Parental Nonstandard Work Schedules and Child Behavioral Outcomes

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Abstract

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Nonstandard work schedules, such as the evening and night shift, are prevalent in the United States, with approximately 17.7 percent of the workforce now employed in a nonstandard schedule. The research thus far indicates that these work arrangements negatively influence children's behavioral development. However, the majority of studies focus on infants and toddlers or on adolescents, with elementary school-age children relatively understudied. Likewise, the role of the father's work schedule and parental involvement has been neglected. To broaden understanding of the effects of nonstandard schedules on children, and how these effects may depend upon the age of the child and the level of parental involvement, I analyze data from the NLSY79 and its Child Supplement from 1994-2006. My findings show that older children whose mothers work rotating or irregular shifts exhibit more behavior problems, while other types of shift schedules do not harm children's behavioral outcomes. While differences in parental involvement and closeness do not explain these relationships, parental closeness has an important influence on behavior problems for all parental employment statuses.

Introduction

In the last few decades, technological breakthroughs have enabled societal advances that would have been unthinkable for the vast majority of human history. One of those breakthroughs is the ability to connect with almost any person at any time and to have 24/7 access to a world of knowledge accessible at the click of a button. The expectation that information can now be demanded at any time has reinforced a relatively recent phenomenon: the demand for services at all hours (Beers 2000; Kalleberg 2000; McMenamin 2007; Presser 2003). Whether the 24/7 economy is viewed through the lens of a night-shift nurse, a stockbroker awake in the early hours to confer on the Japanese stock exchange, or an employee of a fast-food restaurant chain open at 2am, accommodating the desire for on-demand service has become a reality for a significant percentage of employees in the American economy and across the world (Beers 2000; Lesnard 2008; McMenamin 2007; Presser 2003; Strazdins et al. 2004). While the night and evening shifts have always existed in some form, technology has ensured that most businesses have the means to operate at all hours should they desire. The standard 9-to-5 work day has therefore become less "standard."

In the face of these changes, it is important to understand how nonstandard schedules affect the individuals working them, and the families that must respond to them. This thesis aims to address this question by examining the relationship between parents' nonstandard work hours and child behavioral adjustment, investigating whether having a mother or a father who works a nonstandard schedule harms children's behavioral development, and whether this effect depends on the age of the child or the level of involvement of their parents.

Currently, 17.7 percent of the workforce is employed in a nonstandard work schedule such as an evening, night, rotating, split or irregular shift, and the prevalence of such schedules is

only expected to grow (McMenamin 2007). Over the next ten years, the fastest growing occupations are projected to be in sectors of the economy in which nonstandard schedules are very common, such as in food, retail and health services (BLS 2013). Despite their prevalence, relatively few employees choose to work nonstandard schedules of their own accord. Indeed, the most common reasons offered for working a nonstandard schedule are that the individual had no other choice or that it was "the nature of [their] job" (Beers 2000; McMenamin 2007; Presser 2003a). Other research supports this view, finding that businesses often adopt nonstandard hours in order to maintain profits and competitiveness (Beers 2000; Hosking and Western 2008; Kalleberg 2000; Perry-Jenkins 2005; Presser 2003a; Presser 2003b).

Moreover, those most likely to work alternative schedules are drawn disproportionately from the more disadvantaged segments in American society. For example, evening and night shift schedules are more common among Black adults, young workers, those with young children, and those with lower incomes (Beers 2000; McMenamin 2007; Odom et al. 2013; Presser 2003a). Families with the least bargaining power are, in many cases, left accepting work schedules that they may not have the resources to respond to, negotiating such costly demands as arranging childcare during evenings, nights, or for unpredictable hours. The wellbeing of families for whom such hours are an inconvenient and often undesired reality must therefore be considered as the economy continues to evolve.

Indeed, nonstandard work schedules correspond to a variety of negative health effects for the individuals working them, and these negative health effects often correspond to negative social and family outcomes as well. Evening and night shifts, in particular, disrupt circadian rhythms and sleep, corresponding to more acute and chronic health problems (Boggild and Knutsson 1999; Kantermann et al. 2010; Maume et al. 2010; Wight et al. 2008). Nonstandard

schedules have also been linked to marital strife (Davis et al. 2008; Kalil et al. 2010; Presser 2003a) and, for mothers, to parenting strategies that are less sensitive to children's needs and somewhat more aggressive (Joshi and Bogen 2007; Strazdins et al. 2006). Nonstandard schedules also place severe time constraints on families. Childcare arrangements must be negotiated to accommodate the times during which childcare facilities usually do not operate, partners may not see each other if their work schedules do not overlap, and parents may have to sleep while children are awake and potentially unsupervised.

Consistent with these findings, previous studies have indicated that nonstandard schedules may correspond to negative outcomes for children. Strazdins et al. (2004) found that, in Canada, children aged 2-11 exhibited higher odds of having behavioral difficulties such as hyperactivity, aggression, separation anxiety, engagement in property offenses, and emotional disorder when one or both of their parents worked nonstandard shifts. Moreover, children of mothers who worked a nonstandard schedule at some point during the first three years of their lives had significantly lower scores in terms of various developmental outcomes such as expressive language and motor skills, sensory perception, learning, and memory (Han 2005). Likewise, in a review of 23 studies examining nonstandard schedules and child outcomes, 21 of those studies found that parental nonstandard schedules were associated with worse behavioral, cognitive, and/or health outcomes among children (Li et al. 2014).

At the same time, many dual-earner couples choose to off-set their work schedules in order to allow a parent to always be present for their children (Hattery 2001; Lindsay et al. 2009; Presser 1988) and some parents attest that they prefer nonstandard schedules because they allow them to feel like stay-at-home mothers or fathers (Garey 1999; Hattery 2001; Lindsay et al. 2009). Moreover, even if one parent feels strained by their work schedule, the other parent may

be enhancing their involvement in their children's welfare, thereby reducing the negative effects associated with their partner's lowered wellbeing. For example, Lesnard (2008) found that French fathers whose work hours did not overlap or whose work hours overlapped relatively little, with their partners spent more time caring for their children. Likewise, using 1990 data from the National Child Care Survey, Brayfield (1995) found that fathers spent more time with their children when their wives worked evening or night shifts. Children also rate their fathers' parenting skills and parental knowledge higher when their mothers work nonstandard schedules, with higher parental effectiveness ratings corresponding to lower levels of risk-taking behavior and negative outcomes among youths (Barnett and Gareis 2007). Thus, it may be the case that when the mother is absent from the home during the evening or night hours due to her work schedule, the father is increasing his caregiving responsibilities, thereby off-setting reductions in the quality or quantity of time mothers are spending with their children. While it is also possible that mothers may increase their caregiving time in response to the fathers' nonstandard schedule, this seems like a less tenable scenario since mothers are often already highly involved with their children regardless of their or their spouse's work schedule (Barnett and Gareis 2007; Harris 1998). They are therefore relatively unlikely to have additional time to devote to childcare.

Nonstandard schedules may also enable families to save money on childcare costs by allowing them to use available relative or father and mother care (Lindsay et al. 2009; Presser 1988). Nonstandard schedules therefore have consequences for families and children, though it is not entirely clear whether these consequences are positive or negative when the context and the dynamics of the whole family are accounted for. Indeed, children whose fathers are in the household, could even experience reduced behavior problems in response to their parents'

nonstandard schedules if these schedules correspond with elevated parent involvement or closeness.

This study aims to address these dynamics by examining the relationship between parents' nonstandard work hours and child behavioral adjustment. Specifically, it analyzes four central questions: Do parental nonstandard schedules harm children's behavioral adjustment? Do these effects depend on the age of the child? Do these effects differ by the type of shift schedule? And to what extent do parental involvement and closeness influence or explain these relationships? By investigating these questions, this study attempts to improve on previous research in two ways: by modeling explicitly the relationships among nonstandard work, parental involvement and child outcomes for both parents and by accounting for whether these effects and relationships depend on the age of the child. I use panel data from the NLSY-79 main file and Mother-Child supplement spanning the years 1994-2006 to test for these effects.

I first outline the hypotheses that guide the analysis and discuss the research that informs these hypotheses. I then create nested models in which specifications of mother and father closeness and involvement with the child are sequentially tested in order to examine the extent to which parental closeness and involvement influence the relationships between nonstandard schedules and child behavioral outcomes. Lastly, I show how predicted behavioral problem scores differ for children whose parents work each type of nonstandard schedule at each ranking of parental closeness. Overall, the findings indicate that most types of nonstandard schedules are *not* associated with worse child outcomes, and some types of nonstandard schedules may even be associated with improved behavioral outcomes. Additionally, neither parental involvement nor parental closeness substantially mediate these relationships, though parental closeness plays a consistently important role in child behavioral outcomes across employment statuses.

Parents' Nonstandard Work Schedules and Child Outcomes

The role of parental involvement in accommodating a spouse's absence while the spouse works a nonstandard shift is a relatively understudied component of the literature, particularly with regards to father involvement. For many families, nonstandard schedules are used strategically in order to allow one parent to be present at all or almost all times of the day for their children, a strategy often called tag-team parenting (Barnett and Gareis 2007; Han 2004; Hattery 2001; Lindsay et al. 2009; Presser 1988). In such cases, nonstandard schedules may correspond to positive behavioral outcomes if children are able to spend more time with one or both of their parents. In particular, nonstandard schedules may disrupt gendered caregiving arrangements by taking the mother away from the home at key times during the day—such as during a child's bedtime—and thereby increasing the amount of caregiving time fathers provide. Indeed, a variety of studies have indicated that fathers increase their parental involvement in response to their wives' nonstandard schedules (Barnett and Gareis 2007; Brayfield 1995; Lesnard 2008; Rapoport and Le Bourdais 2008; Wight 2008). Since increased father closeness tends to be associated with fewer behavior problems and better socioemotional adjustment among children (Barnett and Gareis 2007; Brayfield 1995; Harris et al. 1998; Marsiglio 1993), this increased time could correspond to higher overall child wellbeing.

In the multivariate analyses that follow, I hypothesize that, consistent with prior studies, nonstandard schedules will be positively associated with child behavior problems. Thus, children whose mothers or fathers work nonstandard schedules will exhibit more behavior problems relative to children whose mothers or fathers work day shifts. I also anticipate that father involvement will partially explain the relationship between nonstandard shift schedules and behavior problems, but that these explanations may differ for different types of shift schedules. I

therefore expect to see a weaker relationship between nonstandard schedules and child behavior problems once father involvement is included in the model. Additionally, I expect that "involved" fathers will be more likely to perform the responsibilities that mothers cannot complete when they work nonstandard schedules, responsibilities such as checking homework, reading to children, and putting them to bed. I expect this to occur in households with mothers who work evening or night shifts, given that these shifts affect the temporal dynamics of the family in systematic ways, thereby putting consistent caregiving demands on the father. For rotating and irregular shifts, this influence may not be as clear since these schedules do not necessarily draw mothers away from the family at critical times or they may do so sporadically, potentially making fathers less inclined to assume greater parenting duties if these changes are perceived as temporary. The impact of maternal involvement is less clear, as mothers tend to be highly involved in their children's lives regardless of their work schedules (Barnett and Gareis 2007; Harris 1998). It may therefore be the case that maternal involvement will do little to affect the relationship between nonstandard schedules and child behavioral problems.

Additionally, while the impact of parents' nonstandard work schedules on children has generally been shown to be negative for children's behavioral, cognitive, and health outcomes (Li et al. 2014), much of the work in this area has been cross-sectional, limited to short observation periods, or limited to very young children. Short observation periods and studies limited to particular age groups may be problematic for analyzing the effects of nonstandard employment on child behavior because parental work schedules may differ in their effects for younger versus older children. For example, parents may offset their schedules in order to personally care for their young children, potentially leading to improved behavioral outcomes if young children are spending more time with their parents. Indeed, parents seem to be more likely

to work nonstandard schedules when they have young children (Barnett and Gareis 2007; Garey 1999; Han 2004; Hattery 2001; Presser 2003; Wight, Raley, and Bianchi 2008). At the same time, research has indicated that nonstandard schedules are particularly harmful for infants' and toddlers' behavioral development (Li et al. 2014), possibly because parents are less able to spend time in developmentally important activities (Li et al. 2014). It may therefore be the case that the effects of nonstandard schedules on child behavioral outcomes depend on the age of the child. If this is the case, studies that examine a small subset of ages or that do not have the opportunity to follow children through time may be limited in their ability to diagnose these potential age effects. Even studies that examine a wide age-range of children may miss important relationships if children of all ages are examined in tandem.

I also expect the impact of parental involvement and closeness on the relationships between nonstandard schedules and child behavior, to vary by the age of the child. As mentioned above, tag-team parenting, or the off-setting of parental work schedules, may be a more prevalent strategy for families with young children. In this case, children may exhibit fewer behavior problems as a result of heightened parental involvement. Tag team parenting may be a less prevalent strategy as children age, however, and are able to take care of themselves for limited periods of time. Consequently, older children may be more likely to be exposed to nonstandard schedules for negative reasons—such as the parent having no other choice but to accept this type of employment. Alternatively, because younger children are more dependent on their parents than older children, nonstandard schedules may correspond to worse behavioral outcomes for younger children if the time children spend with their parents decreases (such as if a parent needs to sleep while the children are awake) or if the parent feels mental strain because of their work schedule. Therefore, including measures for parental closeness may help explain

the relationship between parental nonstandard schedules and child behavioral outcomes, but this mediating effect may be more or less apparent at different ages.

Data and Research Design

This analysis utilizes the National Longitudinal Survey of Youth-1979 (NLSY79) and its Child Supplement (NLSY79-CS) for the years 1994-2006. The NLSY79 is a probabilistic sample composed of 12,686 men and women interviewed annually between 1979 and 1994, and interviewed biennially thereafter. In 1986, the NLSY79-CS began to interview the children of the women interviewed in the NLSY79, with children continuously added to the supplement as they are born. Additionally, an oversample of minority children was interviewed for all years except for the year 2000. These children are included in the analysis, though their inclusion does mean that the sample is not nationally representative.

The NLSY79-CS children and their mothers provide the data for this analysis, with the unit of analysis being the child. While data are available for infants, toddlers, and older adolescents, this analysis will focus on children aged 4-15-years-old in order to capitalize on the availability of the Behavior Problems Index, an index of 28 questions answered by the mother that assess various behavioral difficulties exhibited by their children. The index is normalized to have a mean of 100 and a standard deviation of 15, with higher scores indicating more behavior problems. Additionally, the index is composed of five subscales: antisocial, anxious/depressed, headstrong, hyperactive, and peer problems (see Appendix A). The BPI is a widely used and tested measure developed from other popular child behavior scales including the Achenbach Behavior Problems Checklist (Achenbach and Edelbrock 1981). Scores are available for children from the age of 4 up until the age of 14, though some slightly older children are included

depending on the timing of interviews, and these individuals have been retained in the sample. Only children with a valid BPI score in a given person-year are included in the sample.

The sample is restricted to 3,806 children for whom the father is in the household. The absence of the father from the household arguably complicates the analysis of the father's response to the mother's shift schedule and vice versa because, in some cases, children in these families will not have any contact with a father figure, thereby limiting the assessment of family dynamics. Likewise, partners, stepfathers, and fathers who are not in the household likely have systematically different relationships with their or their partner's children relative to fathers who are in the household. A Chow test for different estimates for the sample with the father in the household compared to estimates for children whose fathers live elsewhere suggests that this is, in fact, the case (F: 3.54, p <0.001).

In order to assess whether parental nonstandard schedules exert different effects at different stages in the child's life, the parents' shift-schedule arrangements are interacted with a dummy variable indicating whether the child is 4-9-years-old.[1]

Parents' Nonstandard Employment

The effects of both the mother's and the father's shift schedules on child behavioral outcomes are examined because in both cases the temporal rhythms of the family are affected, potentially corresponding to changes in mother and father involvement with their children. For example, a father who works the night shift may be available during the day to care for children,

[1] Initially the sample was split into a sample of 4-9-year-olds and a sample of 10-15-year-olds based on the results of a Chow test which suggested that the model effects on child behavior are systematically different by age group (F= 1.73, p < .05). However, substantively, there were few differences between the two groups. Thus, these age groups were combined in order to maximize the sample size and gain efficiency, and age-group interactions were instead used to capture the different effects shift schedules exert on younger relative to older children.

thereby potentially corresponding to altered expectations concerning who should care for the children in various capacities. The focal independent variables—the father's and mother's shift schedules—are represented in three forms: by a dummy variable indicating if the parent was not employed during the observation period, a dummy variable capturing whether the parent reports working an evening or a night shift, and a separate dummy variable indicating whether the parent reports working a rotating or an irregular shift, with the reference groups being mothers and fathers who work day shifts.

The sample therefore includes both parents who are employed during the time period of interest and parents who are not employed. Given that nonstandard schedules tend to be particularly prevalent in relatively unstable occupations (Kalleberg 2000), excluding observation periods during which individuals are not employed could affect estimates of the influence of nonstandard schedules on child behavioral outcomes. This exclusion could lead to spurious conclusions if worse behavioral outcomes are associated with spells of unemployment, rather than with nonstandard schedules.

The evening shift refers to hours worked between 2pm and 11pm, the night shift refers to hours worked between 9pm and 7am, a rotating shift refers to a shift that changes periodically from one day to the next, and an irregular shift captures hours that vary unpredictably, perhaps extending from 9am to 10pm one day, and from 8am to 4pm the next day. Among NLSY79 respondents, the latter type of shift schedule is particularly prevalent among managers, health service workers, and cashiers. Alternative specifications were tested, including breaking apart the evening, night, rotating, and irregular shifts into four separate dummy variables, but the evening and night shifts have effects of similar direction and magnitude, as did the rotating and irregular shifts. Thus, for efficiency, these shift schedules were combined.

Parental Involvement and Closeness

Parental involvement is operationalized and tested in two ways. In the NLSY79-CS, children aged ten years and older answer questions concerning their relationship with their fathers and mothers. Children answer each set of questions separately for their mother and their father, with questions assessing the closeness of the mother-child and father-child relationship, the extent to which the father and child and the mother and child share ideas, the extent to which each parent listens to the child, how often each parent attends important events, how often each parent and the child discuss important decisions, and whether the child is satisfied with the time he or she spends with each of his or her parents (for details, see Appendix B). The answers to these questions are utilized to construct indices in which higher values indicate a better mother or father-child relationship. Table 1 below outlines the questions included in these indices and the manner in which the answers to these questions are summed into the resulting father and mother involvement indices. The Cronbach alpha score for these six items is 0.71, indicating modest reliability (Nunnally and Bernstein 1994) and indicating that, while these measures are all positively correlated with the index, it may be wise to be cautious in our interpretations of these indices.

Table 1: The child-answered questions and answers utilized to construct the father and mother involvement indices for children ages 10-15-years-old. Source: *NLSY79-Child Supplement*

# value assigned to each answer				
Questions	1	2	3	Range
1. How often does your (mother/father) listen to your side of an argument? *Reverse coded*	Hardly ever	Sometimes	Often	1-3 points
2. How well do you and your (mother/father) share ideas or talk about things that really matter?	Not very well	Fairly well	Quite/extremely well	1-3 points
3. Please think about the time you spend with your (mother/father). Do you think your (mother/father) spends enough time with you?	Does not spend enough time with me	Spends enough time with me	n/a	0-1 point
4. About how often does each parent miss the events or activities that are important to you? *Reverse coded*	Misses events a lot	Sometimes misses events	Almost never misses events	1-3 points
5. How close do you feel to your (mother/father)?	Not very close	Fairly close	Quite/extremely close	1-3 points
6. How often does your (mother/father) talk about important decisions with you? *Reverse coded*	Hardly ever	Sometimes	Often	1-3 points
				Total: 5-16 points

In addition to potential concerns about the indices' reliability, children may not always be accurate reporters concerning their relationships with their parents and only children aged 10 and over answer the questions comprising the father and mother involvement indices. Therefore, analyses are conducted in which parental involvement is operationalized through mother-answered questions concerning how close the father and child are and how close the mother and child are on a scale of 1-4, with higher scores representing greater closeness.[2] Specifically, mothers answer the question: "How close does [Child's name] feel toward you? Does [he/she]

[2] Ideally, the father's perception of the quality of the father-child relationship would be included as well. Unfortunately, the NLSY79-CS does not survey the fathers of the children. This is a particularly troublesome omission for families in which the mother and father are separated or divorced, since the mother may not have complete knowledge about the father-child relationship or may knowingly or unknowingly bias her answers in light of her own relationship with the father. Nevertheless, given the omission of father respondents, the mothers' and the children's reports are the best available sources of information concerning father involvement and the sample is limited to children whose fathers are in the household to reduce this bias.

feel not at all close, fairly close, quite close, or extremely close?" These four answers are reverse coded so that "not at all close" represents a score of 1, while "extremely close" represents a score of 4. Mothers answer the same question regarding father-child closeness, with "toward you" replaced with "toward their (biological) father." Mothers answer these questions for children of all ages, the father and mother closeness scales are therefore available for children aged 4-15-years-old.

Control variables are included for the mother's age, whether the child is 4-9-year-old, whether the child is female, whether the child is African American or Hispanic, the number of children in the family, the logged total net family income, the mother's years of education, the mother's and father's average weekly work hours, whether it is the year 2000 (in order to account for the exclusion of the minority oversample in that year), and whether the mother is out of the labor force and not employed for 30 weeks or more during the year. This latter variable is important to include because, in this sample, an average of one-fourth of mothers are not employed for the full year. Without including this variable, a significant source of difference in a mother's availability to the child would be left unaccounted for in the analyses. The reference group for this analysis is therefore male Caucasian children who are 10-15-years-old.

Analytical Strategy

The relationship between parental nonstandard schedules and child behavior problems is estimated using a linear random-effects model. Random effects models allow each child to have their own intercept, thereby capturing unobserved characteristics of the mother and child. However, unlike fixed effects models, random effects models assume that unobserved variables are randomly distributed and thus they do not correct for unobserved heterogeneity. The drawback of this is that the analyses may be subject to omitted variable bias. Yet, this also means

that time-invariant characteristics, such as race, gender, and parental education, can be included in the models. Likewise, fixed effects models are unable to do model estimation for individuals whose parental closeness and involvement scores do not change. Since father and mother closeness scores do not change over time for approximately 50 percent of respondents, fixed effects models exclude a large portion of the sample in their estimates. Nevertheless, comparisons of fixed and random-effects models yield substantively similar conclusions and the results for the fixed effects models are presented in Appendix C for comparison.

Multiple imputation is also utilized to deal with missing data in the parental closeness and involvement measures, as well as in the total net family income measure. The NLSY79-CS does not ask questions concerning father and mother closeness and involvement of all families in all years, the sample sizes of the models that do not include these variables are therefore much larger than the sample sizes of the models that do include these variables, with approximately 20 percent of person-year observations missing responses to father closeness questions and 30 percent missing responses to mother closeness questions. For children aged 10 years and over, approximately 35 percent of person-year observations are missing responses for the father and mother involvement indices. Additionally, these missing values do not seem to be randomly distributed. Families who answer questions concerning parent-child relationships tend to have fewer children, higher levels of parental education, lower levels of maternal work hours, are less likely to be Black or Hispanic, and, in the case of father closeness, are more likely to have mothers or fathers who are employed in evening or night shifts (these results are presented in Appendix D). The sample of families who do answer these questions is therefore somewhat more advantaged than average.

Moreover, approximately 17 percent of families report that they do not know their total net family income, and approximately 3 percent refuse to report their total net family income. In order to enable comparisons across models and increase the representativeness of the sample, I use multiple imputation to replace the missing values in these measures. Multiple imputation was performed using Stata 13.1's multiple imputation chained command, which iteratively replaces missing values in multiple variables using chained equations (StataCorp). Specifically, the missing values for the father and mother closeness questions are replaced using ordered logit equations, while the missing values for total net family income and the father and mother involvement indices are replaced using truncated linear regression equations.

The multiple imputation procedure is able to account for covariates that may influence the father and mother closeness and involvement scores for each child, thereby leading to less bias and greater variability than would otherwise be the case if missing values were replaced with the mean scores of the father and mother closeness and involvement questions (Osborne 2012). Towards this end, the child's normalized behavioral problem scores, race, gender, and age were included as covariates, as were the mother's age, average weekly work hours, work schedule (evening/night, rotating/irregular, or not employed), and years of education, and the father's average weekly work hours and work schedule (evening/night, rotating/irregular, or not employed). The chained equation procedure also accounts for the observed values of the imputed measures. Specifically, if mother closeness is being imputed, the observed values for father closeness, mother and father involvement, and total net family income can be controlled for even though these measures are also subsequently imputed. The missing values were imputed 20 times, though the results did not vary substantively when fewer or more imputed datasets were created, and the results differed to a relatively small extent when single imputation was utilized

in place of multiple imputation and when the results were limited to children with valid responses to the parental closeness and involvement measures. The multivariate results reported below are therefore robust to various model and variable specifications.

Results

Descriptive statistics averaged across all years for children aged 4-15-years-old with fathers in the household are presented in Table 2 below. In this sample, approximately 18 percent of children have mothers who are employed in a nonstandard schedule in a given year and approximately 19 percent of children have fathers who are employed in a nonstandard schedule in a given year, proportions that are comparable to, though slightly higher than the national average (McMenamin 2007). Additionally, in this sample, 16.9 percent of children have mothers who are not employed, while 12 percent of children have fathers who are not employed. While these numbers may appear unusually high, they include both individuals who are out of the labor force as well as those who are unemployed. They are therefore expected to be higher than conventional unemployment rates. These rates are also driven higher by the inclusion of the minority oversample. Finally, since siblings are included in the sample, it is possible for an unemployed father or mother to have two or more children in the sample, thereby contributing to the slightly higher proportions of non-employed individuals than might otherwise be expected.

Table 2: Means and standard deviations for outcome and explanatory variables for children aged 4-15 with the father in the household, NLSY79 and NLSY79-CS (unweighted data)

	Children aged 4-15 (fathers in HH) n=3,806 Mean	SD
Outcome Variable		
Behavioral Problem Index (BPI)	101.64	14.24
Mother's Work Schedule		
Day Shift	0.650	0.477
Evening/Night Shift	0.063	0.242
Rotating/Irregular shift	0.118	0.323
Mother not employed	0.169	0.375
Father's Work Schedule		
Day Shift	0.691	0.462
Evening/Night Shift	0.066	0.249
Rotating/Irregular shift	0.123	0.329
Father not employed	0.120	0.325
Characteristics		
Race (% of sample)		
Hispanic	0.189	0.392
Non-Hispanic Black	0.165	0.371
Non-Hispanic White	0.646	0.478
Child female (% of sample)	0.494	0.500
Child's Age	9.978	2.971
Mother's Age	38.65	3.526
# of children	2.629	1.110
Mother's Education (in years)	13.72	2.526
Mother's Work Hours	27.73	16.81
Father's Work Hours	42.40	15.41
Total net family income	77,089.93	88,883.01
% mother's not employed full-year	0.251	0.434
Parental Involvement		
Father Closeness	3.572	0.679
Mother Closeness	3.749	0.502
Father Involvement (10+)	12.64	2.337
Mother Involvement (10+)	13.75	1.922

Examining the means and standard deviations of the father and mother closeness and involvement measures yield two important insights. First, and unsurprisingly, mother closeness and involvement scores are, on average, higher than father closeness and involvement scores. Secondly, father closeness and involvement measures exhibit more variability than mother closeness and involvement measures. As mentioned above, research indicates that mothers tend to be highly involved in their children's lives regardless of their shift schedule (Barnett and

Gareis 2007; Harris 1998). The low variability and high average scores exhibited by these measures may offer support for these claims, and may indicate that there is little room for mother closeness and involvement to explain differences in child behavioral outcomes by shift schedule.

This analysis begins by examining if BPI scores are related to parents' employment schedules and if these scores differ by the age of the child. Table 3 compares the mean BPI scores of children whose mothers and fathers are currently not employed, and whose mothers and fathers work standard (day) and nonstandard (evening/night or rotating/irregular) schedules by the two age groups of interest in this analysis—children aged 4-9-years-old and children aged 10-15-years-old. Dividing the sample into these two age groups allows for an initial assessment of whether the effects of nonstandard schedules depend on the age of the child. If the effects of the shift schedules operate similarly for younger and older children, we would expect to see the same types of shift schedules corresponding to higher or lower BPI scores for 4-9-year-olds and 10-15-year-olds.

Table 3 compares these groups using a oneway ANOVA test and reports the results of a multiple comparison Scheffe test in parentheses under the mean BPI score for each age and shift schedule combination. The significance levels reported in Table 3 are based on the results of the Scheffe test indicating if the given shift schedule is associated with a BPI score significantly different from the BPI scores of children whose mothers or fathers work day shifts. To reiterate, higher values of the BPI indicate *more* behavior problems and therefore *worse* behavioral outcomes.

Table 3: ANOVA comparisons of BPI scores between parents who work nonstandard schedules and parents who work day shift schedules; results of Scheffe test reported in parentheses beneath mean BPI scores for each age and shift schedule combination

	Model 1: 4-9-yo n=2,570	*Model 2: 10-15-yo n=3,048*
Parent Shift Schedules[a]		
Mother's Day Shift (ref)	100.10	102.45
	(ref)	(ref)
Mthr's EN Shift	98.92	104.68^
	(-1.181)	(2.192)
Mthr's RI Shift	101.64	105.08***
	(1.548)	(2.598)
Mthr not employed	99.00	102.56
	(-0.311)	(0.073)
Father's Day Shift (ref)	99.66	102.44
	(ref)	(ref)
Fthr's EN Shift	100.42*	104.74*
	(0.757)	(2.300)
Fthr's RI Shift	100.51	102.94
	(0.557)	(0.496)
Fthr not employed	102.22**	104.61**
	(2.557)	(2.166)

^p < .1; *p < .05; **p < .01; ***p < .001
[a]EN = evening/night shift; RI = rotating/irregular shift

Consistent with much of the literature, Table 3 shows that older children and adolescents whose parents work nonstandard schedules exhibit significantly higher mean BPI scores relative to children whose parents work day shifts. This is particularly the case for 10-15-year-old children whose mothers work nonstandard schedules and for 10-15-year-old children whose fathers work evening or night shifts. In contrast, among young children, mean BPI scores are fairly consistent across maternal and paternal employment groups. For both age groups, however, children whose fathers are not employed exhibit significantly higher average behavioral problem scores relative to children whose fathers work day shifts. This is to be expected given the loss of income associated with father non-employment.

While the older children's mean BPI scores do point to a potential relationship between nonstandard schedules and behavioral problems, nonstandard schedules tend to be associated with income, race, education, and numerous other factors that influence BPI scores. Likewise,

for young children, the relationships between nonstandard schedules and BPI scores may be masked by other variables. In order to tease out these relationships, Table 4 presents the findings from the random effects models.

Table 4: Results from RE models for children aged 4-15 with the father in the household, NLSY79 and NLSY79-CS

	Model 1: n=3,806	*Model 2: n= 3,806*	*Model 3: n= 3,806*
10-15-yo reference group			
Parent Shift Schedules[a]			
Mother's Day Shift	Ref.	Ref.	Ref.
Mthr not employed	0.578	0.404	0.396
Mthr's EN Shift	0.437	0.131	0.323
Mthr's RI Shift	2.725***	2.706***	2.649***
Father's Day Shift	Ref.	Ref.	Ref.
Fthr not employed	-1.172^	-1.148^	-1.005
Fthr's EN Shift	0.004	0.063	0.014
Fthr's RI Shift	-0.311	-0.337	-0.389
Control Variables			
Child female	-2.151***	-2.244***	-2.155***
Child White	Ref.	Ref.	Ref.
Child Hispanic	0.168	-0.025	0.029
Child Black	0.815	0.599	0.788
Mther's Age	-0.090	-0.157**	-0.129*
Mther's Ed.	-0.673***	-0.608***	-0.637***
Family income[b]	-0.423**	-0.412**	-0.409**
Mthr's Work Hours	0.020	0.018	0.017
Fthr's Work Hours	-0.020	-0.016	-0.018
Mthr not EFY[c]	-0.669	-0.540	-0.590
Number of children	-0.577*	-0.648**	-0.650**
Year 2000	-1.875***	-2.015***	-1.897***
Age Interactions[a]			
Age 4-9	-1.988***	-1.711***	-1.833***
Age 4-9*MthrEN	-1.442	-1.008	-1.293
Age 4-9*MthrRI	-1.414^	-1.306^	-1.315^
Age 4-9*FthrEN	-0.329	0.045	0.160
Age 4-9*FthrRI	0.578	0.575	0.614
Parental Closeness			
Fthr closeness		-2.179***	
Mthr closeness			-2.714***
Constant	123.04***	134.47***	134.32***
F-statistic	10.43***	16.65***	14.06***

[a]EN = evening/night shift; RI = rotating/irregular shift; FathEN = Father's evening/night shift; FathRI = Father's rotating/irregular shift
[b]Family income refers to logged total net family income
[c]EFY = employed full-year
^p < .1; *p < .05; **p < .01; ***p < .001

In these models, parental shift schedule arrangements are interacted with a dummy variable indicating whether the child is 4-9-years-old, thereby helping to account for the

differential effects of shift schedules on younger versus older children displayed in the ANOVA test above. Additionally, standard errors are clustered around the mother's ID in order to account for the presence of siblings in the model. The reference group for all models includes White 10-15-year-old boys whose mothers and fathers are employed in day shift schedules.

The findings in Model 1 are, for the most part, contrary to expectations and the findings in much of the literature that indicate that nonstandard schedules are generally associated with worse behavioral outcomes. Controlling for a host of relevant characteristics, most parental nonstandard schedules are not associated with significantly worse outcomes relative to day shift schedules. Indeed, for both 4-9-year-olds and for 10-15-year-olds, fathers' nonstandard schedules and mothers' evening and night shift schedules do not significantly affect levels of behavior problems.

Surprisingly, father non-employment is associated with marginally significantly fewer behavior problems, and this result holds for both younger and older children (results for separate ages not shown). Subsequent analyses in which covariates are individually added into the model indicate that the effect of father non-employment on child behavioral problems is positive until logged total net family income is included in the model. While non-employment is not the central focus of this analysis, this finding bears further exploration in subsequent studies.

However, mothers' rotating and irregular shift schedules are associated with significantly more behavior problems among older children, with BPI scores 2.725 points higher for children whose mothers work rotating or irregular shifts relative to children whose mothers work day shifts. This result is significantly different for younger children, for whom rotating and irregular shifts are not associated with more behavior problems. Thus, with the exception of the effects of mothers' rotating and irregular schedules on older children, parental nonstandard schedules may

not necessarily be as harmful for children's behavioral adjustment as much of the literature has portrayed.

These results may be due, in part, to the effect of mother and father closeness and involvement, as discussed above. For example, fathers who are not employed may be more involved in their children's lives, thereby leading to improved behavioral outcomes. Likewise, stronger relationships between mothers' evening and night shift schedules and between fathers' nonstandard shift schedules and child behavioral outcomes may manifest themselves if father and mother closeness and involvement are accounted for. For example, some mothers who work evening and night shifts may do so because of job constraints, while other mothers may be employed in evening and night shifts in order to engage in tag team parenting. The exclusion of mother and father closeness from the model may therefore be masking important relationships among the non-statistically significant shift schedule arrangements.

The relationship between rotating and irregular schedules and behavioral problems may also be associated with parental closeness and involvement. For example, rotating and irregular shifts may be associated with lower parental closeness and involvement if, for example, parents' schedules are continuously disrupted by their employers' demands and if they are therefore less able to make or keep commitments to their children, potentially explaining the positive relationship between behavior problems and mothers' rotating/irregular shifts. If parental closeness does help to explain these relationships, we would expect to see a decrease in the magnitude of the coefficients as parental closeness explains these relationships.

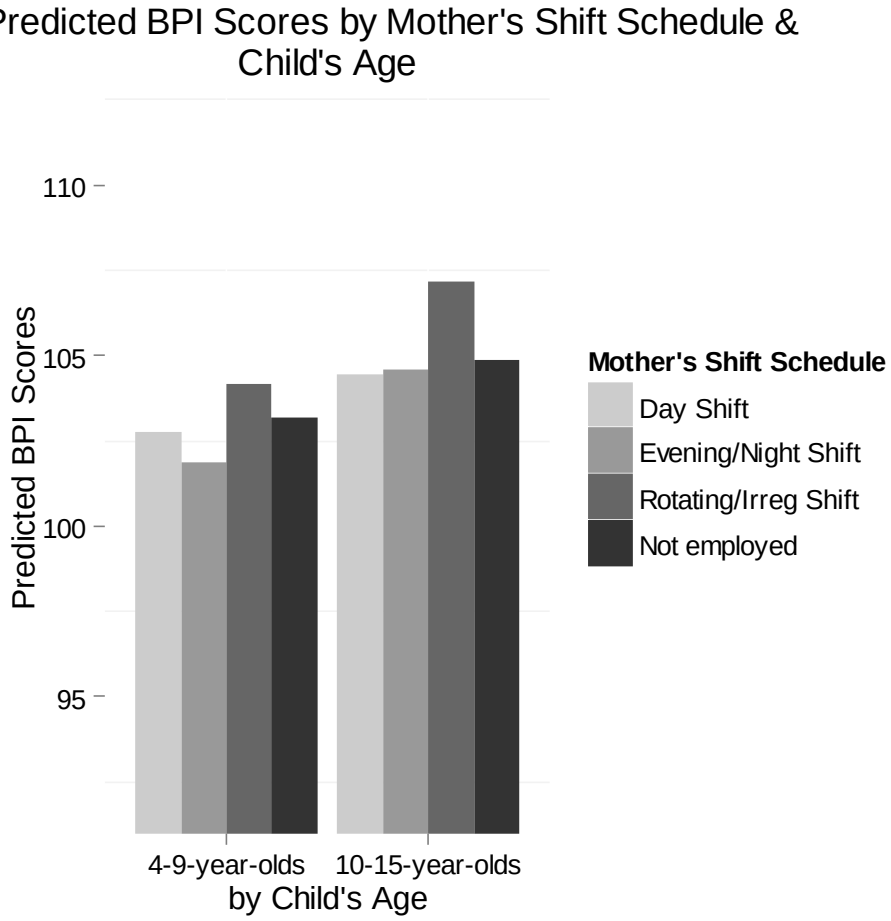
However, Model 2 in Table 4 shows that including father closeness does not have a strong impact on any of the relationships of interest. Indeed, there is little indication that these relationships are explained to any significant degree by father closeness. Thus, while father

closeness exhibits a strong effect on child behavioral outcomes, it does not explain to any appreciable extent the relationships between parental work schedules and child behavior.

Is a similar pattern evident for the role of mother's closeness? Model 3 includes a variable assessing mother closeness. Once again, the shift schedule coefficients remain, for the most part, unchanged. The mother's evening and night shift status does become marginally significant and negatively related to behavior problems for 4-9-year-olds. Additionally, the father's non-employment status becomes non-significant with the inclusion of mother closeness in this model. This could indicate that when fathers are not employed, mothers are closer to their children, thereby leading to improved behavioral outcomes and partially explaining the relationship between fathers' non-employment status and behavioral problems. The other shift schedules, however, do not seem to be affected by the inclusion of mother closeness in the model. The fact that these predicted BPI scores do not substantially change with the inclusion of father and mother closeness in models 2 and 3 respectively, indicates that these variables likely do not mediate the effects of nonstandard employment.

Figure 1 below illustrates this more clearly. In this figure, the predicted BPI scores produced by Model 2 in Table 4 are graphed for each of the mother's shift schedule arrangements for 4-9-year-old children and 10-15-year-old children. Though this model accounts for father closeness, the relationships between nonstandard schedules and child behavioral outcomes remain unchanged. Mothers' rotating and irregular schedules are still associated with higher levels of behavior problems among 10-15-year-old children, while mothers' evening and night shifts appear to be associated with fewer behavioral problems among 4-9-year-old children, though the difference is small and, in this model, not statistically significant.

Figure 1: Predicted BPI scores produced by Model 2 in Table 4 by the child's age and the mother's shift schedule



However, mothers may fear portraying themselves or their partners as bad parents if they answer that they or their partners are "not at all" or are "fairly close" with their children. Thus, the lack of explanatory power of these measures may be due, in part, to the perceived social desirability of certain answers and the resulting lack of variation in these scales. In order to address this potential limitation, Table 5 below makes use of the father and mother involvement indices for 10-15-year-old children, thereby providing an additional measure with which to assess the robustness of our results. Specifically, these measures allow us to determine whether the results for the mother-answered closeness questions hold for the child-answered parental involvement questions. Indeed, the conclusions for the father and mother closeness measures

largely hold when the father and mother involvement measures are added in models 2 and 3 in Table 5 below. In both cases, including the involvement measures does little to alter the effects of shift schedules on child behavioral outcomes. Therefore, parental closeness and involvement do not seem to explain or even greatly affect any of the relationships of interest and these results are robust to various specifications of parental involvement.

Table 5: Results from RE models for children aged 10-15 with the father in the household, NLSY79 and NLSY79-CS

	Model 1: 10-15-yo n=3,048	*Model 2: 10-15-yo n= 3,048*	*Model 3: 10-15-yo n= 3,048*
Parent Shift Schedules[a]			
Mother's Day Shift	Ref.	Ref.	Ref.
Mthr not employed	1.497	1.445	1.459
Mthr's EN Shift	0.135	-0.062	-0.080
Mthr's RI Shift	2.452***	2.340***	2.495***
Father's Day Shift	Ref.	Ref.	Ref.
Fthr not employed	-1.057	-0.962	-0.908
Fthr's EN Shift	0.051	-0.094	0.091
Fthr's RI Shift	-0.294	-0.294	-0.150
Control Variables			
Child female	-2.069***	-2.272***	-2.075***
Child White	Ref.	Ref.	Ref.
Child Hispanic	0.548	0.490	0.504
Child Black	0.731	0.522	0.610
Child Age	0.408***	0.396***	0.404***
Mther's Age	-0.333**	-0.348***	-0.350***
Mther's Ed.	-0.596***	-0.544**	-0.570**
Family income[b]	-0.394*	-0.382*	-0.375*
Mthr's Work Hours	0.023	0.024	0.013
Fthr's Work Hours	-0.031^	-0.026	-0.029^
Mthr not EFY[c]	-1.218^	-1.178^	-1.395*
Number of children	-0.662*	-0.682*	-0.702*
Year 2000	-1.600***	-1.598*	-1.622***
Parental Closeness			
Fthr involvement		-0.598***	
Mthr involvement			-0.582***
Constant	126.77***	134.22***	135.25***
F-statistic	8.61***	12.03***	10.07***

[a]EN = evening/night shift; RI = rotating/irregular shift
[b]Family income refers to logged total net family income
[c]EFY = employed full-year
^p < .1; *p < .05; **p < .01; ***p < .001

Up until this point, the variables for parental closeness and involvement have been discussed in terms of how their inclusion affects the coefficients of the other variables. However,

the effects of the variables themselves are also interesting. For children of all ages, parental closeness and involvement act in the expected directions, with an increase in parental closeness or involvement corresponding to statistically significant decreases in behavior problems. The results indicate that children who are very close to their fathers have BPI scores that are approximately 8.16 points lower than children who are not at all close to their fathers, representing a difference of more than one half of a standard deviation in BPI scores. Likewise, a 10-15-year-old whose father involvement index is one standard deviation (2.6 points) above the mean has a BPI score approximately 3.11 points lower than a child whose father involvement index is one standard deviation below the mean. These relationships hold for mother-child closeness and involvement as well, though there is much less variation in these measures. It is therefore not particularly meaningful to compare children who are "not at all close" with their mothers to children who are "extremely close" with their mothers, as only a handful of mothers attest that they do not have close relationships with their children. Nevertheless, mother-child closeness and involvement significantly influence the level of behavior problems exhibited by children and are therefore important to consider when examining the factors that affect behavior problems.

The Contextual Influence of Father Closeness on Child Behavior Problems

Contrary to expectations, parental closeness and involvement do not mediate any of the observed relationships between work schedules and behavioral outcomes. However, it was also hypothesized that children will not have worse outcomes and may even have improved behavioral outcomes (i.e. fewer behavior problems) when they have involved fathers who assume the parenting duties mothers cannot complete while they are employed in nonstandard schedules. It was also hypothesized that because mothers are already highly involved in their

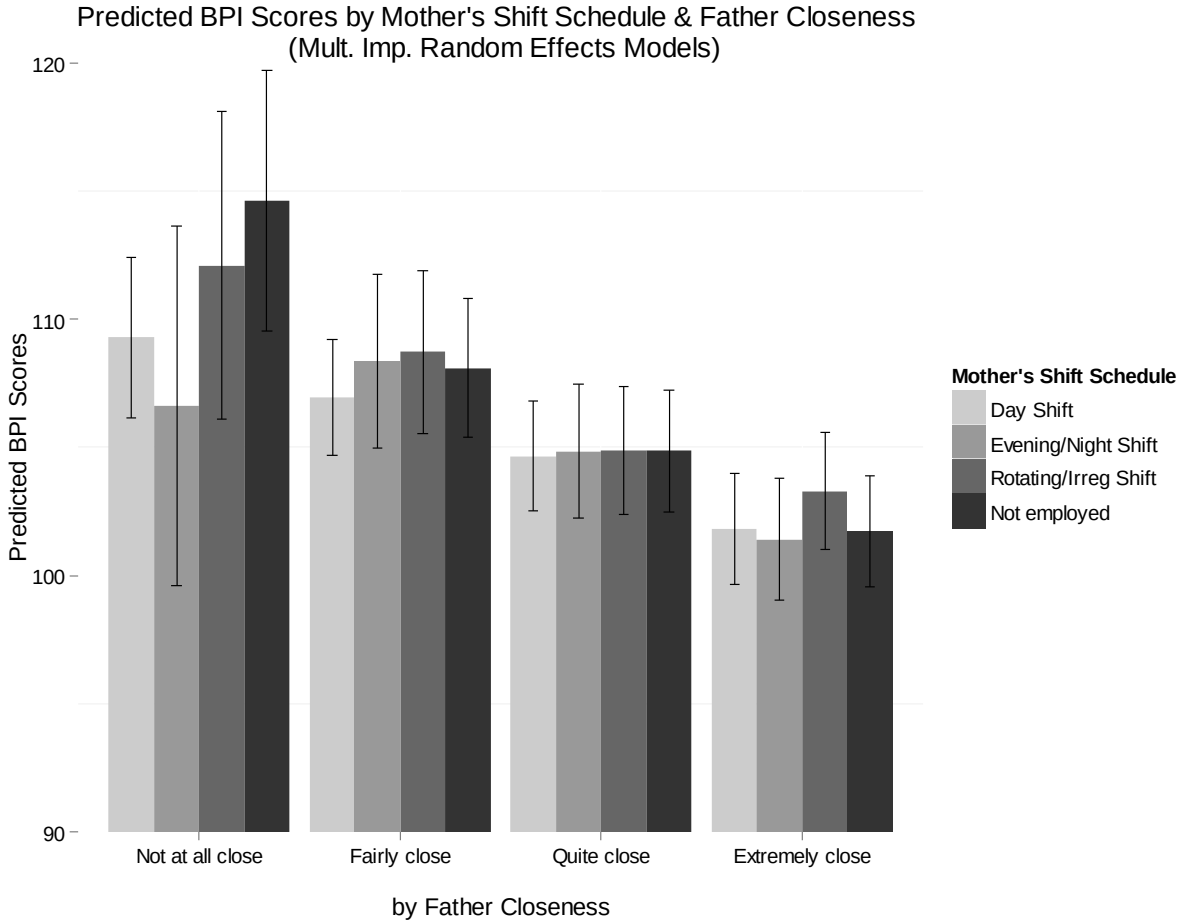
children's lives, their involvement may have less of an effect on the relationship between nonstandard work schedules and child outcomes. These hypotheses require subtly different tests because they do not hypothesize that fathers whose wives are employed in nonstandard schedules will be more involved in their child's lives. Rather, they hypothesize that mothers' nonstandard schedules will be associated with fewer behavior problems *when* fathers are involved with their children, thereby implying a conditional effect.

This hypothesis was assessed by estimating interactions between the mother's shift schedule arrangements and father closeness using random-effects models, controlling for the child's age (fixed effects models presented in Appendix E). These models are estimated using the multiple imputation datasets discussed above. Only the results for the mother's shift schedule interacted with father closeness are presented because fathers' shift schedules do not seem to exert strong effects on children's behavioral outcomes and the variability in the mother closeness scale is restricted considerably, since few mothers attest to being "not at all" or "fairly close" to their children. The results for these models are therefore not substantively interesting.

Additionally, this analysis differs from the above analyses in that it does not interact the child's age with the parents' work schedules. These models therefore jointly analyze children ages 4-15. This strategy was utilized since relatively few fathers answer that they are "not at all" or are "fairly close" with their children. As a result, the predicted behavioral problem scores for children who are "not at all" or are "fairly close" with their father are unrealistic for some shift schedules when these age groups are analyzed separately and these estimates are very sensitive to outliers. These age groups were therefore combined in order to enable more accurate comparisons across the parental closeness scores.

The predicted BPI scores for combinations of father closeness scores and mothers' shift schedule arrangements are presented in Figure 2. Comparing across categories of parent employment, we see that the results offer both support and challenges to the hypotheses mentioned above.

Figure 2: Mothers' shift schedules interacted with father closeness for all ages (4-15). Predicted probabilities from fixed-effects models, *Source: NLSY-79 and NLSY79-CS, 1994-2006.*



For a given level of father closeness, nonstandard schedules are not associated with worse child behavioral outcomes relative to day shifts. This finding supports the assertion that when fathers are close to their children, nonstandard schedules will not be associated with worse behavioral outcomes. Contrary to expectations, however, this conclusion holds at all levels of

father closeness, and is not solely observed for children who are quite or extremely close to their fathers.

Additionally, with the exception of the "not at all close" category, which is highly influenced by outliers, for all shift schedules, greater father-child closeness is associated with fewer behavior problems and these decreases are quite substantial for a given increase in father-child closeness. These results therefore demonstrate that, as expected, heightened father involvement corresponds to improved behavioral outcomes, and this relationship is consistent across employment statuses.

The findings from this analysis provide valuable insights into the relationships between parental closeness, nonstandard schedules, and child behavioral outcomes. For each shift schedule, an increase in the level of father-child closeness corresponds to a decrease in the level of predicted behavioral problems exhibited by children, indicating the importance of father closeness for children's behavioral development. Moreover, the results demonstrate that nonstandard schedules are not associated with worse outcomes for a given level of father closeness, indicating that father closeness plays an important contextual role in the relationship between nonstandard schedules and child behavior problems.

Discussion

These results paint a surprising, though not implausible picture. For older children, mothers' rotating and irregular shifts are significantly associated with more behavior problems. Fathers' nonstandard shift schedules and mothers' evening and night shifts, however, do not significantly influence children's behavioral outcomes. Given that much of the literature has focused on the negative influence of nonstandard schedules on child and family wellbeing, this latter finding is notable and important for families attempting to balance work and family.

The positive relationship between rotating and irregular shifts and child behavior problems is, however, consistent with the findings of previous research that nonstandard schedules are associated with worse child outcomes, though few studies specifically examine rotating and irregular shifts. One of the few studies that has examined rotating and irregular shifts, found that these shift schedules are associated with lower mother-child closeness and time (Han and Waldfogel 2007). Mothers employed in rotating and irregular shifts were also more likely to miss important events (Han and Waldfogel 2007). However, these findings only held for single mother families and only children ages 10-14 were examined. Other studies have found that women who are employed in rotating and irregular schedules are the least satisfied with their work-life balance relative to women employed in other types of schedules (Fagan 2001) and have a particularly difficult time arranging childcare (Presser 2003). While this study did not find that parental closeness or involvement explained this positive relationship, it could be that it is this stress or job dissatisfaction that corresponds with worse outcomes among children. Additionally, it is possible that mothers who are employed in rotating and irregular schedules are less able to monitor their children, a possibility that will be explored in more detail below.

For the most part, however, these findings depart from the findings in much of the literature on nonstandard shift schedules and child behavioral outcomes. This is not entirely surprising given the focus of this study. For one thing, this study is primarily interested in two-parent families. As such, it focuses on children who are more advantaged, on average, than children who come from single mother families. Moreover, compared to two-parent families, single-parent families are less likely to have a supportive partner available to care for children. This study is premised on the notion that parental nonstandard schedules will be associated with better behavioral outcomes when a supportive partner is available, this hypothesis is therefore

consistent with the notion that nonstandard schedules may be associated with worse behavioral outcomes in single-parent families. Indeed, previous studies have tended to find that nonstandard schedules are particularly harmful for children from single-mother and lower-income families (Han 2008; Li et al. 2014). This focus may therefore partially explain why this study found that nonstandard schedules largely do not correspond to worse behavioral outcomes, while other studies have come to the opposite conclusion.

Additionally, this study examined two age groups: 4-9-year-olds and 10-15-year-olds. Splitting the analysis in this way enabled insights that would not have occurred by combining the age groups. Specifically, the positive relationship between mothers' rotating and irregular shift schedules and between child behavior problems is less apparent when the two age groups are combined. The finding that rotating and irregular shifts are only associated with worse outcomes among older children also indicates that children may experience and respond to their parents' work schedules differently depending on their age and that families may have different reasons for working schedules when their children are younger or older. Few studies have analyzed 4-9-year-olds (Li et al. 2014) and no studies that I know of have analyzed different age groups within the same sample. Previous research has therefore been limited in its ability to determine whether the effects of parental shift schedules depend on the age of the child. It is therefore probable that the unique conclusions offered by this study are due to this study's focus on two-parent families and its attention to age effects.

Limitations

There are limitations associated with these findings. The level of missing information in the father and mother closeness and involvement measures is particularly concerning. While multiple imputation is a valuable tool, and does account for numerous measures that affect

parental involvement and closeness, it is not perfect. The fact that these results are consistent when different multiple imputation models are utilized and are largely consistent with models that use single imputation indicates that we can be confident that our results are reliable. Nevertheless, the disproportionate absence of parental involvement and closeness scores for children from less well-off families means that we must be particularly cautious in our interpretations of the results for these children.

It is also problematic that the father and mother closeness questions are answered solely by the mother. As mentioned in the data and research design section above, mothers may not have complete knowledge of their children's relationships with their father, even if the father is in the household. Additionally, few mothers answer that they are "not at all" or are "fairly close" to their children. While, for most mothers, this may indeed be true, it is also possible that these answers are influenced by social desirability, with mothers feeling that they may be perceived as "bad parents" if they do not attest to having close relationships with their children. Consequently, for both the mother and the father closeness measures it would be ideal to also have the father's perception of his and his partner's relationships with their children. Given this data limitation, the mother-answered questions are the best source of data the NLSY79-CS provides for assessing these relationships, and the parental involvement measures are utilized in order to provide the children's perception of their relationships with their parents, thereby offering a robustness check of the results for the parental closeness measures.

It may also be problematic that the behavioral problem index is composed entirely of mother-answered questions. Mothers may not have complete knowledge of their children's wrongdoings, and this incomplete knowledge may be unequally distributed. For example, working mothers, particularly those who work full-time and/or work more than one job, may be

less able to monitor their children's behavior throughout the day than mothers who are out of the labor force or who work part-time. Additionally, it is extremely rare for a mother to be present in her child's classroom, a setting in which children may exhibit additional behavior problems or may act more well-behaved than they would otherwise be at home. It is not entirely clear in which direction this incomplete knowledge would bias BPI scores, however, as some mothers may primarily witness good behaviors, while other mothers may primarily witness bad behaviors. In either case, it would be worthwhile to have the fathers' reports, as well as teachers' or school administrators' reports in order to gauge this measure's reliability.

Contributions and Future Research Directions

Despite its limitations, this study offers numerous insights into the effects of maternal and paternal employment on child behavioral outcomes. For one thing, the extent to which this relationship depends on the age of the child is unexplored terrain, and the finding that nonstandard schedules do have different effects for younger relative to older children is an important finding that indicates that we should be cautious in our interpretations of studies that jointly examine a wide range of ages. As mentioned above, this finding also demonstrates that children respond differently to parental employment depending on their age. These unique responses point to fruitful areas for future research and may help to elucidate the mechanisms through which parental employment influences child outcomes.

Likewise, this study found that it is important to separately examine different types of shift schedules, since different types of shift schedules uniquely influence child behavioral outcomes. Indeed, the finding that most nonstandard schedules are not associated with worse behavioral outcomes is very important, particularly for families attempting to balance work and the wellbeing of their children. For some families, these schedules may be important resources

that enable them to creatively balance work and life. For other families, these schedules may be imposed, presenting constraints that families must adapt to. The findings of this study indicate that these attempts are largely successful, yielding outcomes that are neither better nor worse than the behavioral outcomes exhibited by children whose parents work day shifts.

In contrast, the finding that rotating and irregular schedules are consistently associated with worse child outcomes indicates that rotating and irregular schedules pose unique constraints for individuals and families. They create unpredictability and disrupt schedules, childcare arrangements, and after-school activities, likely inducing stress as a result. Examining nonstandard schedules as a binary category masks these unique constraints, and it is only by identifying these constraints that the mechanisms behind the relationship between rotating and irregular schedules and child behavior problems can be illuminated.

This study also found that it is important to include mothers and fathers who are not employed in a given period. The majority of longitudinal studies that examine the relationship between nonstandard schedules and child behavioral outcomes look solely at parents who are continuously employed, but the exclusion of this group severely restricts the representativeness of the sample and limits the statistical power of the sample, since a considerable number of individuals and observation periods are excluded.

Finally, the finding that parental closeness and involvement largely do not explain the relationships between nonstandard schedules and child outcomes is important, and contradicts many conventional explanations of this relationship. Overall, this study found that mothers tend to be highly involved in their children's lives, with little room for variability in maternal closeness. The results also demonstrate that father closeness operates very similarly for all maternal employment statuses, and is consistently important for children's behavioral

development. Given the demonstrated importance of father closeness in children's lives, this finding makes sense (Barnett and Gareis 2007; Brayfield 1995; Harris et al. 1998; Marsiglio 1993).

The findings offered by this study point to many potential avenues for future research. It would be worthwhile to account for the occupations of both parents and their levels of job satisfaction. As mentioned in the data and research design section, in this sample, the most common occupations for individuals who work rotating or irregular shifts are cashiers, bookkeepers, health service workers, and managers. The most common occupations for individuals who work evening or night shifts in this sample include nurses, nurses' aides and orderlies, food service workers, cashiers, and building and grounds cleaners. These occupations are associated with different characteristics, including differences in income, in the ability to set one's own schedule, and in occupational prestige and educational requirements. Likewise, average levels of job satisfaction are likely different across these occupations and are probably somewhat dependent on the extent to which an individual chose their shift schedule or not. Accounting for these factors may help to explain some of the observed relationships.

Similarly, it may be the case that the exclusion of the mother's occupational status is masking important relationships between the mothers' evening and night shift schedules and behavioral outcomes. For example, it could be that evening and night shifts are associated with improved child behavioral outcomes for mothers who have a greater ability to set their own schedules—such as nurses, but is not apparent for mothers who rarely have this opportunity—such as janitors. Indeed, preliminary analyses (not shown) indicate that the negative relationship between mothers' evening and night schedules and child behavior problems is observed for mothers who are employed in sales, services, and professional occupations, and this relationship

is significant when these occupations are analyzed together. However, evening and night shifts are associated with significantly more behavioral problems when mothers are employed in manual occupations, as bus drivers, parking attendants, factory workers, or gardeners, for example.

Another unexplored, but potentially important avenue in this paper is the role of relative care. It is a common practice for parents who work nonstandard schedules to rely on relatives to help with caregiving (Presser 2003a). It could be that these relationships correspond to better behavioral outcomes because of the emotional benefits they offer and/or because of the increase in monitoring capabilities provided by multiple adults. Indeed, Baydar and Brooks-Gunn (1991) found that grandmother care was associated with better cognitive and behavioral outcomes for preschoolers in poverty relative to other childcare arrangements.

It would also be worthwhile to examine the role of parental monitoring and its potential ability to explain some of the relationships between nonstandard schedules and child behavioral outcomes. Even if parents who work nonstandard schedules are not more involved with their children, their presence in the household may be enough to forestall negative behavioral outcomes. For example, even if parents are asleep while their children are awake, as may likely be the case if the parent works an evening or a night shift, they may still be available if the child needs help. Some studies have also found that fathers are more likely to know where their children are if they or their wives work nonstandard schedules (Barnett and Gareis 2007) and mothers who work the night shift are more likely than mothers employed in other types of shifts to be at home during the "at-risk" timeframe of 3pm to 6pm (Han and Waldfogel 2007; Wight et al. 2008). Thus, even if parents are not necessarily closer to their children, they may be better able to keep track of their children's activities and friends. If this is the case, evening and night

shifts may not correspond to worse behavioral outcomes, in part, because of increases in parental monitoring.

The positive relationship between mothers' rotating and irregular shift schedules and behavior problems could also be due to monitoring. Perhaps mothers whose hours consistently fluctuate are less able to keep track of their children's friends and activities, thereby making consistent monitoring difficult. Rotating and irregular schedules may also be associated with lower worker control and less job satisfaction. Indeed, Henly and Lambert (2005) found that parents whose schedules changed relatively frequently had difficulties arranging childcare when their schedules changed and felt stressed and not in control as a result. These feelings could easily reverberate onto family life, both because of parents' decreased mental health and because of the instability of childcare arrangements and/or monitoring capabilities. Numerous factors could explain these relationships, beyond the ones mentioned briefly above, and these factors are worth further exploration in subsequent studies.

Conclusion

This study set out to examine four questions: do parental nonstandard schedules harm children's behavioral adjustment? Do these effects depend on the age of the child? Do these effects differ by the type of shift schedule? And to what extent do parental involvement and closeness influence these relationships? Contrary to expectations, parental nonstandard schedules are not, for the most part, associated with worse behavioral outcomes. Mothers' rotating and irregular shift schedules are a cause for concern, however, particularly for older children. The differences in these influences by the child's age indicate that the effects of mothers' shift schedules do depend on age, though the effects of fathers' nonstandard schedules and mothers' evening and night shifts are largely consistent across age groups. Likewise, the results outlined

above demonstrate that accounting for the type of shift schedule matters when assessing the relationship between nonstandard schedules and child behavioral outcomes. As for the final question, though father and mother closeness and involvement do not seem to explain any of the observed relationships, the consistently important role of father closeness is an important finding. Thus, the hypotheses set forth at the beginning of the analysis are partially borne out.

For many families, nonstandard schedules may offer much-needed flexibility, even if these schedules also come with strains in health, scheduling, and even marital relationships. For example, nonstandard schedules may allow parents to off-set their schedules and tag-team parent, they may allow parents to save money on childcare costs or encourage fathers to take on more parenting duties and thereby enhance feelings of parental effectiveness. Children may have closer relationships with extended family if these kin provide babysitting or childcare in place of childcare centers. These arrangements may allow parents to feel as though they are stay-at-home parents and therefore more involved in their children's lives. The 24/7 economy does have drawbacks, drawbacks that much of the literature on nonstandard schedules has convincingly outlined, but just as 24/7 service offers customers greater flexibility, so too might it give families more flexibility, in some cases, enhancing the wellbeing of their children as a result.

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Appendix A

Table 6 Composition of Behavior Problem Index (BPI) with accompanying means, standard deviations, and ranges for each subcategory of the BPI

Behavioral problem questions comprising each subscale	*Name of subscale*	*Mean*	*SD*	*Range*
Cheats or tells lies	Antisocial (E)[a]			
Bullies or is cruel/mean to other	Antisocial (E)			
Does not seem to feel sorry after misbehaving	Antisocial			
Breaks things deliberately (<12 years old)	Antisocial (E)			
Is disobedient at school	Antisocial (E)			
Has trouble getting along with teachers	Antisocial (E)			
Total Score	Antisocial	103.53[b]	13.27	88-146
Has sudden changes in mood or feelings	Anxious/depressed (E)			
Feels/complains no one loves him/her	Anxious/depressed (I)			
Is too fearful or anxious	Anxious/depressed (E/I)			
Feels worthless or inferior	Anxious/depressed (I)			
Is unhappy, sad, or depressed	Anxious/depressed (E/I)			
Total Score		101.44	12.73	86-142
Clings to adults	Dependent (I)			
Cries too much	Dependent (I)			
Demands a lot of attention	Dependent (I)			
Is too dependent on others	Dependent (I)			
Total Score		103.30	13.14	87-135
Is rather high strung, tense, and nervous	Headstrong (E)			
Argues too much	Headstrong (E)			
Is disobedient at home	Headstrong (E)			
Is stubborn, sullen, or irritable	Headstrong (E)			
Has strong temper and loses it easily	Headstrong (E)			
Total Score		101.70	13.02	82-127
Has difficulty concentrating/paying attention	Hyperactive (I)			
Is easily confused, seems in a fog	Hyperactive (E/I)			
Is impulsive or acts without thinking	Hyperactive (E)			
Has trouble getting mind off certain thoughts	Hyperactive (E)			
Is restless, overly active, cannot sit still	Hyperactive (E)			
Total Score		101.93	13.41	85-139
Has trouble getting along with other children	Peer problems (E)			
Is not liked by other children	Peer problems (E)			
Is withdrawn, does not get involved with others	Peer problems (I)			

Total Score		103.34	11.86	96-145
BPI externalizing score		101.07	13.90	83-173
BPI internalizing score		100.76	14.09	86-188
Total BPI score		102.71	14.34	72-149

Notes: [a]E refers to an externalizing behavior, I refers to an internalizing behavior
[b]Means and standard deviations are only available for subscales and for entire scale, not for individual component questions

Appendix B

Table 7 Composition of Father and Mother Involvement Indices from child-answered questions with accompanying means, standard deviations, and ranges

Question:	Mother Mean (SD)	Father Mean (SD)	Range
How often does your (mother/father) listen to your side of an argument?	2.27 (.72)	2.13 (.76)	1-3
How well do you and your (mother/father) share ideas or talk about things that really matter?	2.73 (.55)	2.56 (.74)	1-3
Please think about the time you spend with your (mother/father). Do you think your (mother/father) spends enough time with you?	.78 (.42)	.58 (.49)	0-1
About how often does each parent miss the events or activities that are important to you? *Reverse coded*	2.60 (.60)	2.28 (.74)	1-3
How close do you feel to your (mother/father)?	2.90 (.35)	2.75 (.56)	1-3
How often does your (mother/father) talk about important decisions with you?	2.36 (.69)	2.07 (.76)	1-3

Appendix C

Table 8: Results from FE models for children aged 4-15 with the father in the household, NLSY79 and NLSY79-CS

	Model 1: n=3,781	*Model 2: n=3,781*	*Model 3: n= 3,781*	*Model 4: n= 3,781*	*Model 4: n= 3,781*
Parent Shift Schedules[a]					
Mother's Day Shift	Ref.	Ref.	Ref.	Ref.	Ref.
Mthr not employed	0.526	0.617	0.489	0.253	0.316
Mthr's EN Shift	-0.505	-0.178	-0.521	-0.533	-0.539
Mthr's RI Shift	1.529**	1.965**	1.919**	1.952**	1.899**
Father's Day Shift	Ref.	Ref.	Ref.	Ref.	Ref.
Fthr not employed	-2.608**	-2.149*	-2.609**	-2.504**	-2.527**
Fthr's EN Shift	-0.808	-0.804	-0.818	-0.805	-0.873
Fthr's RI Shift	-0.438	-0.619	-0.435	-0.501	-0.502
Control Variables					
Family income[b]	-0.772**	-0.774**	-0.778**	-0.780**	0.772**
Mthr's Work Hours	0.005	0.004	0.004	0.000	0.002
Fthr's Work Hours	0.005	0.005	0.004	0.006	0.005
Mthr not EFY[c]	-1.299*	-1.265*	-1.296*	-1.186^	-1.255*
Year 2000	-1.669***	-1.696***	-1.681***	-1.684***	-1.665***
Age Interactions[a]					
Age 4-9	-1.211***	-0.795^	-1.045**	-0.719*	-0.881*
Age 4-9*NE		-0.457			
Age 4-9*EN		-0.961			
Age 4-9*RI		-1.719^	-1.533^	-1.499^	-1.528^
Age 4-9*NE		-1.975			
Age 4-9*FathEN		-0.072			
Age 4-9*FathRI		0.633			
Parental Closeness					
Fthr closeness				-1.771***	
Mthr closeness					-1.445***
Constant	111.73***	111.66***	111.81***	118.07***	117.12***
F-statistic	6.09***	4.38***	5.78***	7.97***	6.65***

Table 9: Results from FE models for children aged 10-15 with the father in the household, NLSY79 and NLSY79-CS

	Model 1: 10-15-yo n=3,095	*Model 2: 10-15-yo n= 3,095*	*Model 3: 10-15-yo n= 3,095*
Parent Shift Schedules[a]			
Mother's Day Shift	Ref.	Ref.	Ref.
Mthr not employed	1.437	1.493	1.451
Mthr's EN Shift	-1.741	-1.718	-1.807
Mthr's RI Shift	1.565*	1.514*	1.592*
Father's Day Shift	Ref.	Ref.	Ref.
Fthr not employed	-2.650*	-2.522^	-2.521*
Fther's EN Shift	-0.971	-1.053	-0.927
Fthr's RI Shift	-0.800	-0.808	-0.710
Control Variables			
Family income[b]	-0.914*	-0.883*	-0.885*
Mthr's Work Hours	0.030	0.032	0.026
Fthr's Work Hours	-0.003	-0.000	-0.002
Mthr not EFY[c]	-2.086**	-2.044**	-2.161**
Number of children	-0.477	-0.463	-0.500
Year 2000	-1.315***	-1.323***	-1.331***
Parental Closeness			
Fthr involvement		-0.273**	
Mthr involvement			-0.257*
Constant	114.31***	117.66***	117.63***
F-statistic	3.97***	4.67***	4.01***

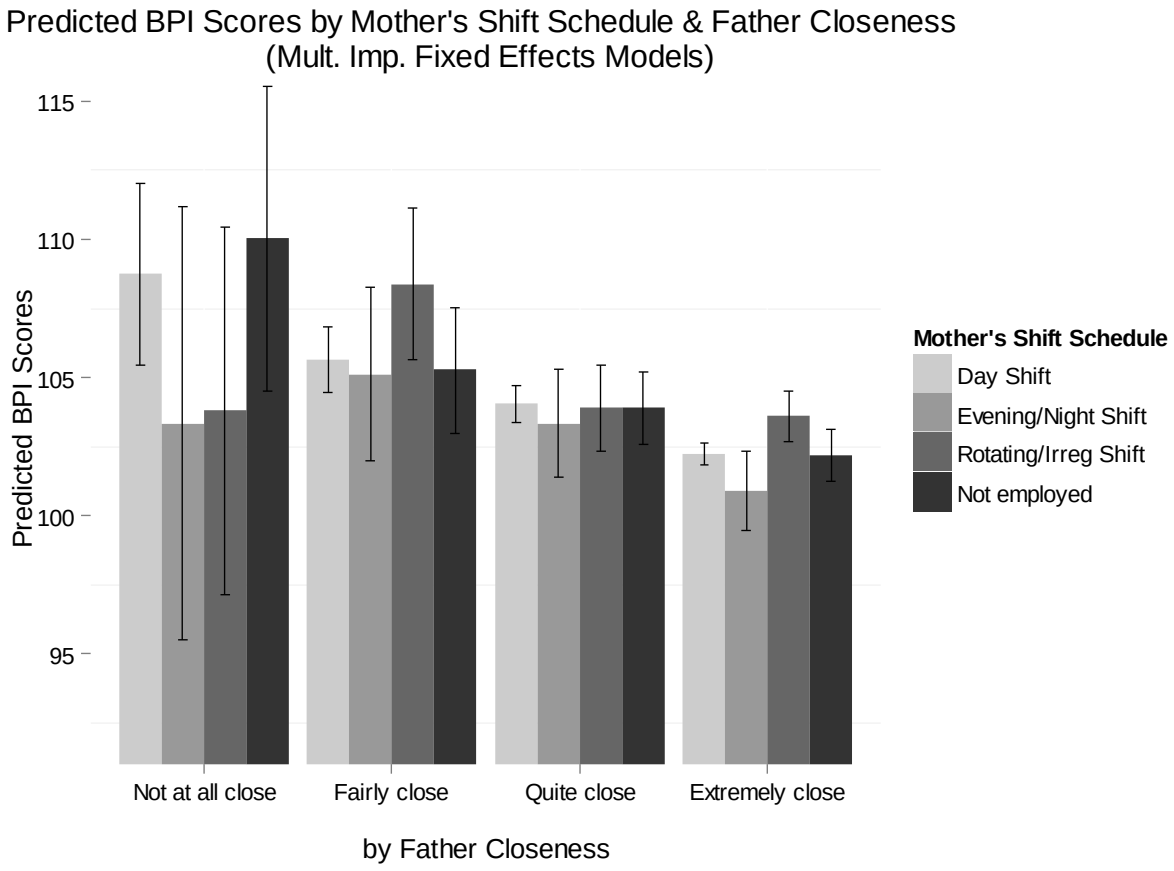
Appendix D

Table 10 Odds ratios obtained from logit estimates indicating whether covariates are significantly associated with not answering father and mother closeness and involvement questions for each age group

	No father closeness 4-15-yo n= 4,028	*No moth. closeness 4-15-yo n= 4,028*	*No father involve. 10-15-yo n= 3,095*	*No moth. involve. 10-15-yo n= 3,095*
Control Variables	OR	OR	OR	OR
BPI score	1.008	0.996	1.002	0.998
Mother Day Shift	Ref.	Ref.	Ref.	Ref.
Mother not employed	0.989	0.946	1.015	0.803
Mother's EN Shift[a]	0.444^	1.211	0.927	0.917
Mother's RI Shift	1.555^	0.937	1.046	0.978
Father Day Shift	Ref.	Ref.	Ref.	Ref
Father not employed	2.015**	1.149	1.174	0.878
Father's EN Shift	0.433*	0.808	0.900	1.124
Father's RI Shift	0.783	1.116	0.937	0.975
Child female	1.089	0.940	0.893^	0.933
Child White	Ref.	Ref.	Ref.	Ref.
Child Hispanic	2.243***	1.608**	1.061	1.105
Child Black	2.734***	2.070***	1.334**	1.255^
Child Age	1.080**	0.973^	0.486***	0.670***
Mother's Age	0.934**	1.123***	1.008	1.061***
Mother's Ed	0.815***	0.780***	0.963*	0.935**
Family income[b]	0.986	0.969	0.955	0.991
Mom's Work Hours	1.000	1.011*	0.999	0.999
Dad's Work Hours	0.991	1.001	1.001	0.998
Mother not EFY[c]	1.333	1.310^	0.983	1.135
Number of children	0.918	1.221***	0.990	1.357***
Year 2000	0.603^	2.981***	0.570***	0.895

[a]EN = evening/night shift; RI = rotating/irregular shift
[b]Family income refers to logged total net family income
[c]EFY = employed full-year
^p < .1; *p < .05; **p < .01; ***p < .001

Appendix E


Predicted BPI Scores by Mother's Shift Schedule & Father Closeness
(Mult. Imp. Fixed Effects Models)
Predicted BPI Scores
115
110
105
100
95
Not at all close
Fairly close
Quite close
Extremely close
by Father Closeness
Mother's Shift Schedule
Day Shift
Evening/Night Shift
Rotating/Irreg Shift
Not employed