

Parental Non-standard Work Schedules and Child
Behavioral Outcomes:
The Salience of Mother and Father Involvement and Closeness

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Introduction

In the last couple of 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. 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. 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.”

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 exceedingly 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; rather, businesses often utilize nonstandard hours in order to maintain profits and competitiveness (Beers 2000; Hosking and Western 2008; Kalleberg 2000; Perry-Jenkins 2005; Presser 2003a; Presser 2003b). Indeed, the most common reasons for working a nonstandard

schedule are that the individual had no other choice or that it was “the nature of [their] job” (Beers 2000; McMenemy 2007; Presser 2003a).

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 Americans, young workers, those with young children, and those with lower incomes (Beers 2000; McMenemy 2007; 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.

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 familial 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, 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 either 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 child's life had significantly lower scores in terms of various developmental outcomes such as expressive language skills, motor skills, sensory perception, learning, and memory (Han 2005). Likewise, in a review of 23 studies examining nonstandard schedules and child outcomes, 21 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 parents 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 parents (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. Nonstandard schedules may also enable families to save money on childcare costs by allowing them to utilize 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.

This article aims to address these dynamics 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 at various ages, and whether parental involvement and closeness influences this relationship. In doing so, this study attempts to improve on previous research in two ways: by modeling explicitly the relationships among nonstandard work, parental involvement and child outcomes and by accounting for whether these effects and relationships persist or change throughout childhood and early adolescence. 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 upon which this analysis is based and the research that informs these hypotheses. I then create nested models in which specifications of mother and father closeness and involvement are individually included in order to examine each specification's influence on the relationships between nonstandard schedules and child behavioral outcomes. Lastly, I examine how predicted behavioral problem scores differ for children whose parents work each type of nonstandard schedule at each ranking of parental closeness. Overall, these 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 mediate these relationships, though children whose parents work evening or night shifts and who are very close to their parents tend to exhibit the fewest behavior problems.

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 home at key times during the day—such as 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; 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 analyses that follow, I hypothesize that once father involvement is controlled for, the relationship between parents' nonstandard schedules and behavior problems will diminish and may even become negative. I expect that involved fathers will be more likely to perform the responsibilities that mothers cannot complete when their wives 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. 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 controlling for maternal involvement makes little difference with regards to the impact of parental nonstandard schedules on behavior 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 may be problematic for analyzing the effects of nonstandard employment on child behavior because parents may choose to work nonstandard schedules only when their children are young, or may find evening or night shift employment unsustainable given the physical, emotional, and practical demands these schedules require. Nonstandard schedules also tend to be concentrated in professions with low worker control and relative instability (Kalleberg 2000; Presser 2003). Because workers tend to cycle in and out of nonstandard schedules, and because very little is known about the durable effects of exposure to a parent's nonstandard hours, this analysis follows children aged 4-15 for the years 1994-2006. It is therefore able to examine the effects of nonstandard schedules on child and adolescent outcomes and whether these effects persist or change as children age and parents move in and out of nonstandard employment.

I also expect the impact of nonstandard schedules and the impact of parental involvement on nonstandard schedules and child behavioral outcomes to vary depending on the age of the child. For example, tag-team parenting may be a more prevalent strategy for families with young children. In this case, children may exhibit fewer behavioral 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. Consequently, older children may be more likely to be exposed to nonstandard schedules for negative reasons—such as the parent having no other choice. On the other hand, 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 mentally strained 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 as well 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 analysis.

In order to assess whether parental nonstandard schedules exert differential effects at different stages in the child's life, the overall sample is broken into a sample of 4-9-year-olds and a sample of 10-15-year-olds. The younger sample consists of 6,446 children from 3,344 families. The older sample consists of 7,246 individuals from 3,455 families. These results can be compared to the full sample consisting of 8,492 individuals comprising 3,729 families. Thus, for the most part, the same individuals contribute to both samples, explaining why the total sample is not a summation of the younger and older sample sizes, and the different samples capture the unique life cycle characteristics of elementary school-age children on the one hand and pre-teens and teenagers on the other. Preliminary analysis using a Chow test reveals that separating the two

age groups is appropriate because model effects on child behavior are systematically different by age group ($F= 1.73, p < .05$).

The 10-15-year-old sample was further restricted to 4,043 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, these families will not have a father figure available, thereby limiting the analysis 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. For 10-15 year olds, 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 ($F: 3.06, p < 0.001$). The Chow test for the 4-9-year-olds was non-significant, indicating that the model effects were not significantly different for children with fathers in the household to merit limiting this sample ($F = 1.47, p = .096$), though subsequent analyses suggested that this was largely a function of the small sample of young children without fathers in the household and with information on the relevant covariates ($n=287$). Thus, this study is based on two primary analytic samples: a pooled 4-9-year-old sample and a 10-15-year-old sample restricted to children whose father are in the household.

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 situations the temporal rhythms of the family are disrupted, 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, 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 two forms: by 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. Typically, 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, often around a fairly stable average timeframe. 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 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. These questions are asked separately about the mother and the father and assess the closeness of the mother-child and father-child relationship, the extent to which the parent and child share ideas, the extent to which the parent listens to the child, how often the parent attends important events, how often the parent and child discuss important issues, and whether the child is satisfied with the time he or she spends with his or her parent (for details, see Appendix B). The answers to these questions are utilized to construct an index in which higher values indicate a better mother or father-child relationship.

However, children may not always be reliable reporters concerning their relationship with their parents and this index is restricted to children aged 10 and over. 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.¹

Control variables will be included for the mother's and child's age, the child's gender and race, 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 the father is in the household (for the pooled 4-9-year-old sample), 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. This latter variable is important to include because, in this sample, an average of one-fourth to one-third of mothers are out of the labor force in a given 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.

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

¹ 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.

that time-invariant characteristics, such as race, gender, and parental education, can be included in the models. Random effects models also allow for single imputation of missing values.

Because questions concerning father and mother closeness and involvement are not answered by all families in all years, the sample sizes of the models that do not include these variables are much larger than the sample sizes of the models that do include these variables. It is not entirely clear why these variables are missing, since many individuals have valid scores for one measure of parental closeness and/or involvement and missing values for others. However, these missing values do not seem to be randomly distributed. Families who answer questions concerning parent-child relationships tend to have older mothers, fewer children, higher levels of education, are less likely to be Hispanic, and, in the case of father involvement questions, have significantly less income (these results are presented in Appendix C). The sample of families who do answer these questions is therefore somewhat more advantaged than average.

In order to enable comparisons across models, single imputation is utilized, with missing values replaced by the mean values of the mother and father closeness and involvement measures. A dummy variable representing whether the person's data was imputed is utilized in order to control for unobserved characteristics that are associated with not answering these questions. While this method reduces overall variability, it does allow all cases to be included in the models and, perhaps most importantly, it allows the models to be compared across specifications of parental involvement. Additionally, the results from analyses including imputed missing values do not differ substantively from the results that are found using models that include only the families who gave valid responses to parental involvement and closeness questions. Likewise, the estimate patterns are similar for random effects and fixed effects models

that do and do not utilize single imputation. The multivariate results reported below are therefore robust to various model and variable specifications.

Results

Descriptive statistics averaged across all years for children aged 4-9 and aged 10-15 for children with fathers in the household are presented in Table 1. The samples of 4-9-year-old children and 10-15-year-old children with the father in the household parallel one another rather closely, though the younger group is somewhat more disadvantaged, claiming a lower total net family income, a higher proportion of minorities, higher average maternal work hours, and more parents employed in nonstandard shifts, particularly rotating or irregular shifts. This is to be expected given that this sample includes children without fathers in the household.

Table 1: Means and standard deviations for outcome and explanatory variables for children aged 4-9 and for children aged 10-15 with the father in the household, NLSY79 and NLSY79-CS (unweighted data)

<i>Outcome Variable</i>	<i>Children aged 4-9</i>		<i>Children aged 10-15: Father in household</i>	
	Mean	SD	Mean	SD
Behavioral Problem Index (BPI)	103.025	15.019	103.917	14.096
<i>Mother's Work Schedule</i>				
Cumulative maternal NS Shift	.740	1.221	.919	1.390
Cumulative maternal day Shift	1.633	1.556	1.893	1.607
Day Shift	.738	.440	.776	.417
Evening Shift	.071	.256	.048	.215
Night Shift	.036	.187	.033	.178
Rotating/Irregular shift	.155	.362	.143	.350
<i>Father's Work Schedule</i>				
Day Shift	.774	.473	.775	.417
Evening Shift	.039	.193	.038	.191
Night Shift	.043	.202	.045	.208
Rotating/Irregular shift	.149	.356	.137	.344
<i>Characteristics</i>				
Race (% of sample)				
Hispanic	.211	.408	.220	.414
Non-Hispanic Black	.272	.445	.185	.389
Non-Hispanic White	.517	.500	.595	.491
Child female (% of sample)	.492	.500	.489	.500
Child's Age	7.089	1.420	12.137	1.600
Mother's Age	34.453	4.676	37.192	4.466
P (father in the household)	.672	.469	1	1
# of children	2.592	1.185	2.707	1.137

Mother's Work Hours	34.292	12.398	33.948	12.431
Total net family income	52,137.20	82,011.68	66,151.25	82,418.58
% mother's out of the labor force	.331	.471	.268	.443
<i>Parental Involvement</i>				
Father Closeness	3.420	.893	3.493	.728
Mother Closeness	3.788	.486	3.710	.534
Father Involvement	n/a	n/a	12.11	2.616
Mother Involvement	n/a	n/a	13.56	2.004

Table 2 compares the mean BPI scores of children whose mothers and fathers work standard (day) and nonstandard (evening/night or rotating/irregular) schedules. To reiterate, higher values of the BPI indicate *more* behavior problems and therefore *worse* behavioral outcomes. Consistent with much of the literature, older children and adolescents whose parents work nonstandard schedules do exhibit significantly higher mean BPI scores relative to children whose parents work day shifts, this is particularly the case for children whose mothers work nonstandard schedules. However, with the exception of the father's evening and night shift status, this relationship does not hold for younger children. Rather, mean BPI scores are fairly consistent across maternal and paternal employment groups.

Table 2: T-test comparisons of BPI scores between parents who work nonstandard schedules and parents who work day shift schedules

	<i>Model 1:</i> 4-9-yo	<i>Model 2:</i> 10-15-yo
<i>Parent Shift Schedules^a</i>		
Mother's Day Shift (ref)	102.76	103.56
Mother's EN Shift	102.76	106.02***
Mother's RI Shift	102.95	105.07**
Father's Day Shift (ref)	101.28	103.45
Father's EN Shift	103.22***	105.19**
Father's RI Shift	101.66	103.94

^ap < .1; *p < .05; **p < .01; ***p < .001

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 and the probability of working a nonstandard schedule. 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 3 presents the findings from the random effects models, with the findings for the 4-9-year-old and the 10-15-year-old samples presented in Models 1-3 and 4-8 respectively. Standard errors are clustered around the mother's ID in order to account for the presence of siblings in the model.

Table 3: Results from RE models for children aged 4-9 and for children aged 10-15 with the father in the household, NLSY79 and NLSY79-CS

	<i>Model 1:</i> 4-9-yo n=1,872	<i>Model 2:</i> 4-9-yo n= 1,872	<i>Model 3:</i> 4-9-yo n= 1,872	<i>Model 4:</i> 10-15-yo n=1,872	<i>Model 5:</i> 10-15-yo n= 2,043	<i>Model 6:</i> 10-15-yo n= 2,043	<i>Model 7:</i> 10-15-yo n= 2,043	<i>Model 8:</i> 10-15-yo n= 2,043
<i>Parent Shift Schedules^a</i>								
Mother's EN Shift	-1.882 [^]	-1.857 [^]	-1.847 [^]	-0.431	-0.587	-0.471	-0.565	-0.533
Mother's RI Shift	1.009	1.102	1.070	1.386 [^]	1.309 [^]	1.270 [^]	1.310 [^]	1.421*
Father's EN Shift	-0.182	-0.305	-0.251	0.594	0.547	0.546	0.446	0.623
Father's RI Shift	-0.054	-0.003	-0.123	-0.372	-0.399	-0.516	-0.427	-0.316
<i>Control Variables</i>								
Child female	-2.185***	-2.184***	-2.181**	-1.787**	-1.889***	-1.818**	-2.015***	-1.790**
Child Hispanic	-0.479	-0.541	-0.490	0.457	0.292	0.344	0.420	0.426
Child Black	-.006	0.072	0.036	1.266	1.396	1.315	1.192	1.206
Child Age	0.582***	0.752**	0.528**	0.445**	0.230 [^]	0.354**	0.460***	0.434***
Mother's Age	-0.134	-0.137	-0.133	-0.332**	-0.343***	-0.330***	-0.335***	-0.334***
Father in household	-1.024	0.283	-1.009	n/a	n/a	n/a	n/a	n/a
Mother's Ed.	-.559***	-.534***	-0.550***	-0.505***	-0.453**	-0.501**	-0.470**	-0.500**
Family income ^b	-0.931*	-0.884*	-0.927*	-1.479**	-1.420**	-1.449**	-1.481***	-1.468**
Mom's Work Hours	0.010	0.010	0.010	0.000	0.004	-0.005	0.001	-0.004
Dad's Work Hours	-0.016	-0.015	-0.016	-0.009	-0.005	-0.005	-0.006	-0.009
Mother OLF ^c	-0.791	-0.678	-0.664	-1.757*	-1.263	-1.516 [^]	-1.646*	-1.784*
Number of children Year 2000	-0.868*	-0.951*	-0.926*	-0.260	-0.375	-0.293	-0.256	-0.266
	-1.706**	-1.783**	-1.764**	-1.149*	-1.145*	-1.112*	-1.178*	-1.192**
<i>Parental Closeness</i>								
Father closeness		-2.281***			-3.037***			
Missing		0.047			0.492			
Mother closeness			-2.3274**			-3.433***		
Missing			-0.567			-0.724		
Father involvement							-0.625***	
Missing							0.163	
Mother involvement								-0.580***
Missing								-0.030

^aEN = evening/night shift; RI = rotating/irregular shift

^bFamily income refers to logged total net family income

^cOLF = out of labor force

[^]p < .1; *p < .05; **p < .01; ***p < .001

Model 1: F: 91.21, p < .001, R² = .0473; Model 2: F: 105.76, p < .001, R² = .0635; Model 3: F: 94.56, p < .001, R² = .0555; Model 4: F: 90.56, p < .001, R² = .0588; Model 5: F: 175.41, p < .001, R² = .1031; Model 6: F: 133.69, p < .001, R² = .0814; Model 7: F: 126.10, p < .001, R² = .0807; Model 8: F: 102.76, p < .001, R² = .0663

The findings in Model 1 for children aged 4-9 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. In fact, mothers' evening and night shift schedules are actually associated with lower Behavioral Problem scores. For children aged 4-9, having a mother who is employed in an evening or night shift is associated with a marginally significant decrease in one's BPI of 1.882 points. As can be seen in Models 1 and 4, the negative relationship between maternal evening/night shift status and behavior problems holds for both younger and older children, though the relationship is not significant for older children.

On the other hand, mothers' rotating and irregular shift status is marginally associated with more behavior problems among children, and this relationship is statistically significant for older children, with behavior problems increasing by 1.386 points in response to a mother's rotating or irregular shift. The fathers' nonstandard shift schedules are non-significant for both groups, however. Thus, with the exception of mothers' rotating and irregular schedules, parental nonstandard schedules may not necessarily be as harmful for children's behavioral adjustment as much of the literature has portrayed. Mothers' evening and night shifts may even be associated with improved behavioral outcomes.

These results may be due, in part, to the effect of mother and father closeness and involvement, as discussed above. For example, the negative relationship between mothers' evening and night shift status and behavior problems may be due to the use of tag team parenting, which could increase the closeness between the child and both parents, particularly with their fathers. Given that tag team parenting is likely a more common strategy for families

with young children, this could explain why this coefficient is significant for young children, while it is non-significant for older children. It may also explain why, net of other factors, young children of mothers working an evening or night shift have better behavioral outcomes than young children of dual-earner parents who both work day shifts, whereas the latter do not differ significantly from children whose mothers are not in the labor force. Compared to children with mothers who work the evening or night shift, neither of these latter groups is likely to be exposed to tag-team parenting.

On the other hand, rotating and irregular schedules 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 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, Table 2 shows that including father closeness does not have a strong impact on any of the relationships of interest, though the models including father closeness do have the best model fit. The only estimate particularly affected by the inclusion of father closeness is the variable indicating if the father is in the household, whose effect decreases dramatically in magnitude when this variable is added to the model. 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 for children aged 4-9 and model 6 for children aged 10-15 each include a variable assessing mother closeness.

Once again, the shift schedule coefficients remain virtually unchanged. These conclusions hold for the addition of the father and mother involvement measures in models 7 and 8, though the inclusion of the mother involvement index does result in a stronger positive effect of the mother's rotating and irregular work schedules on behavioral problems. Therefore, parental closeness and involvement do not seem to explain or even greatly affect any of the relationships of interest. However, as occurred with the inclusion of father closeness, the inclusion of mother closeness and parental involvement do improve the fit of the model, with models including father closeness exhibiting the best model fit, models not including parental involvement or closeness measures exhibiting the worst fit, and with the models including the other parental closeness and involvement measures falling in between.

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. These decreases are fairly sizeable, even with the use of single imputation which tends to reduce the magnitude and significance of the observed relationships (Osborne 2012). The results indicate that young children who are very close to their fathers have BPI scores that are approximately 6.85 points lower than children who are not at all close to their fathers. For older children, the difference is even greater, with BPI scores an average of 9.1 points lower for children who are very close to their fathers relative to children who are not at all close to their fathers. Likewise, a child whose father involvement index is one standard deviation (2.6 points) above the mean has a BPI score approximately 3.25 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 are important to consider when examining the factors that affect behavior problems.

Interaction Analysis

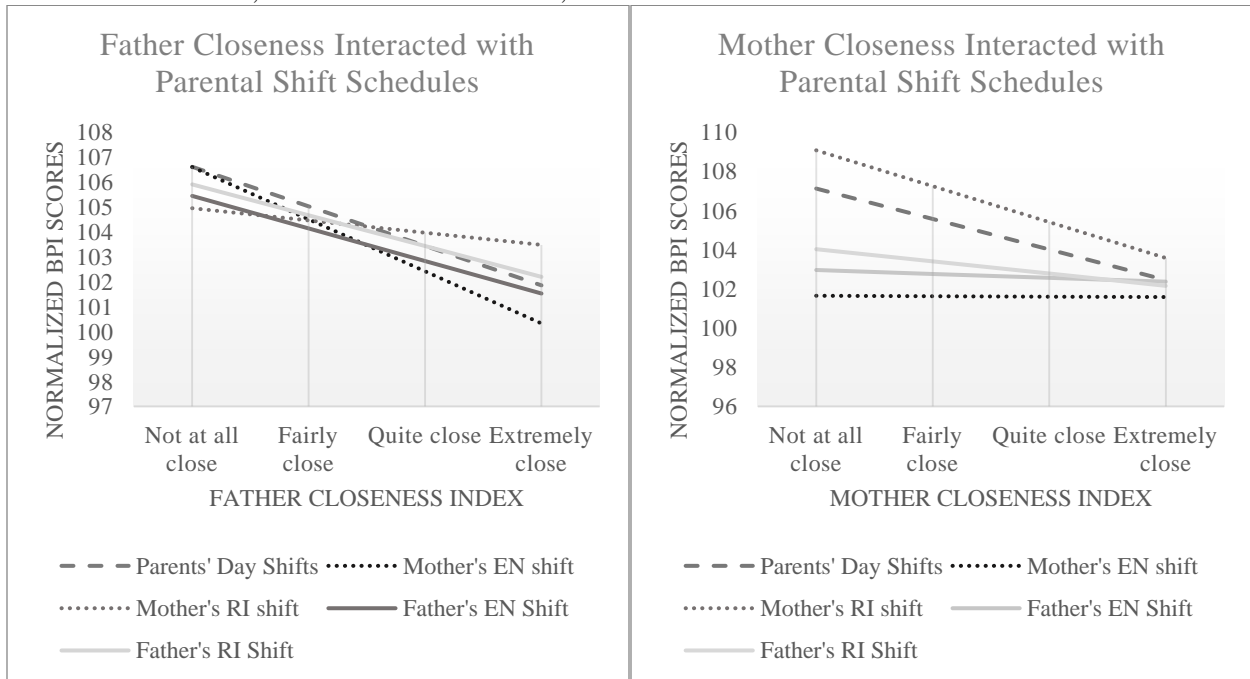
Contrary to expectations, parental closeness and involvement do not mediate any of the observed relationships between work schedules and behavioral outcomes. However, it was also hypothesized that children will have improved behavioral outcomes (i.e. fewer behavior problems) when they have involved fathers 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.

This hypothesis was assessed by estimating interactions between the shift schedule articulations and father and mother closeness using fixed-effects models, controlling for the child’s age. Fixed-effects models were utilized because this analysis was restricted to children with valid parental closeness and involvement measures since the interest was not in comparing nested models, but rather in examining how levels of behavior problems change in response to

greater reported parental involvement. Hausman tests confirm that fixed-effects models are preferred over random-effects models in this situation, though the results from random-effects models are presented in Appendix D for comparison. Because these models are restricted to families who answered questions concerning parental closeness, this analysis is limited to a subset of families that differs from the sample utilized for the analyses described in the previous section.

The predicted BPI scores for combinations of father and mother closeness scores and shift schedule articulations are shown in Figure 1. Comparing across categories of parent employment, reported father closeness seems most salient for child behavior outcomes when mothers work the evening shift, still matters, but slightly less so for children whose parents both work the day shift, and is least consequential for behavioral differences among children whose mothers work rotating or irregular schedules. These results echo some of the findings from the random effects models without interactions (Table 2). The mother's evening and night shifts correspond to improved behavioral outcomes, but these improved outcomes only become apparent at high levels of father closeness. Therefore, as was hypothesized, heightened father involvement corresponds to improved behavioral outcomes when mothers work evening or night schedules. On the other hand, if mothers work a rotating or irregular shift, we observe weaker behavioral benefits when fathers are quite or extremely close to their children. Therefore, father closeness does seem to play an important but conditional role in the context of behavior problems and nonstandard schedules, though the predicted BPI scores do cluster closely together at most levels of father closeness.

Figure 1 Parental shift schedules interacted with parental closeness for all ages (4-15). Predicted probabilities from random-effects models, NLSY-79 and NLSY79-CS, 1994-2006.



*EN = evening/night shift; RI= rotating/irregular shift

*Parents' day shifts refers to both parents working day shifts; for nonstandard schedules, default is that partner works standard day shift schedule

The right panel of Figure 1 also shows that differences in reported mother closeness have little to no influence on child behavior among children whose mothers work evening/night shifts or whose fathers hold down any type of nonstandard schedule. Interestingly, mother closeness is strongly tied to the BPI scores of children whose parents both work day shifts and whose mothers work rotating or irregular shifts., Much like what is observed for father closeness in the left panel of Figure 1, mothers' rotating or irregular shiftwork corresponds to relatively more child behavior problems at all levels of mothers closeness. The strong “closeness” effects observed for children of parents with day shifts or with mothers who work evenings/nights may be, in part, because these shift schedule articulations have higher sample sizes, thereby allowing for greater variation to be expressed. Additionally, mothers do not often change their rankings of their closeness with their children. Thus, the null effects observed for some types of shift schedules may be the result of fixed effects model specifications that require variables to change

over time in order to be captured in the analysis. Indeed, random effects estimation of these interactions, which does not require within-subject reports to change in order to be included in the analysis, yield estimates showing that mother closeness does have the expected negative relationship with predicted BPI scores.

Discussion

These results paint a surprising, though not implausible picture. For both younger and older children, mothers' rotating and irregular shifts are associated with more behavior problems, and this relationship is significant for older children. Fathers' nonstandard shift schedules, 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 perhaps encouraging. Even more encouraging, mothers' evening and night shifts may actually be associated with fewer behavior problems relative to other types of nonstandard schedules. This is particularly the case for families in which fathers are very close to their children and therefore probably more likely to assume the caregiving responsibilities mothers may not be able to complete while they are at work. While this is a positive finding, and indicates that nonstandard schedules may offer benefits to families who have supportive partners, this finding is also somewhat problematic. Compared to two-parent families, single parent families are less likely to have a supportive partner available to care for children. 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).

Additionally, parental closeness and involvement are intimately intertwined with socioeconomic status, since parents with more resources are often more able to control their schedules and thereby their time with their families and since involved fathers tend to be more

highly educated (Hofferth and Anderson 2003; Yeung et al. 2001). Thus, nonstandard schedules may offer greater flexibility to families who are already relatively well-off. Nevertheless, it is still encouraging to find that nonstandard schedules may offer some benefits for families who are able to take advantage of the potential flexibility they offer.

This study also set out to examine whether parental involvement could explain any the relationships between nonstandard schedules and behavioral outcomes. Though father and mother closeness and involvement did not explain any of the observed relationships, children exhibited the fewest behavior problems overall when they were very close to their parents, particularly their fathers, and when their mothers worked evening or night schedules. Thus, the hypotheses set forth at the beginning of the essay are partially borne out. When fathers are very close with their children, and thereby more likely to assume childcare responsibilities while their wives are at work, children experience improved behavioral outcomes.

Because parental involvement and closeness do not explain away the relationships between nonstandard schedules and child behavioral outcomes, explanations must be sought elsewhere. One unexplored 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.

Parental monitoring could also explain some of the observed relationships. 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, the negative relationship between some types of shift schedules and behavior problems could be due, in part, to 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.

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 relationships are utilized in place of childcare centers, they may allow parents to feel as though they are stay-at-home parents and therefore more involved in their children's lives, etc. 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 4 Composition of Behavior Problem Index (BPI) with accompanying means, standard deviations, and ranges for each subcategory of the BPI

	Name of subscale	Mean	SD	Range
Cheats or tells lies	Antisocial (E)			
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	102.12	12.67	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		101.62	12.67	86-146
Clings to adults <12 years	Dependent (I)			
Cries too much <12 years	Dependent (I)			
Demands a lot of attention <12 years	Dependent (I)			
Is too dependent on others <12 years	Dependent (I)			
Total Score				
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		101.73	13.2	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		101.61	13.29	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		103.00	11.61	96-145
BPI externalizing score		100.6	13.8	83-170
BPI internalizing score		100.6	13.97	83-176

Total BPI score 102.5 14.2 72-149
*E refers to an externalizing behavior, I refers to an internalizing behavior

Appendix B

Table 5 Composition of Father and Mother Involvement Indices from child-answered questions with accompanying means, standard deviations, and ranges

	Mother Mean (SD)	Father Mean (SD)	Range
Question: 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? <i>Reverse coded</i>	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 6 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

<i>Control Variables</i>	<i>No father</i>	<i>No moth.</i>	<i>No father</i>	<i>No moth.</i>	<i>No father</i>	<i>No moth.</i>
	<i>closeness</i>	<i>closeness</i>	<i>closeness</i>	<i>Closeness</i>	<i>involve.</i>	<i>involve.</i>
	<i>4-9-yo</i>	<i>4-9-yo</i>	<i>10-15-yo</i>	<i>10-15-yo</i>	<i>10-15-yo</i>	<i>10-15-yo</i>
	<u>OR</u>	<u>OR</u>	<u>OR</u>	<u>OR</u>	<u>OR</u>	<u>OR</u>
BPI score	1.006	0.998	1.009	0.989	1.004	1.000
Mother's EN Shift ^a	1.025	1.147	0.416	1.363	1.088	0.993
Mother's RI Shift	0.917	1.236	1.401	1.219	0.929	0.838
Father's EN Shift	1.147	0.697 [^]	0.436	0.875	0.980	1.225
Father's RI Shift	1.343	1.179	0.672	0.859	1.087	1.077
Child female	1.283 [^]	1.142	1.143	0.850	0.956	0.882
Child Hispanic	1.322	1.393 [*]	2.274 [*]	1.728 [^]	0.943	0.844
Child Black	0.713	1.194	0.985	2.101 [*]	1.192	1.097
Child Age	0.025 ^{***}	0.447 ^{***}	1.129	1.088 [^]	0.466 ^{***}	0.658 ^{***}
Mother's Age	0.937 ^{**}	0.991	0.807 ^{***}	1.109 ^{***}	1.006	1.068 ^{***}
Father in household	0.086 ^{***}	0.420 ^{***}	n/a	n/a	n/a	n/a
Mother's Ed	0.943 [^]	0.962	0.978	0.733 ^{***}	0.984	0.959
Family income ^b	0.944	1.016	0.804	0.837	0.872 [*]	0.955
Mom's Work Hours	1.005	1.007	1.009	1.010	0.998	1.000
Dad's Work Hours	0.996	0.993	1.004	1.007	1.001	0.998
Mother OLF ^c	0.775	1.021	1.241	0.938	0.953	1.209
Number of children	0.967	1.116 [^]	0.917	1.872 ^{***}	0.974	1.424 ^{***}
Year 2000	1.240	0.945	1.295	1.035	0.647	1.015

^aEN = evening/night shift; RI = rotating/irregular shift

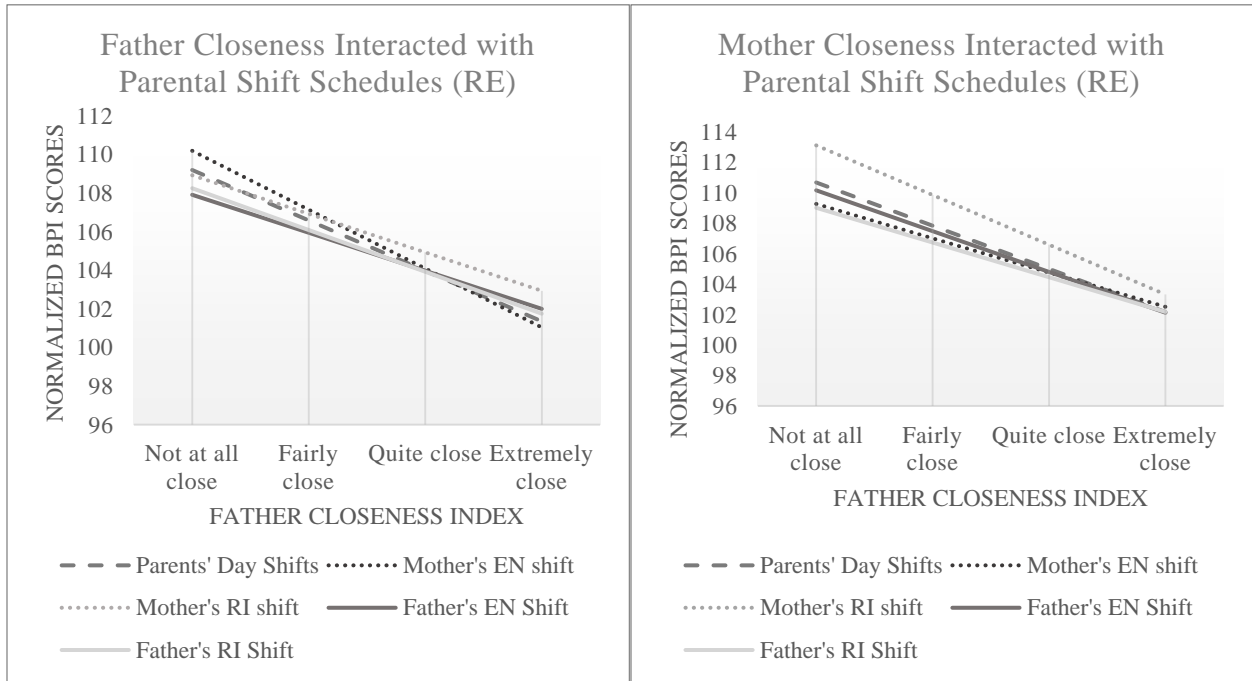
^bFamily income refers to logged total net family income

^cOLF = out of labor force

[^]p < .1; *p < .05; **p < .01; ***p < .001

Appendix D

Figure 2 Parental shift schedules interacted with parental closeness for all ages (4-15). Predicted probabilities from random-effects models, NLSY-79 and NLSY79-CS, 1994-2006.



*EN = evening/night shift; RI= rotating/irregular shift

*Parents' day shifts refers to both parents working day shifts; for nonstandard schedules, default is that partner works standard day shift schedule