families of color McLoyd and colleagues (2000) write that early work on the frequency and management of conflict suggest that "African American couples and families have more conflictual relations and are more tolerant of open, intense disclosure than their European American counterparts" (page 1077). However, McLoyd et al. also suggest that these findings may result from methodologically weak analyses that recent investigations have not yet resolved. They also report that no consistent patterns of race differences have been found in how couples manage conflict. These observations are also in line with White and Rogers (2000) who state the opinion that race effects on family outcomes remain unresolved.

In my research, I do observe significant associations between race/ethnicity and relationship conflict. Blacks argue significantly more often than non-black, non-Hispanics (the reference group). These results are consistent with some prior research. Research on marital happiness shows that black couples consistently report being less happy than white couples (McLoyd et al. 2000). Broman (1993) investigates differences in the marital harmony of black and white families, and he finds that black couples have less marital harmony than white couples net of family income, education, age, employment status and number of children. Spousal emotional support and financial satisfaction intervene in this relationship, but do not fully explain race differences in marital harmony, according to his path analysis results. My research, which holds constant the presence of children, employment status, and dual-earner status (a possible proxy for income) and controls for education, also suggests that other variables will need to be invoked in order to explain race-differences in relationship conflict.

Hispanics also argue more than the reference group, but this association is not significant. Prior research, little as it may be, focusing on Hispanic couples and conflict suggest that Hispanic couples do not differ from European American couples in the frequency of major or overt conflict (as summarized by McLoyd et al. 2000, p. 1077). My results are not inconsistent with this prior research.

Contrary to expectations, family structure in childhood does not significantly affect relationship conflict for this sample. Even more surprising, the coefficient is positive for this variable, suggesting that an 'intact' family background is associated with higher levels of relationship conflict. I would suggest that this could be an indication that these couples interact frequently if they also had higher levels of positive interaction. However, as the upcoming analyses will show, having an intact family status does not lead to significantly more positive interaction.

Looking at the basic correlation between intact family status and conflict, there is virtually no relationship for this sample (.009).

Positive interaction. Table 4.2 summarizes the results for the OLS regression of positive couple interaction. Panel 1 presents the bivariate coefficients. Again, compared to couples where both work a regular day shift, split-shift couples spend significantly less time together in 'positive interaction'. Irregular work hours determined by the worker also lead to lower levels of positive interaction, compared to couples who both work day shifts, but this difference is not statistically significant. The coefficient for irregular work hours controlled by the worker is again about half the size as for split-shift couples, suggesting that control over work hours is important.

It is possible that the observed relationship between work schedules and positive interaction is spurious. If the bivariate relationship between split-shift schedules and positive interaction is spurious, than it will become insignificant when I add education and family background to the equation.

Panel 2 adds background variables. Split-shift couples have significantly lower levels of positive interaction compared to couples who both work day shifts, even with background variables in the equation. This gives me more confidence that this relationship is not spurious. The coefficient for split-shift couples is reduced somewhat by adding in these background factors. This suggests that some of the observed correlation between working split-shifts and lower levels of positive interaction are actually due to differences in the educational and racial make-up of the couples who work these shifts, compared to those who work day shifts.

In relationships where at least one person holds a college degree, the partners have higher levels of positive interaction than couples with a high school education or less. Education seems to have a linear influence on positive interaction, as 'some' college also increases positive interaction relative to couples with a high school education or less, but the size of the coefficient is only half as large as that for 'having a college degree'.

Similar to the results for relationship conflict, black respondents report significantly less positive interaction than non-black, non-Hispanic respondents. The Hispanic respondents report lower levels of positive interaction than non-black, non-Hispanic respondents, but this result barely misses statistical significance.

Contrary to expectations, family structure in childhood does not significantly affect positive interaction in this sample. In both bivariate (not shown) and multivariate analyses, the coefficient is virtually zero, indicating no effect. This is a similar pattern as for relationship conflict. **Maybe some conflict and limited amounts of positive interaction are okay.** As measured, I have detected significantly higher conflict and significantly lower positive

interaction for split-shift workers compared to couples who both work days. But, *some* conflict may not be bad; in fact if it is accompanied by good problem solving, this can be beneficial (Bradbury et al. 2000). In order to further understand the association between work schedules and relationship quality, I created a new outcome measure that captures high conflict and simultaneous low positive interaction --"poor communication". This measure is meant to address the question of whether split-shift work schedules are related to sub-optimal levels of conflict and positive interaction, and not just 'higher' or 'lower' levels. Poor communication is a dummy variable capturing those who are both high in conflict (answering "argues often" about either children, chores, money, affection or leisure time) and low in positive interaction (answers "less than once a month" or "once or twice a month" about how frequently the respondent reports calmly discussing something, laughing together or telling spouse about her day). About 6 percent of the respondents in my sample report being both high in conflict and low in positive interaction.

Table 4.3 presents logistic regression results for the impact of split-shift schedules, irregular hours controlled by the worker, education, race and intact family structure in childhood on poor communication. Even with a narrow measure combining high conflict and low positive interaction, split-shift couples are significantly worse off compared to day-shift couples. The coefficient for couples where one works irregular hours that s/he sets, although insignificant, is in the opposite direction, suggesting that they are less likely to have poor communication. These results present a story consistent with earlier results: split-shift couples are more likely than day shift couples to have relationships characterized by frequent arguing *simultaneously* with infrequent time spent in positive interaction.

Also similar to earlier results, the coefficients for education are in the expected direction. Compared with those who have a high school degree or less, couples in which at least one partner has a college degree have a lower likelihood of poor communication. Having achieved some college leads to slightly lower likelihood of, but insignificant levels of poor communication compared to having achieved a high school degree or less. When the highest education earned by the couple is a college degree, this significantly reduces poor communication compared to a high school degree.

The coefficients for race and ethnicity indicate a caveat to earlier results that black respondents argue significantly more with their spouse or partner and interact significantly less positively with their spouse or partner. It appears that, compared to the reference group of non-black, non-Hispanic respondents, black respondents are not significantly more prone to poor communication – an arguably more stringent measure of relationship quality than

relationship conflict or positive interaction alone. The direction of the coefficient is towards poorer communication, as is the direction of the coefficient for Hispanics, but neither is statistically significant.

Finally, not even with a more stringent measure of relationship quality does family background seem to matter for this sample. Those who grew up with both parents do not have significantly better levels of communication.

Summary. For relationship conflict, positive interaction and poor communication, a variable that indicates both high conflict and low positive interaction, there is a consistent pattern. Nonstandard work hours *not* determined by the worker have adverse effects, compared to couples who both work days. These effects persist both at the bivariate level and with background variables expected to influence both the probability of working nonstandard hours and relationship quality. Control over work hours may make a difference, as irregular hours controlled by the worker do not have significantly adverse effects on relationship conflict, positive interaction or poor communication compared to couples who both work days, while other split-shift schedules do. To further test this possibility I reran equations combining this group with split-shift couples for the outcomes of conflict and positive interaction. In both cases, the coefficient for the combined category was weaker (although still significant and in the hypothesized direction), suggesting it is useful to consider the value of control over one's work hours separate from hours worked.

Better education and being white was associated with significantly more optimal levels of relationship conflict and positive interaction. In the case of 'poor communication', arguably a more stringent indicator of relationship quality than conflict or positive interaction, the protective influence of education is still present. Notably, I do not observe the same significant race/ethnicity differences in poor communication as I did when examining conflict and positive interaction separately.

Finally, the respondent's family structure in childhood does not produce the expected associations with relationship quality in this sample. Family background does not significantly influence relationship conflict, positive interaction, or poor communication at the bivariate or multivariate levels.

Type of Non-standard Schedule

Tables 4.4 and 4.5 address the question of whether the type of nonstandard schedule worked by one's partner makes a difference for relationship conflict and positive interaction. Among couples where one partner works a nonstandard work-schedule, I expect that nonstandard shifts that are regular will have a less negative effect

on relationships than irregular work hours. I also expect that night work hours will have a more negative effect than evening work hours since night shifts have been shown to have negative effects on health, in addition to resulting in low overlap between partners' schedules. The coefficients for evening split shifts, night split shifts, and irregular hours represent a comparison between these couples and the omitted category of couples who both work a day shift. The coefficients for each shift category can be compared to one another to evaluate hypotheses -- higher coefficients would indicate one category is associated with more arguments than another. In order to test for statistically significant differences, I run the same models with the contrast categories of interest omitted (e.g. irregular hours and night hours). This will allow me to directly compare irregular hours couples to regular night shift and regular evening shift couples to address the first hypothesis, and regular night shift couples to evening shift couples to address the second hypothesis.

As above, panel 1 represents the bivariate relationship between work arrangements and conflict and positive interaction, and panel two adds controls for socio-economic characteristics. Additional analyses (not presented) test whether differences between hypothesized categories are statistically significant.

First at the bivariate level, relative to dual-earner couples who both work days, having a partner who works a regular night shift increases couple conflict, as does having a partner who works irregular work hours (not controlled by the worker). Working evening hours is positively related to conflict, although barely misses statistical significance (p=.101, one-tailed test). I do not discuss the results for background variables, since they are essentially the same results as just discussed and presented in tables 4.1 and 4.2.

The results for the outcome of positive relationship interaction are similar to those for the outcome of conflict, as shown in Table 4.5. Having a partner who works a regular evening shift, night shift or irregular work hours (not controlled by the worker) all decrease positive interaction, relative to couples who both work days. The coefficient for evening shifts surpasses statistical significance for the outcome of positive relationship interaction, while it just misses it for the outcome of conflict. These relationships remain significant even when controlling for background characteristics.

Irregular hours vs. regular shift schedules. Are irregular hours more detrimental to relationship conflict and positive interaction than regular hours? In additional analyses (not shown), I run the same OLS regression model, except that I leave out the category of 'irregular, rotating or split shift' as the omitted category, allowing significance testing between this category and regular shift categories. Looking at absolute levels of relationship

conflict reported in Table 4.4, irregular work hours increase conflict more than evening shifts, but not more than night shifts. However, none of these differences are statistically significant ($p<.10$, one-tailed test). This is the same pattern that occurs when background characteristics are controlled.

Looking at absolute levels of positive relationship interaction reported in Table 4.5, working regular evening shifts and regular night shifts actually lead to lower levels of positive relationship interaction than working irregular work hours (not controlled by the worker). However, again, none of these differences are statistically significant ($p<.10$, one-tailed test) in both the bivariate and multivariate equations.

Based on the lack of statistical significance, I conclude that there is no support for the hypothesis that irregular work hours are more detrimental to relationship quality than regular shift work.

Evening shifts vs. night shifts. Are night shifts more detrimental to relationship quality and positive interaction than evening shifts for dual earner couples? Again, I examine this question by running the same OLS regression model as for Tables 4.1 and 4.2, except that I designate the category of 'night shift' as the omitted reference category, allowing significance testing between this category and evening shifts. In accordance with my hypothesis, night split-shifts increase conflict and decrease positive interaction more than evening split-shifts, when considering absolute levels of conflict. In fact, the coefficient for night split-shifts is double the size for evening split shifts for the outcome of conflict in Table 4.4. Dampening my confidence in my hypothesis, however, is the similarity between the coefficients for evening and nights shifts when the outcome is positive interaction (Table 4). Further dampening conclusions in support of the hypothesis that night shifts may be more detrimental to workers than evening shifts, the differences between these variables fail to reach statistical significance, ($p<.10$, one-tailed test). This is the same pattern that occurs when background characteristics are controlled.

Based on the lack of statistical significance, I conclude that there is no support for the hypothesis that night-shift work is more detrimental to relationship quality than evening shift work.

ALTERNATIVE EXPLANATIONS

In the previous section I found a consistent pattern: dual-earner parents who have split-shift work arrangements argue more frequently and spend less time engaged in positive interaction compared to dual-earner parents that both work day shifts. These associations are even significant when looking at a more stringent measure of poor communication. Having more children mainly adds to this burden, as more children are associated with significantly higher levels of arguments and more arguments about affection (analyses not shown). Couples who

have younger children in the house tend to argue more and positively interact less frequently then couples whose oldest child in the house is 13-18 years old, although having a newborn child seems to be better for relationship quality then having school-age children, at least in this sample (analyses not shown).

The consistency in these patterns suggests a reason to be concerned for parents when one of them works a nonstandard work schedule. I hypothesized that having more or younger children might make it even more difficult for these couples to negotiate household responsibilities or find time to interact with each other; but having these responsibilities generally did not predict which couples were more vulnerable to split-shift work schedules. Taken together, does this really suggest that non-standard work schedules place the relationships of dual-earner parents at risk? There are still questions that remain to be addressed to better understand the implications of nonstandard work schedules for couples. I can address some of these issues here.

Prior Relationship Quality, Work Schedules and Current Relationship Quality.

Are couples with poorer quality relationships more likely to move into nonstandard work hours? I use a longitudinal study design to address this question, whereby I use relationship quality items measured *prior* to couples moving into a nonstandard work schedule. In 1994, the survey year before the current study point of 1996, the same items I use to create relationship conflict and positive interaction were collected. However, I lose about 10 percent of my sample due to the fact that they either a) were not interviewed in 1994, or b) they were not living together as a couple in 1994, or c) did not have valid answers on relationship quality questions. Therefore, I restrict the following analyses to the 901 respondents who were both interviewed in 1994 and also living with the same partner as in 1996.

I also create a new measure of non-standard schedules. I create a dummy variable where respondents are coded one only if a)neither the respondent or her spouse worked a nonstandard schedule in 1994, but b) one of them were working a nonstandard schedule at the 1996 survey round. This allows more confidence in the causal inquiry between relationship quality and work schedules, since relationship quality is measured *prior* to a move into a nonstandard work shift. In 9 percent of the couples in this subsample, at least one person moved into a nonstandard work shift between 1994 and 1996.

I perform a logistic regression analysis predicting the likelihood of a spouse or partner moving into a nonstandard work shift between 1994 and 1996. The key predictor variables are relationship conflict and positive interaction in 1994, and analyses control for socio-demographic background and family characteristics. If the

coefficients for relationship conflict or positive interaction are significant, this suggests that couples who have poorer quality relationships to begin with have greater odds of taking on nonstandard work hours than not taking on nonstandard work schedules. This would challenge my running hypothesis that *work schedules* influence relationship quality, and not the other way around. If relationship conflict or positive interaction in 1994 predicts the likelihood of working nonstandard shift, this would offer some support to those who argue that troubled couples are more likely to accept nonstandard work schedules. These results are presented in Table 6.4.

The results revealed in Table 6.4 are mixed. On the one hand, couples that argue more frequently in 1994 are significantly more likely to start working non-overlapping work shifts in 1996 than they are to remain in their same work schedules or stop working nonstandard shifts. This reinforces the importance of accounting for prior levels of relationship conflict in order to distinguish whether non-standard work schedules lower relationship quality, or the other way around. On the other hand, earlier levels of positive interaction in 1994 do not significantly distinguish couples who are more likely to move into nonstandard work schedules by 1996.

Do split shift work schedules actually cause *changes* in relationship quality over time? Again, I restrict this analysis to the 901 respondents who were both interviewed in 1994 and also living with the same partner as in 1996. I address the question at hand by performing regressions predicting relationship conflict and positive interaction in 1996, but this time I include relationship conflict and positive interaction in 1994 as predictor variables. Thus, the dependent variable is essentially change in relationship quality between 1994 and 1996, or the portion of 1996 relationship quality that cannot be explained by relationship quality in 1994. If current non-standard work scheduling continues to be associated with worse levels of relationship quality in 1996, this would further support my hypotheses that something about nonstandard work schedules make couple's relationships vulnerable, and not the other way around.

Table 6.5 displays the regression results for relationship conflict and positive interaction in 1996 on prior levels of relationship quality, background and family characteristics. The first panel displays the results for the outcome of relationship conflict. Not surprisingly, relationship conflict in 1994 significantly predicts the frequency that couples argue in 1996 – the more couples argued in 1994, the more they argued in 1996. In these same equations, split-shift couples argue significantly more than couples that both work day shifts, suggesting that split shifts are actually associated with increases in conflict between 1994 and 1996. The second panel displays the same results for the outcome of positive interaction, which are similar to the results for relationship conflict. The more

couples interact positively in 1994, the more likely they are to report spending time in positive interaction in 1996. In these same equations, split shift couples are less likely to spend time in positive interaction compared to couples that both work day shifts, suggesting that split shifts are actually associated with decreases in positive interaction between 1994 and 1996. The significance level for this association barely reaches significance, possibly suggesting that the results for positive interaction are more tenuous than the results for relationship conflict.

SUMMARY AND DISCUSSION

In this study I have explored the linkages between couples' work schedules and the quality of their relationships. Specifically, I took into account the combined schedules of couples, comparing couples where both partners work regular day hours to those couples where one person works a nonstandard shift. A primary motivation of this research was to understand links between work and family, and the role that joint work schedules might play in shaping the nature of family interactions, for better or for worse.

I accomplished my research goals by first examining the cross-sectional relationships between couples' joint schedules and their reports of conflict and time spent in positive interaction. Not only did I compare couples where both partners work regular day hours to those where one person works a nonstandard-shift, but I also compared couples based on their hours of timing and overlap in their schedules. Finally, I considered that couples themselves play a role in shaping their work schedules, and I took this into account by estimating the influence of prior relationship quality on the likelihood of starting work at nonstandard hours, and I also estimated the influence of nonstandard work schedules on relationship quality taking into account prior levels of this outcome.

As I discussed, recent research has illustrated at least two trends that make a current study of non-standard work hours and family life critical. First, jobs are increasingly offered at non-standard hours, and recent estimates suggest that among dual-earner couples with children under age 5, about 1 in 3 have a spouse who regularly works day shifts while the other works mostly in the evening, night, or on a rotating schedule (Presser 2000). The demographic profile of nonstandard workers is likely to transition to a higher proportion of female workers than has been observed in the past, given both the prevalence of employed women in the United States, as well as projected growth of shift work in predominantly female occupations (Presser and Cox 1997). Work at nonstandard hours has also been linked to divorce (Presser 2000), which has arguably been considered a social problem (Popenoe 1992; Stacey 1992).

While these trends suggest the importance of a contemporary study of nonstandard work hours and family life, one of the main reasons why such a study is of concern is decades old – work hours may be one way that work 'spills over' into the home to create conflict between parents' work and family roles. One concern is that couples who work different schedules from another have little time together to invest in their relationship. Conversely, the scheduling of work hours can also play a role in facilitating work and family roles, especially if parents have some control over their work hours (Tausig and Fenwick 2001; Glass and Estes 1997; Staines and Pleck 1983). A third possibility is that employment at non-standard hours is tolerated by some couples who have poor relationships to begin with, and the end result may actually be helpful to their relationship (e.g. they have less time to interact in negative ways), or else further drive them apart. In this research I have presented findings that shed light on these potential processes. In the following paragraphs I provide a discussion of how nonstandard work hours influence the relationships of dual-earner couples living with children under 18 in their household.

Do Nonstandard Work Hours Harm Relationship Quality?

One concern driving this research is that couples who work different schedules from one another have little quality time together to invest in their relationship with their spouse or partner. My research findings suggest a reason to be concerned for these couples. Nonstandard work hours not determined by the worker have harmful effects on relationship conflict and positive interaction, compared to couples who both work days. These effects persist both at the bivariate level and with background variables expected to influence both the probability of working nonstandard hours and relationship quality. The quality of a shift-worker's job does not explain the association between work at nonstandard hours and relationship conflict and positive interaction (analyses not shown). An arguably more stringent indicator of poor relationship quality would tap into couples who both argue frequently and spend little time in positive communication activities such as talking and laughing together. Even with such a measure, split-shift couples are more likely to have poor communication quality relative to couples that both work day shifts. Control over work hours may make a difference, as irregular hours controlled by the worker do not have significantly harmful effects on relationship conflict, positive interaction or poor communication compared to couples who both work days, while other split-shift schedules do. Yet more convincing, split-shift couples engage in more conflict, despite prior levels of this variable, suggesting that working alternating schedules is associated with changes in conflict over time.

These findings are consistent with Presser (2000) who finds that working a night shift is associated with less time spent together with one's spouse. My findings also suggest an extension of Presser's work. Although Presser (2000) hypothesizes that the significant influence of nonstandard work hours on the higher likelihood of divorce might be explained by less couple time spent together, she does not find support for this hypothesis. Rather, she suggests that the critical mediator might be the "changing nature of family life generated by different work schedules" (p. 105). I consider the outcome measures in my research to be a closer indicator of the nature of family life than 'time spent together' with one's spouse. 'Positive interaction' is not only a measure of the frequency of time spent together, but a measure of the frequency of time spent together in activities like talking, laughing and calm discussions. Conflict is not only a measure of frequent arguments, but also arguments about salient everyday domestic issues – chores and responsibilities, children, and affection, for example. A further step for my research would be to explore the intervening influence of relationship quality for the association of nonstandard work schedules and divorce likelihood.

While Presser finds that night shifts for men, and additionally rotating shifts for women, are the critical predictors of relationship instability, my analyses do not necessarily suggest such a difference. Similar to Presser, I find that night shift work and irregular, split and rotating shifts (a combined category) significantly increase relationship conflict, but evening shifts do not, compared to couples where both partners work a day shift. However, when I test for statistical differences between evening and night shifts, I do not find any. Presser does not test specifically for these differences. I also do not find that evening shifts have a different influence on positive interaction compared to night shifts. Whereas one might argue that the evening hours are a critical 'family together' time period that would be detrimental to miss out on, or that work during night hours is critical because it results in both low overlap of spousal time together as well as interruptions of sleep and poorer health, my findings support a more general negative effect of most all types of nonstandard work hours on relationship quality.

Do Nonstandard Work Hours Have the Potential to Facilitate Work and Family Roles?

The one exception to the patterns just described above is the situation when one spouse works irregular hours that she or he himself controls—in this case relationship quality is the same for these couples as it is for couples that both work day shifts. Consistently in all analyses, these types of work hours do not lead to significantly more or less conflict or positive interaction, relative to couples that both work day shifts. This supports a growing

recognition of 1) the importance in flexibility of work hours for containing work-family conflict, on the one hand, and 2) that there is a sharp distinction between nonstandard work hours (which are normally present in lower quality jobs where the employer determines one's hours) and actual flexible work hours and work place policies (Bureau of Labor Statistics 2000) on the other hand. The latter of the two being the better of the two for combining work and family.

Are Opposing Work Schedules a Response to Couples Not Wanting to Spend Time Together?

Another possibility is that employment at non-standard hours is tolerated by some couples who have poor relationships to begin with. There is evidence that those who argue more in 1994 are also more likely to move into nonstandard work schedules between 1994 and 1996. Even so, the tendency towards higher conflict among split-shift couples compared to both-day couples is not due entirely to poor quality relationships to begin with: non-standard work hours are associated with significantly higher conflict *after* prior levels of relationship conflict are taken into account. For the outcome of positive interaction, lower levels of positive interaction in 1994 *do not* select couples into nonstandard work hours by 1996, and nonstandard work hours are related to decreases in positive interaction over time, but this result is barely significant. This is evidence of a complex story. *First*, indeed it appears that nonstandard work schedules are the cause of deterioration in relationship quality over time. *Second,* it also appears that some couples are more amenable to working opposing schedules because their relationships were lower in quality to start out with, and yet they continue to experience deterioration in their relationship quality.

When considering positive interaction as a measure of marital quality, my results are consistent with those of Presser (2000), whose analysis does not support the hypothesis that those who enter into night and rotating shifts are selective of those with lower quality marriages. They are also consistent with the analyses of White and Keith (1990), who find that adding a shift-worker to a family between 1980 and 1983 leads to significant increases in disagreements, whereas dropping a shiftworker significantly increased marital interaction and decreased child-related problems. But, taken together, my results really suggest a more complex reality: yes, nonstandard work hours seem to have real and negative impacts on relationship quality; but they also reveal that some couples already may have poor relationships to begin with. Further, for these couples, nonstandard hours are associated with further deteriorations in relationship quality over time.

My analyses suggest that there is no simple remedy to the problem of nonstandard work hours. For some couples, the problems associated with working nonstandard hours may be attributed to the bigger issue of problems

in their relationship. It is difficult to say whether these couples are satisfied with their opposing work arrangements, but it is clear from my results that working a nonstandard shift is linked with a subsequent higher level of conflict, despite already poor levels of relationship quality. These couples may need relationship counseling, more than anything else.

Even if couples' split-shift work arrangements are beneficial for securing childcare, couples are paying a price for this security in terms of their relationship quality, which has the potential to jeopardize the security of a child's home environment. Earlier research as well as the present study suggests that having control over one's work hours may relieve some of the stress of these schedules. Also, this may be especially important for shift-workers, since their jobs carry fewer benefits and are lower quality, on average than jobs primarily offered during the day hours. Couples may also benefit from other workplace supports that are targeted at the difficulties of shift-workers – counseling to help couples navigate the difficulties that arise when they work a different shift from their partner, for example. It also bears repeating that work-family interference is not just a problem for couples with split-shift work arrangements – this is a problem for many families, and is a subject of on-going research and implementation of work-place policies.

Limitations of the Current Research

This study is limited to dual-earner couples who have children and who are working primarily full-time jobs. These sample decisions are well-suited to my study question, but this decision also distinguishes my results from most other studies of shift work and family outcomes. No other study of nonstandard work hours to my knowledge addresses this group specifically, and I believe they should be singled out since the overlap in their work hours, or lack thereof, is clearly non-trivial. The respondents in my sample all have nearly full time work hours, as well as responsibilities for their children. The insight into how work schedules cross over into family life gleaned from this study may be specific to this population. Consistent with this idea, household responsibilities were a source of conflict for nonstandard hours, and the presence of more children exacerbated this conflict. Couples who together work fewer hours or do not have the same levels of family responsibilities may exhibit different patterns as a result of shift-work.

The argument could also be made that the importance of nonstandard work schedules for couples with children would be more pronounced when these couples are compared to those without children. In this sense, it is a limitation of this study that I excluded couples without children from my sample.

Respondents were aged in their thirties and in a relationship during the survey year that I selected for this analysis. While this decision allowed me to study parents with children whose ages range from newborn through 18, it also poses some limitations. For example, it is likely that some respondents were not selected at my survey point because their relationships had already deteriorated at an earlier age. In fact, it may be especially important to understand the impact of nonstandard work schedules when couples are younger in their ages and relationships. Younger respondents would presumably have access to fewer resources (such as financial resources or job stability), which may make them more vulnerable to work-family stresses. In addition, some of the couples in my sample may have previously worked split-shifts, but moved out of these work arrangements when their relationships became strained.

An additional limitation due to my sample selection is that my results are generalizable only to dual-earner couples in predominantly full-time jobs. The time constraints for these couples warrant careful examination, and yet most past studies have not made the distinction between these couples and those where only one person works at full-time hours. Even so, nonstandard work schedules create difficulties even for these couples. But one thing I cannot determine in my study is whether couples that anticipate that split schedules could lead to problems might be less likely to have two workers; these couples would be selected out of my sample.

There is one question that no studies to date have been able to address: Does the reason that one's spouse or partner works nonstandard hours bear on whether this type of work arrangement affects their relationship quality? I do not have the data available to address this question, but the answers seem to be an important consideration for this research. The answers also could provide insight into what 'remedies' might be appropriate for 'which' split-shift couples. These types of schedules may work better for people who actually prefer to work nonstandard hours. It would also be telling to see whether the association between nonstandard work hours and relationship quality is affected when a respondent chooses to work these hours due to childcare concerns.

My research is notable in that I am able to take into account information about *both* partner's work schedules. However, I was only able to study women's reports of relationship quality, and therefore I do not know

how men's perceptions might have differed. Specifically, I would be interested in whether men in split-shift couples report more frequent arguments about chores and children than men in couples where both spouses work a day shift.

	N (Unwtd)	Percentage (weighted)	Average (s.d.) (weighted)	Min.	Max.
Dependent Variables					
Relationship Conflict Index	1016	--	6.4 (3.0)	0	15
Relationship conflict items					
Arguments over chores	1016	--	1.6 (.9)	0	3
Arguments over children	1016	--	1.5 (.8)	0	3
Arguments over money	1016	--	1.4 (.9)	0	3
Arguments over affection	1016	--	1.0 (.9)	0	3
Arguments over leisure time	1016		.9 (.9)	0	3
Positive Interaction Index	1016	--	8.2 (1.5)	0	9
Independent Variables					
Shift arrangements					
Both work day	683	69.0	--	--	--
One works non-standard shift					
Evening	77	6.7	--	--	--
Night	66	5.4	--	--	--
Irregular hours/split/rotating	126	12.4	--	--	--
Irregular hours set by worker	64	6.5	--	--	--
Additional background variables					
Highest education completed by couple					
High school degree or less	392	38.6	--	--	--
More than high school	317	29.3	--	--	--
College degree	307	32.1	--	--	--

Continued

Table 3.1. Descriptive Characteristics of Dependent and Independent Variables

Table 3.1. continued

Race and ethnicity					
Black	210	8.8	--	--	--
Hispanic	228	7.1	--	--	--
Non-black, non-Hispanic	578	84.1	--	--	--
Family background					
Lived with both biological/adoptive parents through age 16	707	74.5	--	--	--
Family characteristics					
Number of children	1016	--	1.9 (.8)	1	6
Age of youngest child					
Under 1	82	8.9	--	--	--
1-5 years	367	36.8	--	--	--
6-12 years	432	40.7	--	--	--
13-18 years	135	13.6	--	--	--
Married (vs cohabiting)	929	92.9	--	--	--
Relationship Duration	1016	--	10.9 (5.5)	0	23

	Factor Loadings	
	1	2
	Conflict	Positive interaction
Z-Scored Item		
How often argue about chores and responsibilities	0.75	-0.03
How often argue about children	0.69	-0.10
How often argue about money	0.75	-0.02
How often argue about showing affection to each other	0.66	-0.30
How often argue about leisure time	0.62	-0.17
How often respondent and spouse/partner laugh together	-0.16	0.83
How often respondent and spouse/partner tell each other about their day	-0.10	0.76
How often respondent and spouse/partner calmly discuss something	-0.10	0.84
Cronbach's Alpha	.75	.79

Table 3.2: Factor Analysis for Conflict and Positive Interaction Indexes, Based on Study Sample (N=1,016)

	Husband or male partner works this shift (%)	Wife or female partner works this shift (%)	Total
Non-standard shift of partner or spouse			
Evening	51.5%	48.5%	100.0%
Night	70.9	29.1	100.0
Irregular hours/rotating/split-shift	66.7	33.3	100.0
Irregular hours set by spouse	65.2	34.8	100.0

Table 3.3: Distribution of work shifts: Weighted percentages of nonstandard shifts that are worked by husbands (or male partners) and wives (or female partners).

	1		2	
	B	S.E.	B	S.E.
Shift arrangements				
Both work day (reference category)	--	--	--	--
One spouse/partner works				
Irregular hours, decided by worker	0.35	0.40	0.35	0.41
One works non-standard shift	0.68	0.22[b]	0.57	0.23[b]
Background characteristics				
Highest education completed by couple				
High school degree or less (reference)			--	--
More than high school			-0.23	0.23
College degree			-0.55	0.24[c]
Race and ethnicity				
Non-black, non-Hispanic (reference)			--	--
Blck			0.65	0.26[**]
Hispanic			0.35	0.24
Intact family status through age 16			0.24	0.22
R-squared	.009		.02	

a p<.001, one-tailed **** p<.001, two-tailed
b p<.01, one-tailed *** p<.01, two-tailed
c p<.05, one-tailed ** p<.05, two-tailed
d p<.10, one-tailed * p<.10, two-tailed

Table 4.1: Relationship Conflict Regressed on Background Characteristics, NLSY79 Mothers in Dual-Earner Couples (N=1016).

	1		2	
	B	S.E.	B	S.E.
Shift arrangements				
Both work day (reference category)	--	--	--	--
One spouse/partner works irregular hours, decided by worker	-0.16	0.21	-0.14	0.21
One works non-standard shift	-0.38	0.11[a]	-0.31	0.12[b]
Background characteristics				
Highest education completed by couple				
High school degree or less (reference)			--	--
More than high school			0.16	0.12[d]
College degree			0.32	0.12[b]
Race and ethnicity				
Non-black, non-Hispanic (reference)				
Black			-0.36	0.13[***]
Hispanic			-0.20	0.12
Intact family status through age 16			-0.04	0.11
R-squared	.01		.03	

a p<.001, one-tailed **** p<.001, two-tailed
b p<.01, one-tailed *** p<.01, two-tailed
c p<.05, one-tailed ** p<.05, two-tailed
d p<.10, one-tailed * p<.10, two-tailed

Table 4.2: Positive Relationship Interaction Regressed on Background Characteristics, NLSY79 Mothers in Dual-Earner Couples (N=1016).

	B	S.E.
Shift arrangements		
Both work day (reference category)	--	--
One spouse/partner works irregular hours, decided by worker	-0.16	0.62[ns]
One works non-standard shift	0.48	0.28[c]
Background characteristics		
Highest education completed by couple		
High school degree or less (reference)	--	--
More than high school	-0.11	0.29[ns]
College degree	-1.12	0.41[b]
Race and ethnicity		
Non-black, non-Hispanic (reference)	--	--
Black	0.27	0.34[ns]
Hispanic	0.11	0.33[ns]
Intact family status through age 16	0.16	0.30[ns]

a p<.001, one-tailed **** p<.001, two-tailed
b p<.01, one-tailed *** p<.01, two-tailed
c p<.05, one-tailed ** p<.05, two-tailed
d p<.10, one-tailed * p<.10, two-tailed

Table 4.3: Poor Communication Regressed on Background Characteristics (Logistic Regression), NLSY79 Mothers in Dual-Earner Couples (N=1016).

	Unstandardized Coefficients			
	1		2	
	B	S.E.	B	S.E.
Shift arrangements				
Both work day (omitted category)	--	--	--	--
One works non-standard shift				
Evening	0.47	0.37	0.32	0.37
Night	0.85	0.40[c]	0.70	0.40[c]
Irregular hours/split/rotating	0.71	0.30[b]	0.66	0.30[c]
Irregular hours set by spouse	0.35	0.40	0.35	0.41
Background characteristics				
Highest education completed by couple				
High school degree or less (reference)			--	--
More than high school			-0.23	0.24
College degree			-0.56	0.24[b]
Race and ethnicity				
Non-black, non-Hispanic (reference)			--	--
Black			0.65	0.26[**]
Hispanic			0.36	0.24
Intact family status through age 16			0.24	0.22
R-squared	.01		.02	

a p<.001, one-tailed **** p<.001, two-tailed
b p<.01, one-tailed *** p<.01, two-tailed
c p<.05, one-tailed ** p<.05, two-tailed
d p<.10, one-tailed * p<.10, two-tailed

Table 4.4: Relationship Conflict Regressed on Type of Work Shift and Background, NLSY79 Mothers in Dual-Earner Couples (N=1016).

	Unstandardized Coefficients			
	1		2	
	B	S.E.	B	S.E.
Shift arrangements				
Both work day (omitted category)	--	--	--	--
One works non-standard shift				
Evening	-0.46	0.19[b]	-0.37	0.19[c]
Night	-0.49	0.21[b]	-0.40	0.21[c]
Irregular hours/split/rotating	-0.26	0.15[c]	-0.23	0.15[d]
Irregular hours set by spouse	-0.16	0.21	-0.14	0.21
Background characteristics				
Highest education completed by couple				
High school degree or less (reference)			--	--
More than high school			0.16	0.12[d]
College degree			0.32	0.12[b]
Race and ethnicity				
Non-black, non-Hispanic (reference)			--	--
Black			-0.35	0.13[***]
Hispanic			-0.19	0.13
Intact family status through age 16			-0.04	0.11
R-squared	.01		.03	

a p<.001, one-tailed **** p<.001, two-tailed
b p<.01, one-tailed *** p<.01, two-tailed
c p<.05 one-tailed ** p<.05, two-tailed
d p<.10, one-tailed * p<.10, two-tailed

Table 4.5 Positive Interaction Regressed on Type of Nonstandard Work Schedule and Background, NLSY79 Mothers in Dual-Earner Couples (N=1016).

	1	
	B	S.E.
Relationship quality in 1994		
Relationship Conflict	.07*	.04
Positive Interaction	.03	.08
Background characteristics		
Highest education completed by couple		
High school degree or less (reference)	--	--
More than high school	-.39	.28
College degree	-.62**	.31
Race and ethnicity		
Non-black, non-Hispanic (reference)	--	--
Black	.22	.31
Hispanic	.36	.28
Intact family status through age 16	-.06	.25
Family characteristics		
Number of children	.09	.13
Age of youngest child		
Newborn (0-11 months)	-.89	.61
Preschool (1 –5 years)	-.41	.36
School-age (6-12 years)	-.56*	.33
Adolescent (13-18 years) (reference)	--	--
Married (compared to cohabiting)	-.21	.47
Number of years couple has lived together	-.03	-.03

**** p<.001, two-tailed
*** p<.01, two-tailed
** p<.05, two-tailed
* p<.10, two-tailed

Table 6.4: Added Shiftworker between 1994 and 1996, Logistic Regression on Relationship Quality in 1994 and Background and Family Characteristics, NLSY79 Mothers in Dual-Earner Relationships with the Same Partner between 1994 and 1996 (N=901)

	Conflict		Positive interaction	
	B	S.E.	B	S.E.
Relationship Quality in 1994	.60a	.03	.55a	.04
Shift arrangements				
Both work day (reference)	--	--	--	--
One spouse/partner works				
Irregular hours, decided by worker	.16	.35	-.06	.21
One works non-standard shift	.38b	.15	-.15d	.11
Background characteristics				
Highest education completed by couple				
High school degree or less (reference)	--	--		
More than high school	-.18	.20	.04	.12
College degree	-.22	.21	.16	.13
Race and ethnicity				
Non-black, non-Hispanic (reference)	--	--	--	--
Black	.26	.22	-.26c	.13
Hispanic	.26	.21	-.08	.13
Intact family status through age 16	.12	.18	-.05	.11
Family characteristics				
Number of children	.17c	.10	.01	.06
Age of youngest child				
Newborn (0-11 months)	.18	.41	.20	.25
Preschool (1 –5 years)	.58c	.29	-.11	.17
School-age (6-12 years)	.61c	.26	-.17	.16
Adolescent (13-18 years) (reference)	--	--		
Married (compared to cohabiting)	-.24	.40	.38	.24
Number of years couple has lived together	-.05c	.02	.01	.01
R-squared	.39		.25	

a p<.001, one-tailed **** p<.001, two-tailed (or F-test of change in R-squared from panel 1)
b p<.01, one-tailed *** p<.01, two-tailed (or F-test of change in R-squared from panel 1)
c p<.05, one-tailed ** p<.05, two-tailed (or F-test of change in R-squared from panel 1)
d p<.10, one-tailed * p<.10, two-tailed (or F-test of change in R-squared from panel 1)

Table 6.5: Relationship Conflict and Positive Interaction Scale in 1996 Regressed on Prior Conflict and Positive Interaction, Work Schedules, Background, and Family Characteristics, NLSY79 Mothers in Dual-Earner Couples in 1996 (N=901)

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APPENDIX A

OCCUPATIONAL TITLES OF WOMEN WORKING NON-STANDARD SHIFTS IN 1996, NLSY79 MOTHERS IN DUAL-EARNER COUPLES (UNWEIGHTED N=97)

1980 Census occupation code and title	Frequency	Percent	Cumulative Percent
Managerial and professional specialties			
8.00 Personnel and labor relations managers 123	1	1.04	1.04
19.00 Managers and administrators, n.e.c.	7	7.29	8.33
23.00 Accountants and auditors 1412	2	2.08	10.42
89.00 Health diagnosing practitioners, n.e.c. 289	1	1.04	11.46
95.00 Registered nurses 29	4	4.17	15.63
105.00 Therapists, n.e.c. pt 303	1	1.04	16.67
195.00 Editors and reporters 331	1	1.04	17.71
Technical			
203.00 Clinical laboratory technologists and technicians	1	1.04	18.75
207.00 Licensed practical nurses 366	5	5.21	23.96
208.00 Health technologists and technicians, n.e.c. 369	1	1.04	25.00
225.00 Science technicians, n.e.c. 3832, 3833, 384, 389	1	1.04	26.04
Sales			
243.00 Supervisors and proprietors, sales occupations 40	2	2.08	28.13
264.00 Sales workers, apparel pt 4146	1	1.04	29.17
274.00 Sales workers, other commodities	4	4.17	33.33
275.00 Sales counter clerks pt 4162	1	1.04	34.38
276.00 Cashiers 4683	10	10.42	44.79
Administrative support and clerical			
308.00 Computer operators 4852	1	1.04	45.83
335.00 File clerks 4696	1	1.04	46.88
337.00 Bookkeepers, accounting, and auditing clerks 4712	3	3.13	50.00
354.00 Postal clerks, exc. mail carriers 4723	3	3.13	53.13
365.00 Stock and inventory clerks 4744	1	1.04	54.17
375.00 Insurance adjusters, examiners, and investigators	1	1.04	55.21
378.00 Bill and account collectors 4786	1	1.04	56.25
379.00 General office clerks 4632	1	1.04	57.29
384.00 Proofreaders 4792	1	1.04	58.33
Service			
424.00 Correctional institution officers 5133	1	1.04	59.38
426.00 Guards and police, exc. Public service 5134	1	1.04	60.42
433.00 Supervisors; food preparation and service occupations	1	1.04	61.46

Continued

Appendix A: Occupational Titles of Women Working Non-Standard Shifts in 1996, NLSY79 Mothers in Dual-Earner Couples (Unweighted N=97)

Appendix A continued

435.00	Waiters and waitresses 5213	2	2.08	63.54
444.00	Miscellaneous food preparation occupations 5219	1	1.04	64.58
446.00	Health aides, except nursing 5233	1	1.04	65.63
447.00	Nursing aides, orderlies, and attendants 5236	8	8.33	73.96
453.00	Janitors and cleaners 5244	1	1.04	75.00
456.00	Supervisors, personal service occupations 5025	1	1.04	76.04
458.00	Hairdressers and cosmetologists 5252	3	3.13	79.17
459.00	Attendants, amusement and recreation facilities	1	1.04	80.21
467.00	Welfare service aides 5262	1	1.04	81.25
469.00	Personal service occupations, n.e.c. 5257, 5269	1	1.04	82.29
Farming, forestry and fishing				
473.00	Farmers, except horticultural 5512-5514	1	1.04	83.33
Precision production and craft repair				
683.00	Electrical and electronic equipment assemblers	1	1.04	84.38
Operators – machine, assemblers and inspectors				
744.00	Textile sewing machine operators 7655, pt 7656	1	1.04	85.42
749.00	Miscellaneous textile machine operators	1	1.04	86.46
754.00	Packaging and filling machine operators	1	1.04	87.50
769.00	Slicing and cutting machine operators 7478, 7678	1	1.04	88.54
779.00	Machine operators, not specified	1	1.04	89.58
785.00	Assemblers 772, 774	2	2.08	91.67
796.00	Production inspectors, checkers, and examiners	1	1.04	92.71
Operators – transportation and material moving				
805.00	Truck drivers, light 6414	1	1.04	93.75
808.00	Bus drivers 6415	3	3.13	96.88
877.00	Stock handlers and baggers 824	1	1.04	97.92
Operators – handlers, helpers and laborers				
889.00	Laborers, except construction 842, 846, pt 659	2	2.08	100.00
Missing		1		
Total		97		

APPENDIX B

OCCUPATIONAL TITLES OF MALE SPOUSES/PARTNERS WORKING NON-STANDARD SHIFTS IN 1996, NLSY79 MOTHERS IN DUAL-EARNER COUPLES (UNWEIGHTED N=172)

1970 Census occupation code and title	Frequency	Percent	Cumulative Percent
Professional, technical, and kindred workers			
45.00 Chemists	2	1.19	1.19
145.00 Teachers, except college and university, n.e.c.	2	1.19	2.38
151.00 Chemical technicians	1	0.60	2.98
162.00 Engineering and science technicians, n.e.c.	1	0.60	3.57
171.00 Radio operators	1	0.60	4.17
194.00 Writers, artists, and entertainers, n.e.c.	1	0.60	4.76
Managers and administrators, except farm			
212.00 Health administrators	1	0.60	5.36
215.00 Inspectors, except construction, public administration	1	0.60	5.95
230.00 Restaurant, cafeteria, and bar managers	3	1.79	7.74
231.00 Sales managers and department heads, retail trade	4	2.38	10.12
245.00 Managers and administrators, n.e.c.	11	6.55	16.67
Sales workers			
264.00 Hucksters and peddlers	1	0.60	17.26
265.00 Insurance agents, brokers, and underwriters	1	0.60	17.86
270.00 Real estate agents and brokers	1	0.60	18.45
280.00 Salesmen and sales clerks, n.e.c.	3	1.79	20.24
Clerical and kindred workers			
310.00 Cashiers	1	0.60	20.83
313.00 Collectors, bill and account	1	0.60	21.43
332.00 Mail handlers, except post office	1	0.60	22.02
343.00 Computer and peripheral equipment operators	1	0.60	22.62
361.00 Postal clerks	3	1.79	24.40
374.00 Shipping and receiving clerks	1	0.60	25.00
381.00 Stock clerks and storekeepers	1	0.60	25.60
Craftsmen and kindred workers			
410.00 Brickmasons and stonemasons	1	0.60	26.19
413.00 Cabinetmakers	1	0.60	26.79
415.00 Carpenters	1	0.60	27.38
420.00 Carpet installers	1	0.60	27.98
441.00 Foremen, n.e.c.	4	2.38	30.36
461.00 Machinists	1	0.60	30.95
471.00 Aircraft	1	0.60	31.55

Continued

Appendix B: Occupational Titles of Male Spouses/Partners Working Non-Standard Shifts in 1996, NLSY79 Mothers in Dual-Earner Couples (Unweighted N=172)

473.00	Automobile mechanics	4	2.38	33.93
481.00	Heavy equipment and diesel mechanics	4	2.38	36.31
495.00	Mechanics and repairmen, n.s.	2	1.19	37.50
522.00	Plumbers and pipe fitters	1	0.60	38.10
545.00	Stationary engineers	2	1.19	39.29
561.00	Tool and die makers	1	0.60	39.88
575.00	Craftsmen and kindred workers, n.e.c.	1	0.60	40.48
	Operatives, except transport			
602.00	Assemblers	3	1.79	42.26
610.00	Checkers, examiners, and inspectors, manufacturing	1	0.60	42.86
612.00	Cutting operatives, n.e.c.	1	0.60	43.45
615.00	Dry wall installers and lathers	1	0.60	44.05
631.00	Meat cutters and butchers, except manufacturing	1	0.60	44.64
633.00	Meat cutters and butchers, manufacturing	1	0.60	45.24
640.00	Mine operatives, n.e.c.	3	1.79	47.02
643.00	Packers and wrappers, except meat and produce	3	1.79	48.81
644.00	Painters, manufactured articles	1	0.60	49.40
651.00	Grinding machine operatives	1	0.60	50.00
656.00	Punch and stamping press operatives	1	0.60	50.60
666.00	Stationary firemen	1	0.60	51.19
672.00	Spinners, twisters, and winders	1	0.60	51.79
681.00	Winding operatives, n.e.c.	1	0.60	52.38
690.00	Miscellaneous machine operatives	4	2.38	54.76
692.00	Machine operatives, n.s.	5	2.98	57.74
694.00	Miscellaneous operatives	1	0.60	58.33
695.00	Operatives, n.s.	2	1.19	59.52
	Transport equipment operatives			
704.00	Conductors and motormen, urban rail transit	1	0.60	60.12
705.00	Deliverymen and routemen	3	1.79	61.90
706.00	Fork lift and tow motor operatives	7	4.17	66.07
715.00	Truck drivers	9	5.36	71.43
	Laborers, except farm			
751.00	Construction laborers, except carpenters' helpers	1	0.60	72.02
753.00	Freight and material handlers	3	1.79	73.81
755.00	Gardeners and groundskeepers, except farm	1	0.60	74.40
762.00	Stockhandlers	1	0.60	75.00
770.00	Warehousemen, n.e.c.	1	0.60	75.60
780.00	Miscellaneous laborers	5	2.98	78.57
785.00	Laborers, n.s.	2	1.19	79.76

Continued

Service workers, except private household			
902.00 Cleaners and charwomen	3	1.79	81.55
903.00 Janitors and sextons	6	3.57	85.12
912.00 Cooks, except private household	3	1.79	86.90
915.00 Waiters	1	0.60	87.50
925.00 Nursing aides, orderlies, and attendants	1	0.60	88.10
926.00 Practical nurses	1	0.60	88.69
944.00 Hairdressers and cosmetologists	1	0.60	89.29
961.00 Firemen, fire protection	2	1.19	90.48
962.00 Guards and watchmen	9	5.36	95.83
964.00 Policemen and detectives	7	4.17	100.00
Missing	4		
Total	172		