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Shift Work, Role Overload, and the Transition to Parenthood

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Abstract

This article examines how the work hours, work schedules, and role overload of working-class couples are related to depressive symptoms and relationship conflict across the transition to parenthood. Data are from 132 dual-earner couples interviewed 5 times across the transition. Multilevel modeling analyses revealed that working evening or night shifts, as opposed to day shifts, was related to higher levels of depressive symptoms. For mothers only, working rotating shifts predicted relationship conflict. Increases in role overload were positively related to both depression and conflict; working a nonday shift explained variance in depression and conflict above and beyond role overload. Results suggest that for new parents, working nonday shifts may be a risk factor for depressive symptoms and relationship conflict.

Keywords

conflict; depression; dual-earner; transition to parenthood; work family balance; work hours

A growing trend among parents of young children is to work alternating shifts, where partners' paid work schedules are opposite and nonoverlapping (Presser, 1989,1994,2005). It has been suggested that working alternating shifts is a strategy that enables new parents to avoid the high cost of child care and/or to maintain values regarding the importance of exclusive parental care, especially with infants (Deutsch, 1999). Research shows, however, that working nonday shifts is less often a parental choice and more often a nonnegotiable job condition (U.S. Bureau of Labor Statistics, 2000). Moreover, the potential benefits of shift work, especially for parents of young children, may be negated by its deleterious effects on parents' mental health and their close relationships (Finn, 1981;Presser, 2000;Simon, 1990).

More than 15 million, or 16.8% of all full-time wage and salary employees, work nonday and/or nonfixed shifts, that include evening shifts between 2 p.m. and midnight, night shifts, rotating shifts, and irregular shifts (Beers, 2000). Among dual-earner couples in the United States, one in four includes at least one partner who is a shift worker; this number rises to one in three if they have children (Presser, 2000). Shift work is most common among blue-collar workers in the protective and food service industries and among those employed as operators, fabricators, and laborers (Beers). Given these demographic trends, important questions arise as to how working nonday shifts affects the psychological well-being and intimate relationships of dual-earner couples, especially those with young children and employed in blue-collar occupations. Moreover, because a large literature indicates that it is not enough to look at work hours or work schedules alone to predict individual or family outcomes, we must also understand individuals' subjective experiences of these work conditions (Barling, 1990; Gareis, Barnett, & Brennan, 2003). The current study explores both the direct relationships among work hours, work schedules, and new parents' reports of depression and relationship conflict, as well as how these relationships may differ as a function of workers' perceived role overload.

Work Schedules, Marriage, and Mental Health

Questions surrounding how much and when people work have pervaded the work and family literature since its inception (Perry-Jenkins, Repetti, & Crouter, 2000). Presser (1994, 2000) contends that a shortcoming of much of this research is the implicit assumption that workers hold fixed, daytime employment schedules. Her research points to the significance of the scheduling of work hours, and the degree of overlap between partners' schedules, as holding important implications for family life.

Nonday work schedules have been associated with relationship stress and work-family conflict (Kingston & Nock, 1987; Mellor, 1986; Rubin, 1994; Simon, 1990; Staines & Pleck, 1983). Much of this research, however, is cross-sectional; thus, it is not clear whether nonday shift-work schedules lead to troubled relationships or if more negative relationships lead individuals to work opposite shifts. Using a national, random sample of married couples in 1980 and again in 1983, White and Keith (1990) examined the effects of nonday shift work on multiple indicators of relationship quality. Nonday shift schedules were shown to have a modest, but consistently negative effect on relationship quality, and significantly increased the likelihood of divorce from 7% to 11% over a 3-year period.

More recently, Presser (2000) found that nonday shift-work schedules had negative effects on relationship stability, especially for couples with children. Among men married fewer than 5 years and with at least one child, working fixed nights made separation or divorce six times more likely than working days. Mothers married *more* than 5 years and who worked fixed night shifts were three times more likely than day shifters to experience separation or divorce. Exploratory analyses did not support the alternative hypothesis that couples with troubled relationships may be more likely to select nonday shifts.

Turning to the relationship between work hours, schedules, and employees' well-being, a consistent finding in the literature indicates that employed women are less depressed than nonemployed women (Perry-Jenkins et al., 2000). Looking beyond simple work hours, however, data on work schedules indicate that working nonday or rotating shifts is associated with various psychological problems including higher levels of stress (Coffey, Skipper, & Jung, 1988), lower levels of psychological well-being (Bohle & Tilley, 1990), neurotic disorders (Costa, Lievore, Casaletti, Gaffuri, & Folkard, 1989), and increased reports of depression and anxiety (National Sleep Foundation, 2003). Thus, working nonday shifts can hold negative implications for relationships and mental health. From a theoretical perspective, however, research points to the utility of looking past hours and schedules to individuals' subjective experiences of their jobs as they shape individual and family outcomes (Barling, 1990).

Work Schedules, Role-Related Experiences, and Social-Psychological Outcomes

Many researchers have argued that to understand the effects of work on adult well-being, it is important to look beyond role occupancy, such as the worker role, to understand people's experiences in these roles (Barling, 1990; Coverman, 1989; Greenberger & O'Neil, 1993; Zedeck, Jackson, & Marca, 1983). For example, Crouter, Bumpus, Head, and McHale (2001) found that fathers' work hours, even when over 60 hours per week, were unrelated to marital quality; fathers' role overload, however, defined as feeling overwhelmed by multiple commitments and a lack of time for one's self, was significantly related to less love and more marital conflict. Similarly, when looking specifically at perceptions of shift work, Zedeck et al. found that one's acceptance and adjustment to shift work predicted better psychological well-being than the simple fact of working a nonday shift.

More recently, Gareis et al. (2003) explored how partners' assessments of "work schedule fit" were related to job-role quality, relationship-role conflict, and psychological distress. These researchers focused on the perception of "fit" between work schedules and personal and family needs. Work schedule fit was assessed by (a) the fit of one's own schedule with one's own needs and (b) the fit of one's partner's schedule with the needs of other family members. For women, better partner/family schedule fit predicted higher relationship-role quality, with a similar trend for men. In terms of crossover, there was a trend indicating that fathers who reported higher levels of partners' work schedule fit had partners reporting higher relationship-role quality. The more fathers felt that their own schedule met their own needs, the lower their partners' relationship quality. These findings highlight the interdependence of partners' work-family experiences and the importance of using the correct methodology in studying the dyad. They also point to the importance of crossover effects whereby not only one's own job, but that of one's spouse, can affect the couple relationship.

Finally, using data from the National Study of the Changing Workforce, Fenwick and Tausig (2001) explored the relationships among shift work, schedule control, and family and health outcomes. They found that, with sense of control in the model, working nonday shifts had no significant effect on outcomes such as distress, burnout, or work-home conflict.

Research suggests that one's experience of shift work or perception of fit between family work schedules is a key factor that moderates the ways in which work schedules are related to mental health or relationship quality. Because a number of studies on shift work point to stress as a critical variable related to nonstandard shifts (Hood & Milazzo, 1984; Monk, 1988), we reasoned that role overload (i.e., a feeling of having too much to do and not enough time to do it) may be a critical factor affecting the work-family interrelationship, such that once role overload is accounted for, the effects of work schedules on depressive symptoms and conflict may dissipate or disappear altogether.

Life course issues

The question of whether work hours, work schedules, and role overload are linked to individual and family outcomes in different ways at different points across the life course has received little attention. Presser (i.e., 1994,2000) highlights instances where life course issues shape the nature of work-family connections. For example, men married fewer than 5 years, who had children, and who worked fixed nights were six times more likely to separate or divorce. For women, separation or divorce was three times more likely if married more than 5 years and working the night shift (Presser, 2000). It is possible that the effects found for fathers may be related to the fact that fathers married fewer than 5 years are likely to have young children. Working nonday schedules may be especially challenging when one has young children. It may be that working a night shift and coming home to an infant demands more involvement from exhausted fathers, which leads to marital discord. Perhaps for women, working nonday shifts when children are in school is difficult because their work schedules are out of sync with their children's school day. To address these life course issues, this study focuses on a critical stage in the family life cycle, the first-time transition to parenthood.

The Transition to Parenthood

Research on the transition to parenthood indicates increased psychological strain for both women and men (Veroff, Douvan, & Kulka, 1981), although that strain is often accompanied by a general sense of life satisfaction. Some studies point to improvement in psychological and physical health from pregnancy to postnatal time points (Cutrona, 1985; Elliott, Rugg, Watson, & Brough, 1983), but others document a decline in the psychological well-being of parents, especially women, during this time (Russell, 1974). The National Institute of Mental Health (2003) estimates that 70 – 80% of women experience *postpartum blues*, feelings of sadness,

anger, or anxiety, after birth that can last a few days to a number of months. *Postpartum depression* occurs for about 10% of new mothers and includes stronger feelings of sadness and despair. New fathers can also experience depression after their baby's birth (Ballard, 1996). Thus, the study of new parents' depression is important in its own right, to highlight potential areas for intervention and prevention during this important life transition. It is also a critical area of study because parental depression has been linked to deficits in parenting styles and poor psychosocial outcomes in infants and children (Field, 2000).

The transition to parenthood literature has also consistently documented a decline in relationship quality for parents; again, this decline is greater for women than men. Although almost all of the longitudinal studies on the transition to parenthood show declines in relationship satisfaction (see Cowan & Cowan, 1992; Glenn, 1990, for reviews), the mean level of change in relationship satisfaction is not very large (Belsky & Rovine, 1990). Group averages mask the fact that for some couples, the transition is very difficult, whereas for others relationships may actually improve. Thus, even in the face of consistently documented trends that mark overall declines in relationship quality for new parents, there is variability in relationship quality during this time.

Although a large literature exists on the transition to parenthood, few researchers have studied new parents' return to paid employment early in the baby's first year of life. In one of the first studies to address this gap in the literature, Lewis and Cooper (1988) examined aspects of parents' employment across the transition to parenthood in a study of 92 dual- and single-earner couples. They concluded that this time period was not one characterized by extreme stress, although women experienced more stress than men. New parents in single-earner couples (couples in which women stopped working once the baby was born), however, reported greater declines in life satisfaction than dual-earners couples.

More recently, Klein, Hyde, Essex, and Clark (1998) examined work status, family leave, and role quality as predictors of new mothers' psychological well-being. Among their sample of homemakers, part-time, and full-time employed mothers, they found no differences on any psychological well-being outcomes 1 year postpartum. In addition, length of parental leave was unrelated to new mothers' psychological well-being; there was an interaction, however, such that women who took long leaves and reported high work salience were the most depressed. Results revealed that women whose employment status was not consistent with their employment preferences (e.g., employed but does not want to work or employed but wants to work) reported significantly higher anger and anxiety. Although these studies offer insight into the role of employment across the transition to parenthood, they did not address how the scheduling of work may be related to new parents' well-being or relationship quality.

A goal of the current investigation is to build on both the shift work literature and the research that links role behavior and role experiences to individuals' social-psychological outcomes. Using data from a sample of 132 working-class, dual-earner couples interviewed at five different time points across the transition to parenthood, we explore how couples coping with new parenthood fare in terms of depression and relationship conflict. We chose to examine depression because (a) it has been identified as a significant negative consequence of new parenthood for some parents and (b) we know little about the role of work as it relates to postnatal depression. Second, we chose to study relationship conflict because we were interested in examining a potential process to explain Presser's finding linking nonday shift work to separation and divorce. To date, the majority of research on nonday shift – work schedules has explored large samples over time and assessed the probability of separation or divorce. In the present investigation, we are interested in the ways in which work schedules, role overload, depression, and relationship conflict are interrelated over a shorter, but possibly

more acute, time span, which may begin to elucidate processes that lead to separation or divorce.

Of course, relationship conflict and depression do not occur in a vacuum, and it is likely that relationship conflict contributes to depression, and conversely, depression may increase levels of conflict. Barnett, Raudenbush, Brennan, Pleck, and Marshall (1995) found that as marital quality increased, depression and anxiety decreased for women. Thus, in the current study, when examining the relationship between shift work and depression, the effects of relationship conflict and change in conflict are included in the model. Conversely, for conflict, depression levels and change in depression are included as predictors. In addition, we build on the work of Gareis et al. (2003) by examining crossover effects, whereby one partner's work hours, depression, conflict, and shift schedule may be related to the other's report of depression and relationship conflict across the transition to parenthood.

We hypothesize that working evening, night, or rotating shifts, as opposed to day shifts, will be related to higher levels of parents' depression and relationship conflict, as well as significant increases over time in depression and conflict. In addition, we hypothesize that one's partner working a non-day shift will also predict higher depression and conflict for the other partner, as well as increases in depression and conflict over time. Finally, we predict that parents' reports of role overload, when added as time-varying covariates to the models, will predict higher levels and increases in depression and conflict, and will attenuate the relationship between shift work and depression and conflict. Multilevel modeling techniques are employed that allow us to analyze data at the level of the dyad, while exploring how work schedules are related to levels of and change in depression and relationship conflict.

Method

Sample

Data for this project come from an ongoing study of 132 working-class couples who were interviewed five times across the transition to parenthood. Data were obtained in face-to-face interviews with dual-earner couples experiencing the transition to parenthood for the first time. Heterosexual couples in their third trimester of pregnancy were recruited from various prenatal classes at hospitals in Western New England. Criteria for eligibility included the following: (a) both members of the couple were employed full time (32+ hours per week) prior to the baby's birth, (b) both members of the couple planned to return to full-time work within 6 months of the baby's birth, (c) both members of the couple were "working class" (defined by restricting educational level to an associate's degree and work in a unskilled or semiskilled job), (d) both members of the couple were expecting their first child, and (e) the couple was either married or cohabiting (for at least 1 year) at the time of inclusion in the study.

Data from the hospitals and clinics indicated that 75% – 85% of first-time parents attended prenatal classes. Of the 15% – 25% of parents not attending classes, close to 80% of that group were single mothers and did not fit the criteria for inclusion in the study. Thus, we had access to a fairly representative sample of first-time, working-class, new parents. Trained graduate students were given 5 minutes at the beginning of prenatal classes to describe the study to expectant parents and address any questions they might have. At that time, all parents filled out a short demographic form with basic information on age, relationship status, income, type of job, work hours, and intent to return to work after the baby's birth. On a second sheet, respondents indicated if they were willing to be contacted to learn details about the project and, if so, they provided us with contact information. Interested families were contacted and scheduled for an interview; all families received \$150 for their participation in all five interviews. In comparing our sample of first-time parents to the broader population of first-time parents in the prenatal classes, the present sample, as expected given the selection criteria,

was less educated, had lower family income and worked more hours than the full sample of new parents attending prenatal classes.

The key outcome variables of interest were depression and relationship conflict. Both depression and relationship conflict were measured for each partner individually across five assessment occasions: (a) during the couples' third trimester of pregnancy (Time 1), (b) 1 month after the baby's birth (Time 2), (c) 1 month after mothers returned to full-time employment (15 weeks postpartum, on average, Time 3), (d) a mail survey conducted when the baby was 6 months (Time 4), and (e) a final face-to-face interview when the baby was 1 year old (Time 5). The timing of the third interview is based upon mothers' return to work, thus there is variability in this assessment occasion. Mothers were called by interviewers about a month before they reported they would return to work to keep track of the timing of the transition. Once mothers were back at work for approximately 1 month, we scheduled the Time 3 interview. Multilevel models can account for this within-person variability in the time series. In the majority of cases, mothers returned to full-time work before 6 months because that was a criterion for inclusion in the study. In cases when mothers returned to only part-time work or did not plan to return at all, they still completed a Time 3 interview. If the mother knew she was not going back to work at all, we conducted the interview at 14 weeks, the mean of the other Time 3 interviews. If she was going back part time only, we conducted the interview after she was back at work for 1 month. If she was unsure of her plans, we stayed in contact and conducted the interview by the fifth month, no matter what her work status. At each phase, interviews were conducted separately with both partners in their homes and were between 2 and 3 hours long. To ensure privacy, parents were interviewed in different rooms out of hearing distance from each other. Respondents provided detailed information about work schedules and demographic characteristics and completed a series of standardized questionnaires that assessed role overload, depression, and relationship conflict. Over the course of the first year, we lost eight families from the project, an attrition rate of approximately 5%. These families did not differ on any of key demographic variables such as work hours, income, marital status, or age from those families who remained in the study. They did, however, report significantly higher marital conflict at their Time 1 interview. Of the eight families we lost, four were either separated or divorced by Time 5. The age of participants ranged from 19 to 41 years. Men's age at the time of their partner's pregnancy was 29.1 ($M = 28.7$), and women's average age was 27.8 ($M = 27.5$). Nearly, 80% (79.7) of the couples were married, and the average length of relationship was 3.3 years. Cohabiting couples had lived together an average of 2.1 years. A high percentage of those who participated were White (92.2% of women, 90.6% of men) with only 1.5% representing African Americans, 1% Latino women, 3% Latino men, and 5% not reporting race or ethnicity.

The highest degree held by 16% of women and 22.5% of men was a high school diploma or GED; a majority of the sample (44.8% of women, 63.4% of men) had some type of additional schooling or vocational training after high school (e.g., beautician's school, refrigeration mechanic training). Only 31% of women and 14.1% of men, however, held a 1- or 2-year associate's degree. None of the parents had a college degree.

Individually reported income ranged from \$7,000 to \$54,000 annually for men and from \$6,000 to \$60,000 for women. Median salaries were \$27,000 and \$22,000 for men and women, respectively, and the median family income was \$47,000. In most cases, the loss of one partner's income would move many of the families close to or below the poverty line in this part of the country. The most common types of jobs held by men were factory workers, truck drivers, and food service workers. Women were employed most often as food service workers, factory workers, and beauticians. All partners were employed full time at Time 1; men worked an average of 47 hours per week and women averaged 40 hours per week.

Measures

Work hours and schedules—During in-home interviews, both partners provided detailed information on work schedule and hours. A schedule for a typical workweek was established for each partner; in cases where the individual worked rotating shifts, participants described a typical month. For the purposes of this study, a work shift variable was calculated for each partner on the basis of Presser's (1994, p. 354) operationalization of shift work for full-time workers:

Fixed day shift: At least half the hours worked during the reference week fall between 8 a.m. and 4 p.m.

Fixed evening shift: At least half the hours worked during the reference week fall between 4 p.m. and midnight.

Fixed night shift: At least half the hours worked during the reference week fall between midnight and 8 a.m.

Rotating shift: Work hours change periodically (e.g., from daytime to evening or night).

Given the small number of parents who worked fixed night shifts ($n = 2$ for mothers and $n = 4$ for fathers) yielding a subgroup too small for analytical purposes, we included the night shifters in the fixed evening group. We ran all the analyses twice with the night shifters included and excluded from the sample; their inclusion did not change the results. We kept rotating shift as a separate category because there is some research, suggesting that constant change in work schedules is more challenging, both physically and psychologically, than fixed schedules (Fenwick & Tausig, 2001). According to Presser (2000), couples married fewer than 5 years (the majority of couples in this sample) in which one partner worked fixed evening, fixed night, or rotating shifts had higher rates of separation or divorce than fixed day – shift workers. Thus, we reasoned that combining the evening and night shift workers, although perhaps masking some results, could still offer insights into advantages and disadvantages of working fixed day shifts versus fixed evening/night shifts or rotating shifts. Consequently, each parent was coded as either (a) a fixed day – shift worker ($n = 112$ mothers; $n = 106$ fathers), (b) an evening/night shift worker ($n = 20$ mothers; $n = 24$ fathers), or (c) a rotating shift worker ($n = 21$ mothers; $n = 23$ fathers). Because we focus on dual-earner families, 13 families were deleted from the analyses because mothers were unemployed at Time 3 or worked fewer than 20 hours per week. These 13 families combined with the 8 families who dropped from the study left 132 couples for analyses. Although the majority of mothers returned to work full time (75% working 32 hours or more per week), there was a range in work hours, from 20 to 60. It is logical to assume that work hours may affect the outcomes variables as much as, if not more than, the type of shift one works. Thus, it is important to examine the effects of shift work controlling for hours of work.

In the majority of families, when one partner worked an evening/night or rotating shift, the other partner worked days. In 13 families, however, both parents worked nonday shifts. In five families, both parents worked rotating shifts, but rotated on different schedules; in another five families, one partner worked a fixed night or evening shift, whereas the other rotated, and three couples included parents who both worked a fixed evening or night shift. Thus, in all cases, the couples worked *off schedule* from each other but neither worked a day shift.

Work schedules and hours are rarely a stable phenomenon. We reasoned that some couples in this sample may have chosen to move to an alternating shift schedule after their child was born as one way to manage child care. We examined work hours and schedule information for all partners at the Time 1 prenatal interview and again at Time 3, which occurred 1 month after both parents had returned to work. Surprisingly, only seven (5%) couples changed work shift schedules over this time period, making it impossible to examine differences between couples

who consistently held alternating shift schedules versus those who changed schedules as a childcare strategy. Thus, construction of the shift work variables were based on shifts at Time 1 except in the case of the seven couples who changed shifts; in their cases, we used the shift codes from Time 3.

Family income—Women and men reported their individual gross annual incomes independently during the first interview. Individual incomes were summed to create a total family income variable.

Relationship status—A dummy variable indicating whether a couple was married or cohabiting at the time of the birth was created (0 = *married*, 1 = *cohabiting*).

Depressive symptoms—Depressive symptoms were assessed using a 20-item scale devised by the Center for Epidemiological Studies Depression Scale (CES-D) of the National Institute of Mental Health (Radloff, 1977). Participants were asked to consider the previous 7 days and to indicate how often they experienced different moods and thoughts. Using a 4-point scale ranging from 0 (*rarely or none of the time—less than once a day*) to 3 (*most or all of the time—5 – 7 days*), respondents estimated the frequency of feelings corresponding to statements such as “I was happy” and “I felt that people disliked me.” Scale reliability alpha for the 20 items ranged from .84 to .87 for women and men across all time points. Descriptive analyses on the CES-D revealed a skewed distribution indicating that more respondents reported fewer depressive symptoms. A square root transformation was conducted on the CES-D, resulting in a fairly normal, far less skewed, distribution. This transformed variable was used in all analyses. The clinical cutoff for depression on the CES-D is a summed score of 16. Across time points 1 through 5, the percent of fathers at or above the clinical cutoff for depressive symptoms was 15% at Time 1, 13% at Time 2, 13% at Time 3, 16% at Time 4, and 12% at Time 5. For mothers, the percent above the clinical cutoff for depressive symptoms across phase was much higher 44% at Time 1, 27% at Time 2, 32% at Time 3, 30% at Time 4, and 27% at Time 5.

Because depressive symptoms were assessed across five time points, we fit trajectories to each individual’s longitudinal depression data. Each trajectory was characterized by three parameters: a level component, a slope component (linear rate of change), and a rate of change component that measures curvature in the slope (quadratic). In terms of measuring levels, we centered the depressive symptoms trajectory at Time 4 (when the baby is 6 months old) by subtracting the Time 4 value of months, resulting in an intercept model that represents levels when the baby is 6 months old. The decision to center the data at Time 4 was based on a methodological concern. Because we are examining the trajectory of symptoms across five time points, a collinearity problem can arise if one centers the data at the final time point (1 year after the baby’s birth) because often the slope of the trajectory is highly correlated with the end point. Thus, we chose the second-to-last time point to avoid this issue.

Relationship conflict—Relationship conflict was assessed using a subscale from the Personal Relationships Scale (Braiker & Kelley, 1979). This subscale assesses how often partners argue and/or have negative interactions. Using a 9-point scale ranging from 1 (*not at all/never*) to 9 (*very much/very often*), parents reported on conflict using a 5-item subscale. Sample items include “How often do you and your partner argue with each other?” and “How often do you feel angry or resentful of your partner?” Cronbach’s α on this subscale ranged from .65 to .84 across times and partners. Similar to depressive symptoms, relationship conflict was measured across the five time points. In our longitudinal trajectory models, we centered relationship conflict at Time 4. Thus, our models predict levels of conflict when the baby is 6 months old as well as linear and quadratic rates of change from Time 1 to Time 5.

Role overload—All participants completed Reilly’s (1982) 13-item measure of role overload at all five time points. This measure was designed to assess how overwhelmed individuals feel by their responsibilities and lack of time for themselves. Respondents were asked to think about the past 2 months as they decided to what extent they agreed with each item on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Items include statements such as “There are too many demands on my time” and “I seem to have more commitments to overcome than some of the other people I know.” The alpha coefficient for this scale ranged between .88 and .92 for women and men across the five time points. Role overload was included as a time-varying covariate in the model and was centered at Time 4 consistent with our centering of depressive symptoms and relationship conflict.

Results

Table 1 provides means and standard deviations for depressive symptoms, relationship conflict, and role overload scores for mothers and fathers across the five time points. Mothers report significantly higher depressive symptoms, conflict, and role overload across all five time points. Intercorrelations of fathers’ and mothers’ reports on depressive symptoms were modestly related, ranging from .06 to .21 across the five time points; reports of role overload were unrelated at all time points. Intercorrelations of parents’ conflict scores were significant across all five time points, ranging from .36 to .46. A complete table of all intercorrelations is available upon request. Analysis of variance analyses revealed no mean differences in role overload by shift work group, although overload was slightly higher for rotating and evening/night workers (fathers: $M = 3.3$ rotating, $M = 3.3$ evening/night, $M = 3.1$ days; mothers: $M = 3.8$ rotating, $M = 4.0$ evening/night, $M = 3.6$ days).

Analytic Strategy

We used multilevel linear modeling (MLM; Raudenbush & Bryk, 2002) to fit the models and test our hypotheses. MLM provides a robust method for modeling individual change over time, in this case, changes in depressive symptoms and relationship conflict across the transition to parenthood. MLM also allows individual outcomes to be linked to partner’s outcomes, thus accommodating the dependent nature of couple data (Sayer & Klute, 2005).

With five time points, linear and quadratic rates of change in depressive symptoms and conflict were examined for each parent. As a first step, the unconditional model (i.e., no predictors at level 2) examined whether there was significant variability in levels of depressive symptoms and conflict as well as a significant degree of average change in slope and curvature of the trajectory in depression and relationship conflict over time. We then tested to see if there was a significant level of variability across the estimates of change for individual partners. If the unconditional model revealed variability in both levels and rates of change in depressive symptoms and relationship conflict, we moved on to a predictor model where parents’ Time 4 levels on the outcome variables as well as change parameters became the dependent variables.

We fit six different predictor models: three models for depressive symptoms and three for conflict. To examine predictors of depressive symptoms, in Step 1 respondent’s age, work hours, marital status, as well as partner’s work hours were entered. In addition, to account for the association between relationship conflict and depressive symptoms, we included variables capturing respondents’ and partners’ reports of conflict in the Step 1 model. We devised a strategy in which we generated predicted values or estimates of conflict trajectories for each individual. We then included these estimates as predictors in the models. To obtain estimates of these reports of conflict, an unconditional linear change model with conflict as the dependent variable was fit. This model generated estimates of the coefficients for both respondents’ and partners’ levels and slopes in conflict. When examining the relationships between these estimates, mothers’ and fathers’ reports were very highly correlated for both levels of conflict

($r = .68, p < .001$) and rates of change in conflict ($r = .86, p < .001$). Thus, in the models predicting depressive symptoms, only respondents' reports and not partners' reports of relationship conflict were used.

After the key control variables were in the model, both parents' shift schedules were entered as predictors in Step 2. The shift variable was dummy coded such that three dummies were created representing day shift, evening/night shift, and rotating shift. The day shift dummy was omitted from the model and thus became the reference variable to which the others were compared. Model comparison tests were conducted to examine whether couples' shift schedules made a significant improvement in fit over the model with control variables.

Finally in Step 3, both parents' reports of role overload were added as time-varying covariates to the model. Again, model comparison tests were conducted to see if adding overload to the model significantly improved the fit of the overall model.

These same analyses were repeated using conflict as the outcome variable. We followed the same strategy as above to generate estimates of depressive symptoms for both mothers and fathers. Parents' reports of depressive symptoms were only modestly related ($r = .36, p < .01$ for level; $r = .28, p < .01$ for slope); thus, both respondents' and partners' estimates were used as predictors in the Level 2 model predicting conflict. The following report of findings is organized by first examining the models for depressive symptoms and then relationship conflict.

Level 1 Results

Depressive symptoms—We fit an unconditional model for depressive symptoms (with no Level 2 predictors) to determine if there was a substantial amount of variance in the CES-D scores trajectories across respondents, thus warranting an analysis of predictors of change. Analyses revealed that, on average, Time 4 depressive symptoms were significantly different from zero for both women and men ($\beta = 712, p < .001$; $\beta = 614, p < .001$, respectively). On average, there was also a significant negative, linear change in mothers' depressive symptoms (mothers $\beta = -.007, p < .01$) indicating a decline in depressive symptoms over time. On average, there was no significant change in fathers' depressive symptoms over time. There was also a significant quadratic change for mothers ($\beta = .001, p < .001$), highlighting positive curvature in the trajectory with an initial decrease in depressive symptoms followed by a slight increase. There was no significant curvature in the model for fathers.

In addition, results of the final estimation of variance components indicated that, for both fathers and mothers, there was significant variability in levels of depressive symptoms ($\chi^2 = 434.609, p < .001$ for fathers; $\chi^2 = 534.327, p < .001$ for mothers). Moreover, there was significant variability in slope for mothers ($\chi^2 = 155.119, p < .05$ linear) but no variability in curvature. Thus, for mothers, we included predictors for level and slope. For fathers, only level of depressive symptoms at Time 4 was predicted because there was no variability around the slope or curvature to be explained.

Relationship conflict—With regard to relationship conflict, analyses revealed that average levels of mothers' and fathers' conflict were significantly different from 0 ($\beta = 3.99, p < .001$; $\beta = 3.40, p < .001$, respectively). There was also a positive increase in change at Time 4 for mothers ($\beta = .029, p < .001$) and fathers ($\beta = .020, p < .01$), indicating that reports of relationship conflict increased for both partners. Finally, there was a significant negative quadratic term for the curvature for mothers ($\beta = -.003, p < .05$), indicating an increase and then slight decrease in conflict over time.

Results of the final estimation of variance components indicated that, for mothers and fathers, there was significant variability around the average levels of conflict ($\chi^2 = 652.069, p < .001$ for fathers; $\chi^2 = 742.529, p < .001$ for mothers). For mothers only, there was significant variability around the average slope for conflict ($\chi^2 = 164.271, p < .05$), indicating that for some women, conflict increased or remained stable and for others conflict declined. There was also significant variability around the curvature in the trajectory for mothers as well ($\chi^2 = 159.268, p < .05$). Thus, in the predictor models for conflict, only variability in fathers' levels of conflict was examined, whereas for mothers, variability in level, slope, and curvature were examined.

Results: Predictor Models at Level 2

In the next step, we moved to predicting variability in both levels of depressive symptoms and conflict as well as variability in rates of change in these constructs. The predictor variables in Step 1 of the model included demographic variables (i.e., age, relationship status, work hours) as well as levels and slope of depressive symptoms in conflict models and level and slope of conflict in depressive symptoms models. Family income was dropped from all models because it was highly collinear with work hours. Given the focus in the current investigation on work schedules, we kept total hours worked in the model because working 32 hours versus 60 hours could hold important implications for conflict and depressive symptoms irrespective of work schedule. The restricted range in income for this working-class sample may have limited its effect on the outcomes. Tables 2 and 3 indicate all variables that were tested in the models, but coefficients are only presented for variables that had significant fixed effects in the final trimmed model.

Depressive symptoms—Table 2 reveals that the more mothers work, the fewer depressive symptoms they report; fathers' higher work hours are related to declines in mothers' depressive symptoms. Both fathers' and mothers' reports of conflict predicted their own levels of depressive symptoms. For mothers only, increases in conflict were related to increases in depressive symptoms.

Above and beyond controls, shift variables added significantly to the model predicting depressive symptoms. The model comparison test indicated that work schedules significantly improved the fit of the model ($\chi^2 = 3.70, p < .05$). For fathers and mothers, working evening/night shifts predicted higher levels of depressive symptoms at 6 months postpartum compared to parents on day shifts. Shift schedule, however, was unrelated to rate of change in mothers' depressive symptoms. Mothers' and fathers' rotating shifts were unrelated to depressive symptoms, and there were no significant crossover effects from one partners' work schedule to the others' depressive symptoms. As shown in Figure 1, for all mothers, depressive symptoms declined but then increased slightly, remaining highest for those on evening/night shifts, followed by those on rotating shifts, and then day shifts.

Finally, in Step 3, both parents' reports of role overload were included as time-varying covariates in the models and again model comparison tests were conducted. As hypothesized, role overload significantly improved the model ($\chi^2 = 121.536, p < .001$) such that, as mothers and fathers overload increased, so to did their depressive symptoms ($\beta = .125, p < .001$ for fathers; $\beta = .106, p < .001$ for mothers). There were no crossover effects. Even when controlling for the effects of role overload, working evening/night shift schedules still significantly predicted depressive symptoms at 6 months postpartum for both mothers and fathers. Role overload does not appear to mediate the effects of shift on depressive symptoms. Beta coefficients for fathers with only shift in the model was .056 and with overload in the model was .053; for wives, the beta changed from .132 to .123 indicating that overload did not reduce the effects of shift work.

Relationship conflict—Findings for relationship conflict are presented in Table 3. For all parents, higher levels of depressive symptoms predicted more conflict. For mothers only, increases in their depressive symptoms predicted lower overall levels of conflict *but* increases in conflict over time as well.

Once again, analyses revealed that above and beyond the controls in the model, work schedules added significantly to the model predicting conflict. The model comparison test indicated that work schedules significantly improved the fit of the model ($\chi^2 = 8.75, p < .05$). As shown in Figure 2, mothers working rotating shifts had higher levels of conflict ($\beta = .655, p < .05$) compared to mothers on day shifts. In addition, there was a small effect such that mothers who worked rotating shifts had slightly flatter declines in conflict over time compared to the slightly sharper decline in conflict for mothers who worked day shift ($\beta = -.007, p < .05$).

In Step 3, both partners' reports of role overload were included as time-varying covariates and model comparison tests were conducted. Role overload significantly improved the model ($\chi^2 = 15.67, p < .01$); as parents overload increased so did reports of conflict (mothers: $\beta = .175, p < .05$; fathers: $\beta = .250, p < .01$). In terms of crossover, a trend emerged whereby fathers' role overload predicted mothers' conflict. Even with role overload in the model, the effect of working a rotating shift for mothers remained significant. Again, role overload did not mediate the effects of shift on conflict for mothers. The beta coefficient with only shift in the model was .58; when overload was added, the beta increased only slightly to .65.

Discussion

The goal of this study was to explore the connections between new parents' shift work schedules and their depressive symptoms and relationship conflict across the first year of parenthood, using a unique sample of dual-earner, working-class couples. We were interested in the potentially positive and negative effects of working non-day shifts on new parents' depressive symptoms and relationship conflict, and also, the effects of role overload on the hypothesized linkages between work schedules and the outcomes.

Before addressing the research questions, results from the baseline models in MLM provide a good description of how mothers' and fathers' depressive symptoms and relationship conflict changed across the transition to parenthood. For mothers, on average, depressive symptoms decreased after the baby's birth but increased slowly as the year progressed. For fathers, there was no significant linear or quadratic change in depressive symptoms, meaning that, on average, their depressive symptoms did not change over time. In terms of variability in depressive symptoms, there were significant differences in levels of depressive symptoms at 6 months postpartum for both mothers and fathers. For mothers, there was also significant variability in the depressive symptoms trajectories, suggesting that change in depressive symptoms varied considerably across mothers. For fathers, no such variability was present. The result for mothers that points to a U-shaped curve in the trajectory for depressive symptoms may explain the discrepant findings in the literature related to new mothers' mental health whereby some researchers have found declines and others improvements in well-being (Cutrona, 1985; Elliott et al., 1983; Russell, 1974). If we had conducted cross-sectional analyses with our data, depending upon what time point we used to assess depressive symptoms in the first year, either of the above findings could have emerged. These results highlight the importance of longitudinal data in assessing change.

In terms of relationship conflict, both mothers and fathers reported significant increases in conflict across the first year, a finding consistent with past research (Cowan & Cowan, 1992; Glen, 1990). For mothers only, relationship conflict began to level out near the end of the first year. There was significant variability around the slope and curvature in conflict for mothers,

indicating that whereas, on average, conflict increased and then leveled off, some women experienced decreases in conflict, some increases, and some increases followed by recovery. For men, there was little variability in conflict trajectories; all reported similar increases over time. Once we determined that there was variability in levels of depressive symptoms and conflict for all parents and variability in change over time in depressive symptoms and conflict for mothers, our primary goal was to examine whether shift work schedules could explain any of this variability.

The first hypothesis predicted that working a non-day shift schedule would be related to higher levels of depressive symptoms for parents, above and beyond the effects of demographic variables and relationship conflict. This hypothesis was partially supported. After controlling for demographic variables (i.e., age, work hours, marital status, partners' work hours) and conflict, working evening or night shifts, but not rotating shifts, predicted higher levels of depressive symptoms at 6 months postpartum for both fathers and mothers as compared to those working day shifts. Mothers' and fathers' depressive symptoms, however, were not related to the shifts their partners worked. In addition, parents' reports of level of relationship conflict at 6 months postpartum were significant predictors of depressive symptoms such that the more conflict the more depressive symptoms. This result is not surprising and is consistent with previous research linking marital quality to spouses' psychological distress. It is compelling that model comparison tests revealed that parents' shift work schedules added significantly to the model even after controlling for the significant effects of conflict on depressive symptoms.

It was also hypothesized that perceptions of role overload would be related to more depressive symptoms and that this relationship would attenuate the links between shift work and depressive symptoms. Although one's own role overload significantly predicted higher depressive symptoms, there was no evidence to suggest that role overload mediates the effects of shift work on depressive symptoms.

Turning to relationship conflict, it was hypothesized that working non-day shifts would predict higher levels of conflict and greater increases in conflict over time. Again, there was only partial support for this hypothesis. After controlling for demographic variables (i.e., age, work hours, marital status, partner's work hours) and respondent's and partner's depressive symptoms, mothers working rotating shifts reported higher levels of conflict 6 months postpartum. No such relationship emerged for fathers. Moreover, working evening or night shifts was unrelated to relationship conflict for mothers or fathers. Past research suggests that rotating shifts are particularly stressful because it is difficult to establish regular patterns in family life, whereas working fixed night or evening shifts may require less negotiation and conflict, on a regular basis. Although role overload was also a significant predictor of conflict for parents, it did not attenuate the effects of working a rotating shift on conflict for mothers.

We were less successful in identifying significant predictors of change in mothers' depressive symptoms or relationship conflict with our current models. In terms of depressive symptoms, fathers' work hours and increases in mothers' conflict predicted increases in depressive symptoms across the first year. Shift work, however, was unrelated to change in depressive symptoms. In the case of conflict, increases in mothers' depressive symptoms predicted increases in conflict as well as steeper increases once she was back at work. Interestingly, mothers' actual level of depressive symptoms predicted less steep rises in conflict, suggesting that more depressed mothers are less likely to engage in conflict with their partner. Perhaps, the effects of shift work had set in even prior to the baby's birth; thus, we saw no significant effect of shift on increases or decreases in depressive symptoms or conflict.

A number of caveats are in order. First, our sample of nonday workers is small and studies are needed with larger subsamples of various types of shift workers. We explored the unique effects of working day, evening and night, or rotating shifts to determine if different shifts held different consequences for workers and their relationships. This approach, however, limited the power of our analyses because of the small size of the subgroups. It is reassuring that when we conducted analyses comparing day shift workers to a combined group of shift workers (evening, night, and rotating), the results were stronger. When shift schedules are teased apart, however, a more complex pattern of relationships emerges.

This study focuses on a primarily White, working-class, dual-earner sample, limiting our generalizability. Although, we made an intensive effort to increase our enrollment of racial/ethnic minority families, a flaw in the original study design served to eliminate many minority families. The study was designed around a life course pattern that included finishing school, getting a job, getting married, and having children, in that order. The ethnocentric bias in these assumptions (i.e., White, middle class) led to the exclusion of many African American families because demographic data indicate that the majority of African American women experience the transition to first-time parenthood as single mothers. To correct this shortcoming, a new study is underway that explores the transition to parenthood and transition back to paid employment for Black, Puerto Rican, and White single mother and two-parent families.

Finally, our measure of overload does not directly tap parents' feelings about shift work. It would be useful to have data on why parents work shifts, their job preferences, and how much control they have over their schedules. Unfortunately, our measure of overload is too global to tap into what aspects of shift work may be affecting role overload.

The current research indicates that working nonday shifts may hold some negative implications for depressive symptoms and relationship conflict for dual-earner couples. Working evening and night shifts predicted both mothers and fathers levels of depressive symptoms, whereas mothers' rotating shift increased conflict. Contrary to our hypotheses, role overload did not mediate the effects of shift work on the outcomes and, in fact, there were no significant differences in overload across work shift group. Thus, we are left to wonder what aspects of shift work are related to depressive symptoms and conflict if it is not feeling stressed and overloaded.

Future research should explore how life changes when couples have nonstandard and/or alternating work schedules. Do they have less time together? Do they share fewer meals and leisure activities? Do they have a less active social life and weaker social ties? What aspects of family life differ in shift work families, especially when mothers work nonday shifts, which may affect depression and conflict? It would also be interesting to explore change that occurs for couples past the first year and as more children are born. Finally, there is likely to be great variability in how couples cope with shift work schedules and family life, and we would benefit from studies that elucidate under what conditions shift work has drawbacks and benefits.

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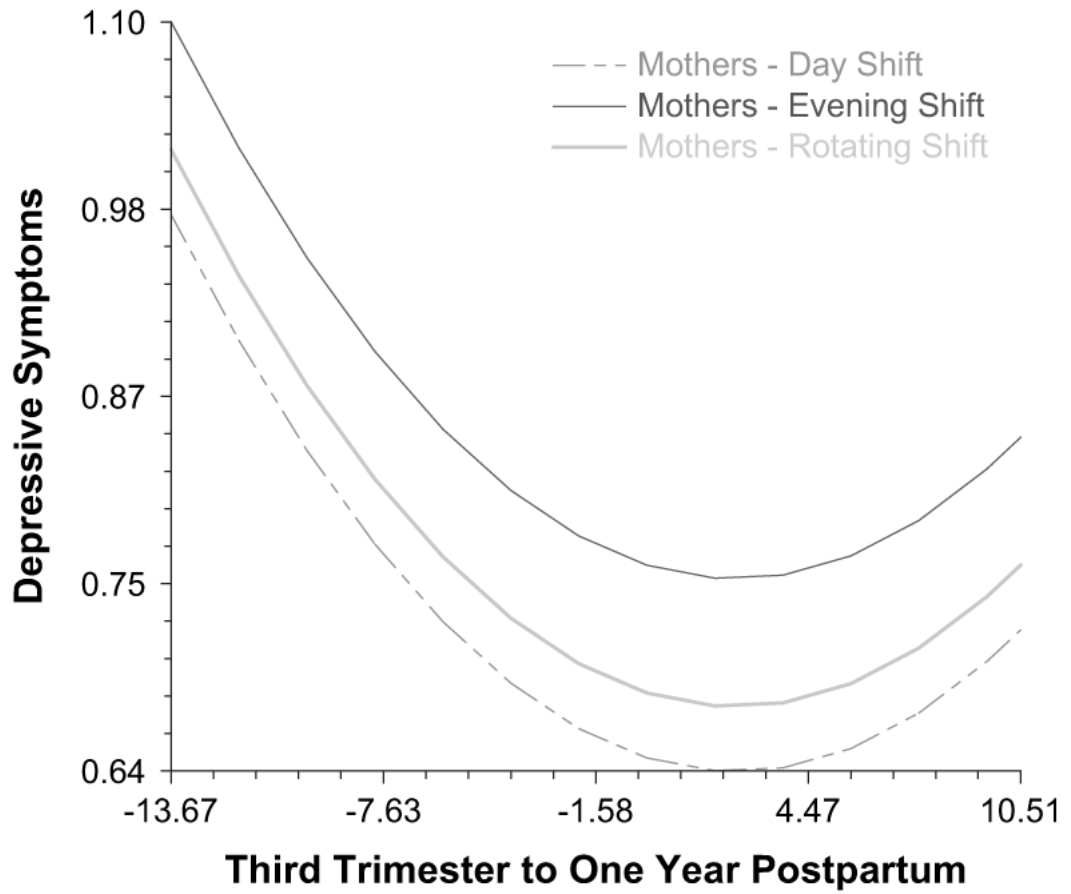


Figure 1.
Main Effects of Mothers' Shift Schedule on Depressive Symptoms With Controls in Model.

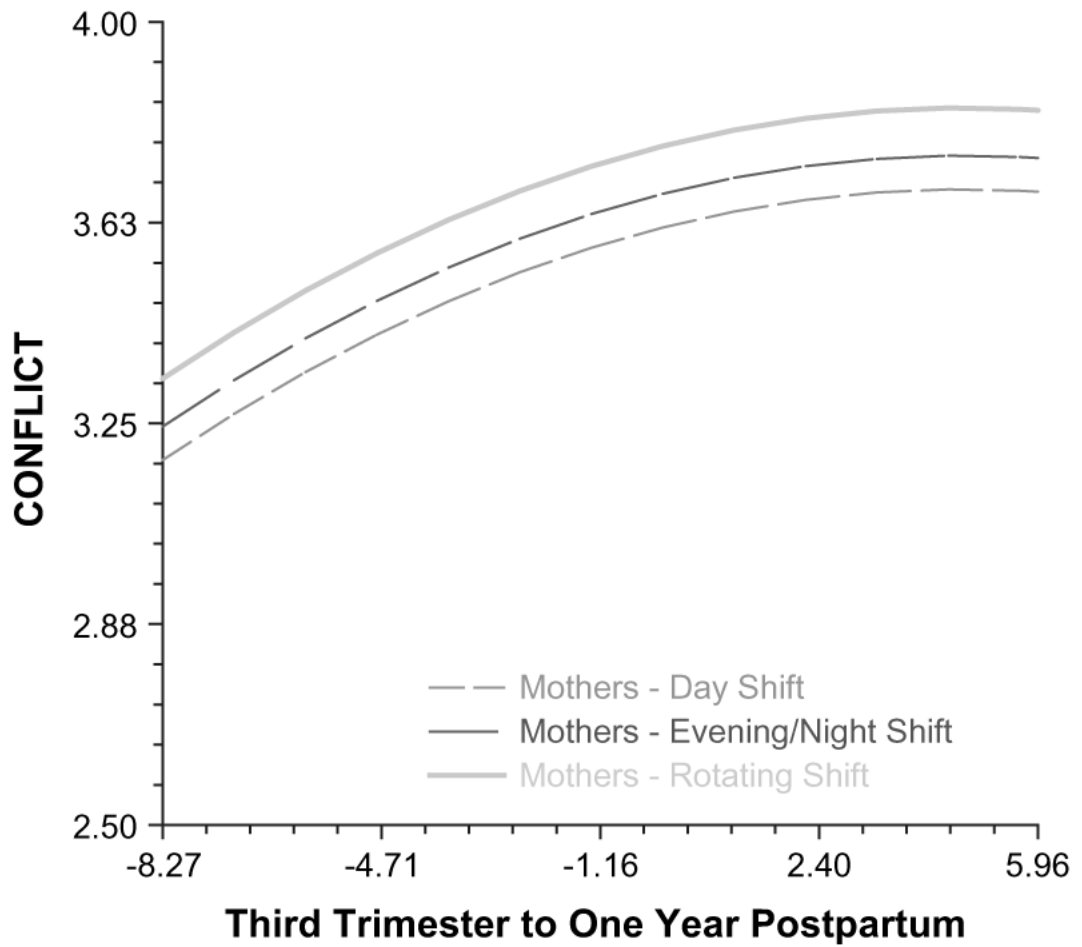


Figure 2. Main Effects of Mothers' Shift Schedule on Relationship Conflict (Quadratic Term) With Controls in Model.

Table 1
Descriptive Statistics for Mothers' and Fathers' Depressive Symptoms, Relationship Conflict, and Role Overload

Variable	Mothers ^a					Fathers				
	M	SD	Minimum	Maximum	N	M	SD	Minimum	Maximum	N
Depressive symptoms T1 ^b	16.01	9.06	2	45	45	8.61	6.39	0	35	35
Depressive symptoms T2	12.23	8.22	0	51	51	8.88	6.45	0	38	38
Depressive symptoms T3	12.30	9.42	0	43	43	8.48	6.74	0	34	34
Depressive symptoms T4	12.57	9.29	0	44	44	8.70	7.72	0	49	49
Depressive symptoms T5	12.01	9.27	0	45	45	7.87	6.04	0	32	32
Conflict T1	3.62	1.13	1.00	6.80	6.80	3.33	1.08	1.20	6.20	6.20
Conflict T2	3.72	1.32	1.00	8.20	8.20	3.06	1.15	1.00	6.60	6.60
Conflict T3	3.82	1.42	1.00	8.60	8.60	3.37	1.35	1.00	7.60	7.60
Conflict T4	4.03	1.41	1.00	8.60	8.60	3.45	1.38	1.00	7.80	7.80
Conflict T5	3.97	1.34	1.00	7.40	7.40	3.44	1.32	1.00	6.80	6.80
Overload T1	3.24	.81	1.00	4.85	4.85	3.07	.74	1.00	4.92	4.92
Overload T2	3.31	.84	1.00	4.85	4.85	3.01	.70	1.00	4.85	4.85
Overload T3	3.65	.81	1.00	5.00	5.00	3.11	.70	1.00	4.85	4.85
Overload T4	3.40	.88	1.00	5.00	5.00	2.95	.79	1.00	4.92	4.92
Overload T5	3.41	.82	1.00	5.00	5.00	3.02	.76	1.00	5.00	5.00

^a N ranges between 127 and 132 for parents because of missing data at different time points.

^b Depressive symptoms scores are the mean of the summed score on Center for Epidemiological Studies Depression Scale; conflict and overload means are based on average score for respondents so as to be able to compare means to past studies.

Table 2

Final Summary Table: Unstandardized Coefficients for Respondent and Cross-Partner Links Between Control Variables, Conflict, and Level and Rate of Change in Depressive Symptoms for Fathers and Mothers (N = 132 Couples)

Predictors	Level of Depressive Symptoms			Rate of Change in Depressive Symptoms		
	Father Coefficient	Mother Coefficient		Father Coefficient	Mother Coefficient	
Step 1: controls						
Intraspouse work hours	ns	-.005*		-	ns	
Cross-spouse work hours	ns	ns		-	-.001*	
Marital status	ns	ns			ns	
Respondent age	ns	ns			ns	
Marital conflict						
Intraspouse level	.051***	.100***		-	-	
Intraspouse slope	ns	ns		-	.277**	
Step 2: work schedules ^a						
Intraspouse evening/night	.053*	.123**		-	ns	
Intraspouse rotating	ns	ns		-	ns	
Cross-spouse evening/night	ns	ns		-	ns	
Cross-spouse rotating	ns	ns		-	ns	
Step 3: role overload						
Intraspouse overload	.125***	.106***				
Cross-spouse overload	ns	ns				

Note: Table indicates all variables tested; coefficients presented for significant predictors in final, trimmed model. ns = nonsignificant.

^a Shift variables dummy coded. Evening/night and rotating shifts compared to day shift.

† $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3
 Final Summary Table: Unstandardized Coefficients for Respondent and Cross-Partner Links Between Control Variables, Depressive Symptoms, and Level, Rate of Change, and Curvature in Conflict for Fathers and Mothers (N = 132) Couples

Predictors	Level of Conflict		Rate of Change in Conflict		Curvature in Conflict	
	Father Coefficient	Mother Coefficient	Father Coefficient	Mother Coefficient	Father Coefficient	Mother Coefficient
Step 1: controls						
Intraspouse work hours	ns	ns	-	ns	-	ns
Cross-spouse work hours	ns	ns	-	ns	-	ns
Marital status	ns	ns		ns		ns
Respondent age	-.03*	ns		ns		ns
Depressive symptoms						
Intraspouse level	2.14***	3.32***	-	ns	-	-.02*
Intraspouse slope	-	-51.55	-	4.68***	-	.56*
Cross-spouse level	ns	ns	-	ns	-	ns
Cross-Spouse slope	ns	-	-	ns	-	ns
Step 2: work schedules ^a						
Intraspouse evening/night	ns	ns	-	ns	-	ns
Intraspouse rotating	ns	.655*	-	ns	-	-.007*
Cross-spouse evening/night	ns	ns	-	ns	-	ns
Cross-spouse rotating	ns	ns	-	ns	-	ns
Step 3: role overload						
Intraspouse overload	.250**	.175*				
Cross-spouse overload	ns	.092 [†]				

Note: Table indicates all variables tested; coefficients presented for significant predictors in final, trimmed model. ns = nonsignificant.

^a Shift variables dummy coded. Evening/night and rotating shifts compared to day shift.

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

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 $p < .001$.