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**Parental Exposure to Routine Work Schedule  
Uncertainty and Child Behavior**

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# Parental Exposure to Routine Work Schedule Uncertainty and Child Behavior

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# Parental Exposure to Routine Work Schedule Uncertainty and Child Behavior

## **Abstract**

Parents working in the service sector often face unpredictable work schedules and children exposed to such parental schedules could suffer negative consequences. This paper takes advantage of novel survey data from the Shift Project, covering 4,275 parents working in the service sector with children (mean child age of 7.7), to examine the association between parental schedules and child behavior. Parental exposure to unpredictable work schedules is associated with children's externalizing and internalizing behavior. Mediation analysis shows that parents' schedules affect children's behavior by increasing economic insecurity, reducing parental time with children, and diminishing parental wellbeing. These results demonstrate that work scheduling conditions may have broad effects on not just workers themselves but also on their children.

Environmental and contextual forces exert a powerful influence on child health and wellbeing (Bronfenbrenner, 1979). Of particular importance, parental employment affects children by shaping family processes and household economic security. However, since the 1970s, employment in the United States has become much more precarious (Kalleberg, 2009), especially among workers at the bottom of the income and occupational distribution (Fligstein and Shin, 2004). Precarious work is characterized by low-wages, few benefits, and non-standard work hours that encompass evenings, nights, and weekends (Kalleberg, 2011; Presser 1999). More recently, scholars and policy makers have identified a new form of employment precarity: unpredictable work schedules. Many workers receive their work schedules as little as a few days in advance, scheduled work hours and work days may change substantially week-to-week, and shifts may be changed, cancelled, or added at the last minute (Golden, 2001; Lambert, 2008).

Unpredictable work schedules are widespread in the retail sector (Golden, 2001; Henly et al., 2014). Over 10% of workers are employed in retail and 1 in 10 children age 5-18 have a parent who works a service job in retail (Author's calculations from 2015 ACS). Further, exposure to these practices is unequal. Children whose mothers have not finished college are twice as likely to have a parent working retail as those whose mothers have a degree. Black and Hispanic hourly workers receive less advance notice than white workers of their schedules and have less control over their schedules (Henly et al., 2014). Scheduling practices may then transmit disadvantage across generations, perpetuating socio-economic and race/ethnic inequalities from parents to children.

Since many workers exposed to precarious schedules are parents, and these parents are generally low-income, unpredictable and unstable work schedules have important implications for the inequality of child behavior. Unpredictable scheduling practices are likely to affect children through several pathways. Children whose parents are exposed to such scheduling practices may experience higher levels of household economic strain, may expe-

rience more time-based conflict that could deplete parental time with children, and may experience more parental stress which could lead to lower quality parent-child interactions.

While there is evidence that other dimensions of precarious work – such as stable, but non-standard hours – negatively affect child wellbeing (i.e. Li et al., 2014), the evidence base on the effects of unstable and unpredictable scheduling practices on child behavior is very limited. Data sources containing information on both parental work schedules and child outcomes are rare, and workers in low-wage unstable jobs are difficult to sample. We draw on new data collected by The Shift Project from 4,270 parents of children age 2-15 working in the retail and food service sectors. These data contain detailed measures of parental exposure to scheduling, of mediating variables such as household financial insecurity and parental stress and wellbeing, and child behavior outcomes.

We find that there is a high degree of exposure to “just in time” work scheduling practices among parents in the retail and food service sectors. We then show that children whose parents are exposed to such practices, specifically on-call shifts, cancelled shifts, last minute schedule changes, and consecutive closing then opening shift (“clopens”), exhibit more internalizing and externalizing behavior. We show that these associations are significantly mediated by household economic strain, time-based strain, and parental wellbeing, with the latter playing the largest explanatory role.

## Background

Children’s growth and development is shaped by their ecological contexts – the complex and multi-level set of systems that define a child’s environment (Bronfenbrenner, 1979; 1986). These early life conditions matter a great deal for setting life-long trajectories of achievement and attainment (i.e. Heckman, 2006). Children’s environments are a product of the neighborhoods they live in, the schools they attend, but also, crucially, the families in which they grow-up (Duncan and Murnane, 2011; McLanahan, 2004). Children’s relationships with their parents, including time spent together and positive interactions, are an important

determinant of child wellbeing (Bronfenbrenner, 2005) and family contexts appear to powerfully shape disparities in child achievement (Waldfogel and Washbrook, 2011; Larson et al., 2015).

The jobs that parents hold exert a strong influence on family life and the experiences of their children (Shonkoff and Phillips, 2000; Edwards and Rothbard, 2000; Menaghan, 1991). Unstable and unpredictable schedules in particular may spill over to affect children's behavior and health through several pathways. Children whose parents are exposed to such scheduling practices may experience higher levels of material deprivation, which is likely to negatively affect wellbeing (Duncan and Brooks-Gunn, 1997) as well as higher levels of income instability, which may directly affect cognitive processes and development (Gennetian and Shafir, 2015; Mani et al., 2013). Parents who have unstable and unpredictable work schedules may also experience time-based conflicts (Greenhaus and Beutell, 1985) that affect parental investments in child development by depleting parental time with children and leading to the use of lower quality childcare arrangements (Conger and Donnellan, 2007). Parental exposure to unstable and unpredictable scheduling practices may increase parental stress and depression and so diminish the quality of parent-child interactions (Conger and Elder, 1994; McLoyd, 1990; Yeung, Livner, and Brooks-Gunn, 2002).

## **Mechanisms**

Parents' unstable and unpredictable work schedules are likely then to affect child behavior through the specific mechanisms of increased household financial insecurity, time-based conflict, and stress-based conflict.

### *Household Financial Insecurity*

First, parental exposure to unstable and unpredictable scheduling practices at work may serve to negatively affect child health and wellbeing by increasing household material deprivation and economic volatility. Variable hours may, mechanically, lead to income volatility for

hourly workers, especially if that variability makes it difficult for workers to hold secondary jobs that might otherwise be used to smooth earnings. Recent survey data shows that low- and moderate-income workers name an irregular work schedule as the most common cause of intra-year income volatility (Federal Reserve Board, 2014). Similarly, in a financial diary study, negative income shocks were common and a drop in work hours was one of the main culprits (Morduch and Schneider, 2014). Last-minute changes to work schedules through short-notice scheduling or on-call shifts may similarly make it difficult for workers to actually make the shifts that they are scheduled for, increasing income volatility, but also household material hardship (Golden, 2015; Haley-Lock, 2011; Luce et al., 2014; Zeytinoglu et al., 2004; Edin and Schaefer, 2015).

Economic deprivation and economic instability appear, in turn, to have some direct effects on child health and wellbeing. Children may observe family economic stress and be affected by it, even absent changes to parenting behaviors (Leininger and Kalil, 2014). Further, hardships could result in relegation to substandard housing which could result in exposure to damaging levels of lead and other pollutants that can seriously negatively affect child behavior (Evans, 2004; Duncan et al., 2014; Brooks-Gunn and Duncan, 1997; Aizer and Currie, 2017). Low and volatile parental incomes can lead to food insecurity and poor nutrition (Bhattacharya et al., 2004), which in turn negatively affect child both internalizing and externalizing behavior (Slopen et al., 2010; Whitaker, Phillips, and Orzol, 2006). Poverty also appears to affect the neurobiology of the developing brain (Thompson, 2014; Duncan et al., 2014). Exposure to scarcity and uncertainty reduces cognitive performance (Mani et al., 2013) and increases chronic stress among children and adolescents (Evans and Kim, 2007).

### *Time-Based Conflict*

Time-based conflict results when work is scheduled at times that directly interfere with family responsibilities (Greenhaus and Beutell 1985). Such time-based conflicts are likely to interfere with parents' ability to invest in the development of their children (Conger and

Donnellan, 2007). These time-based conflicts may be widespread, but they are likely to be especially acute for low-wage hourly workers for whom unstable and unpredictable work schedules interfere with parents' ability to establish regular routines for their children, to make time for regular engagement in developmental activities such as reading and homework help, and to facilitate children's involvement in organized enrichment activities. Workers who have less advance notice of their schedules and less schedule control report less time to do things such as schedule a doctor's appointment or cook a meal at home (Lambert and Henly, 2014). Further, parental exposure to irregular work schedules reduces shared family meals (Han and Waldfogel, 2007; Hsueh and Yoskikawa, 2007) and low-wage mothers' lack of flexibility and control over their schedules substantially interferes with parental engagement with children's schools and school-based activities (Haley-Lock and Posey-Maddox, 2016).

These forms of parental investment are in turn consequential for child behavior. Parenting behaviors shape trajectories of internalizing and externalizing behavior (Galambos, Barker, and Almeida, 2003; Reitz, Dekovic, and Meijer, 2006). Increased maternal time in activities with children is negatively related to internalizing and externalizing behavior (Estes, 2004).

### *Stress-Based Conflict*

Parents who do not know how many hours they will work, when their shifts will occur, if they might be sent home early or asked to stay late are likely to experience elevated stress and depression. While limited, existing research on the effects of unstable and unpredictable schedules on worker wellbeing suggests that these scheduling practices do increase stress. Workers exposed to unpredictable hours report higher levels of stress and irritability (Zeytinoglu et al., 2004) as well as more depressive symptoms and less happiness (Schneider and Harknett, 2019). Retail workers with unstable and unpredictable work schedules also report lower quality sleep (Schneider and Harknett, 2019; Lambert et al., 2019). Mothers who work an irregular schedule during the first year of their infants' lives reported more



depressive symptoms (Grzywacz et al., 2016) and workers exposed to unstable and unpredictable scheduling practices had more anxiety and feelings of loss of personal control (Henly and Lambert, 2014). Importantly, these effects of precarious schedules are likely to be net of effects on household economic insecurity.

A large body of theoretical and empirical research in turn makes the case that parental stress and depression negatively affect child behavior. This work generally proceeds from the Family Stress Model (FSM) (Conger and Elder, 1994; McLoyd, 1990). The FSM posits that financial problems and strain negatively affect child wellbeing by increasing parental strain and depression which in turn results in harsh, inconsistent, or uninvolved parenting (Conger, Conger, and Martin, 2010). Empirical research has shown that lower economic well-being negatively affects teachers' ratings of social behavior by reducing parental psychological well-being (Mistry et al., 2002), and that low family incomes increase child behavioral problems by increasing maternal emotional distress (Yeung, Livner, and Brooks-Gunn, 2002).

## **Prior Empirical Research**

Scholars have long been concerned with the effects of parental work time on parent and child wellbeing (i.e. Han et al., 2001; Bianchi, 2000; Brooks-Gunn, Han, and Waldfogel, 2010). Prior research has also now carefully documented the effects of non-standard work schedules on child wellbeing (see reviews by Dunifon et al., 2012 and Li et al., 2014). Separate research in sociology and epidemiology, primarily focusing on professionals, has shown how limited flexibility in the workplace depresses worker wellbeing (Glass and Estes, 1997) and parental time with children (Davis et al., 2015).

While both non-standard schedules and inflexible schedules are important dimensions of job quality, they are quite distinct from the unpredictable schedules that appear common in the retail sector and that are the object of recent policy attention. Yet, there is little research that directly examines the effects of unpredictable schedules on child behavior. However, as reviewed above, early research on unpredictable scheduling does provide an important

basis for the hypothesis that by showing empirical evidence of how unpredictable schedules are related to household economic insecurity, time-based conflict, and stress-based conflict – the factors hypothesized to mediate relationships between parental work schedules and child behavior.

While few studies directly examine the relationship between unpredictable schedules and child behavior, there are important exceptions. Maternal variable schedules are associated with more problem behavior and lower social competence for infants (Grzywacz et al., 2016). Maternal work schedules that are both variable and non-standard are associated with lower teacher-reported school engagement and performance and higher externalizing behaviors (Hsueh and Yoshikawa, 2007). Further, week-to-week fluctuations in the hours that mothers work are also negatively associated with child behavior problems including internalizing and externalizing behavior (Johnson, Dunifon, and Kalil, 2012). However, using Fragile Families data, Dunifon et al. (2013) find no association between maternal work at “different times each week” and children’s aggressive or anxious behaviors.

## **Limits of Existing Research**

Further research on the relationship between unpredictable work schedules and child well-being is constrained by a lack of current data that contains detailed measures of scheduling, child wellbeing, and mediating mechanisms. Both Johnson et al. (2012) and Hsueh and Yoshikawa (2007) rely on state-specific data that is now twenty years old. The other extant studies rely on either the Fragile Families and Child Wellbeing study or the National Longitudinal Survey of Youth-Child Supplement. Both contain useful measures of child wellbeing and some measures of parental work schedules. However, the measurement of schedules is very limited and is much better suited to capturing work during non-standard hours than unpredictable schedules as experienced through practices such as on-call work, cancelled shifts, and changes in shift timing. Further, the available measure of variable work cannot separate the distinct experiences of high-SES workers who have the autonomy and control to

achieve desirable flexibility from the low-SES workers who have little control and are subject to employer-driven instability (Han et al., 2010; Li et al., 2014).

Other large-scale data sets are even more limited. Most existing surveys do not measure schedule instability (PSID, ACS, CPS, NLSY79). Those surveys that carefully measure scheduling practices, lack data on child outcomes (EINet Polls). Additionally, the few data sets that measure both scheduling and come close to outcomes of interest (NLSY97 for 2014 and GSS in 2016) have insufficient power to study the policy-relevant samples of low-wage workers in the retail and food service sectors.

## Method

The data for this study were collected as part of The Shift Project, an ongoing study of low-wage work that began in 2016 and is currently in its sixth wave of data collection. The Shift Project has collected data from more than 50,000 service sector workers across the country using an innovative data collection approach. For the purposes of this paper, the larger Shift Project survey sample is restricted to 4,297 parents with children aged 15 years or younger.

The Shift Project study takes advantage of sophisticated targeting capabilities available through Facebook’s advertising platform to recruit workers to complete an online survey. Workers who were employees of particular named employers could be targeted because Facebook’s advertising platform compiles data on all of its users through a combination of user self-reports, user activity, and third-party vendors. Facebook then offers advertisers the opportunity to purchase advertisements to display to particular populations of interest. In this case, the Shift Project targeted survey recruitment advertisements to active users on Facebook and Instagram who resided in the United States, were over age 18 and under age 65, and were employed by one of 120 large retail or food service companies. A detailed description of data collection procedures used in the study and validation checks, including comparisons of the Shift data with probability samples from the CPS and NLS, are available

in Schneider and Harknett (2019a) and a set of tests of bias from unobservables is detailed in Schneider and Harknett (2019b).

Advertisements placed by the study appeared in the Facebook desktop or mobile newsfeeds or Instagram account of targeted users with an invitation to participate in a short UC Berkeley survey. The advertisement included a picture of a worker in a uniform and a setting designed to be similar to the worker’s workplace, and the advertisement text named the employer in the survey invitation for added resonance. Users who clicked on the link in the ad were redirected to an online survey hosted through the Qualtrics platform, which contained modules on work schedules, demographics, economic security, health, parenting, and child wellbeing. The front page of the survey contained introductory information and a consent form that respondents could assent to by clicking and then advance to the survey instrument. Respondents who completed the survey and provided contact information were entered into a lottery for an iPad. Approximately 1.2% of advertisement displays yielded survey data. Although these response rates are lower than obtained in many probability-sample phone surveys, a large sample of working parents employed in the service sector would be difficult if not impossible to reach through traditional methods given the absence of an appropriate sampling frame.

The Shift Project method of collecting data results in a strategically-targeted, non-probability sample, raising concerns about representativeness and bias (Groves 2011; Smith 2013). However, in light of threats to traditional probability sample surveys such as steeply declining response rates (Keeter et al. 2017), an emerging body of work demonstrates that non-probability samples drawn from nontraditional platforms, in combination with statistical adjustment, can yield similar distributions of outcomes and estimates of relationships as probability-based samples. This work draws data from Xbox users (Wang et al. 2015), Mechanical Turk (Goel, Obeng, and Rothschild 2017; Mullinix et al. 2015), and Pollfish (Goel et al. 2017). Yet, of all these platforms, Facebook is the most commonly and widely used by the public (Perrin 2015).

Although the use of Facebook as a sampling frame will largely exclude workers without internet access and who are not active on Facebook or Instagram, recent estimates suggest that 84% of working adults aged 18 to 50 years are active on Facebook or Instagram (Greenwood, Perrin, and Duggan 2016). Thus, the sampling frame is now on par with coverage of telephone-based methods (Christian et al. 2010). Furthermore, Facebook/Instagram use is not especially stratified by demographic characteristics (Greenwood et al. 2016). Additionally, with a similar data collection approach using Facebook, Zhang et al. (2017) compare respondents drawn from Facebook and the American Community Survey in terms of veteran status, homeownership, and nativity and find a high degree of similarity.

## Key Variables

### *Child Behavior*

First, parents complete the Child Behavior Check-List Brief Problem Monitor, which contains items that we use to construct scales for internalizing and externalizing behavior (Achenbach et al., 2011). For internalizing, the scale ( $\alpha = 0.86$ ) is based on parent reports on a 0-2 scale of if it is “not true,” “sometimes true,” or “very true” that the focal child (1) feels worthless or inferior, (2) is too fearful or anxious, (3) feels too guilty, (4) is self-conscious or easily embarrassed, (5) is unhappy, sad, or depressed, and (6) worries. For externalizing, the scale ( $\alpha = 0.86$ ) is based on parents report using the same response options to items on whether the focal child (1) argues a lot, (2) destroys things belonging to his/her family or others, (3) disobedient at home, (4) disobedient at school/care, (5) stubborn, sullen, or irritable, (6) has temper tantrums or hot temper, (7) threatens people. These alphas meet or exceed the benchmarks reported by Piper et al. (2014) in their validation study.

The reports are summed across items for each scale. The internalizing scale has a mean of 1.8 and the externalizing scale a mean of 3.4. These scores are higher than the means of 1.5 and 2.5 reported by Piper et al. (2014) in their validation study using a convenience sample of Oregon caregivers.

### *Schedule Unpredictability*

We measure the key independent variable, schedule unpredictability, with several indicators: (1) if the respondent worked “on-call” in the past month, (2) if the respondent experienced cancelled shifts in the past month, (3) if the respondent experienced last minute changes to schedule timing in the past month, and (4) if the respondent worked “clopening” shifts in the past month. We use these items individually and to create an additive scale summarizing schedule unpredictability (range 0 - 4).

### *Mediating Factors*

We measure three types of mediating factors: household economic insecurity, time-based conflict, and stress-based conflict.

First, we measure household economic insecurity to capture the pathway in which unstable and unpredictable work schedules negatively affect children’s wellbeing by increasing deprivation and economic volatility in the household. We construct a scale variable ( $\alpha = 0.62$ ) that is composed of four items. For the first item, use of high-cost credit, respondents are coded as “1” if they reported using either a payday loan or a pawn shop in the past twelve months. For the second item, material hardship, respondents are coded as “1” if they reported experiencing one or more of seven serious material hardships in the domains of hunger, housing, medical, and bills (Mayer and Jencks, 1989; Hefelin, 2016). For the third item, financial fragility, respondents are coded as “1” if the report not being confident in their capacity to cope with a \$400 expense shock (Lusardi, Schneider, Tufano, 2011; Federal Reserve, 2017). For the fourth item, income volatility, is coded as “1” if respondents report that their household income “goes up and down” from week-to-week (Federal Reserve, 2018).

Second, we measure time-based conflict to capture the pathway in which unstable and unpredictable work schedules negatively affect children’s wellbeing by upsetting parents’ ability to spend time with children. We construct a scale variable ( $\alpha = 0.86$ ) that is composed of four items. Each item gauges the frequency (never in past month, 1-2 times in past month,

once a week, several times a week, every day) with which parents report spending time with their children (1) “working on homework or reading a book together,” (2) participating in indoor activities together (such as arts and crafts or board games),” (3) “having a meal together,” and (4) “participating in outdoor activities together (like going for a walk or to a playground).”

Third, we measure stress-based conflict to capture the pathway by which unpredictable work schedules negatively affect children’s wellbeing by increasing parental stress and depressing parental mood such that parent-child relationships are strained and interactions are of lower quality. We construct a scale variable ( $\alpha = 0.66$ ) composed of three sets of indicators. The first is coded as “1” if parents reporting being “pretty happy” or “very happy” as opposed to “not too happy.” The second is coded as “1” if parents report their sleep quality as “very good” or “good” as opposed to “fair” or “poor.” The third item is coded as “1” if respondents score below 12 on the Kessler-6 scale of psychological distress.

### *Control Variables*

The relationship between unpredictable work schedules and child wellbeing could also be confounded by other parental and household attributes. We adjust our models for hourly wage, household income, job tenure, and managerial position as well as age, race/ethnicity, school enrollment, marital status, and the age and gender of the focal child. We also include a set of year and month fixed-effects.

Table 1 presents key demographic and economic information on the analysis sample. The sample is socio-economically disadvantaged, with 60% reporting household incomes of less than \$35,000 per year and only 8% reporting more than a high school diploma. The parents skew female, with an average age of 35.6. The sample is also three-quarter White, non-Hispanic. An additional 4% are Black, non-Hispanic and 12% are Hispanic. There is significant variation in marital status, with 45% reporting being married, 27% cohabiting, and 28% single. The focal children are evenly divided by gender, with a mean age of 7.8.

## Analytical Approach

We use the observed variation in work schedules to estimate descriptive associations between parental exposure to unstable and unpredictable schedules and the child outcomes. We regress each outcome on the measures of parental schedules controlling for individual characteristics, other job characteristics, and year and month fixed effects.

While these estimates are not causal, we note that by design the sample has limited heterogeneity – everyone is a non-managerial hourly retail worker and we control for economic and demographic characteristics. This limited heterogeneity is a key strength of the data as compared to sources like the NSLY-97 that, because of sample size limitations, would have to rely on comparisons between low-wage retail workers and other, higher-SES workers to infer the effects of precarious schedules on wellbeing.

$$Y_i = \beta_0 + \beta_1 \textit{Scheduling}_i + \beta_2 X_i + \beta_3 J_i + \beta_4 C_i + \gamma_m + \mu_y \quad (1)$$

In equation (1), the outcome of interest,  $Y$  for individual  $i$ , is regressed on a set of demographic controls variables,  $X$ , a set of job scheduling characteristics,  $J$ , and a set of child characteristics,  $C$ , all described above. The coefficients of interest are represented by  $\beta_1$  and summarize the relationship between work schedules and the wellbeing of children in terms of the dependent variables described above. The terms  $\gamma$  and  $\mu$  represent month and year fixed effects, which control for seasonality and secular trends.

We next examine the extent to which these effects operate through the pathways of household economic insecurity, time-based conflict, and stress-based conflict. We introduce the groups of measures that capture each of the mediating paths and assess if the size and significance of the coefficients on the scheduling measures attenuates relative to the estimates in the baseline model. We use the Karlson-Holm-Breen (-knb-) method (2013) test to assess if the moderation is statistically significant.



## **Robustness**

The main results presented above pool all respondents across states and across employers. We test the robustness of these results to the introduction of state fixed-effects and employer fixed-effects. By including state fixed-effects, we isolate the relationship between parental work schedules and child behavior from any time-invariant state-level economic, policy, or cultural factors that may affect by scheduling practices and child outcomes. By introducing employer fixed-effects, we focus our identification on within employer variation in scheduling practices. To the extent that workers sort into firms based on knowledge of scheduling practices, the introduction of these fixed-effects reduces bias in the estimates. However, they do not address selection into more unstable and unpredictable schedules among a given company’s workforce.

We are conceptually focused on schedule unpredictability as opposed to flexibility from the worker’s perspective. While it is unlikely that reported on-call shifts, cancelled shifts, and timing changes reflect desirable schedule flexibility, we also assess the robustness of our results to conditioning the sample on respondents who report that, “Starting and finishing times are decided by my employer and I cannot change them on my own” or that “Starting and finishing times are decided by my employer but with my input,” and not that the employee can decide within limits or entirely on her own.

## **Results**

### **Descriptive Statistics**

We describe the work schedules of parents of children under the age of 15 in Figures 1a and 1b. In the bars on the right-hand side of Figure 1a, we show that 12% of parents report a cancelled shift in the prior month, 25% report working on call in the past month, and 40% report a clopening shift in the past month. Exposure to last minute changes to schedule timing is more common still, at nearly 70%. Notably, we see no evidence that parents are at all protected from exposure to unstable and unpredictable work scheduling practices. The

left-hand side set of bars in Figure 1a shows that workers who do not have children under the age of 15 have essentially the same exposure to cancelled shifts, on-call, clopenings, and timing changes as those who are parents. These four measures of schedule unpredictability are moderately correlated at between 0.11 and 0.23.

In Figure 1b, we show the distribution of the summed scale of scheduling exposures. For parents, 1 in 5 workers reports schedule predictability - no cancelled or on-call shifts, clopenings or timing changes in the past month. About a third of parents report one of these exposures and a slightly smaller share report two. Nearly 15% of parents report being exposed to three of these sources of schedule unpredictability and a small minority, about 4% report exposure to all four in the past month. As was the case with the particular items, the distribution of this summative measure is essentially the same for parents and for non-parents.

## Regression Results

### Main Estimates

We present our main regression estimates in Table 2. Each coefficient represents an estimate from a separate model that contains that focal measure of work scheduling exposure alongside the full set of control variables. In column (1), we present the estimates of the associations between work scheduling and child internalizing behavior. We see that exposure to each dimension of precarious scheduling significantly increases child internalizing - there is a significant and positive coefficient on on-call shifts, cancelled shifts, changes to schedule timing, and clopening shifts. In column (2), we similar, if somewhat weaker, associations between on-call shifts, cancelled shifts, and changes to schedule timing and child externalizing behavior, but no significant association with clopening shifts.

Table 3 presents our estimates of the association between the schedule unpredictability scale and each of the child behavior outcome measures. For internalizing, we see that compared to children whose parents are unexposed to unpredictability or only have one such

exposure, children whose parents have 2 or 3 exposures exhibit significantly more internalizing behavior, though to a similar extent. In contrast, children in the 5% of families whose parents are exposed to the full set of unpredictable scheduling practices have a much higher degree of internalizing. Figure 2 plots predicted values from this model to help size these effects. Moving from 0 exposures to 2 or 3 exposures is associated with a one-quarter of a standard deviation increase in internalizing. Moving from 0 to 4 exposures is associated with a half of a standard deviation increase in internalizing.

We find more modest associations with externalizing, though a similar step-wise pattern prevails in which 2-3 exposures significantly increases externalizing behavior and then 4 exposures substantially increases externalizing behavior. In terms of effect sizes, we see in Figure 2 that going from 0 to 2-3 exposures increases externalizing by about a tenth of a standard deviation and going from 0 to 4 by approximately a quarter of a standard deviation.

## Robustness

Figure 3 presents plotted coefficients from Table 2 ( $\circ$  markers) as well as coefficients from two alternative models designed to test the robustness of these results. The first robustness test introduces state and employer fixed-effects. These coefficients ( $\square$  markers) closely follow the pattern of our preferred estimates. Accounting for both time-invariant features of states (such as aspects of the policy environment, labor market, and local cultures) and features of employers (such as differential selection into employment) does not materially affect the estimated associations between scheduling and child outcomes.

The second robustness test assesses if the estimates are consistent after limiting the sample to only those parents who do not have primary control over their work schedules in order to ensure that we are observing the “instability” that is of primary theoretical interest rather than “flexibility.” These estimates ( $\diamond$  markers) are generally also quite close to our preferred estimates, though in the case of 3 or 4 exposures predicting internalizing, are slightly smaller.

We also tested for the presence of moderation by focal child gender and by focal child

age. Interactions between age and the schedule instability scale to predict both internalizing and externalizing behavior were insignificant as were interactions between child gender and the schedule instability scale.

## Mediation

Finally, we examine if these associations between unpredictable parental work schedules and child wellbeing are mediated by our hypothesized pathways of (1) economic insecurity, (2) lack of developmental time with children, and/or (3) diminished parental wellbeing.

We first establish the direct relationship between unpredictable work schedules and each of these potentially mediating pathways. Figure 4 plots predicted values for each of three mediating variables (y-axes) by levels of schedule instability (x-axis). These are estimates from a version of our main regression model that includes controls for child and parent demographics, parent work characteristics, and year and month fixed-effects. We see that for each mediator, there are strong and positive associates with work schedule instability, with effect sizes on the order of half to three-quarters of a standard deviation across the range of the scheduling exposures.

We next conduct the formal mediation analysis using the -knb- method. The results of this analysis are summarized in Table 4. For each outcome, we show the unmediated association with our scale measure of exposure to schedule unpredictability. Each of the coefficients is relative to the base category of no exposures and is shown labeled “Total Effect.” These coefficients are the same as those in Table 3.

We next decompose this “Total Effect” for each level of unpredictability (1, 2, 3, and 4 vs. 0) into a portion that is accounted for by our mediating variables (“Indirect Effects”) and into the remaining unmediated association with unpredictability (“Direct Effect”). The significance of the “Total Effect,” the remaining “Direct Effect,” and the “Indirect Effects” is noted with star symbols. Finally, for each level of unpredictability, we show the percent of the “Total Effects” that are accounted for by each of the three mediating pathways. These

percentages do not generally sum to 100% unless we are able to completely mediate the association.

For internalizing (M1), we do not substantially mediate the (relatively small) effect of one exposure, but we find that the association between internalizing and 2-4 exposures to unpredictability is reduced by 50% - 60%, but remains significant, after accounting for our mediators and, in the case of four exposures, this indirect effect is statistically significant. We see a consistent pattern in the relative importance of the three pathways across the levels of instability. Economic insecurity mediates 14-23% of the total effect and time with children mediates 11-16% of the total effect. Parental wellbeing is a more important pathway, mediating between 27% and 42% of the total effect - approximately as much as the other two combined.

For externalizing (M2), as discussed, the total effects are smaller, but we mediate a more substantial portion of those associations - between 75% and 100%. As with internalizing, parental wellbeing is the dominant pathway, accounting for roughly the combined influence of economic insecurity and time with children.

We also re-estimate the mediation models comparing children whose parents had no exposure to unpredictable work schedules against children whose parents had at least one exposure. Here, we find that economic factors explain 16% of the association with internalizing (23% with externalizing), that time with children mediates 13% of the association with internalizing (18% with externalizing), and that parental wellbeing remains the most important explanatory factor, accounting for 33% of the association with internalizing (49% with externalizing).

## Discussion

A large share of workers employed in the service sector experience unpredictable work schedules. Given that many of these workers combine work with parenting responsibilities, this schedule unpredictability has potential consequences for child wellbeing. In this paper, we

use novel data from The Shift Project to demonstrate that schedule instability is associated with children’s internal and externalizing behavioral problems. Previous research has examined how non-standard work schedules affect child wellbeing, but a lack of data has precluded an examination of how unstable schedules are associated with child behavior. Therefore, these findings on schedule instability and unpredictability are a novel extension to the research literature on parental work and child wellbeing.

Work schedule unpredictability takes many forms including on-call work, canceled shifts, shifts that are changed with little notice, and closely spaced shifts with little time for rest in between. Most workers are exposed to some of these unpredictable work conditions, and some workers are exposed to several of these conditions. We find that the relationship between work schedule instability and child behavior follows a dose-response relationship: children whose parents have the most unpredictable schedules fare the worst, those whose parents have the most stable schedules fare the best, and those whose parents experience moderately unpredictable schedules occupy an intermediate position.

The Shift Data allows us to examine potential pathways through which unpredictable work schedules may affect child wellbeing. Unpredictable work schedules are associated with greater economic insecurity, less parental time spent engaging in activities with children, and diminished parental wellbeing, and the relationship between parental work schedules and child wellbeing is mediated, in part, by each of these mediating conditions. Parental wellbeing is a particularly strong mediator, but economic insecurity and parental time also play a role as intervening mechanisms.

These findings point towards the intergenerational consequences of low-wage work. Prior research and policymaking has often focused on economic deprivation as a key driver of intergenerational disadvantages. Complementing and extending this narrative, we show that the temporal dimensions of low-wage work that influence parents’ time and stress as well as their economic security have important implications for child development. When parents experience routine instability in their work schedules, we see downstream effects on children’s

internalizing and externalizing behaviors. This temporal disadvantage compounds economic disadvantages faced by workers in the service sector and their children.

These intergenerational consequences, in turn, point towards an important consideration for the policy arena. Currently, a handful of cities and states including San Francisco, Seattle, Emeryville in California, New York City, Oregon State, and Philadelphia have passed local legislation to encourage more stable work schedules in the service sector, and Los Angeles, Chicago and several other cities and states are considering similar legislation. Our research suggest that these new labor regulations, if successful in creating more stable work schedules for parents, could have important collateral benefits for children.

The Shift Data allow us to examine relationships that have previously been suspected but not systematically researched because of data limitations. However, several limitations of the Shift Data should be kept in mind. First, the relationships examined in this paper are based on parental self reports of work schedules, mediators, and child outcomes. Therefore, these data are subject to shared method bias that can occur when a single informant reports on predictors and outcomes. In this paper, shared method bias would occur if the same child behavior was perceived as more problematic by parents with unstable schedules than by parents with stable schedules. This could be the case, for instance, if the stress of uncertain schedules led parents to have less patience and tolerance for children’s acting out and to view children’s externalizing behavior in a more negative light. This potential bias seems relatively less of an issue for internalizing behavior. It is worth noting that this limitation is not unique to the Shift Data. Many datasets, such as the Fragile Families and Child Wellbeing surveys, also face this same source of potential bias.

The Shift Project data allows unprecedented insight into how uncertainty in parental work schedules is associated with child behavior, but the data come from a non-probability sample. Comparisons of the Shift data with NLS and CPS data sources has found the Shift data to be in line with these probability samples (Harknett and Schneider 2018). But, the parental sample in Shift may not be fully representative of the population of parents working in the

service sector. The Shift data cover large employers and do not represent workers employed by smaller, non-chain employers. Therefore, there may be limitations to the generalizability of the results in particular to workers employed at smaller-sized employers. Although we cannot think of any compelling reasons why the relationship between parental work schedules and child behaviors would differ by employer size, the prevalence of work-schedule instability that we report on may differ between larger and smaller employers.

A final limitation involves ambiguity in time ordering of relationships. Our data come from repeat cross-sections, therefore, we cannot be certain about the causal ordering among our predictors, mediators, and outcomes. One area of particular concern is that parental wellbeing may, in part, causally influence work schedule instability if parents with lower levels of wellbeing are less reliable workers and are penalized with worse schedules. Another possibility is that children’s externalizing behavior could interfere with parents’ ability to fulfill work obligations, perhaps by making it difficult to arrange child care. Therefore, when interpreting our results, we must keep in mind that the possibility of reverse causality for some of our measured relationships could lead us to somewhat overestimate the influence of schedules on mediators and child outcomes. The Shift Project is collecting longitudinal data from a subsample of workers, which in the future will offer some leverage to reduce ambiguity in the time ordering of these relationships.

Using the newly available data from the Shift Project, we have presented evidence of a striking relationship between the instability and unpredictability of parental work schedules and children’s behavioral problems. Service sector jobs are sometimes characterized as temporary jobs for teenagers, but a sizeable share of service sector workers are parents whose children are affected by the temporal instability introduced by the demands of these jobs. For workers with higher socioeconomic status, demanding jobs are often accompanied by generous compensation packages. But, in the low-wage service sector, jobs are frequently demanding, often requiring workers to be available 24/7 and on short notice, but financial compensation and fringe benefits are meager. In this context, the portrait that emerges is



one of children facing an accumulation of disadvantages and barriers to intergenerational mobility: economic resources are low, parental time is constrained, and parental well-being is reduced.

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## Tables and Figures

Figure 1a: Schedule Unpredictability (Non-Parents vs. Parents)

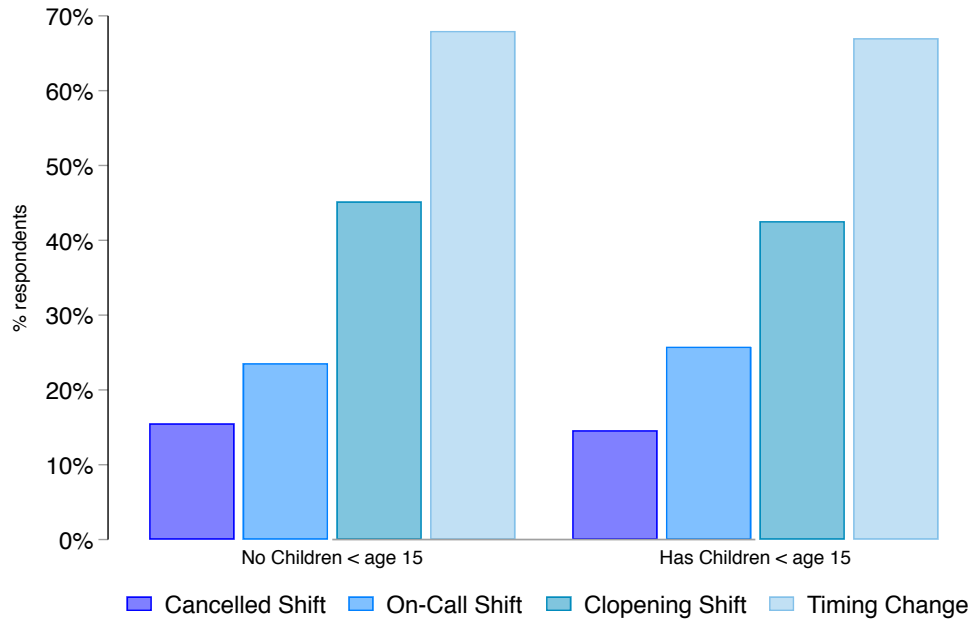
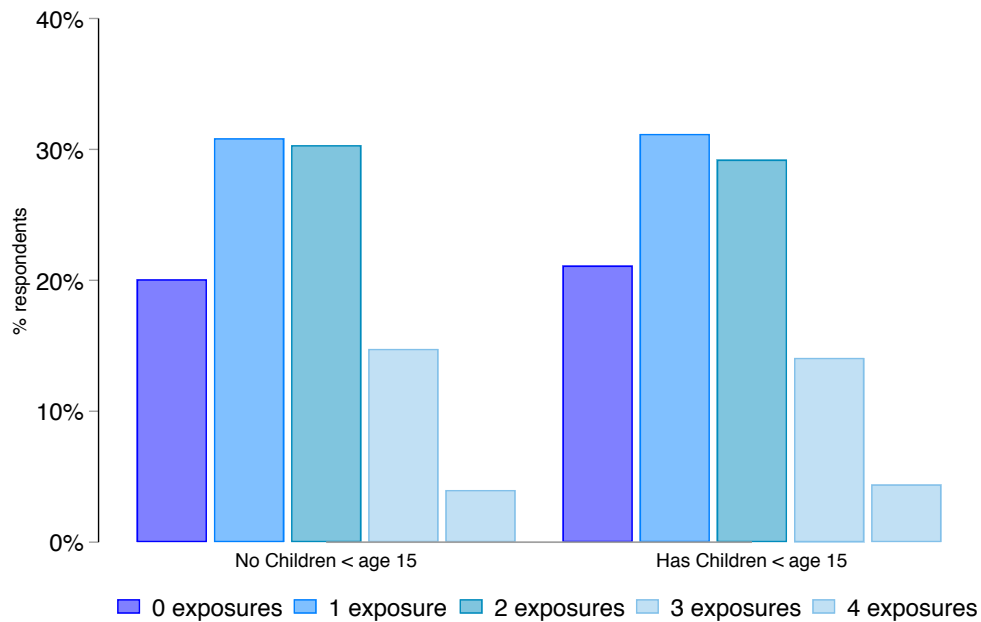


Figure 1b: Schedule Unpredictability Scale (Non-Parents vs. Parents)





**Figure 2: Schedule Unpredictability and Child Behavior**

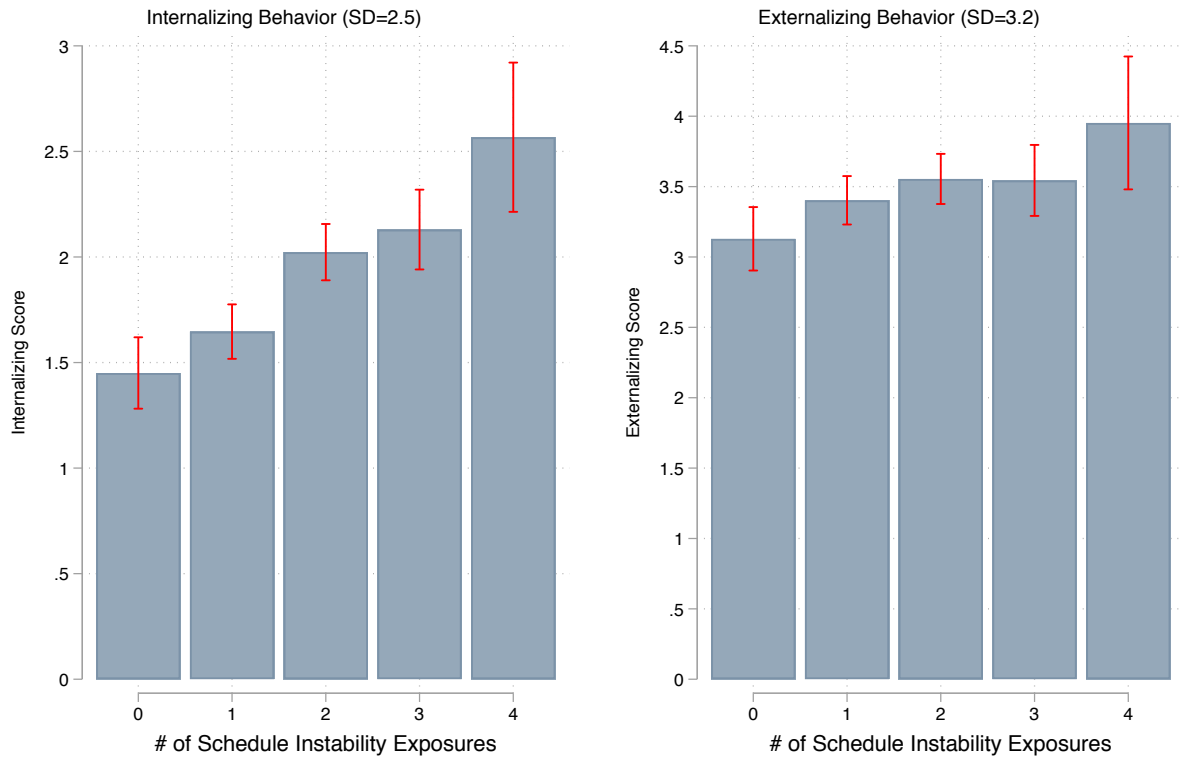


Figure 3: Schedule Unpredictability and Child Behavior - Robustness

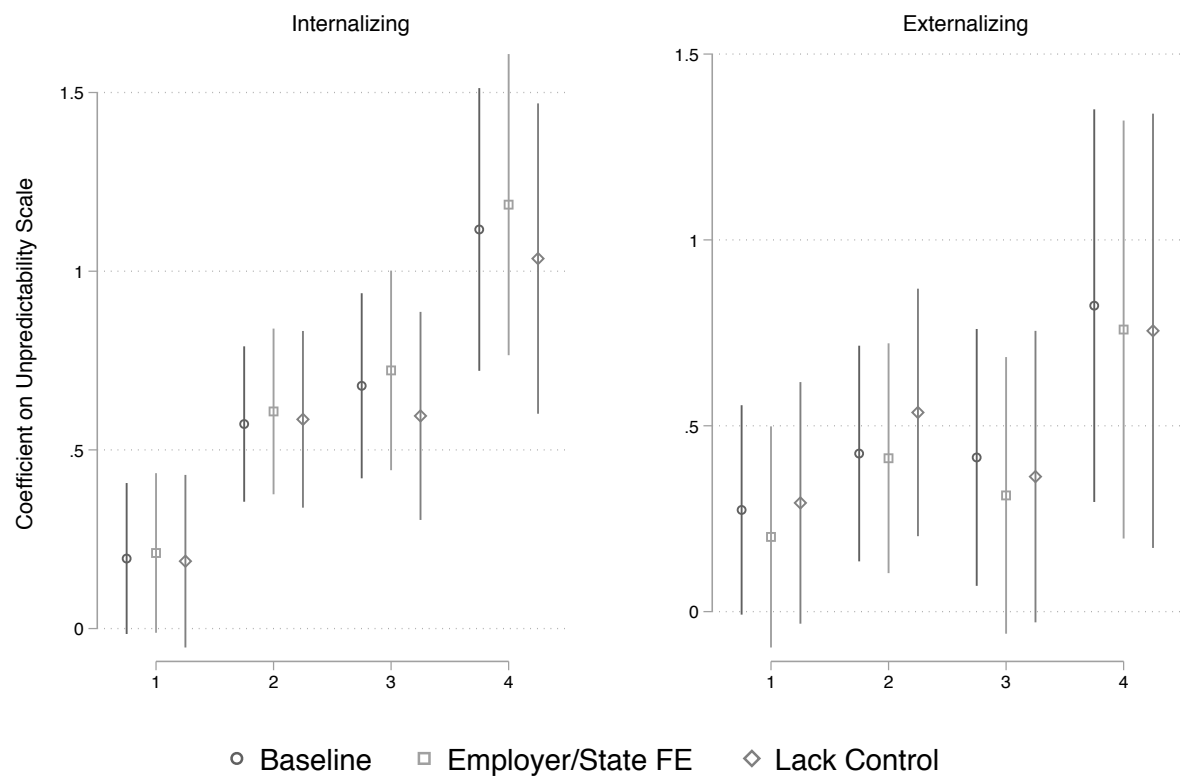
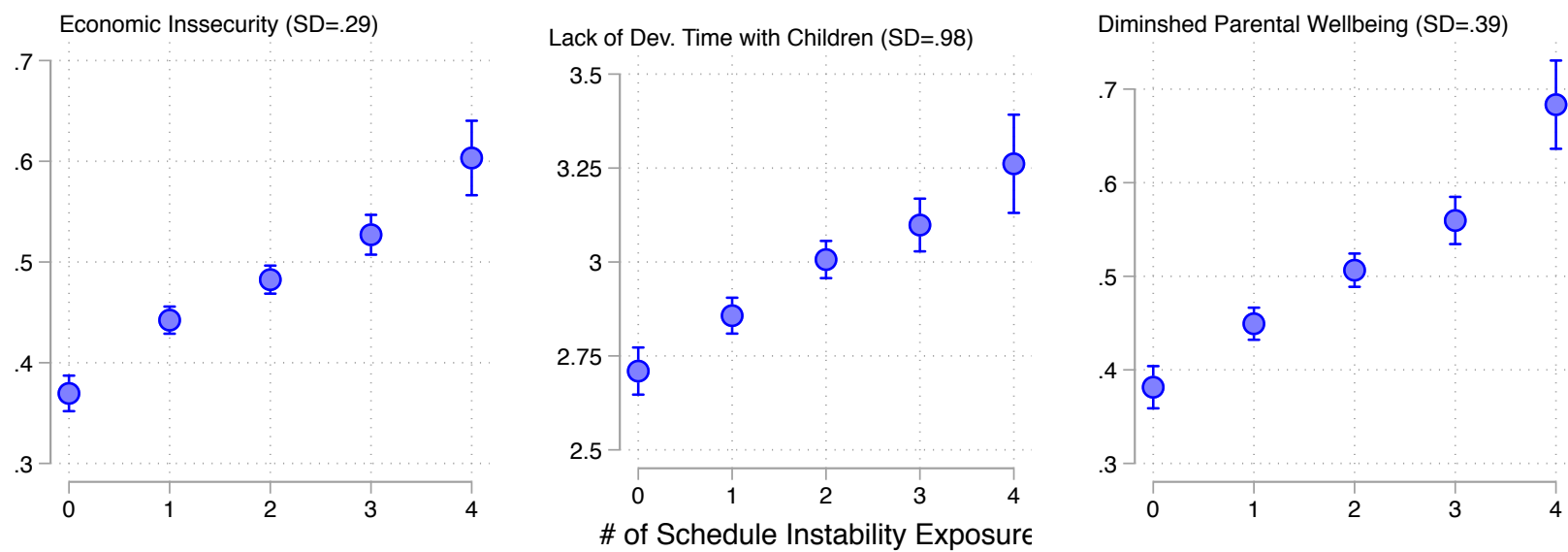


Figure 4: Schedule Unpredictability and Mediating Factors



**Table 1. Descriptive Statistics**

<b>Household Income</b>		
Less than \$15K		18%
\$15K - \$25K		24%
\$25K - \$35K		17%
\$35K - \$50K		17%
\$50K-\$75K		13%
\$75K - \$100K		6%
\$100K or more		4%
<b>Parent Age</b>		
Mean		35.6
Median		35
<b>Parent Gender</b>		
Female		78%
<b>Parent Race/Ethnicity</b>		
White, non-Hispanic		77%
Black, non-Hispanic		4%
Hispanic		12%
Other or Multiple		7%
<b>Parent Educational Attainment</b>		
Less than HS		42%
HS or GED		49%
Some College or More		8%
<b>Parent School Enrollment</b>		
Currently Enrolled		7%
<b>Parent Marital Status</b>		
Married		45%
Cohabiting		27%
Single		28%
<b>Child Age</b>		
Mean		7.8
Median		7
<b>Child Gender</b>		
Female		48%

**Table 2: Schedule Unpredictability and Child Behavior**

	(1)	(2)
	Internalizing	Externalizing
<i>On Call Shift</i>		
No	0.00	0.00
Yes	0.36***	0.28*
<i>Cancelled Shift</i>		
No	0.00	0.00
Yes	0.42***	0.26+
<i>Change to Schedule Timing</i>		
0	0.00	0.00
1 yes	0.48***	0.33**
<i>Cloping Shift</i>		
No	0.00	0.00
Yes	0.32***	0.11
Observations		

**Table 3: Schedule Unpredictability Scale and Child Behavior**

	(1)	(2)
	Internalizing	Externalizing
<i>Unpredictability Scale</i>		
0	0.00	0.00
1	0.20+	0.25+
2	0.58***	0.41**
3	0.69***	0.41*
4	1.11***	0.80**
Observations	4275	4275

**Table 4: Mediation of Schedule Unpredictability and Child Behavior**

	Internalizing	Externalizing
<i>1 Exposure</i>		
Total Effect	0.20+	0.25+
Direct Effect	0.04	0.05
Indirect Effect	0.16	0.20
Economic Insecurity	24%	23%
Time with Children	16%	15%
Parental Wellbeing	42%	41%
<i>2 Exposures</i>		
Total Effect	0.58***	0.41**
Direct Effect	0.29**	0.06
Indirect Effect	0.30	0.36
Economic Insecurity	13%	22%
Time with Children	11%	18%
Parental Wellbeing	27%	46%
<i>3 Exposures</i>		
Total Effect	0.69***	0.41*
Direct Effect	0.28*	-0.08
Indirect Effect	0.41	0.49
Economic Insecurity	15%	30%
Time with Children	13%	24%
Parental Wellbeing	32%	65%
<i>4 Exposures</i>		
Total Effect	1.11***	0.80**
Direct Effect	0.46*	0.02
Indirect Effect	0.65*	0.78*
Economic Insecurity	14%	23%
Time with Children	11%	17%
Parental Wellbeing	34%	57%