



Published in final edited form as:

*Health Sociol Rev.* 2009 June 1; 18(1): 36–49.

## Parental Work Schedules and Adolescent Depression

Wen-Jui Han and Daniel P. Miller

Columbia University

### Abstract

Using a large contemporary United States data set, the National Longitudinal Survey of Youth-Child Supplement (NLSY-CS), this paper examines the relationship between parental work schedules and adolescent depression at age 13 or 14, paying particular attention to the mechanisms that may explain this relationship. Analysis based on structural equation modeling showed that increased work at night by mothers was significantly associated with a lower quality of home environment and fewer meals together, and this mediator was significantly linked to increased risks for adolescent depression. In addition, evening work by fathers was significantly associated with lower paternal closeness and this mediator was significantly associated with increases in adolescent depression. In contrast, irregular shifts by both mothers and fathers increased the likelihood of mothers knowing where the child was and this relationship in turn reduced adolescent depression. Implications and avenues for future research were discussed.

### Keywords

adolescents; depression; nonstandard work schedules; shift work; sociology

### Introduction

Although psychological disorders occur in only a minority of adolescents, depression is unfortunately relatively common. Depression can have significant impacts on the life of an adolescent (Cicchetti and Toth 1995), affecting functioning in the home, school and other social contexts, and leading to difficult relationships with family and friends and the withdrawal from typical activities (Shaffer 2005). Estimates of clinical depression (based on DSM-IV-TR criteria, American Psychological Association 2000) suggest that major depression has a point prevalence of less than one percent in children and between one and six percent in adolescents (Shaffer 2005) and it is twice as common in girls (Birmaher *et al* 1996; Shaffer 2005).

By focusing on the cumulative effect of parental work schedules across childhood (see below), this paper is concerned with the role shift work may have in the development of adolescent depression. From a developmental perspective, the emergence of depressed mood at any point during childhood or adolescence is viewed as part of a pathway reflecting past and current influences (Cicchetti and Rogosch 2002). By extension, any depression in adolescence is important both because of the immediate disruption it causes in an adolescent's functioning and its implications for future pathology. Because of this, depressive symptomatology in adolescence that does not meet the criteria for a clinical diagnosis is still important to consider (Cicchetti and Cohen 1995). This notion is bolstered by a number of previous studies, which have suggested that an even higher proportion of adolescents experience depressive symptoms that do not meet the clinical criteria for depression, but which may nonetheless impact their functioning (Brooks-Gunn *et al* 2001; Stewart *et al* 1994). For example, recent US nationally

representative data (Centers for Disease Control and Protection 2008) shows that in the previous year, 28.5% of high school students felt so sad or hopeless every day for two weeks that they discontinued some normal activities.

This paper investigates whether parental shift work poses a risk for the development of depression in adolescence and explores if and how this process operates through a number of mediating variables. To the extent that parental shift work exacerbates parents' own difficulties in making them less available, disrupts their relationships with their children or otherwise jeopardises the provision of an ecological environment to meet a child's needs, such work may pose a risk for the development of depression. To this end, we examine whether parental shift work is associated with self-reported adolescent depression at age 13 or 14, paying specific attention to whether this association is mediated by adolescent-parent relationships, parental monitoring and the home environment.

### **The link between parental work schedules and adolescent depression**

Studies of shift work (e.g. Presser 2003) typically distinguish between four main types: evening work (between 2 pm and midnight), night work (between 9 pm and 8 am), rotating shifts (i.e., alternating shifts but on a fixed schedule) and irregular hours (i.e., some evening or night hours but not on a fixed schedule). Distinguishing between these types is important because they may affect family processes and adolescent depression in different ways. Different shifts may have varied impacts on parents' time in the home, and effects of one parent's work schedule will depend on whether another parent's employment status and work schedule allow for being home, awake and energised to take care of the child. Thus, the effects of shift work on family processes and adolescent depression are likely to vary depending on both the type of nonstandard schedule and the patterns of both parents' work schedules (for two-parent families).

An important correlate of both adolescent depression and parental shift work is the parent-child relationship. A healthy and constructive relationship with parents is an important part of adolescent development, and connection between parents and their children is a protective factor against a number of undesirable outcomes for children (Roth and Brooks-Gunn 2000). Parents' ability to monitor and foster healthy relationships with their children is affected by a number of factors, including how their work schedules fit with family responsibilities. Both ecological theory (Bronfenbrenner 2005) and literature on work-family balance (Nock and Kingston 1988) indicate that time spent with parents is important for close and positive child-parent relationships. While developmental psychologists have emphasised the importance of parent-child contact for helping children foster close relationship with their environments (Belsky 2001), sociological theory (e.g., Coleman 1988) points to the transmission of cultural and social capital (e.g., values) important to children's later well-being. Shift work may reduce the parent-child contact necessary for positive outcomes in all of these areas and can be physically and emotionally draining so as to impede parents' abilities to nurture their children's healthy development (Heymann 2000).

Research on parents' shift work has typically only examined cognitive and behavioral effects, often finding negative associations (Han 2008; Heymann 2000; Strazdins *et al* 2004; 2006). To our knowledge, only one quantitative study (Strazdins *et al* 2006) has examined the association between parental shift work and children's social-emotional well-being at ages 4 to 11 and found parental shift work to be associated with an overall increase in an index of child behavioral difficulty. In addition, a qualitative study has shown that parental shift work was strongly linked with school-aged children's mental health and behavior problems (Heymann 2000). No study, however, has examined social-emotional outcomes in adolescents.

A few studies of parental shift work have concentrated on adolescent outcomes and find a mixed relationship between parental work schedules and adolescent-parent relationships. Han and Waldfogel (2007) found parental shift work to be associated with improved parental monitoring but poorer adolescent-parent closeness for two-parent families. Another smaller study found that while adolescents reported closer relationships with mothers who worked nonstandard hours, fathers who worked nonstandard hours seemed to be less knowledgeable about their teenage children's daily activities (Davis *et al* 2006). Barnett and Gareis (2007) found that husbands of women who worked evening hours reported spending significantly more time with their children, more knowledge of their children's activities, higher disclosure by children about their activities and were identified as having higher parenting skills. Finally, in an examination of many different aspects of the parent-child relationship, Presser (2003) found shift work to have a mixed association with measures of one-to-one parent-child interaction, and to be associated with decreased frequency of dinner meals with children but an increased frequency of breakfast with children.

Adolescent-parent relationships have also been associated with depression. Previous studies have found that adolescents with close relationships to their parents had lower levels of depression (Ge *et al* 1996) and that closeness to parents mediated the effects of stressful life events on the development of depression (Dmitrieva *et al* 2004). Parental monitoring has also been associated with decreased depression (Gil-Rivas *et al* 2003; Jacobson and Crockett 2000) or identified as a mediating factor against depression (Elgar *et al* 2007: 951-952). The frequency of contact between children and parents has likewise been cited as protective against negative psychosocial outcomes. A report by the Council of Economic Advisors (2000) suggested that teenagers who often ate dinner with their parents were significantly less likely to have suicidal ideations or to attempt suicide.

We formulate three hypotheses regarding the effects of parental shift work on adolescent depression. Shift work by parents could (1) have negative effects on adolescent depression if it negatively impacts the parent-adolescent relationship and/or it makes management of the family routine and environment difficult for families; (2) positive effects if it allows for greater parental monitoring or closeness or a more supportive home environment; or (3) overall neutral effects if the shift work creates some negative and some positive effects on the mediating factors.

This study builds upon and complements the previous work highlighted above in a number of ways. Our analysis includes longitudinal information from a particularly rich data set. The NLSY-CS includes information on mothers, fathers and children longitudinally and provides comprehensive information regarding both mothers' and fathers' work patterns on throughout a child's lifetime. Thus, it improves on previous research that was cross-sectional or was based on information about only mothers' or fathers' work schedules and it allows us to discern whether various types of nonstandard shifts identified by Presser (2003) and others have differential effects on adolescent depression through the mediators of our interest.

## Data and methods

### Data

This study uses data from the US National Longitudinal Survey of Youth (NLSY), which followed a nationally representative sample of 12,686 young men and women who were 14 to 21 years old when the survey was initiated in 1979. Data were collected annually until 1994 and every other year thereafter. Beginning in 1986, a separate biennial Child Supplement (the NLSY-CS) was administered to collect data on the children of the women in the NLSY. In 1988, the NLSY-CS was expanded to survey children ages 10-14 on a variety of measures.

The NLSY-CS remains the only national survey in the US that includes longitudinal information on both parental work schedules and various adolescent outcomes.

The sample for the present study consists of all of the children of mothers in the NLSY-CS who have been followed for 13 to 14 years and have no missing data on the outcome variable at ages 13 or 14. We used maximum likelihood estimation methods to impute missing data on the predictors, including the endogenous mediators (Little and Rubin 1987), employing the expectation-maximisation algorithm which was included in the *MPlus* software package. In general, demographic variables had missing data in 5% or fewer cases. Our endogenous mediators (see below) had missing data in about 20% of the cases, which may limit the generalisability of our results.

Because of the way the NLSY-CS is structured (e.g., no adolescent self-report questions until 1988 and biennially afterwards) and in order to utilise the longitudinal information on children since birth, the sample for the analysis consists of five cohorts of children who were born between 1982 and 1991 and followed from birth to age 13 or 14. Approximately 4,200 children are available for analysis. Of these, 54% are non-Hispanic White, 26% are non-Hispanic African American, and 19% are Hispanic. About half of the children are males.

### Depression at age 13 or 14

Children were asked to report how often they felt: (1) sad and blue; (2) nervous, tense or on edge; (3) happy; (4) bored; (5) lonely; (6) tired or worn out; (7) excited about something; (8) too busy to get everything; and (9) pressured by mom or dad. These nine items were adopted from the National Committee on Children, Parent and Child Study (NCC, 1990). Responses included often (1), sometimes (2), or hardly (3), with items 3 and 7 reverse coded. A standardised score was used, with higher scores representing more depressive symptoms (Cronbach Alpha of .70). It is important to note that the NLSY-CS does not contain a more widely used measure of adolescent depression, and no information regarding its validity or correlation with other measures exists. However, the NLSY-CS measure does correspond, in part, to other more well-established measures. For example, questions regarding how often a child felt sad and blue, tired or worn out or too busy to get everything correspond to similar criteria used to identify a major depressive episode in the Fourth Edition of Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association 2000).

### Endogenous mediators

From 1988 onwards, the NLSY-CS collected self-administered information from children aged 10 and older on various dimensions of their daily life, along with information gathered from their mothers. The NLSY did not collect information from fathers. Thus, there may be important aspects of daily life or the home environment that were missed. Because the outcome measure was collected at age 13 or 14, to specify a proper pathway and to address at least partially the potential for reverse causality, all of the exogenous predictors including parental work schedules were taken from the first 11 or 12 years of a child's life and all of the endogenous mediators were taken from ages between 11 or 12 and 13 or 14. Below we describe how we use this data to operationalise variables identified in the literature as potential mediators of the links between parental shift work and adolescent depression. These included adolescent-parent relationships (measured by time spent together, maternal closeness, and paternal closeness), parental knowledge about children's whereabouts (measured by whether the mother knows who the child was with when not at home), the home environment (measured by the Home Observation and the Measurement of the Environment - Short Form HOME-SF and frequency of eating meals together) and hours of watching TV.

**Time spent together**—The time spent together with parents was measured using eight yes/no questions that asked the adolescents to report whether they went to church, movies, dinners, shopping or outings with their parents in the month preceding the survey, or had done things, worked on schoolwork together, or played a game or sport together with their parents in the week preceding the survey. A variable was created to record the number of different activities the child had done together with their parents with values ranging from a minimum of 0 to a maximum of 8 (Cronbach Alpha of 0.60). Adolescents reported that they had done an average of about 4 things together with their parents during the preceding period.

**Maternal closeness**—Three variables were used to proxy the child's closeness with the mother as a single latent factor (Cronbach Alpha of 0.70). The child reported how close he/she felt toward the mother and how well he/she shared ideas and talked about important things with the mother, each coded as: not very (1), fairly (2), quite (3) and extremely (4). Finally, the child was asked how often his/her mother missed important events with possible responses of: a lot (1), sometimes (2) and almost never (3). About 64% of the adolescents reported they felt extremely close to their mothers, 40% of the adolescents reported they shared ideas and talked about important things extremely well with the mother, and 13% of the adolescents reported that their mother missed important events a lot.

**Paternal closeness**—Data reported by the children on four observed variables were used to create this latent factor (Cronbach Alpha of 0.70). Similar to maternal closeness, this included measures of children's reports of how close they felt toward their fathers, how well they shared ideas and talked about important things with their fathers and how often their fathers missed important events. In addition, this factor included the child's report of how often the father knows whom the child is with when not at home, and the responses included: all the time (4), most of the time (3), some of the time (2) and rarely (1). About 48% of the children reported that their father knew who they were with most or all of the time, 28% of the adolescents reported that the father missed important events a lot, 42% of the adolescents reported they felt extremely close to their fathers and 26% of the adolescents reported they shared ideas and talked about important things extremely well with the father.

**Whether mother knows whom child is with**—Adolescents were asked how often the mother knows whom the child is with when not at home; responses included all the time (4), most of the time (3), some of the time (2) and rarely (1). About 40% of the children reported that their mother knew most or all of the time who they were with when not at home.

**Home environment**—Two variables were used to create this measure (Cronbach Alpha of 0.64). The first was the Home Observation and the Measurement of the Environment (HOME) scale, a frequently used measure of the home environment (Baker and Mott 1989). The NLSY used the short-form (HOME-SF), which has been found to have excellent reliability and validity (Baker and Mott 1989). We used the total standardised score. The second variable, only asked of mothers in two-parent families, was the frequency of eating meals together with both parents during a week, which ranged from never (coded 0) to more than once a day (coded 5). Approximately 50% of the mothers reported that their children ate dinner with both parents five or more times a week.

**Hours of watching TV**—This variable was created by averaging the number of hours watching TV on weekdays and on weekends reported by the child. On average children watched almost 5 hours of TV on a typical day.

## Exogenous Predictors

**Parental work status/schedules**—Following the definitions used by the NLSY, a mother's work schedule was coded as "standard" if her work began at 6 am or later and ended by 6 pm. Her schedule was coded as "evenings" if her job began at 2 pm or later and ended by midnight, "nights" if it began at 9 pm or later and ended by 8 am, and "irregular hours" if the respondent had another type of schedule outside of standard hours or otherwise (e.g., her shift changed periodically from days to evenings or nights). Women who were not working at any type of job at the time of the interview were identified as "not working."

Given the complex and potentially cumulative relationships between parental work schedules, our potential mediators, and adolescent depression that have been documented in previous empirical studies, a simple measure of parental work schedules may not be sufficient to disentangle them. Thus, both a measure of contemporary work schedules and a variable that indicates whether or not a parent had ever worked nonstandard shifts by the time the child was 11 or 12 might not adequately capture the experiences of children whose parent(s) worked nonstandard shifts for a long time or the differential effects of various types of shift work on adolescent depression.

Therefore, we created the number of years mothers had worked at (1) evenings, (2) nights or (3) irregular hours by the time her child was 11 or 12 years old. This measure might more fully capture the extent of children's experience with parents working nonstandard shifts and better assess the varied associations that different types of shift work may have with the mediating factors. For two-parent families, data on fathers' shift work were also available every year since 1981 and every other year after 1994, and variables for them were created in a similar fashion.<sup>1</sup>

**Other parental and family characteristics**—Parents who work nonstandard hours may differ from other parents on characteristics that are associated with both their adolescents' well-being and our mediators (Presser 2003). To reduce potential omitted variable or selection bias, an extensive set of child, parental and family characteristics were controlled for in the models. Unless otherwise noted, each of the following characteristics were measured at the time of the interview or child assessment at age 11 or 12: whether the child is a boy, the child's race/ethnicity, whether the child has any siblings, whether the child had a low birth weight, the mother's age, her educational level, her marital status at birth, the family income for the year before the child's birth, frequency of mother smoking during pregnancy (ranging from 0 for never to 3 for 2 or more packs a day), frequency of mother drinking alcohol during pregnancy (ranging from 0 for never to 7 for every day), the number of years that the child has lived in a single-mother family and the number of years that the child's family has received welfare.

In all analyses, we also controlled for the average number of hours both mothers and fathers had worked by the time their children were age 11 or 12, and the number of years mothers had worked in service or cashier, sales or managerial/professional positions, as both work hours and type of job have been linked to nonstandard shifts in previous analyses (Presser 2003). Of course, even with these extensive controls, the possibility remains that families differ in other ways that cannot be controlled for in the data and that might bias the results.

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<sup>1</sup>The term "father" is used loosely in this analysis to refer to the spouse residing in the home, even if he is not the child's biological father. This is done to more fully consider the contribution of shared supervision and monitoring. About 60% of the children in two-parent families in this sample lived with their biological fathers. For the remaining 40% of the children, the mother's spouse was either the child's step-father, adoptive father, or was not related.



## Empirical analysis

We conducted structural equation modeling (SEM) using *MPlus* software to evaluate the fit of our hypothesised model (shown in Figure 1). Because the large sample size afforded by the NLSY-CS renders some of the traditional fit indices of SEM less reliable (or less meaningful), we consulted several other fit indices that are less reliant on sample size (Fan *et al* 1999). In the analyses summarised below, we evaluate model fit using the Comparative Fit Index (CFI) and the root mean square error of approximation (RMSEA), for which Hu and Bentler (1999) recommended cutoff values of .95 and .06 respectively.

## Results

Table 1 presents the means and standard deviations of all predictors, mediators and the dependent variable. Shift work is very prevalent in this sample. More than two-thirds of working mothers had ever worked nonstandard shifts by the time their children were 4 years old, and more than 80% had done so by the time their children were age 11 or 12, with an average duration of about 4 years of nonstandard shift by that time. Over 80% of working spouses had ever worked nonstandard schedules. The mean number of years spouses worked nonstandard schedules by the time the child was age 11 or 12 was also 4 years.

Preliminary analysis (available upon request) suggested that mothers working night hours tend to be less advantaged compared to other mothers, as indicated by negative correlations with family income, mother's marital status, age and education and a positive correlation with the number of years spent as a single-parent. Similar correlations with marital status, age and education were observed for fathers working night hours. On the contrary, mothers and fathers working irregular schedules tend to be more advantaged than their counterparts.

Our preliminary analysis also suggested that different shifts are differentially correlated with the mediators. For example, the number of years mothers worked evening hours was positively correlated with mothers knowing where the child was and the number of hours the child watched TV, but negatively correlated with the child sharing ideas with the father and the frequency of having meals together. At the same time, the number of years mothers worked night hours was negatively correlated with the home environment, the frequency of having meals together and closeness toward the father, but it was positively correlated with both the mother and father missing important events as well as hours watching TV. As a large sample size may result in statistical significance for correlations of small magnitude, we are cautious not to overemphasise these relations.

For simplicity, we focus our discussion on parental shift work variables, although all exogenous demographic variables are included in the models below. In addition, we focus our discussion below on those mediators that were significantly associated with both parental work schedules and adolescent depression

Over all, the model we proposed in Figure 1 achieved good fit indices (CFI = .950, RMSEA = .020,  $\chi^2$  ( $df=79$ ) = 250.314). Table 2 presents the total, direct and indirect effects of parental work schedules on adolescent depression, and Figure 2 presents the SEM standardised coefficients linking various parental work schedules (that were associated with at least one significant pathway to adolescent depression) to each of the six mediators and then to the outcome. Results in Table 2 indicate that night shifts by mothers were significantly and indirectly associated with higher adolescent depression. Specifically, results shown in Figure 2 indicate that while all of the mediators were important in linking maternal night shifts to adolescent depression, the number of years mothers worked night hours was significantly associated with a less supportive home environment and fewer meals together, which in turn significantly contributed to higher adolescent depression.

Furthermore, as shown in Figure 2, the number of years fathers worked evening hours was associated with adolescent depression through two indirect pathways. It appears that more years of evening shifts by fathers were associated with lower paternal closeness, which in turn was associated with higher adolescent depression. This indirect pathway was significant at the 5% level. Similarly, more years of evening shifts by fathers were linked to a less enriching home environment and fewer meals together, which in turn contributed to higher depression, although this indirect pathway did not achieve the statistical significance of 0.05.

Results in Figure 2 also indicate that both mothers' and fathers' irregular shifts were associated with adolescent depression through one significant indirect pathway. Specifically, years of work at irregular shifts by mothers and fathers was associated with mothers being significantly more likely to know where the child was when not at home, which in turn was associated with lower adolescent depression.

## Discussion and conclusion

This paper examined the pathways linking parental work schedules with adolescent depression, paying particular attention to factors that have been suggested by theory and previous research to mediate the influence of parental work schedules on adolescent depression. We were interested in knowing if parental work schedules have cumulative effects on adolescent depression.

Our results indicate that years of maternal night shifts and paternal evening shifts were associated with unfavorable family experiences and that such experiences translated into higher adolescent depression. In particular, the results point to lower closeness with fathers and a lower quality home environment (e.g., lower emotional support, having less frequent meals together) as two important mediating pathways that link parental work schedules with adolescent depression. However, irregular shifts worked by mothers and fathers increased the likelihood of mothers and fathers knowing where the child was and this in turn led to lower adolescent depression, although these associations were generally small in magnitude. Although different characteristics among families where mothers worked night shifts or fathers worked evening shifts might account for these findings, we have controlled for a large set of such potentially confounding characteristics.

A contribution of this paper is that we have examined both mothers' and fathers' work schedules. In contrast, most previous studies have mainly focused on maternal work schedules. However, our data on fathers are not as detailed as the data on mothers. One possible explanation for the associations we found for maternal night shifts and adolescent depression is that fathers' work patterns might play a role in these associations. Although most mothers who had ever worked night hours had spouses who worked during the day, their spouses were more likely to work night shifts than the spouses of mothers who did not work night shifts. Mothers who worked night hours were also more likely to work in the service sector and they worked more hours on average (approximately 30 hours per week). This constellation of parent work might create a particularly difficult atmosphere and a poor home environment for young adolescents, although how this might operate is difficult to specifically discern with the existing data. It would be important for future research to further examine the pattern of maternal and paternal shift work to understand how mothers and fathers juggle family and work demands and how this may affect adolescents' well-being.

On a positive note, we also found that adolescent children experienced a lower level of depression if their parents worked irregular shifts that allowed their parents and particularly their mothers to more adequately monitor their children. This result is hardly surprising considering that parents working irregular shifts were more likely to be in advantaged



circumstances (e.g., they were more likely to be married, were older, had higher maternal education and had higher family income), and thus they might have had the choice of more flexible work schedules to allow them to monitor their adolescent children while working. Studies have documented the benefits of having flexible schedules to the work-family balance (Hill *et al* 2001).

Overall, our results emphasise the importance of parent-child closeness and the home environment to adolescent well-being. The results presented here provide important new evidence that a contributing factor to parent-child closeness, relationships and home environments is parental nonstandard shifts, particularly maternal night work, father evening work or irregular work by either parent

Several caveats are worth noting and also provide implications for further research. Developmental psychology has emphasised that the factors that influence child development and the mechanisms linking those factors to child well-being may operate in different ways depending on a child's developmental stage (Duncan and Brooks-Gunn 1997). This discussion suggests that the impact of parental work schedules and their associated mechanisms may also depend on when and for how long these processes occur during a child's life.

In this paper, we mainly focused on the cumulative experiences of parental shift work on adolescent depression, and thus the results for the number of years mothers and fathers worked at different shifts were presented. We have also specified models using the number of years mothers and fathers worked at any nonstandard shift over the first 11-12 years of a child's life. The results using this measure were typically weaker but in line with those displayed in the text. The weaker results using this measure may have resulted from the mix of positive and negative effects associated with different types of nonstandard shifts on the mediators, which might have offset each other when included as part of a more generic construct that included any type of nonstandard shift. We also conducted analyses using controls for whether or not mothers and fathers had *ever* worked at different types of shifts. Significant results were found for both sets of analyses, indicating that both the experience of having parents work at nonstandard shifts (no matter for how many years) and the cumulative experience (or the "dosage" effect) were associated with adolescent depression. These analyses provide evidence that parental shift work matters for the initial level of adolescent depression at age 13 or 14. A question for further research would then be whether and how parental shift work is associated with any escalation in adolescent depression. Such research would help illustrate the exact nature of the relationship between parental shift work and adolescent well-being by more clearly delineating the relative importance of the timing, amount, and continuity of such work.

Because we imputed data only for predictor variables, our analysis excluded children with missing information on the outcome variable. These children were also those who are more likely to face disadvantageous circumstances, such as being a member of a racial/ethnic minority group and having mothers who were younger at child's birth, who had lower educational attainment and who were more likely to use a substance during pregnancy. Also, information on work schedules was not collected on a monthly basis and was not available for weekends. Thus, our measures of nonstandard work might undercount the occurrence of shift work because some parents might have worked weekends or have switched into and then back out of a nonstandard schedule between data collection points. To the extent that these undercounts occurred, the associations between nonstandard schedules and adolescent outcomes would be underestimated in this analysis.

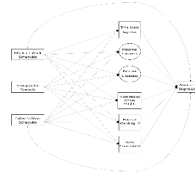
Not all parents have the option to choose their shifts; for many parents, particularly those working in low-paid and low-skilled positions, a nonstandard shift is a requirement of the job, rather than a choice for work-family balance. Findings of our study will contribute to a better

understanding of difficult circumstances many working families find themselves in when trying to juggle family and work responsibilities and will inform government policies that aim to enable these families to balance work and family life. With so many families working nonstandard schedules in the US and world wide (Presser 2000), the way we respond to this challenge is likely to have profound implications for adolescent mental well-being.

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**Figure 1.** Hypothesised pathways of parental work schedules to adolescent depression



**Figure 2. Pathways linking parental work schedules to adolescent depression (full sample)**  
Note. Bolded pathways represent mediated relationships that were significant at least at the 5% level. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

**Table 1**

Means and standard deviations of the analysed variables

Variable	Mean or %	SD
Male	51%	0.50
Hispanic	19%	0.39
Black	26%	0.44
Having siblings	60%	0.49
Low birth-weight	8%	0.27
Log family income before birth	10.29	0.96
At birth		
Mother married	69%	0.46
Mother's age	24.62	3.56
Mother's education	12.10	2.30
Frequency of mother smoking during pregnancy	0.40	0.67
Frequency of mother drinking alcohol during pregnancy	0.65	1.14
# of years receiving welfare by child age 11/12	1.38	2.53
# of years living in single-mother families by child age 11/12	2.40	3.34
Mother's work schedule		
# of years working at evening hours	0.54	1.12
# of years working at night hours	0.21	0.63
# of years working at irregular hours	0.77	1.28
Average # of work hours	24.03	15.00
# of years working at professional jobs	1.43	2.46
# of years working at sales jobs	0.38	1.02
# of years working at service jobs	3.46	3.18
Father's work schedule		
# of years working at evening hours	0.27	0.85
# of years working at night hours	0.28	0.81
# of years working at irregular hours	0.60	1.28
Average # of work hours	43.13	10.01
HOME-SF	953.35	158.96
Mom miss important events a lot	12%	0.33
Dad miss important events a lot	27%	0.44
Mom knows where the child was	40%	0.49
Dad knows where the child was	54%	0.50
Feel close to mom	3.51	0.76
Not very	2.85%	
Fairly	7.66%	
Quite	25.33%	
Extremely	64.16%	
Feel close to dad	3.01	1.04
Not very	12.58%	
Fairly	15.78%	



Variable	Mean or %	SD
Quite	29.45%	
Extremely	42.19%	
Share ideas with mom	3.12	0.89
Not very	6.19%	
Fairly	15.63%	
Quite	37.74%	
Extremely	40.44%	
Share ideas with dad	2.70	1.02
Not very	16.10%	
Fairly	23.96%	
Quite	34.25%	
Extremely	25.69%	
Frequency of having meals together	2.75	1.81
Never	24.00%	
Once a month or less	4.25%	
Once a week	7.02%	
Several times a week	17.90%	
Once a day	31.12%	
More than once a day	15.69%	
Hours watching TV on a weekday	4.98	5.65
Hours watching TV on a weekend day	4.86	4.76
Time spending together	4.12	1.90
Adolescent depression	-0.87	0.52

**Table 2**

Total, direct and indirect effects of parental work schedules on adolescent depression

	<b>Total</b>	<b>Direct</b>	<b>Indirect</b>
Mother Evening hours	0.003 (0.010)	0.001 (0.010)	0.002 (0.003)
Mother Night hours	0.009 (0.018)	-0.004 (0.018)	0.012 (0.005)*
Mother Irregular hours	0.004 (0.008)	0.006 (0.008)	-0.003 (0.002)
Father Evening hours	0.013 (0.013)	0.008 (0.012)	0.005 (0.004)
Father Night hours	0.004 (0.012)	0.000 (0.012)	0.004 (0.004)
Father Irregular hours	-0.001 (0.008)	-0.001 (0.008)	0.000 (0.002)

Note. N = 4175.

\*  $p < .05$ .